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DEVELOPMENT OF COMPREHENSION OF IRONIC UTTERANCES IN 3- TO 9-YEAR-OLD FINNISH-SPEAKING CHILDREN

This study explores the comprehension of simple ironic utterances in 210 Finnish children aged from 3 to 9 years. If the child answered the question correctly, he/she was asked to explain correct answers. The results indicated that there was large individual variation within age groups both in answers and explanations. In terms of correct answers there was a significant difference between 6- and 7-year-olds and in correct explanations between age groups of 3–4, 6–7 and 7–8. Analysis of incorrect answers showed that literal interpretation of an utterance was the most common incorrect answer type in all age groups. Totally irrelevant answers occurred only in children aged 3 and 4. In terms of incorrect explanations, "turntaking" and "incorrect focus" categories were the most common incorrect explanation types. Contrary to previous studies, in this study already some of the 3- and 4-year-olds showed an emerging ability to comprehend irony.
Key words: ironic utterances, comprehension of irony, verbal irony vs. literal language

Introduction

In everyday communication there are sometimes situations where people use verbal irony instead of literal language. This means that a speaker says one thing and means something entirely different and thus there is a discrepancy between the literal meaning and the speaker's intent (Mey, 2001, p. 44). The meaning of an ironic utterance can be perceived as the result of incongruity between the statement and the context (Ivanko & Pexman, 2003). An ironic utterance involves the implicit expression of a speaker's attitude (Giora, 1995; Sperber & Wilson, 1995, pp. 238-

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239). Ironic criticism is one common form of verbal irony. In ironic criticism the speaker says something positive instead of negative and thus criticism is expressed indirectly. Verbal irony is typically accompanied by a special intonation (e.g. mocking) and certain kinds of behavioral cues such as facial expressions (e.g. smirking) and bodily gestures (e.g. making a fist). When interpreting ironic utterances it has been found that both adults and children rely more on behavioral cues than an intonation (Winner, 1988, p. 148-152). A close relationship between the speaker and the hearer facilitates understanding of irony (Pexman & Zvaigzne, 2004).

There are several theories that try to explain how irony is processed (e.g., Gibbs & Moise, 1997; Gibbs, 2002; Giora, 1997, 2002) and, in addition, traditional pragmatic theories (Grice, 1975; Sperber & Wilson, 1995) have been used when explaining ironic comprehension. At the moment researchers do not entirely agree on whether what is said literally should first be analyzed before inferring a contextually consistent meaning. Gibbs and Moise (1997) suggest that in a sufficient context people understand nonliteral meanings without first analyzing the complete literal meaning. This direct access model is also supported by the study of Ivanko and Pexman (2003), while Giora (1997, 2002) suggests that the salient literal meaning is interpreted first except in cases of familiar irony.

Interpretation of verbal irony demands the hearer's understanding of the speaker's thoughts so that ironic utterances are always at least second-degree interpretations. Incongruity between what is said and the facts of the matter can be seen as a reliable cue to ironic intent. However, it is clear that the incongruity between the speaker's attitude and action is not similar in all cases and the degree of discrepancy affects the perception of irony (Gerrig & Goldvarg, 2000).

In interpreting ironic utterances, the hearer must use contextual information in order to derive the intended meaning (Cummings, 2005, p. 14; Ivanko & Pexman, 2003). Context can be seen as an extensive and multidimensional concept, which includes cognitive, social, linguistic, physical, and other non-linguistic contexts (Milosky, 1992; Prutting, 1982). Therefore, context can be said to encompass all the information that the hearer utilises when interpreting utterances. When interpreting contextual factors, there is a need to make connections between information and to link information together. Therefore, inference plays a significant role in the comprehension process (Leinonen, Letts, & Smith, 2000, pp. 130-132).

Understanding of verbal irony is one important aspect of social-cognitive development (Pexman & Glenwright, 2007; Pexman, Glenwright, Krol, & James, 2005). Children's ability to understand verbal irony depends on their neural maturation, mentalizing skills, and social learning that develops between middle and late childhood (Pexman & Glenwright, 2007). According to Winner (1988, pp. 181-182) in order to interpret an ironic utterance correctly the child has to have the ability to detect incongruity or falsehood, to avoid taking irony as error, to interpret beliefs of another's mind and avoid taking irony as deception. Earlier studies suggest that the ability to recognize the intent behind verbal irony starts to

develop between five and six (Dews et al., 1996; Harris & Pexman, 2003; Winner, 1988, p. 133-135).

Children understand ironic criticism more easily than ironic compliments (Hancock, Dunham, & Purdy, 2000; Pexman & Glenwright, 2007). In everyday language use people tend to use ironic criticism more often than ironic compliments and thus expectations affect the understanding of statements. The study by Pexman, Glenwright, Hala, Kowbel, and Jungen (2006) found that five- and eight-year-old children's interpretations of ironic remarks were affected by a speaker's personality traits. In ironic criticism conditions children rated nice speakers to be less mean than mean speakers in the same conditions suggesting that children integrate trait information with other sources of information in deriving the speaker's intent. The study by Pexman et al. also showed that between the ages of five and eight there is a remarkable improvement in the speed with which children are able to coordinate different sources of information to arrive at an understanding of verbal irony. The researchers suggest that increasing cognitive abilities and knowledge are central factors behind these developmental changes.

According to the study by Pexman et al. (2005) children aged seven to ten perceive verbal irony in a different way than do adults. Children understand that an ironic speaker's belief is opposite to his/her stated belief, but they cannot yet share adults' understanding that ironic remarks are funnier and more teasing than are literal remarks. Similar kinds of findings were found earlier by Dews et al. (1996) whose study showed that adults find subtler forms of irony funnier than do children.

Although several studies have assessed children's understanding of verbal irony, there is still a need for studies with a wider age distribution to chart the developmental course of the processing of ironic utterances. In addition, research into development of comprehension of irony in other languages than English has been scarce and it is an open question whether the results of English-speaking children can be generalized to other cultural settings and other languages. In addition, there is still lacking a knowledge about how aware children are from the contextual factors they have utilized in the interpretation of an utterance. In other words, if a child can interpret an ironic utterance, can he/she explain how he/she interpreted it?

In this study we examine comprehension of four simple ironic utterances in a large population of Finnish children aged from three to nine years. We have used ironic utterances where the discrepancy between statement and context is clear. In the case of incorrect answers, the children were asked a follow-up question in an attempt to elicit an explanation. The data of incorrect answers and explanations have been analyzed by using subcategories reflecting what kind of answering strategies children use when they have difficulties in detecting a correct answer or explanation.

Method

Participants

All children were Finnish-speaking and lived in the city of Oulu in Finland. The age range of the children was from 3 to 9 years. The children came from eight day nurseries and two mainstream schools. Parents of 248 children gave permission for the study. Only children with normal development were accepted. This was verified by asking children's parents to fill in a preliminary data sheet, where questions were asked about their child's developmental history. In addition to the preliminary data sheet, parents of school age children (7-year-olds and older) were asked to complete The High-Functioning Autism Spectrum Screening Questionnaire (ASSQ, Ehlers, Gillberg & Wing, 1999) to ensure that there were no children with autism spectrum disorder in the group which could affect the performance in ironic questions. Parents of the younger children did not complete the ASSQ, because there are no normative data available for children younger than 7 years, and because some traits in ASSQ are acceptable in younger children. Therefore, younger children's normal development and behavior were confirmed by their nursery school teachers. On the grounds of the preliminary data, 35 children were excluded from the study.

213 children participated in this study. In addition to the pragmatic material, the Boston Naming Test (Kaplan, Goodglass & Weintraub, 1983; Laine *et al.* 1997) and the auditory association subtest of the Illinois Test of Psycholinguistic Abilities (ITPA, Blåfield & Kuusinen 1974; Kirk, McCarthy & Kirk, 1968) were administered to the participants to assess normal language development. In the research situation three children (3-, 4- and 7-year-old) demonstrated motivation or language problems and because of that they were excluded from the data. All in all, the data of 210 children were analyzed (Table 1).

Materials

The material of this study contained four questions that required the child to connect his/her world knowledge with the given verbal context in order to derive the intended meaning of the ironic question. Questions were designed to be linguistically easy and short in order to minimize memory load. In addition to these questions, the children were asked to give explanations for their correct answers in order to see if the children were aware of how they had derived their answers. English translations of the questions are presented as follows:

1) "It is raining outside. Mother looks out of the window and says (in a sarcastic way): "What a *wonderful* day. What does the mother mean?"
   Follow-up question: "How do you know that?"

2) "A boy drops eggs and they break. Father says to the boy (in a sarcastic way): What a *clever* thing to do. What does the father mean?"
   Follow-up question: "How do you know that?"

Table 1. Characteristics of age groups

| | Age groups | | | | | | |
	3 yrs	4 yrs	5 yrs	6 yrs	7 yrs	8 yrs	9 yrs
Number	30	30	30	30	30	29	31
Boys/girls	15/15	17/13	9/21	10/20	11/19	7/22	18/13
Age							
M	3;5	4;6	5;5	6;4	7;5	8;7	9;6
SD	0.40	0.35	0.35	0.36	0.30	0.35	0.33
Naming[a]							
M	17.8	29.1	31.7	36.3	38.5	42.7	45.7
SD	6.90	6.99	5.01	5.82	7.24	7.15	6.53
Auditory association[b]							
M	6.2	13.6	17.7	22.6	25.9	31.5	33.0
SD	5.40	6.76	6.43	6.20	6.53	6.58	5.77

[a] The Boston Naming Test

[b] Subtest of ITPA

3) "Pekka was at a birthday party where Matti bullied him. When Pekka came home he said (in a sarcastic way): What a *fun* party that was. What does Pekka mean?"
Follow-up question: "How do you know that?"
4) "A boy kicks the little girl next door. At home the father says to the boy: (in a sarcastic way) You were so *kind* again. What does the father mean?"
Follow-up question: "How do you know that?"

Procedure

Each participant was tested individually in a quiet room. Children aged from three to six years were tested in their day nurseries and children aged seven to nine years in their schools. Investigations of three-, seven-, eight- and nine-year-old children were performed by the speech and language therapist, and those of children aged four-, five- and six-year-olds by one of two final year speech and language therapy students.

Analysis

The research sessions were videotaped and the children's answers were later orthographically transcribed and analyzed by the speech and language therapist. The answers were first scored as correct or incorrect. After correct – incorrect scoring, the children's incorrect answers were classified into different answer categories as follows:

Incorrect focus. The child fails to address the focus of the question accurately, so the answer remains inaccurate and cannot therefore be accepted as being correct. Although the child is not able to answer the question accurately, the answer does not show any utilisation of an irrelevant part of the context. Compared to the other categories, the incorrect answers classified in this category are closest to the correct answers.

Don't know. The child answers, "I don't know".

Literal. The child's answer shows that she has interpreted the utterance on the basis of the linguistic meaning of words.

Irrelevant. The answer does not contain anything that the researcher could connect with the context of the question.

Other. The child's answer does not fit into any of the categories above, or he/she gives no reply.

If the child answered correctly, the follow-up question was presented. Answers to these follow-up questions were also first scored as correct or incorrect. If the child explained his/her initially correct answer incorrectly, an incorrect explanation was classified in categories: "incorrect focus", "don't know", "turntaking", "irrelevant", "knowledge" and "other". Definitions of "incorrect focus", "don't know", "irrelevant" and "other" categories were similar to the classifications of incorrect answers (see above). "Turntaking" and "knowledge" categories were defined as follows:

Turntaking. The child uses a routine phrase to answer. When asking "How do you know that?" the child answers, for example, "Like that".
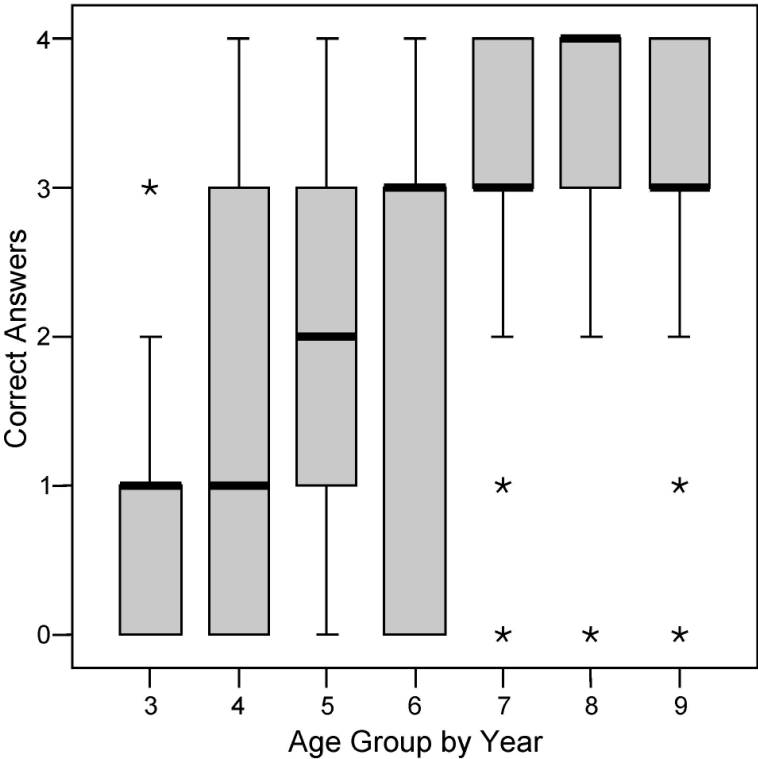
Knowledge. The child gives general information or talks about his/her own experiences which are in some way loosely connected semantically to the question, but do not fit into the particular context of the question.

Results

Statistical methods were used to examine differences between age groups in answer and explanation scores. Because the data did not have normal distribution and variances were unequal, nonparametric tests were used in these comparisons. The reliability of scoring was confirmed by calculating interrater reliability. The interrater reliability between two raters with a sample of 21 children, involving three children from each age group, was 0.995 for answer scores and 0.995 for explanation scores.

For answer and explanation categories the present study is descriptive by nature. The data of answer and explanation categories have been presented graphically in order to show what kind of incorrect answers are the most typical in each age group.

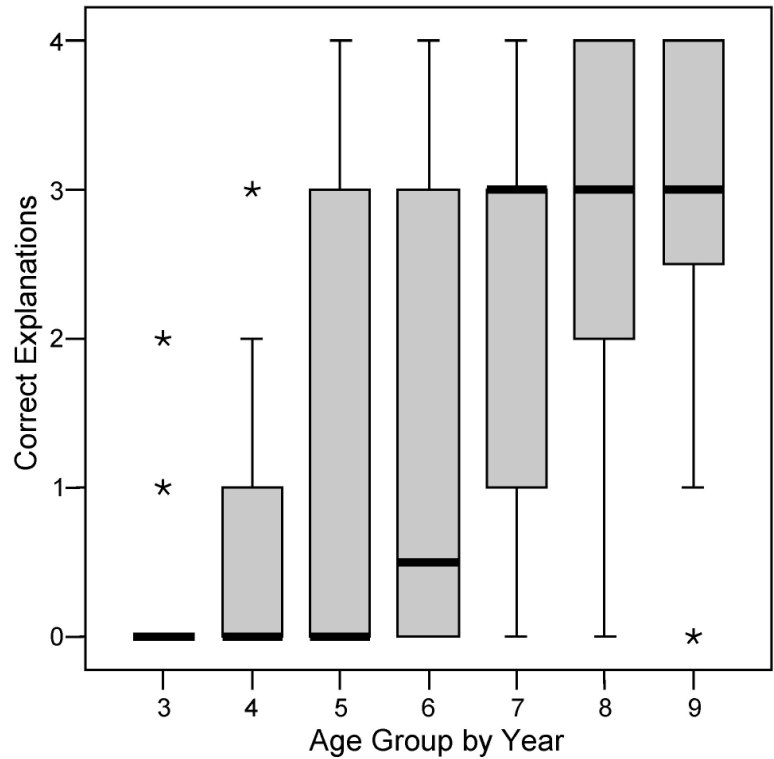Figure 1. Correct answers as a function of the age group

Comparison of scores of correct answers and explanations

Variation of children's correct answers and explanations as a function of age group can be seen in Figures 1 and 2. There was a significant effect of age group for the correct answers and correct explanations by the Kruskal Wallis test: $\chi^2 = 65.184$, df = 6, p < 0.001; $\chi^2 = 82.315$, df = 6, p < 0.001.

The answer scores of younger children were lower when compared to the scores of older children (see Figure 1). Variation of answer scores was especially large in age groups of four, five and six years. When comparing performance of adjacent age groups, pairwise comparison by Mann-Whitney U test showed that a significant difference in answer scores was evident between six- and seven-year-olds (U = 308.50, p = 0.043). In addition, a non-significant trend was found between three- and four-year-olds (U = 336.50, p = 0.078).

Figure 2. Correct explanations as a function of the age group. Explanation question was only asked if a correct answer was given
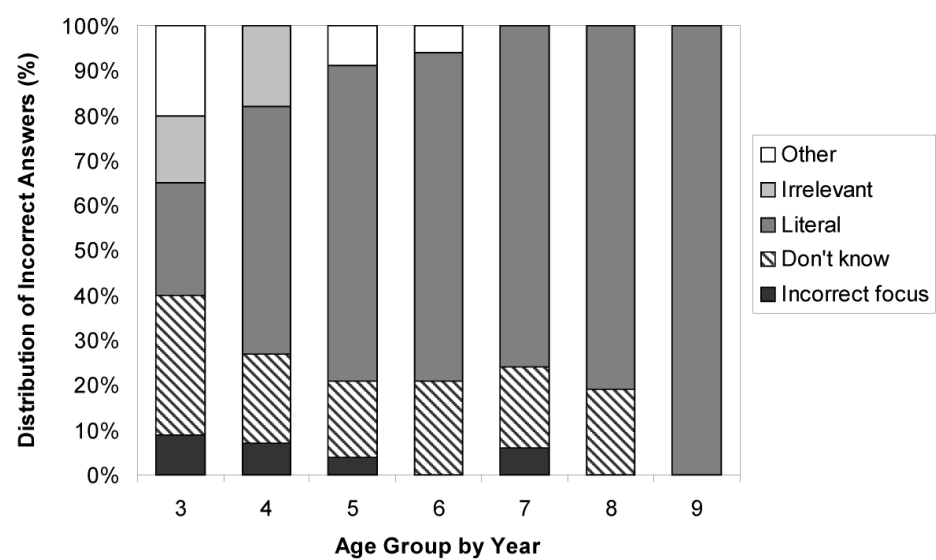

In explanations, the variation within age groups was large especially in the older children. It was common also for some of the older children to struggle when trying to explain their initially correct answers (see Figure 2). For the explanation scores pairwise comparisons by the Mann-Whitney U test indicated that when comparing adjacent age groups there was a significant age effect between the three- and four-year-olds (U = 323.00, p = 0.011), six- and seven-year-olds (U = 270.50, p = 0.010) and the seven- and eight-year-olds (U = 285.00, p = 0.029).

Incorrect answer categories

As shown above more incorrect answers were elicited from younger children and the number of incorrect answers diminished with progressing age. Here, the incorrect answers are presented in proportion to all incorrect answers within each age group (Figure 3).
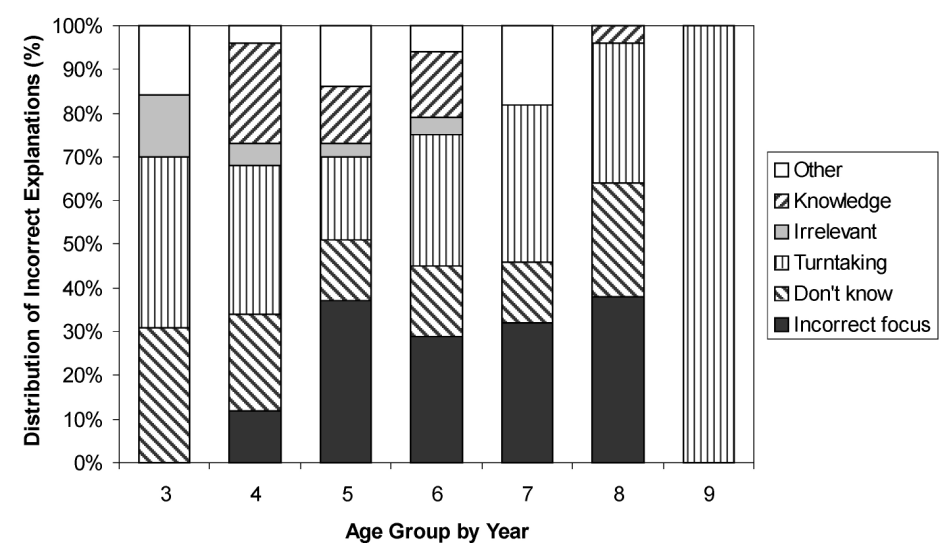
Figure 3. Distribution of incorrect answers within each age group

Literal interpretation of ironic utterances was a common incorrect answer type in all age groups and only incorrect answer type of nine-year-old children (Figure 3). However, qualitative inspection of answers classified to the literal interpretation category showed that even if older children did not always succeed to interpret ironic meaning of an utterance they had used inference in their answers in order to make their answers more reasonable. For example, in question where the mother said that "What a wonderful day" when it was raining, it was typical for younger children to answer that mother means such as "That it is a wonderful day" (a girl aged 3;3 years). Whereas for older children it was typical to answer something like "That after the rain there is a rainbow outside" (boy aged 9;4 years). Thus, even if the nine-year-old boy has interpreted a question literally (mother means that weather is wonderful), his answer was more reasonable compared to the answer of the three-year-old girl and showed the use of deduction. In addition to answers classified as "literal", also "don't know" answers were common in all age groups from three to eight years.

About 17% of three-year-olds' answers and about 18% of four-year-olds' answers were classified as irrelevant. These answers were in no way connected to the context of the question. For example, when asked what the father meant when he said "You were so kind again" to the boy who kicked the little girl, a girl aged 3;1 answered: "He means worms." Older children did not have any irrelevant answers.

Figure 4. Distribution of incorrect explanations within each age group

Incorrect explanation categories

Unexpectedly, all incorrect explanations of nine-year-olds were classified to the "turn-taking" category (Figure 4). This meant that when asking for explanations of their correct answers, the children just answered such as "like that". "Turn-taking" answers were also common in other age groups and especially in children aged three, four, seven and eight years. The "incorrect focus" explanations were common for children aged between five and eight years. This meant that in these explanations children failed to address the focus of the explanation, so the explanation remained inaccurate although it did not show any utilization of an irrelevant part of the context. For example, when asking "How do you know that?" the child answered such as "*Because he said*". It was also common for children aged three- to eight years to answer "don't know" when asked for explanation. About 15% of three-year-olds' explanations were totally "irrelevant". Also children aged four to six gave a couple of "irrelevant" explanations.

Discussion

This study has focused on comprehension of ironic utterances in a population of normally developing three- to nine-year-old Finnish-speaking children. Most of the earlier studies concerning development of comprehension of ironic utter-

ances have been done with English-speaking children (Dews et al., 1996; Hancock et al., 2000; Pexman & Glenwright, 2007; Pexman et al., 2005, 2006) so this study provides information about the development of comprehension of irony in children speaking a different language and of a different cultural background.

Earlier studies have suggested that comprehension of irony starts to develop between the ages of five and six (Dews et al., 1996; Harris & Pexman, 2003; Winner, 1988, p. 133-135). This study suggests that some children start to recognize correctly the intent behind verbal irony as early as at the age of 3 and 4 even if the ability is still somewhat limited. However, on the basis of this study we cannot be sure that is it so that some children have figured out that some words normally used to indicate positive feelings can also be used to indicate negative feelings (see Winner 1988, p. 133), or is it really so that some young children can understand ironic utterances where the discrepancy between statement and context is clear? In any case this is an interesting finding and shows that developmental studies on ironic comprehension by younger children and children of different languages and cultural backgrounds are needed. In our earlier studies investigating other aspects of pragmatic comprehension in Finnish children, we found that some Finnish children learn to answer questions demanding recovery of implicature already at the age of three (Loukusa, Leinonen, & Ryder, 2007, see also Loukusa, Ryder, & Leinonen, 2008) whereas in an English study all three-year-olds were unable to answer implicature questions correctly (Ryder & Leinonen, 2003). Thus, it remains an open question whether there can be some differences in general language use between different cultural backgrounds which could explain why some Finnish children seem to learn to detect intentions behind utterances early.

Even if there were some young children who showed an emerging ability to understand simple ironic utterances, only between six and seven years of age the majority of children became able to detect an intention behind an ironic utterance, which is the age when the development of understanding irony is suggested to start in earlier studies (e.g., Dews et al., 1996; Harris & Pexman, 2003). The understanding of ironic utterances is cognitively challenging and it takes many years for the child to become able to detect irony in utterances. Without the ability to infer another person's beliefs it is not possible to understand irony. In general, the basic understanding of minds has been suggested to develop in children between ages of three and five years (Siegal & Beattie 1991, Bloom & German 2000, Wellman & Lagattuta 2000, Wellman, Cross, & Watson, 2001).

Looking at the distribution of the data it was noted that in children aged 3 to 6 the variation within age groups was large so there is a remarkable individual variation in the development of irony. In the future it would be interesting to study more specifically what factors affect the development of irony. It may be that, for example, some children get more experience about ironic language from their parents or hear how older children use ironic utterances when talking to each other.

The categorization of children's incorrect answers showed that literal understanding caused most of the incorrect answers. Looking at the literal answers of younger and older children, it was obvious that their answers differed. When older children understood utterances literally, they tried to formulate a rational answer, which showed that an answer was derived via deduction even if it remained incorrect and reflected literal comprehension. The second common answer category was "don't know". In children aged three and four there occurred also answers which were classified as irrelevant. In these unsophisticated answers children seemed to say the first thing that came to their mind which may suggest that young children may use a naïve optimism strategy where they assume that the first thing that comes to their mind is what the hearer expects to hear (Sperber, 1994).

Using context in inference is often a very fast and automatic process (Blakemore, 1992). This might be related to our finding that children who initially gave a correct answer were not always able to provide an adequate explanation for it. In addition, becoming aware of the processing involved in an answer requires metacognitive abilities and it has been suggested that young children have general insensitivity to their own thinking (Eisbach, 2004; Flavell, Green, & Flavell, 2000). Thus, it is not surprising that young children struggled when they were asked to give explanations for their correct answers, suggesting that the development of the ability to explain answers takes place gradually over time throughout childhood. In these explanations in all age groups variation was large and there were children who were incapable of explaining in a relevant way how they knew or had derived an answer from context.

The categorization of incorrect explanations showed that "turntaking" explanations were the only incorrect type in nine-year-olds, the most common category in age groups of three-, four- and seven-year-olds and the second common category in five-, six- and eight-year-olds. In these explanations children used routine answers, such as "because" or "like that", in order to fulfill their obligation to provide an explanation. In these cases, we cannot be sure whether the children really knew the explanation, or whether they assumed that they had given a reasonable answer and the researcher would be able to understand and retrieve the relevant information used in the answer. Thus, it may not be obvious for the child that the answer was not explicit enough in that situation. In children aged five, six, and eight most of the incorrect explanations were classified as "incorrect focus" which showed that even if these children did not succeed in explaining their answers in a relevant way their explanations did not contain anything irrelevant but remained inaccurate and thus could not be accepted as a correct explanation.

In this study we investigated children's understanding of ironic utterances using four questions. The test questions were planned to contain information familiar to young children and that discrepancy between the statement and context

was clear and thus there was no need to process subtle information about the meaning of the utterance. This differs from most of the other studies which have used more complex and subtle ironical utterances and did not study young age groups. In addition, the test scenarios were short and contained words which should be familiar to young children. This way we tried to ensure that memory load or linguistic factors did not affect the children's performance. However, in everyday communication context is often more complex and many challenging contextual factors must be utilized at the same time in rapidly progressing communication. In addition, the small number of test questions diminishes the generalizability of the results.

Nevertheless, this study provides information of normally developing Finnish children's ability to answer questions and explain their answers. The findings are largely in line with studies of English-speaking children, even if in these data, surprisingly, some of the three-year-old children could answer the question and studies concerning English-speaking children have not mentioned that development of irony comprehension could start that early for some children. Thus, in the future, it would be important to include young children in studies on comprehension of irony if questions are designed so that linguistic and memory requirements are not too difficult for young children. In the future, it would also be interesting to compare irony comprehension of children with different language and cultural backgrounds in order to increase our information about general and culture-bound factors of language development.

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