Preschoolers can recognize violations of the Gricean maxims

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Abstract

Grice (*Syntax and semantics: Speech acts*, 1975, pp. 41–58, Vol. 3) proposed that conversation is guided by a spirit of cooperation that involves adherence to several conversational maxims. Three types of maxims were explored in the current study: 1) Quality, to be truthful; 2) Relation, to say only what is relevant to a conversation; and 3) Quantity, to provide as much information as required. Three- to five-year-olds were tested to determine the age at which an awareness of these Gricean maxims emerges. Children requested the help of one of two puppets in finding a hidden sticker. One puppet always adhered to the maxim being tested, while the other always violated it. Consistently choosing the puppet that adhered to the maxim was considered indicative of an understanding of that maxim. The results indicate that children were initially only successful in the Relation condition. While in general, children performed better at first in the Quantity condition compared with the Quality condition, 3-year-olds never performed above chance in the Quantity condition. The findings of the present study indicate that preschool children are sensitive to the violation of the Relation, Quality, and Quantity maxims at least under some conditions.

To communicate effectively with others, children need to learn more than just the semantics and syntax of their language; they also need to learn about the pragmatics. Children must be aware of a large body of implicit information on how to conduct a conversation. This conversational awareness is necessary for children to comprehend the intended meaning of another speaker and to successfully convey their own messages to others (Siegal, 1999). Pragmatics, according to Grice (1975), involves conversational implicature where the meaning of a statement is not explicitly stated but is instead implied. To aid one in determining the implicated meaning, Grice argued that there is logic to conversation in the form of implicit maxims that speakers follow. The four types of maxims suggested by Grice were:

Maxims of Quality

1. Be truthful

2. Only say that for which you have adequate evidence

Maxims of Quantity

1. Provide as much information as required

2. Do not provide more information than is required

Maxim of Relation

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Be relevant

Maxims of Manner

1. Avoid ambiguity

2. Avoid obscure expressions

3. Be logical in order of expression

4. Avoid superfluous expressions

These are not rigid rules that must always be followed, but are instead guidelines to assist in achieving the goal of cooperative conversation. In fact, they are routinely violated in a number of situations to create a certain effect. For example, in situations using sarcasm, a maxim of Quality is violated when the speaker purposely says the opposite of what is meant.

Limited research has examined children's understanding of the Gricean maxims and with mixed results. For example, Conti and Camras (1984) presented children a story with two alternative endings. Children were asked to identify which of the endings was 'silly', i.e. violated a Gricean maxim. They found that 6- and 8-year-olds were significantly above chance in identifying statements that violated the maxims, but 4-year-olds were not. Ackerman (1981) found that it was not until 8 or 9 years of age before children could explain maxim violations. Research into the use of the maxims of Quantity to interpret scalar implicatures, where a term like 'some' is used to imply 'not all' (Musolino & Lidz, 2002; Noveck, 2001; Papafragou & Musolino, 2003), or to resolve verbal ambiguity (Bredart, 1984; Jackson & Jacobs, 1982; Surian, 1991) has found that preschoolers performed more poorly than school-aged children and adults. However, Pellegrini, Brody, and Stoneman (1987) found that 2-year-olds rarely violated maxims of Quality and Manner in their own speech. Furthermore, a number of studies have found that 2-year-olds showed some sensitivity in their speech to the knowledge available to their listener, adhering to the maxims of Quantity (Dunham, Dunham, & O'Keefe, 2000; Ferrier, Dunham, & Dunham, 2000; O'Neill, 1996). These results suggest that perhaps children have some awareness of Gricean maxims at an earlier age than indicated in research requiring children to identify or interpret maxim violations.

The maxims of Quality have also been indirectly examined in the extensive literature on children's understanding of lying. Younger children might have an early knowledge of Quality as 3-year-olds have been found to have some basic understanding of lying and its moral implications (Bussey, 1992; Siegal & Peterson, 1996). Furthermore, preschoolers' can use a speakers' level of expertise (Lutz & Keil, 2002; Robinson & Whitcombe, 2003) or past history of reliability (Koenig & Harris, 2005) to determine whether they should trust what a speaker says. Although numerous studies have examined children's understanding of lying, there has been little research to date concerning children's understanding that there are conversational norms that apply to the use of lying. Furthermore, research has rarely examined the development of children's understanding of this maxim as well as the maxims of Relation and Quantity concurrently, making it unclear as to how children come to grips with these maxims in the course of development.

Sperber and Wilson's Relevance theory (1986/1995, 2002) may be useful for making predictions about the order in which children develop an awareness of the different maxims. According to Relevance theory, humans evolved the ability to detect what is relevant in their environment and, in terms of communication specifically, any utterance being delivered in conversation is presumed to be relevant. Also, the relevance of an utterance is presumed to be within a listener's ability to determine. If relevance does indeed play such a fundamental role in communication, as suggested by Relevance theory, children should be sensitive to the violation of the maxim of Relation before violations of the other types of maxims.

Siegal (1991, 1999) suggested that research into children's conversational awareness and their understanding of the violation of conversational norms is more than just of theoretical importance. It also has important methodological implications. For instance, the typical experimental procedure often involves violating Gricean maxims, such as the violation of a Quantity maxim when repeated questioning is necessary. If children do not recognize the purpose behind the violations, their abilities may be underestimated (e.g. Hansen & Markman, 2005; Waterman, Blades, & Spencer, 2004). Siegal argued that it is necessary to determine at what age children recognize that conversational norms can be violated in certain situations. However, it is necessary to first determine at what age children develop an awareness of conversational norms, such as the Gricean maxims, before trying to establish the age at which they understand when the norms can be violated (Lee & Eskritt, 1999).

The purpose of the present study was to determine 3- to 5-year-olds' sensitivity to three Gricean maxims and to compare their developmental progression. Specifically, we examined the maxims, 'Be truthful' (Quality), 'Be Relevant' (Relation), and 'Provide as much information as required' (Quantity). An experimenter hid a sticker under one of four cups. Children won the sticker if they could correctly guess which cup it was hidden under. To help them achieve their goal, children asked one of two puppets for help. One puppet always adhered to the Gricean maxims whereas the other always flouted one of the Gricean maxims. It should be noted that none of the Manner maxims were included. Grice (1975) proposed that the maxims of Manner were different from the other types of maxims as they concerned *how* a statement was made (i.e. in a timely and contingent manner) rather than concerning *what* was said. Therefore, the present study examined whether preschoolchildren recognized a difference in the nature of the answers produced by the two puppets by choosing the puppet that adhered to the Gricean maxims for help in finding the sticker.

Method

Participants

Children between 3 and 5 years of age were recruited from local day cares. Participants included seventy-nine 3-year-olds ($M = 3.46$ years, $SD = 0.3$), ninety-seven 4-year-olds ($M = 4.45$ years, $SD = 0.3$), and sixty 5-year-olds ($M = 5.3$ years, $SD = 0.3$). Roughly, equal numbers of males and females participated.

Procedure

Children were asked to play a guessing game where the goal was to find a sticker hidden under one of four different coloured cups. If they found the sticker, they could keep it. They were told that to help them pick the correct cup they could ask one of the two puppets for help. Unbeknownst to the children, one of the puppets (the Gricean follower) provided accurate information about the location of the sticker, whereas the other (the Gricean flouter) violated one of the Gricean maxims so that the information would not be helpful. There were three different conditions, one for each maxim. In the Quality condition, the puppet lied about the location of the sticker. For example, if the sticker was under the blue cup, the Gricean follower would say, 'It is under the blue cup', while the Gricean flouter might say, 'It is under the yellow cup'. The cup identified by the Gricean flouter was randomly predetermined. For the Quantity condition, the puppet did not provide enough information and said, 'It's under a cup' or 'It's under one of the cups'. For the Relation condition, the puppet gave an answer that was not relevant to the question such as, 'I like these cups' or 'These are pretty cups'. For each child, a different maxim was violated. A between-subjects design was used to avoid practice effects where children might transfer learning from one maxim condition to another.

The game started with four practice trials so children could learn about the type of responses each puppet made. The experimenter and the child sat across a table from one another. A tray with the cups on it, as well as the puppets, was lowered below the table so the experimenter could hide the sticker. The child could not see below the table and was reminded not to peek. During the practice trials, the experimenter asked a puppet for help instead of the child; however, the child still chose a cup to look under. For two of the practice trials, the Gricean follower was asked; and for two other practice trials, the Gricean flouter was asked. After observing the practice trials, children completed 10 test trials. The procedure for the test trials was identical to the practice trials except the children chose which puppet to ask for help. For each trial, a sticker was placed under one of the cups and children were asked to pick a puppet to help them find the sticker. The cups were kept in the same order, but the order in which the stickers were placed under them varied in a predetermined random order. After the puppet made a statement concerning the hiding-place of the sticker, the child picked a cup to find the sticker. The child was allowed to choose only one cup. If they chose the cup with the sticker, they were allowed to keep the sticker. If they did not, each cup was lifted until the hidden sticker was revealed and children were told they could try for that sticker on the next trial. Regardless of whether the sticker was found or not, the location of the sticker was changed after every trial. The procedure took approximately 10–15 minutes.

Results

First trial performance

Performance on trial 1 was examined first to see whether children were able to distinguish the nature of the puppets' responses immediately after the practice trials. A preliminary chi-squared analysis indicated that there was no effect of age and therefore data were collapsed across this variable. Three chi-squared analyses compared the number of correct and incorrect choices made by children for each condition. Just over half of the children in the Quantity (57%, $N = 80$) and Quality (56%, $N = 77$) conditions picked the correct puppet, and performance in these conditions was not significantly above chance. However, 68% of children in the Relation condition chose the correct puppet, which was significantly above chance ($\chi^2(1, N = 79) = 10.65, p < .001$).

Performance across trials

Children were given one point each time they picked the correct puppet and cup. As children received feedback at the end of each trial, there is the possibility that children might show evidence of learning across trials. Consequently, the nine trials after the first trial were divided into three blocks of three trials each (Figure 1). The maximum score for a block was 3. A 3 (Age group) × 3 (Condition) × 3 (Block) ANOVA was conducted on children's performance. A significant main effect was found for Age group ($F(2, 227) = 4.27, p < .05$). Tukey tests indicated that 4- and 5-year-olds did significantly better than 3-year-olds. There was also a significant main effect for Block ($F(2, 454) = 19.15, p < .001$) that was qualified by a Block × Condition interaction ($F(4, 454) = 2.56, p < .05$). *Post hoc* analyses ($p < .05$) indicated that children showed evidence of learning across all three conditions. In the Quantity condition, children did significantly better in the last block of trials compared with the first block of trials, whereas in the Quality and Relation conditions, there was a significant improvement in children's performance from the first block compared with the second and third blocks (Figure 2). Furthermore, children did significantly better in the Quantity condition compared with the Quality condition in the first block of trials. The Age group × Condition interaction only approached significance ($p = .07$).

Since children performed significantly above chance in the Relation condition for the first trial, children's performance across the three blocks of trials for the Quality and Quantity conditions

was examined to see whether children eventually recognized the difference between the two puppets as well. Chi-squared analyses were used to determine whether the pattern of responding to the two different puppets differed from chance for each age group in the Quality and Quantity conditions. Thus, the probability that children would receive a score of 0, 1, 2, or 3 by chance (12.5, 37.5, 37.5, and 12.5%, respectively) was tested. For the Quality condition, 4- and 5-year-olds performed significantly better than chance during the second block ($\chi^2(3, N = 32) = 13.33$, $p < .005$, $\chi^2(3, N = 20) = 10.2$, $p < .01$, respectively) and 3-year-olds by the third block of trials ($\chi^2(3, N = 25) = 12.87$, $p < .01$). In the Quantity condition, 4-year-olds performed significantly different from chance during the first block of trials ($\chi^2(3, N = 33) = 8.44$, $p < .05$) and the 5-year-olds by the second block ($\chi^2(3, N = 20) = 8.23$, $p < .05$). During the last two blocks of trials, 3-year-olds were also significantly different from chance ($\chi^2(3, N = 27) = 14.38$, $p < .005$; $\chi^2(3, N = 27) = 13.79$, $p < .01$, respectively); however, these results were due to the youngest group performing more poorly than expected by chance.

Discussion

The present study examined children's recognition of violations of three different Gricean maxims and their comparative developmental progression. Children, across age groups, were equally likely to pick the Gricean follower or flouter in the Quantity and Quality conditions on the first trial. On the other hand, more than two-thirds of the children chose the Gricean follower in the Relation condition. That children were sensitive to the maxim of Relation is consistent with Sperber and Wilson's (1986/1995, 2002) Relevance theory. Sperber and Wilson argued that the concept of relevance is so fundamental to communication that it does not require learning. In communicating, one assumes that the speaker has an intended meaning that is relevant. Our results partially support this idea in that children initially responded above chance in the Relation condition but did not in the Quality and Quantity conditions. However, our results cannot address whether an awareness of Relation is necessary for the development of the other maxims or whether Relation needs to be learned. Those claims need to be addressed in specifically designed, and preferably longitudinal, studies.

We also found that children showed evidence of learning across trials. Children performed significantly better in the last block of trials compared with the first block, regardless of condition. Of interest, however, is that learning was not uniform across conditions. In general, children did better in the Quantity condition compared with the Quality condition for the first block of trials. Despite this, 3-year-olds never performed chance above chance in the Quantity condition suggesting that detecting the lack of information was particularly challenging for the youngest children. If choosing the more informative puppet was simply a learning task, then we would expect learning across trials to be consistent for each of the conditions. However, learning rates did vary. One possibility is that the rate of reinforcement also varied across conditions when children picked the Gricean flouter. In the Quality condition, children were specifically directed to an incorrect cup which resulted in not winning a sticker. On the other hand, in the Quantity and Relation conditions children were not directed to any specific cup and therefore needed to choose randomly from the four cups. As a result, they would be reinforced roughly 25% of the time.[1] This might suggest that the Quantity and Relation conditions would be the hardest to learn but in fact this was not the case. Another possibility is that the type of information being provided by the puppet affected children's tendency to learn across blocks of trials.

In the present study, children demonstrated an awareness of the Gricean maxims at a younger age than has been previously found. Prior studies asking children to label utterances as silly or to label the speaker as a 'smart aleck' have found comprehension of the maxims to develop

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[1]We would like to thank an anonymous reviewer for pointing this out.

later (Ackerman, 1981; Conti & Camras, 1984). The present findings are more in accordance with research examining the use of the maxims in children's speech production (Dunham *et al.*, 2000; Ferrier *et al.*, 2000; O'Neill, 1996; Pellegrini *et al.*, 1987). The difference might be explained by the fact that the present procedure involved providing feedback, so children may have performed better due to training. However, earlier research typically relied on children's evaluation of the utterances, which introduces heavy meta-linguistic demands. As with grammar where production and comprehension precede the ability to detect errors (Saywitz & Cherry-Wilkson, 1982) and the ability to eventually correct them (Bowey, 1986; Cox, 1989), we are likely tapping into an earlier awareness of the maxims than has previously been noted. We examined whether children could use their understanding of the maxims to implicitly guide their behaviour rather than to explicitly label another's behaviour. It would not be surprising then, if children have some awareness of the maxims, as illustrated in the present study, long before this awareness is reflected in their own speech, as illustrated in prior studies. In addition, their ability to explicitly identify violations or to explain the violations should take longer to develop. Consequently, Conti and Camras (1984) found that 4-year-olds were not successful at their task, whereas 4-year-olds were successful at our task, indicating that children do in fact have some understanding of the maxims, even if that understanding is limited. Research into effective use of a number of pragmatic skills, such as how to make polite requests (Becker, 1986; Ely & Gleason, 2006) or reliably provide necessary background information for a listener (Nadig & Sedivy, 2002), has also found the beginnings in preschoolers' understanding that continues to develop across middle childhood. The further development of preschoolers' initial conversational awareness may be dependent on other aspects of cognitive development, such as memory capacity (e.g. Jackson & Jacobs, 1982), that future research should explore.

Acknowledgments

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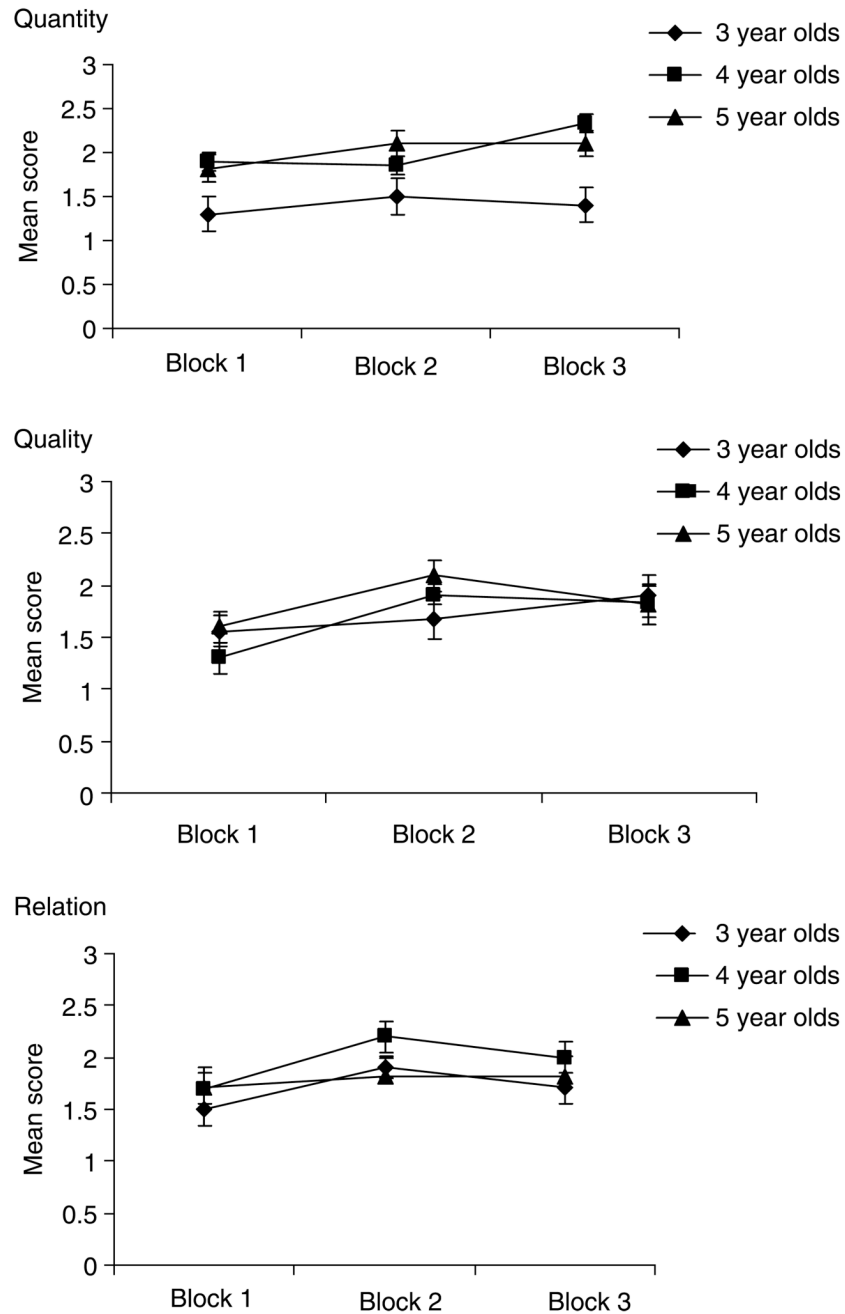
Figure 1.
The mean score, by age group, for choosing the correct puppet across the three trial blocks for the Quantity, Quality, and Relation conditions.
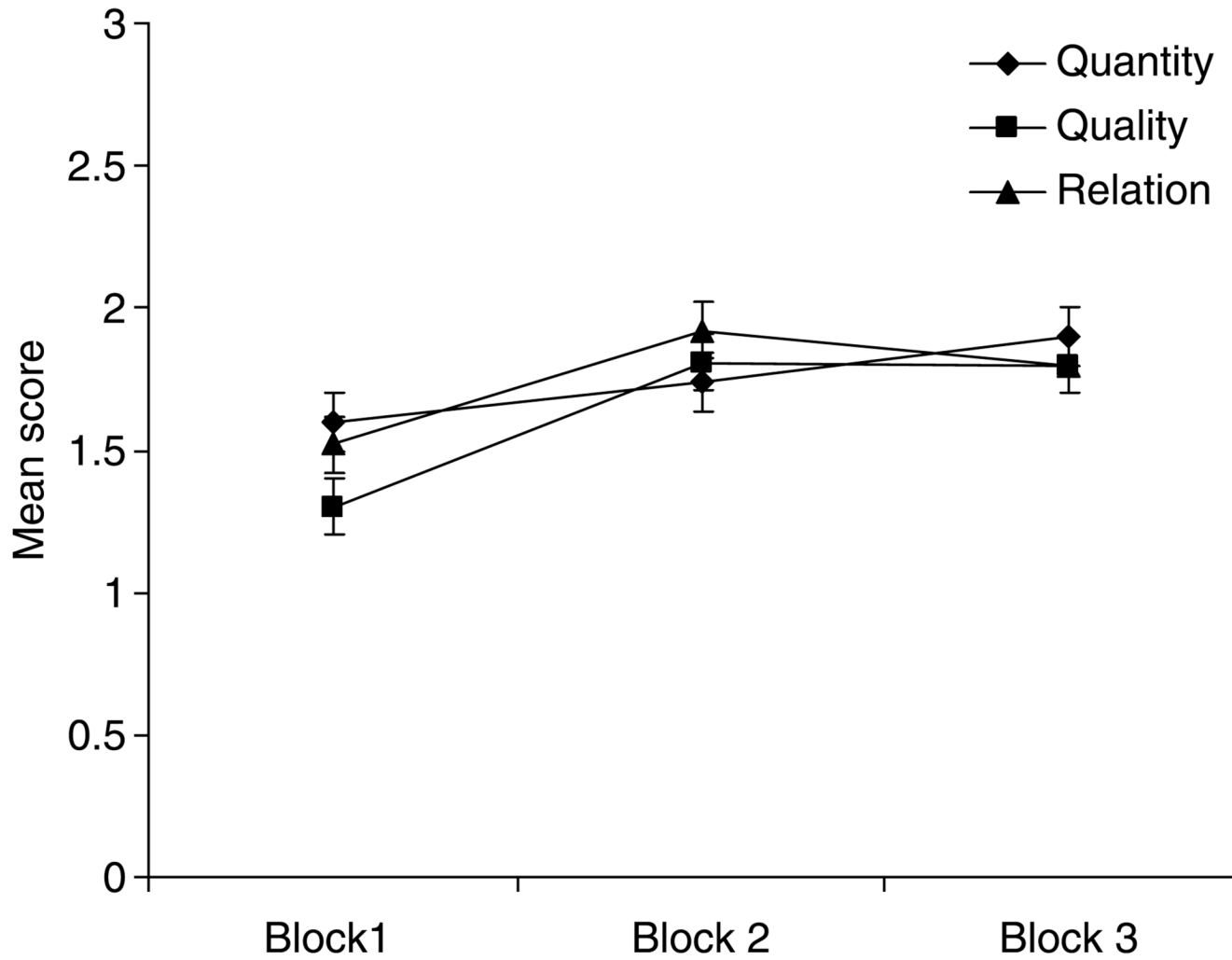
Figure 2.
The mean score for all children across the three trial blocks for each condition.