Development of answers and explanations to contextually demanding questions: A study of three- to nine-year-old Finnish children

Soile Loukusa¹,², Eeva Leinonen² and Nuala Ryder²

¹University of Oulu, Finland and ²University of Hertfordshire, UK

Abstract
This paper presents some findings about studies investigating how children’s ability to answer pragmatically demanding questions and explain their correct answers develops between the ages of 3 and 9 years in Finnish children (Loukusa, 2007; Loukusa, Leinonen & Ryder, 2007; Loukusa, Ryder, & Leinonen, in press). In this paper we summarize the results concerning questions demanding processing of implicatures, routines and feelings. The results of these studies showed that the largest increase in answers to routine and implicature questions occurred between the ages of three and four. In feeling questions rapid development occurred between ages of three and five. After that development progressed more gradually until the age of eight when the children performed near the ceiling level in all of the question types. Giving explanations for correct answers developed gradually between the ages of three and nine which indicated that becoming aware of the information used in inference has a longer developmental timeframe.

1 Introduction

Communicating successfully calls for the ability to go beyond the information given linguistically. Development of pragmatic ability can be defined as children’s progressing ability to use context in language comprehension and expression (Leinonen, Letts, & Smith, 2000). Children’s ability to interpret the meaning that is not explicitly encoded in the linguistic expression begins to develop from an early age (e.g., Bezuidenhout & Sroda, 1998; Jaswal & Markman, 2001; O’Neill, 1996).

As children develop they become more able to utilise more diverse contextual information in their communication in a flexible way (Ryder & Leinonen, 2003). It can be shown that processing demands differ according to the pragmatic complexity of indirect utterances, and the child’s performance is affected by these processing demands. In a study by Bucciarelli, Colle and Bara (2003), simple direct requests and simple indirect requests were equally easy to comprehend by children from 2:6 to 7 years. However, complex indirect utterances were more difficult for all age groups. Already young children have an ability to utilise contextual information in simple familiar situations, but they have difficulties in more complex tasks where they have to consider and connect information from different, more demanding and less familiar
sources (Bezuidenhout & Sroda, 1998; Bucciarelli et al., 2003; Ryder & Leinonen, 2003).

Ability to answer pragmatically demanding questions is dependent on many developmental factors. Linguistic ability makes it possible to understand linguistic information of an utterance and formulate a verbal answer. When utilising contextual information, a child needs the ability to pay attention to relevant factors (Buckley, 2003; Wilson & Sperber, 1988). An ability to operate and store information is essential, and development of memory is therefore one factor supporting the development of utterance comprehension (Gathercole & Baddeley, 1993; Wilson & Sperber, 1988). Inference can be seen as a cognitive process to connect information from different sources. It is an especially important ability when deriving an implied meaning of an utterance, as shown by studies about text comprehension in children (Cain & Oakhill, 1999; Oakhill & Yuill, 1996). In the interpretation of utterances children’s own world knowledge and beliefs play an important role. Over time, children gradually increase their world knowledge, which they are able to utilise when comprehending later utterances (Donaldson, 1992). In interpretation of indirect utterances, also mind-reading ability is needed which is considered to be an ability to infer one’s own and other’s beliefs, intentions and emotions (Baron-Cohen, 2000). In general, the basic understanding of mind develops in children between the ages of three and five years (Wellman, Cross, & Watson, 2001; Wellman & Lagattuta, 2000), which is the same age when the development of pragmatic comprehension progresses actively (e.g., Bucciarelli et al., 2003; Ryder & Leinonen, 2003).

There may be situations where a child understands an utterance but he/she cannot express why or how he/she knows it. Even if the ability to explain is a verbal activity, in order to give a relevant explanation child has to use many cognitive abilities, for example, an ability to distinguish between action and intention and between pieces of evidence and conclusion (Donaldson, 1986). By studying children’s spontaneous language use it has been found that children occasionally start to explain their own inferences as early as just before the age of 3 years (Bartch & Wellman, 1995). Even if 3-year-old children sometimes realise that mental states exist in their own and others’ minds, the ability is not fully developed and young children lack the ability to generalise from this knowledge. Developmentally it is a long process to become fully aware of one’s own processing in different situations (Donaldson, 1986; Letts & Leinonen, 2001). In a study by Donaldson (1986), it was found that although three-year-old children distinguished between cause and effect, it was only at the age of eight when they had the ability to use because and so when giving deductive explanations.

In this paper we present some findings of our earlier studies investigating how three to nine year olds Finnish children answer questions demanding processing of implicatures, routines and feelings and how they can explain their correct answers (Loukusa, 2007; Loukusa, Leinonen & Ryder, 2007; Loukusa, Ryder & Leinonen, in press). At this point we want to bring out that the above mentioned original papers contain also children’s answers in different kind of question types, for example, in the study by Loukusa et al. (2007) we have investigated children’s answers to implicature, reference assignment and enrichment questions of which only answers to implicature questions are summarized in this paper.

In our studies question answering is approached from a framework based on relevance theory (Sperber & Wilson, 1995). Relevance theory aims to explain how the hearer interprets speaker’s meaning on the basis of contextual factors and it is based on the assumption that utterances usually have many possible interpretations that are compatible with the linguistic information. However, all of these interpretations are not equally likely to come to a hearer’s mind at any one point,
because comprehension is driven by a search for relevance, and the hearer therefore utilises only relevant contextual information when interpreting the meaning of an utterance. In our studies, the relevancy of the answers given by the children was assessed on the basis of relevance theory. Thus, here relevant not only means that an answer is on topic, but the answer was also expected to show that the child had utilised a part of the context that was relevant in relation to the question.

2 Method

2.1 Participants

210 normally developing Finnish children aged from three to nine years participated in the studies by Loukusa (2007) and Loukusa et al. (2007, in press). There were thirty children in each age group except 29 children in eight-year-olds and 31 children in nine-year-olds. Children’s normal language development was verified by asking the children’s parents to fill in a preliminary data sheet, where questions were asked about their child’s developmental history and by using the Boston Naming Test (Kaplan, Goodglass, & Weintraub, 1983; Laine, Koivuselkä-Sallinen, 1997) and the auditory association subtest of the Illinois Test of Psycholinguistic Abilities (ITPA, Blåfield & Kuusinen, 1974; Kirk, McCarthy, & Kirk, 1968).

2.2 Material

The children were asked questions based on pictures, short verbal scenarios and short stories. In this paper we summarize results of answers to questions demanding processing of implicature, routine and feeling. In addition we summarize results about how children succeeded to explain their correct answers.

Implicature questions required the child to connect world knowledge and the given context in order to reach the intended meaning. Routine questions were otherwise similar to implicature questions, but were based on very familiar everyday context, which may lead to automatic accessing of routine answers. Feeling questions targeted the feelings of a character in the scenario. (See more information and examples of these question types in Loukusa et al., 2007, in press.)

3 Results

The results of our studies (Loukusa, 2007; Loukusa et al., 2007, in press) indicated that the greatest increase in correct answers occurred between the ages of 3 and 5. After that development progressed more gradually.

Our studies have shown that from the age of five onwards 80% of the answers were correct for routine questions; from the age of six to seven onwards 80% were correct for feeling questions and from age seven onwards 80% were correct for implicature questions (Figure 1).
The children who gave correct answers were not always able to provide adequate *explanations* for their answers. In this study, children were fairly competent (> 80%) at explaining correct routine and feeling answers by the age of eight and implicature answers at the age of nine (Figure 2).
The relationship between correct answers and correct explanations was compared. It was apparent that there was a difference in the relationship between feeling answers and feeling explanations compared to the relationship between answers and explanations to routine and implicature questions (compare Figures 1 & 2). Children over the age of five had as many correct explanations for feeling questions as for routine questions. However, because there were many more correct routine answers than feeling answers, the proportion of correct explanations was greater for feeling questions than routine questions.

4 Discussion

As expected, compared to other question types routine question was the easiest question type so familiarity of context had a significant effect on young children’s ability to answer questions (Loukusa et al., in press). Thus, even though young children can already perform in routine type indirect questions, through development they also become able to integrate and manipulate contextually relevant information in order to answer more demanding questions.

In our studies (Loukusa, 2007; Loukusa et al., 2007, in press) the largest increase in correct answers in answers to routine and implicature questions was seen between the ages of three and four, while for feeling questions this rapid development continued until the age of five. This remarkable developmental phase in the
comprehension of contextual meanings may be related to the development of other functions at that age, such as the development of working memory (Gathercole & Baddeley, 1993), the development of inferencing skills (Bucciarelli et al. 2003), the ability to direct attention (Buckley, 2003), and the ability to understand the mind of others (Wellman & Lagattuta, 2000). Between the ages of three and four children gain many new experiences and thus their world knowledge increases, which directly affects their ability to derive meanings from context (Milosky, 1992).

Although some of the younger children were able to explain a few of their answers correctly, it takes many years for the child to become properly aware of the information that he/she has utilised in the comprehension of an utterance, and to be able to verbalise this information (Loukusa, 2007; Loukusa et al., in press). Becoming aware of the processes involved in providing an answer requires metacognitive abilities showing again how cognition is connected with the development of pragmatic comprehension.

The relationship between feeling answers and feeling explanations was different from that between answers and explanations for routine and implicature questions (see Loukusa, 2007; Loukusa et al., in press). Children were more aware of the information they had used when deriving answers to feeling questions compared to the routine and implicature questions. Children aged five and more had as many correct explanations for feeling questions as for routine questions. Because there were many more correct routine answers than feeling answers, the proportion of correct explanations was greater for feeling questions than for routine questions. This meant that children were more aware of the information they had used when deriving feeling answers. One explanation for this could be that in everyday life, children have more experience of explaining feelings since they are often asked to explain reasons for their own feelings (e.g. “Why are you angry?”), and parents also quite often verbalise reasons for feelings in their everyday speech.

5 Conclusion

Developmental changes in answering questions indicate children’s increasing ability to use more complex contextual information in comprehension process. The becoming aware of the information used in making inferences is a gradual process occurring between the ages of three and nine and for some children development still continues after the age of nine.

Acknowledgements

Thanks for the help and comments are due to speech and language therapists Sirpa Sakko and Kati Tauriainen, Professor Matti Lehtihalmes and Professor Pirjo Korpilahti. The studies concerning development of pragmatic language comprehension are financially supported by the Finnish Cultural Foundation, the Helsingin Sanomat Centennial Foundation, Finland and the Finnish Association of Speech Therapist.

References


