

THE IMPACT OF VIOLATION OF LINGUISTIC EXPECTATIONS ON
CHILDREN'S PERCEPTIONS OF HELPFULESS, KNOWLEDGEABILITY AND
INFORMATION SEEKING BEHAVIOUR

by

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ABSTRACT

When seeking information, children expect informants to provide information that is congruent with their knowledge and to use conventional labels. Violations of these linguistic expectations influence their behaviour and perceptions, as they are less likely to seek information from informants with a history of inaccuracy or of violation of conversational form (Eskritt et al., 2008; Koenig & Harris, 2005) and perceive unreliable informants as “silly” (Brosseau-Liard & Birch, 2010). I explored whether violations of linguistic expectations influence children’s perceptions of knowledgeability and helpfulness and whether these characteristics predict children’s information seeking. Forty 5-year-olds observed a farmer and a car mechanic label objects for a foreign child. The objects were associated with one of the two informants, rendering one as the expert, and the other as the non-expert. The informants labelled the familiarization objects by stating either the object’s color or its super ordinate category. During test trials, children selected one of the two informants to label novel objects that were either related or unrelated to either one’s domain of expertise (i.e. novel animals, tools or odd objects). Finally, children rated informant’s knowledge of the familiarization objects and their willingness to help the foreign child. Results show that children perceive an informant who provided the super ordinate category as more helpful and somewhat more knowledgeable than one who provides the colour. When labelling objects related to the informants’ domain of expertise, children rely on expertise to seek information. For unrelated novel objects, a trend suggests that perceptions of the expert’s knowledge influence decision making. These results provide new factors underlying children’s information seeking.

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TABLE OF CONTENTS

ABSTRACT.....	i
ACKNOWLEDGEMENTS.....	ii
TABLE OF CONTENTS.....	iii
LIST OF TABLE AND FIGURES.....	vi
Chapter 1: INTRODUCTION.....	1
Children’s Understanding of a Speaker’s Knowledge.....	3
Speaker’s Adherence to Conversation Maxims and Conventional Forms.....	9
Chapter 2: METHODS.....	16
Sample.....	16
Materials.....	16
Procedure.....	17
Chapter 3: RESULTS.....	23
Helpfulness.....	23
Knowledge.....	25
Information Seeking.....	33
Chapter 4: Discussion.....	38
Children’s Understanding of a Speaker’s Knowledge.....	39
Speaker’s Adherence to Conversation Maxims and Conventional Forms.....	44
Limitations.....	48
REFERENCES.....	49
APPENDICES.....	55

LIST OF TABLES AND FIGURES

Table 1

Stimuli and Informant responses during familiarization.....	19
---	----

Table 2

Coding for Children’s Justifications to the Question: “Why Didn’t the Farmer Say it Was a Pig and a Cow” or “Why Didn’t the Car Mechanic Say it Was a Wrench and a Wheel?”.....	28
---	----

Figure 1

Pre- and post-test knowledge score for the story expert and non-expert.....	32
---	----

Chapter 1: Introduction

Children depend on external sources of information to learn about the world around them. It is important for them to select reliable sources of information in order to obtain truthful information and avoid embarrassment or confusion in the future. When questioning an individual about the identity of a novel object, research has shown that children do not blindly select informants, instead they have expectations as to the content and structure (or form) of the response (Brosseau-Liard & Birch, 2010; Danovitch & Keil, 2004; Koenig & Harris, 2005; Sobel & Corriveau, 2010). For instance, children expect adults to provide responses that represent their knowledge (Diesendruck, et al., 2010) and adhere to conversational forms that prevent misunderstandings (e.g., referring to objects by their most common label) (Clark, 1993; Hall, 1994). If a speaker violates these expectations, children alter their behaviour, and perhaps their perception towards this speaker. They may perceive the informant as unhelpful or misleading and be less likely to probe this person in the future. In this study, I examined if violations of these linguistic expectations by knowledgeable and less knowledgeable speakers influence children's perceptions of helpfulness and knowledge, as well as how these characteristics influence information seeking behaviour. These findings will clarify whether children attribute negative characteristics to informants who violate linguistic expectations, and will contribute new factors underlying children's information seeking decisions.

A great deal of research has examined how children utilize an informant's past verbal behaviour to guide their own information seeking. However, in addition to altering their behaviour, children may perceive informants who violate linguistic expectations

differently. Consequently, children's interpretations of unexpected verbal statements may influence future behaviour. The present research assessed two characteristics: knowledge and helpfulness specifically, that may underlie this decision making. Considering the value of acquiring accurate information, and the consequences of being misled by false information, it is important to examine which characteristics children attribute to individuals who *should* provide conventional and informative responses but fail to do so.

I addressed two factors on which successful communication is founded: 1) providing a response that is congruent with one's knowledge, and 2) the speaker's adherence to conversational maxims and conventional forms (e.g., quantity maxim and use of common object labels). I selected these two characteristics because they relate to informants' ability and willingness to provide accurate information and research suggests that children perceive and behave differently towards informants who violate these expectations. I assessed whether violations of these expectations lead to negative perceptions (less knowledgeable, unhelpful) of an expert who violates linguistic expectations and whether these predict information seeking behaviour. These findings would clarify the consequences of violating linguistic expectations. It will shed light on how children perceive individuals who violate expectations and clarify the factors that underlie children's information seeking behaviour.

Children's Understanding of a Speaker's Knowledge

When seeking information, children must select an informant who is knowledgeable, and willing to share his/her information. To do so, they must first have an understanding of the knowledge state of others. That is, they must identify who is most likely to *have* the information they need. One way to determine another individual's knowledge state is by their profession (Lutz & Keil, 2002). This ability, referred to as the understanding of division of cognitive labour, allows young children to identify the knowledge of familiar experts. It also leads them to expect professionals to have a comprehensive knowledge of specific domains, such as physics and social sciences. Danovitch and Keil (2004) showed that starting in second grade; children begin to conceptualize the distribution of knowledge among individuals as distinct.

Further demonstrating children's reasoning of informant's mental states, Sobel and Corriveau (2010) examined the inferences that children make based on an informant's knowledge of an object's nonobvious properties. To do this, four-year-olds were introduced to two confederates who provided differing information about the functioning of a machine. In test trials, the experimenters presented a novel object, which functioned according to one of the confederates' previous explanations. Children endorsed the statements made by the informant whose previous explanation was consistent with the novel machine's functioning. These results demonstrate that four-year-olds are selective in the inferences they make about an informant's causal knowledge. They utilized the quality of information they received in the familiarization stage to guide their selection of an informant. Danovitch and Keil's (2004), and Sobel and Corriveau's (2010) studies show that children have inferential abilities about other's

knowledge, in that they predict the type of information a speaker may have based on his/her domain of expertise and causal knowledge.

Another way children can determine whether an informant is knowledgeable, is to assess whether he had appropriate access to the pertinent information. For instance, infants and children are more likely to learn from and endorse statements made by an individual who had visual access to an object (Nurmsoo & Robinson, 2009) compared to one who had no access, or had inadequate access to the information. Nurmsoo and Robinson (2009) used a tunnel task, through which preschoolers used their sense of sight and touch to identify an object. During familiarization, they were presented to one of two puppets: a well-informed one who had adequate, informative access to the target object (visual access to objects that were identified visually, or had touched an object that was identifiable tactically) or an uninformed puppet who had uninformative access to the object (e.g., touched an object that was identifiable visually). Both puppets, regardless of the type of access they had previously, provided incorrect information to the child. The key difference between the two informants was the quality of previous access to the object. On test trials, children had uninformative access to a target object in the tunnel and the puppet subsequently gave information contradicting the children's statement about its identity. Children could either trust their own judgment as to the identity of the object or alter their response based on the information provided by the puppet. Children were sensitive to informants' quality of information access when interpreting the identity of the object. That is, they were more likely to alter their response, and concur with the informant who had informative access, compared to the one who had uninformative

access. In a similar study, Robinson and Withcombe (2003) showed that three-year-olds implicitly monitor the source of information, and are suggestible only to statements made by an informant who had adequate visual or tactile access to information. Also, Robinson, Champion, and Mitchell (1999) demonstrated that when children aged four to seven are presented with contradicting information, they are more likely to believe statements made by speakers who were better informed, compared to their own guesses or those of uninformed speakers. In other words, starting at a young age, children begin reasoning about an informant's knowledge state, using their profession, causal knowledge or quality of access to information in order to guide their behaviour, and select an informant to query. Similarly, children may utilize their perception of an informant's willingness to help to guide their information seeking behaviour.

Once children identify the most knowledgeable informant they must ensure that he is *willing* to provide accurate information. In other words, informants must have helpful intent, and one way to be helpful is to provide responses that are representative of one's knowledge level. Adults and children must rely on an other's intention and ability to provide accurate informant in order to communicate successfully (for reviews, see Fiske, Cuddy, & Glick, 2007; Wojciszke, 2005). It is therefore reasonable to expect a knowledgeable informant to provide the most accurate information about the event or phenomenon in question. If this does not occur, an individual may attribute different intentions (Brosseau-Liard & Birch, 2010; Clark, 1993; Sperber, 1994; Wojciszke, 2005) and behave differently towards this speaker. As numerous studies have shown, children

are less likely to seek information from informants who failed to provide correct answers. This may be because the informants were unreliable or because they were unhelpful.

Children refer to the informant's history of accuracy when seeking information. A growing body of research has explored children's behaviours towards unreliable informants. Findings converge on the fact that children are more likely to seek information and endorse statements made by speakers who have a history of accuracy (Birch et al., 2008; Corriveau et al., 2009; Koenig & Harris, 2005; Pasquini, et al., 2007). Starting at the age of three, children monitor the accuracy of informants and use this information to decide whom to query in the future (Clément, Koenig, & Harris, 2004; Pasquini, et al., 2007). This "selective trust" also extends to learning of game rules (Rakoczy, et al., 2009) and object functions (Koenig & Harris, 2005; Sobel & Corriveau, 2009). Since children expect consistency in others' behaviours (Cain, Heyman, & Walker, 1997; Dozier, 1991; Gnepp & Chilamkurti, 1988), they utilize an informant's past accuracy to guide their future behaviour, and do not seek information from a previously inaccurate informant.

For the most part, the information seeking literature summarized above utilizes a variation of the methodology developed by Koenig and Harris (2005). The procedure consists of participants choosing between a previously accurate or inaccurate informant to endorse or probe about the identity of a novel object. The accurate informant correctly labelled familiar objects (e.g., an apple) whereas the inaccurate informant labelled those same objects with other English words, (e.g., labelling a ball as a shoe). Four-year-olds trusted the reliable informant to provide correct information in the future and endorsed his

labels for novel objects more often than labels provided by the unreliable informant (Koenig & Harris, 2005). Despite its extensive use, Koenig and Harris' methodology has an important limitation. In children's daily learning environment, it is unlikely for English speaking informants to provide such blatantly wrong answers. To address this limitation, informants in the present study were professionals, (e.g., a farmer and a car mechanic), so that children would expect each informant to be knowledgeable about specific domains.

In addition to behaving differently towards accurate and inaccurate informants, some research suggests that children may also perceive the latter less favourably. As suggested by Brosseau-Liard and Birch (2010), responding with an incorrect label is an unusual, odd, and uncooperative response in addition to being evidence of unreliability. Thus, when the answer is obvious, the more accurate informant can also be perceived as cooperative, whereas the erroneous informant can be perceived as misleading or uncooperative (Brosseau-Liard & Birch, 2010). In addition to changes in behaviour, Brosseau-Liard and Birch emphasized the changes in children perceptions as well as the attributions made, when a knowledgeable informant violates linguistic expectations. They suggested that children perceive an inaccurate informant as "ill-disposed". In other words, children's interpretation of inaccurate speakers is that they are unlikely to provide reliable information in the future. On the other hand, children perceived individuals who correctly labelled objects as cooperative and were more likely to seek information from them in the future. I suggest that the changes in children's perceptions may also guide their information seeking behaviour. Specifically, I expect children to perceive a knowledgeable informant who fails to provide the conventional label to an object in his

domain as subsequently less knowledgeable but still more knowledgeable than an informant who is less knowledgeable about the particular domain. Children should, however perceive this informant as less helpful than the non-expert, and consequently avoid seeking information from him¹.

Other studies have examined children's justifications of informant's responses. Three and four year olds typically explained absurd responses as evidence of ignorance whereas a few identified their responses as "silly" (Koenig & Harris, 2005). To my knowledge, there has been no close examination of whether children's interpretation of silliness is positive, such as an attempt to amuse, or negatively, as a way to mislead. Other characteristics, such as knowledge and helpfulness may provide a more precise qualification of children's perceptions of informant. Perceptions of knowledge indicate whether an individual is believed to have the ability to provide accurate information, whereas a perception of helpfulness refers to an informant's willingness to help. If children rely on their perceptions of informant to guide information seeking, the positive or negative valence to of their perceptions is of interest.

Additionally, the information seeking literature has focused mostly on the perception of the inaccurate informant, but it is important to address children's expectations of both informants. This is because following unexpected responses from an expert informant, children may re-evaluate his knowledge, or willingness to help and consequently choose to seek information from an alternate source. Supporting this is

¹ Both informants in the present study were male, hence the pronoun "he" is used throughout to refer to informants.

research suggesting that children perceive a less knowledgeable informant who provides erroneous information, differently from a knowledgeable and erroneous informant. When preschoolers were introduced to a Hebrew speaking puppet, and one who just started to learn Hebrew, children recognized that the latter might not be able to label common objects in Hebrew. Three-year-olds were more lenient of an immature speaker who provided unconventional or even erroneous labels for familiar objects. They attributed the non-Hebrew speaker's erroneous responses to lack of knowledge of conventional labels as opposed to silliness (Diesendruck et al., 2010). Hence, if the information is available, children can attribute unconventional responses to an informant's knowledge state and do not interpret his response as an attempt to amuse. This provides additional support that children interpret errors made by a knowledgeable informant and a less knowledgeable informant differently. For this reason, it is important to assess children's perceptions of both knowledgeable and less knowledgeable informants.

Speakers' Adherence to Conversation Maxims and Conventional Forms

Children expect speakers to provide information that is congruent with their knowledge, but the statement must also adequately represent the target phenomenon and be presented in a comprehensible, concise and cooperative manner that prevents misunderstandings. Successful communication between two experienced listeners relies on adherence to conversational maxims and the use of conventional forms, which assume mutual cooperation in the exchange. The conversational maxims are guidelines that speakers must adhere to in order to ensure a successful dialogue. Conventional forms are the use of terms that are generally accepted and customary within an environment. Within

a conversation, interlocutors expect each other to abide by these rules, in order to maximize the efficiency of the exchange. Children, like adults, expect speakers to adhere to these linguistic norms, and behave differently towards those who fail to abide by them. In fact, children behave similarly towards informants who provide inaccurate information, and those who violate conversational maxims and conventional form. For this reason, it is important to consider both expectations when examining children's perceptions of linguistic expectations.

The four conversational maxims- Quality, Quantity, Manner and Relation, are founded on cooperation within a verbal exchange (Grice, 1975). The Quality maxim requires one to be truthful. The Quantity maxim requires the speaker to provide as much information as required. An individual who is knowledgeable but provides an incomplete answer violates the Quantity maxim (Grice, 1975; Wardhaugh, 2006). The Relation maxim requires the speaker's response to be relevant to the question. Finally, the maxim of Manner necessitates the speaker to avoid ambiguity, obscure and unnecessary expressions (Grice, 1975). When an individual does not formulate his response to adhere to these maxims, he is not contributing to the exchange, or being cooperative, hence he could be perceived as unhelpful.

Several studies have shown that young children are sensitive to conversation maxims in that they perceive an erroneous response to an obvious question (e.g., labelling an apple as a teapot) to be unusual (Koenig & Harris, 2005a). Eskritt et al. (2008) presented children with two puppets that provided information about the location of a sticker. One informant, the "Gricean flouter" always violated one of three conversational

maxims. The “Quality flouter” lied about the location of the sticker, the “Quantity flouter” provided too little information about the location of the sticker (e.g., “it’s under one of the two cups”) and the “Relation flouter” provided an irrelevant response such as “I like these cups”. Children were less likely to select an informant who had violated conversational maxims for subsequent questioning.

In addition to structuring their response in accordance with conversational maxims, experienced speakers must also use the conventional forms of communication. Namely, they must refer to a particular phenomenon in a way that is consistent with the communicative context (Clark, 1993). For instance, parents generally refer to objects by their common labels (e.g., this is rubber duck vs. this is a rubber animal) (Callanan & Sabbagh, 2004; Hall, 1994). For this reason, children prefer basic level terms when referring to common objects (Golinkoff, Blewitt, & Alioto, 1994; Golinkoff, Mervis, Hirsh-Pasek, 1994) and use basic object labels prior to super ordinate categories (Mervis & Crisafi, 1982). Generally, experienced and knowledgeable speakers are expected to adhere to conventional forms, unless they have an alternate goal or intention in mind (Clark, 1993; 1989; Siegal, 1999; Siegal & Surian, 2004). It is possible that this alternate interpretation of a speaker’s statement is negative – in that, the informant is unhelpful and willingly misleads the other speaker. This would be particularly true if the informant is believed to be knowledgeable about the ambiguous object or situation. In turn, these perceptions may influence future behaviour, such as information seeking.

Violation of conversational maxims and conventional form are perplexing for children, especially since they have an implicit, expectation that adults will adhere to

them (Koenig, Clément, & Harris, 2004). Although children may understand the speaker's intent, they may perceive him differently and possibly in a negative light. For example, when six- and eight-year-olds heard story endings that were either reasonable or in violation of a Gricean maxim, both age groups distinguished between violations of Gricean maxims and the conventional (Contin & Camras, 1984). In accordance with findings from Koenig and Harris (2005) and Eskritt et al. (2008) children perceived the story ending with the violation as being "silly" (Contin & Camras, 1984). Hence, young children can distinguish between conventional and non-conventional patterns of verbal behaviour and consequently interpret the speaker's intention as an attempt to amuse.

The Present Study

In the present study, I examined five-year-old children's perceptions of knowledge and helpfulness as well as information seeking behaviour towards knowledgeable and less knowledgeable informants. The informants provided information that was incongruent with their knowledge and violated the Quantity maxim and conventional form of conversation. The study addressed two main questions 1) do violations of linguistic expectations alter children's perceptions of knowledgeability and willingness to help and 2) do these perceptions predict information seeking? Previous research alludes to the fact that children make inference about informants' knowledge as well as their likelihood to provide correct information in the future. This study will add to the literature by specifically assessing children's perceptions of informants' knowledge and helpfulness. Also, it will determine whether interpretations of informant's responses, as measured by knowledge and helpfulness, predict the selection of an informant to provide

new information. Also, whereas previous studies have examined children's responses to informants' violation of the quality maxim, the present study will examine the violation of the quantity maxim. The results will shed light on the consequences of violation linguistic expectations as well as identify new factors underlying children's decision making.

I selected five-year-olds because the literature indicates that by this age children reliably select the most informed (Lutz & Keil 2002; Sabbagh & Baldwin, 2001) and most accurate informant (Koenig & Harris, 2005; Pasquini et al., 2007) when seeking information. In addition, they are sensitive to violation of conversational maxims (Contin & Camras, 1984; Eskritt et al., 2008). Hence, five-year olds have the cognitive ability to judge an informant's ability (knowledge) and willingness to help (helpfulness) based on more subtle verbal behaviour. For instance, five-year-olds have a solid understanding of other's behaviours as goal oriented and consistent over time (Cain, et al., 1997; Dozier, 1991; Gergely et al., 1995; Gnepp & Chilamkurti, 1988) and they make assumptions about conventional labels and functions by monitoring frequency and consistency in the way people refer to objects (Siegel & Callanan, 2007).

First, I instilled expectations of knowledge by using two common professions (a farmer and a car mechanic). I used domains of expertise to establish the knowledge state of each informant, and consequently create expectations as to the type of response they should provide if questioned about their domain. The more knowledgeable informant should be expected to provide responses that are more informative than the less

knowledgeable informant. Specifically, the farmer and car mechanic should provide the best responses when asked about animals and cars respectively.

However, the informants violated linguistic expectations by providing information that was incongruent with their knowledge and violating conversational maxims and conventional form: they stated either the dominant colour of the familiarization objects or its super ordinate category, (i.e. general category of the objects in question) when in reality the expert would be expected to provide the conventional object label. For instance, a farmer labelled a pig (which he is expected to know a lot about) as “pink” and the car mechanic labelled the pig as “an animal”. Regardless of whether he provided the colour or the super ordinate category, the expert’s response violated the Quantity maxim and children’s expectations that of the two informants he was the one most likely to provide a maximally informative answer as he did not use of the conventional basic level term (Mervis & Crisafi, 1982), and was unhelpful to a child learning English. The non-expert informant also provided either the colour or super ordinate category. However, based on his lack of knowledge about the target object, children’s expectations of the non-expert’s responses should have been more lenient. The same response provided by a non-expert may be anticipated, and more forgivable than an inadequate answer provided by an expert (Diesendruck et al., 2010).

Considering the discrepancy between the expert’s knowledge level and his response, I anticipated that these violations would influence perception of knowledge and helpfulness, as well as information seeking behaviour. My first two hypotheses concerned perceptions of helpfulness and knowledge. Specifically, I predicted that children would

perceive the expert as less helpful than the non-expert, regardless of whether he stated its colour or its super ordinate category, because both of those responses are inadequate considering the expert's knowledge of the domain. I anticipated children to continuously rate the expert as more knowledgeable than the non-expert, regardless of his responses because of his profession and its relation to the familiarization objects. However, considering each informant's knowledge state and response, children may re-evaluate each informant's knowledge. Specifically, I expected them to perceive the expert as less knowledgeable over time, and the non-expert as more knowledgeable following violation of linguistic expectations.

Secondly, because perceptions and traits are evaluative in nature (Rholes & Ruble, 1995), and are used to predict future behaviour (Fiske, 1993; Gnepp & Chilamkurti, 1988), I expected children to refer to their perceptions of the informants' ability and willingness to help when seeking information. I examined whether the perceptions of helpfulness and knowledge predict information seeking behaviour for novel objects that are related to informants' domain of expertise and novel objects that are unrelated to either informant.

Information seeking for novel objects that *are related* to one of the two informants could result in two distinct patterns. First, children may weigh knowledge as being more important than helpfulness, hence select the unhelpful expert to label novel objects associated to his domain of expertise. On the other hand, children could perceive the unhelpful expert as misleading, consequently selecting the non-expert informant to label novel objects that are associated with the domain of expertise of the expert. If the latter

occurs, when labelling an unfamiliar animal, children would perceive the car mechanic as a valuable alternative and select him over a farmer who was previously unhelpful.

Overall, I anticipated that perceptions of knowledge and helpfulness would predict the selection of the expert informant when seeking information about novel objects that are related to one of the two informants' domain of expertise.

For the novel objects that are *unrelated* to either of the informants' domains of expertise, I expected children to select an informant based on their perceptions of helpfulness. I hypothesized that helpfulness scores would predict the selection of the expert informant. Specifically, children would become mistrustful of the unhelpful expert and instead select the "helpful non-expert" when labelling novel objects that are unrelated to the informant's domain of expertise. In addition, based on research demonstrating that children are sensitive to informants' knowledge state (Danovitch and Keil's, 2004; Lutz & Keil, 2002; Sobel & Corriveau, 2010), I predicted that children's perception of informants' knowledge about the familiarization objects may also influence their choice of an informant.

Chapter 2: Methods

Participants

The sample consisted of forty children (17 girls and 23 boys, $M = 5.41$ years, $SD = 3.43$ months). Families were recruited from the Kingston community. The children were mostly from two-parent, middle class families. Children's primary language was English.

Materials

Cartoon pictures of a farmer and a car mechanic as well as a picture of a Native American girl in an traditional costume were obtained from non-copyrighted online inventories (see Appendix A). The informant pictures were mounted on 8.5 cm X 5.5 cm index cards and the picture of the girl, who was named Uzma, on a 5 cm X 3.5 cm card.

We used two sets of familiarization pictures, one for each domain of expertise. The “Farmer story” consisted of a pig and a cow as familiarization objects, and the “Car mechanic story” consisted of a wrench and a car tire. The stimuli and each informant’s response are presented in Table 1.

The images used in the information seeking task, consisted of six novel objects presented on 8.5 cm X 5.5 cm cards. There were two novel objects from each informant’s domain of expertise: a muffler and a car engine from the mechanic’s domain and a platypus and exotic monkey for the farmer’s domain. The other two novel objects - a black massager and a pink massager – were unrelated to the informants’ domains of knowledge.

Procedure

Parents or guardians provided informed consent. Children were tested individually. A video conference system allowed parents to observe their child throughout the experiment and the majority of the sessions were videotaped. Some videos are missing due to experimental error or technical difficulties.

Demonstration. Before introducing each informant, children were presented with an example of a helpful and unhelpful response. The experimenter presented a picture of a lychee, and asked children whether they knew what this was. None of the participants guessed the item. The experimenter asked whether saying the colour of the object would help them learn what the object was. If children said yes, then the experimenter would say the color (red) and ask again whether they could identify the object in the picture. The aim was to help children realize that simply saying the color of the object, when one truly knows its identity, is not a helpful answer. Next, the experimenter said that the object in the picture was a fruit, and that it was called a lychee. Children were asked again whether this response was more helpful. The experimenter explained that this was a helpful answer because she had given them the best answer she could give and because now they knew what the item in the picture was. If children did not understand the task with the lychee, it was repeated with a blue stethoscope.

Table 1.

Stimuli and Informant responses during familiarization

		Condition 1		Condition 2	
Informant		Expert	Non-expert	Expert	Non-expert
Car Mechanic	Wrench	<i>“That’s grey”</i>	<i>“That’s a tool”</i>	<i>“That’s a tool”</i>	<i>“That’s grey”</i>
	Tire	<i>“That’s black”</i>	<i>“That’s the piece of a car”</i>	<i>“That’s the piece of a car”</i>	<i>“That’s black”</i>
Farmer	Pig	<i>“That’s pink”</i>	<i>“That’s an animal”</i>	<i>“That’s an animal”</i>	<i>“That’s pink”</i>
	Cow	<i>“That’s</i>	<i>“That’s an</i>	<i>“That’s an</i>	<i>“That’s</i>

*black and animal” animal” black and
white” white”*

Note. Identity of the expert informant and statements were counterbalanced across participants.

The experimenter also explained that the informants were just like other people, sometimes they were helpful, and sometimes they were not helpful. The informants were helpful when they gave the best answer they could give. The experimenter told children that some informants might give unhelpful answers even if they know a lot, while some informants may try to help even if they are not knowledgeable: *“a helpful person is someone who gives the best answer they can give”*.

Finally, the experimenter explained a rating system used in the study, which involved hand gestures: a little bit (hands very close together), medium (arms spread at the shoulder width) and a lot (arms spread far from each other). The experimenter used the rating system throughout the experiment to illustrate confidence, helpfulness and knowledge ratings. The goal of the gestures was to help children visualize the magnitude of each rating.

Familiarization. Children were shown the pictures of the farmer and the car mechanic. The identity of the expert in the story (farmer or car mechanic) and the order of presentation of the expert and non-expert informant were counterbalanced across participants to prevent any order effects to control for potential preference of either

stimuli. The experimenter first asked children to identify informants' professions, and what each is knowledgeable about: "Who is this? What does he know a lot about?", "That's right, he's a farmer and he knows a lot about animals". Next, the experimenter presented two objects related to one of the informants' domain of expertise (see Table 1). Approximately half of the sample was familiarized to a "farmer expert" and the other half to a "car mechanic expert". Children then stated whether each informant knew or did not know about each familiarization object. If an informant was rated as knowledgeable, then children rated whether he knew "a little bit", "medium" or "a lot." The goal of these pre-test knowledge scores was to assess whether children identified the informant within whose expertise the familiarization items fell. Next, children were shown a picture of Uzma, a foreign child who was learning English. Uzma then asked each informant to provide a label for the familiarization object.

Informants violated the Quantity maxim by failing to provide the conventional object labels. In Condition 1, the expert informant provided the dominant color of the presented objects. The non-expert labelled the objects by their super ordinate category. In Condition 2, the responses were reversed: the expert informant labelled the objects by their super ordinate category, whereas the non-expert stated the colour (refer to Table 1).

Information Seeking Task. The test-task required the participant to select which informant they should ask if they wanted to find out the names of six novel objects. The order of labelling was randomized for each child. We included the related novel objects to determine whether previous helpfulness impacted their choice when a clear expert was

present. The choice of informant for the two unrelated novel objects was the measure of selective trust. The pictures are presented in Appendix B.

The experimenter showed children the novel objects individually and asked whether they know what each was. If participants claimed to know, they were corrected, “*I don’t think that’s what it is, and maybe the farmer and the car mechanic can tell us*”. The participants were asked who they *should ask* if they wanted to learn the name of the novel object.

After children had selected an informant for each picture, the cards were reshuffled, and children were asked a knowledge attribution question to determine who they believed *knew the most* about each object. We used a chart, adapted from Brosseau-Liard and Birch (2010), showing the farmer, the car mechanic, the farmer and the car mechanic together (both) or an empty cell (neither) in its four quadrants. The aim of these knowledge attribution questions was to ensure that children perceived these two objects as being unrelated to the farmer or the car mechanic.

Post-Test Measures. The experimenter inquired about the helpfulness then the knowledge of each informant. The helpfulness question aimed to test whether the expert identified as being less helpful than the non-expert when labelling objects for Uzma. The post-test knowledge measures were used to examine whether children’s perception of knowledge of each informant had changed following the manipulation. The perception of knowledge was probed by showing the objects used in the familiarization and asking: “*do you think [informant] knows what these objects are, or doesn’t know?*” The perception of

helpfulness was determined by asking: “do you think the [informant] wanted to help Uzma or didn’t want to help her?” Any positive answer was followed by a rating of “a little bit”, “medium” or “a lot”. The experimenter also asked children why each informant provided their respective response.

Debriefing. The child and caregiver were debriefed about the nature of the experiment. The main experimenter explained that sometimes the informants provided silly answers and that it was all part of the game. Children received stickers and a certificate for their participation.

Chapter 3: Results

I first examined the two manipulation-check measures: helpfulness scores and knowledge scores. Secondly, I examined whether helpfulness scores and knowledge scores predict children’s information seeking when labelling novel objects that were related, and unrelated to the informants’ domain of expertise.

The story expert informant was defined relative to the objects used in the familiarization trial. In the following analyses, the “story expert” refers to the informant to whom the familiarization objects are related.

Choice of Statistical Analyses

To examine the helpfulness scores and knowledge scores, I opted to use Linear Mixed Models (LMMs), as opposed to more commonly used General Linear Models (GLMs). LMMs are statistical models for continuous outcome variables that can handle dependent observations that may have unequal variance. In this study, the helpfulness scores and pre-test and post-test knowledge scores were repeated continuous outcome variables, obtained for the story expert and the non-expert. Another advantage of LMMs is that they estimate fixed and random effects in a single model. Another reason to choose LMMs over GLMs was that each participant provided scores for two informants, and did not contribute to all possible knowledge and helpfulness data points. For instance, due to counterbalancing, approximately half of the participants were familiarized with an expert farmer, and the other half an expert car mechanic. In addition, for about half of the children the expert informant stated the colour of the familiarization objects, whereas on the other half, the non-expert stated the colour. LLMs, unlike GLMs, allow subjects to have missing data points. Consequently, we could not use repeated measures ANOVAs, and opted for LMMs for the analysis helpfulness and knowledge scores.

Helpfulness

The goal of the helpfulness question was to assess whether children perceived an expert who violated linguistic expectations as less helpful than a non-expert. The experimenter first asked children a forced choice question to determine whether they believed the informants wanted to help Uzma learn about the objects used in familiarization or did not want to help. If the child responded that the informant was helpful, they were asked to rate *how much* they believed the informant wanted to help

Uzma (e.g. “did the farmer want to help Uzma a little, medium, or a lot?”). An informant who was rated as unhelpful was given a score of 0. An informant who was rated as “a little” helpful was given a score of 1, a “medium” helpful informant was given a score of 2, and an informant who was “a lot” helpful was given a score of 3.

My first hypothesis predicted that violation of linguistic expectations by an expert informant would result in lower helpfulness ratings for the expert compared to the non-expert. I used LMMs with the helpfulness scores as the dependent variable. The independent variables were the knowledge state of the informant (story expert vs. non-expert) and statement (colour vs. super ordinate category). These independent variables represented the informant’s knowledgeability and violation of conventional form, respectively.

Analyses revealed a main effect of statement, $F(1, 38) = 12.77, p < .001$. When an informant responded with the super ordinate category of the object, children perceived him as more helpful ($M = 2.4, SD = 1.38$) than when an informant responded with the object’s color ($M = 1.38, SD = 1.31$). My first hypothesis was not supported, as the knowledge state of the informant was not significant $F(1, 38) = 1.97, p = .17$ nor was the interaction between the two independent variables $F(1, 38) = .91, p = .35$. It is possible that the expert informant’s violation of linguistic expectations were not strong enough for children to perceive him as unhelpful.

Following the manipulation check, the experimenters asked children why the expert did not provide the conventional object labels for the familiarization objects.

Children's responses were coded into five categories: unhelpful intent (e.g. "he didn't want to help"), knowledge state (e.g. "because he doesn't know the names"), helpful intent (e.g. "he wanted to teach her to colours first"), "other", and "I don't know". The description of each category is presented in Table 2. The "I don't know" responses were clear and coded only by myself. The remaining responses were transcribed verbatim and independently coded by two experimenters, with strong interrater reliability of 87% (Kappa = .82). Discrepancies in coding were first discussed among raters, and in most cases, mutual agreement was achieved. For outstanding disagreements, my codes were chosen over the other raters.

In 58% of children said, "I don't know". Of the other 42% of children who provided a response, 12% said it was unhelpful intent, 24% said it was due to lack of knowledge, 47% said it was helpful intent and 17% could not be coded (other). Of those children who provided a response other than "I don't know", a response at chance would have resulted in random distribution in each of the response categories. However, the chi-square goodness of fit test showed that the distribution was different from a random distribution: $X^2(3, N = 17) = 26.16, p < .0001$. That is, children were more likely to provide justifications that suggest helpful intent for the story expert.

The experimenters also asked children why the non-expert in the story expert did not provide the conventional label for the familiarization objects. Children shrugged their shoulders or said that they didn't know. Consequently, I did not code their responses.

Table 2.

Coding for Children's Justifications to the Question: "Why Didn't the Farmer Say it Was a Pig and a Cow" or "Why Didn't the Car Mechanic Say it Was a Wrench and a Wheel?"

Code	Description
Unhelpful intent	Child's response suggests that the informant did not want to help, or that he was purposely withholding information
Knowledge State	Child's response suggests that the informant did not have the appropriate knowledge to respond correctly.
Helpful intent	Child's response suggests that the informant attempted to help Uzma, and gave the best response he could. However, the attempt could be thwarted.
Other	A response that could not be coded. For example, the child repeated the informant's answer, or changed the subject
I don't know	The child could not explain the informant's behaviour.

Knowledge

Knowledge scores were obtained before and after familiarization. The means and standard deviations are presented in Table 3.

Pre-test knowledge scores. During familiarization, children were asked how much they believe each informant knows about the two familiarization objects (e.g., “does the famer know a little bit, medium, or a lot?”). An informant who was rated as “not knowledgeable” was given a score of 0, an informant who knew “a little bit” was given a score of 1, “medium” a score of 2, and “a lot” a score of 3. This was repeated for both familiarization objects. I calculated the average score for each informant, and used it as the pre-test knowledge score (ranging from 0 to 3) throughout the analyses. I predicted that children would expect the story expert to be more knowledgeable than the non-expert about the familiarization objects.

I utilized a paired sample t-test to examine the difference between pre-test knowledge score of the story expert and those of the non-expert. As predicted, the pre-test knowledge scores for the story expert ($M = 2.8$, $SD = .66$) were significantly higher than those of the non-expert ($M = .79$, $SD = 1.11$), $t(39) = 8.15$, $p < .001$, ($r = .74$). Children expected the story expert to be more knowledgeable about the familiarization objects compared to the non-expert. *Post-test knowledge scores.* I also obtained post-test knowledge scores, as part of the manipulation check to test the hypothesis that children would continue to perceive the expert informant as more knowledgeable than the non-expert about the familiarization objects. The questions and scoring were similar to the pre-test knowledge

scores, but children provided a single score, resulting in a post-test knowledge score ranging from 0 to 3 for each informant.

I analyzed the post-test knowledge scores LMMs primarily because participants did not contribute to all data points. The independent variables were the knowledge state of the informant (story expert vs. non-expert) and statement (colour vs. super ordinate category).

The analysis yielded a main effect of informant $F(1, 38) = 13.37, p < .001, r = 0.39$. As predicted by my hypothesis, the story expert continued to be perceived as more knowledgeable about the familiarization objects ($M = 2.16, SD = 1.3$) compared to the non-expert ($M = 1.05, SD = 1.34$). A marginal main effect of statement $F(1, 38) = 3.21, p = .08, r = .19$, was also revealed. Children rated the informant who provided the super ordinate category as somewhat more knowledgeable ($M = 1.88, SD = 1.34$) than the one who provided the colour ($M = 1.33, SD = 1.42$).

The interaction between informant and statement was not significant $F(1, 38) = .12, p = .73$.

Change in knowledge scores. Pre- and post-test knowledge scores of each informant (story expert and non-expert) were subjected to a repeated measures ANOVA to determine whether perceptions of knowledge changed over time. I predicted that children's perception of knowledge of the expert would decrease and those of the non-expert would increase.

Somewhat supporting my hypothesis, the analysis yielded a significant main effect of informant $F(1, 39) = 36.7, p < .0001$ and a significant interaction of time (pre- and post-) X informant $F(1, 39) = 13.26, p < .001$. As seen in Figure 1, the knowledge scores of the story expert decreased over time, whereas the non-expert's knowledge scores remained constant.

The results from the helpfulness scores analyses and the knowledge scores partially supported my initial hypotheses. First, I expected children to rate the story expert as less helpful than the non-expert, regardless of his statement (colour or super ordinate category). However, children rated the informant who provided the super ordinate category as more helpful than the one who provided the colour, regardless of his expertise. The pre-test and post-test knowledge scores supported my hypotheses, as the story experts' knowledge scores were higher than the non-experts', before and after the manipulation. I also found some evidence that children perceive an informant who provided the super ordinate category as more knowledgeable than one who provided the colour. Finally, the story expert's knowledge scores decreased following the manipulation, whereas the non-expert's knowledge scores remained constant.

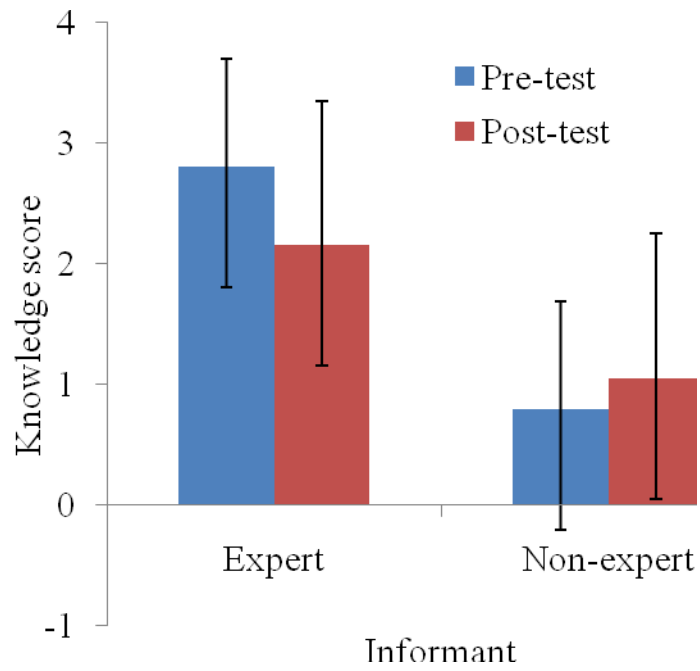


Figure 1. Pre- and post-test knowledge score for the story expert and non-expert.

Note. * $p < .001$

Information Seeking Task

The second goal of this study was to examine how perceptions of helpfulness and knowledge may influence information seeking behaviours. Children were asked to select one informant to provide a label for six novel objects. The novel objects were categorized into two groups: those related to the domains of expertise of the farmer or the car mechanic (the platypus, exotic monkey, car engine, and muffler respectively) and those unrelated to the domains of expertise of the informants (the pink massager and black massagers). I first examined the attribution of knowledge scores in order to ensure that children correctly recognized which objects were associated with the farmer, car mechanic, and the unrelated objects. The attribution of knowledge scores were obtained following the test-task when children were asked who they believe knows the most about each individual novel object. Next, I examined information seeking behaviours for each of these categories separately.

Attribution of Knowledge about Novel Objects. In order to ensure that children correctly categorized the objects as either related or unrelated to the experts, I first verified the attribution of knowledge scores. Children could select the story expert (coded as 1), the non-expert (coded as 0), both informants or neither of the informants (coded as 2). When attributing knowledge, children could select the story expert (coded as 1), the non-expert (coded as 0), both informants or neither of the informants (coded as 2). I combined instances where children stated that informants were equally knowledgeable or not knowledgeable, as they imply equality between the informants.

For the related objects, children attributed knowledge to the corresponding expert. They attributed knowledge to the car mechanic for the muffler 83% of the time, for the car engine 89% of the time. Children attributed knowledge to the farmer for the platypus 78% of the time, and 83% of the time for the exotic monkey. If children had attributed knowledge at chance, they would have selected equally between their options (expert, non-expert, both/neither). However, a chi-square goodness of fit test showed that children did not attribute knowledge at chance: muffler $X^2(2, N = 40) = 17, p < .0001$; car engine $X^2(2, N = 80) = 23, p < .0001$; platypus $X^2(2, N = 40) = 12, p < .0001$ and, exotic monkey: $X^2(2, N = 40) = 17, p < .0001$.

For the two unrelated novel objects, children attributed knowledge about the novel unrelated object to the story expert 33% of the time, the non-expert 23% of the time and both/neither 44% of the time, $X^2(2, N = 80) = 3.28, p = 0.19$. That is, the attribution of knowledge scores were not different from chance, which would have resulted in equal distribution between the story expert (25%), non-expert (25%) and both/neither (50%).

Information Seeking for Novel Objects Related to the Domains of Informant Expertise. Four of the novel objects were associated with either the story expert or the non-expert. I examined whether children were more likely to select the informant to whom the object was related. Then I tested the hypothesis that children's perceptions of knowledge and helpfulness influence their selection of the informant who was an expert about the familiarization objects, regardless of the domain to which the novel object was associated.

First, I examined whether children were more likely to select the relevant informant. When children selected the relevant informant, their responses were coded as 1, and when they did not, their response was coded as 0. For instance, a child who selected the car mechanic to label the muffler was given a score of 1, and one who chose the farmer was given a score of 0. For each of the related novel objects, children were more likely to select the relevant informant. They selected the car mechanic for the car muffler 95% of the time and the car engine 93% of the time. Children selected the farmer to label the platypus 98% of the time, and to label the exotic monkey in 93% of the cases. Hence, children sought information from the informant to whom the object was related. I performed a chi-square goodness of fit test to examine the distribution of children's selection of the expert informant. If children selected an informant at chance, they would be equally likely to select the expert and non-expert for any of the objects, regardless of the domain it was related to. However, all analyses were significantly different from chance: muffler: $X^2(1, N = 40) = 3.62, p < .0001$; car engine: $X^2(1, N = 40) = 27.22, p < .0001$; platypus: $X^2(1, N = 40) = 34.22, p < .0001$, and exotic monkey: $X^2(1, N = 40) = 3.62, p < .0001$. Hence, children relied on an informant's domain of expertise, instead of prior verbal behaviour when seeking information about novel objects that are associated with one of the informants.

Second, although there was little variability in children's responses to the related objects, I tested the hypothesis that perceptions of helpfulness and knowledge influence the selection of the expert informant. If children weighted expertise more heavily than violation of linguistic expectations, they would select the expert informant to label objects

that are associated with his domain of expertise. However, they could perceive the non-expert as an alternate source of information and select him to label objects that are associated with the expert's domain of expertise, because he did not provide the conventional object label. To test these hypotheses, data were recoded so that children who selected the story expert, were given a score of 1, and those who selected the non-expert were given a score of 0.

Next, I calculated the average number of times the expert informant was selected to provide labels for the two novel objects associated with his domain, and the average number of times the expert was selected to label the two objects associated with the non-expert's domain. These two average scores were repeated independent variables. The average scores were subjected to a repeated measures ANOVA to compare the effects of: 1) the identity of the expert informant (farmer vs. car mechanic), 2) the helpfulness scores of the story expert, 3) the helpfulness score of the non-expert 4) the post-test knowledge scores of the story expert and 5) the post-test knowledge score the the non-expert . In addition, the category of the novel object (within subject variable: associated with the story expert vs. non-expert) was included as the within subject independent variable. The first independent variable was included to ensure that children did not have a preference for one of the two informant.

The within-subject variable, that is, whether the object was associated to the expert or non-expert was significant $F(1, 35) = 16.81, p < .001$. Children recognized and were guided by the informant's expertise (and not perceptions of helpfulness or knowledge) when seeking information.

The helpfulness score of the story expert $F(1, 34) = 2.18, p = .15$, the helpfulness score of the non-expert $F(1, 34) = .025, p = .88$, the post-test knowledge score of the story expert $F(1, 34) = .007, p = .93$, and post-test knowledge scores of the non-expert $F(1, 34) = 2.13, p = .15$ did not influence the selection of the expert informant for the related novel objects. The identity of the expert informant did not influence information seeking. When seeking information about objects that are associated with one of the informant's domain of expertise, children refer to the informant's expertise as opposed to perceptions of helpfulness and knowledge.

Information Seeking for Novel Objects Unrelated to the Domains of Expertise of the Informants. I also asked children which informant they should query in order to learn about two novel objects that were unrelated to either of the informants' domain. The dependent variable in the information seeking analyses was the selection of the story expert to label the novel objects, which was repeated over two trials. One child's data were omitted as he did not answer either question.

Over the two trials, children selected the story expert 61% of the time to label the novel unrelated object. To test the hypothesis that helpfulness scores and post-test knowledge scores influence the selection of the expert informant for novel unrelated objects, I first calculated the average number of times the expert informant was selected to provide labels for the two unrelated novel objects and used it as the dependent variable. Next, the average score was subjected to an ANOVA to compare the effects of: 1) the identity of the expert informant (farmer vs. car mechanic), 2) the helpfulness score of the story expert 3) the helpfulness score of the non-expert, 4) the post-test knowledge score

of the story expert and 4) the post-test knowledge score of the non-expert. The first independent variable was included to ensure that children did not have a preference for one of the two informant.

The analysis yielded a marginally significant main effect of knowledge score of the story expert $F(1, 39) = 3.25, p = .08$ ($\eta^2 = .09$, power = .42). Although this finding must be interpreted with caution, it seems that children are more likely to select the story expert to label the unrelated novel objects, when they perceived him as more knowledgeable. Hence, children's information seeking is somewhat guided by perceptions of knowledge, as opposed to helpfulness. The power to assess this effect is insufficient, and a larger sample would be necessary to draw firmer conclusions.

The identity of the expert informant $F(1, 39) = 1.86, p = .18$, the post-test knowledge score of the non-expert, $F(1, 39) = 2.9, p = .1$, the helpfulness score of the story expert $F(1, 39) = .001, p = .98$, and the helpfulness score of the non-expert $F(1, 39) = .02, p = .9$ did not influence children's information seeking.

Chapter 4: Discussion

This study addressed to questions: 1) do violation of linguistic expectations alter children's perceptions of knowledgeability and willingness to help and 2) do these perceptions predict information seeking? These questions aim to obtain specific information about children's interpretations of informants' responses, and contribute new factors to their information seeking decisions. I found that children perceive the informant who provided the super ordinate category as more helpful and somewhat more

knowledgeable than one who provided the colour, regardless of the informant's expertise. Children's perception of the expert's knowledge decreases after he failed to provide the conventional object label for objects associated with his domain of expertise. Albeit weakly, I found that children's perceptions of the expert's knowledge influence the selection of the expert informant to label the novel unrelated objects.

Children's Perceptions of Helpfulness and Knowledge

Helpfulness. I predicted that children would perceive an expert who failed to provide the conventional object label for an object associated with his expertise as less helpful than a non-expert. However, I found that children perceive the informant who stated the super ordinate category as more helpful than the one stating the colour, regardless of his expertise. These results suggest that children are sensitive to the type of responses that would be helpful to a novice English speaker. I did not predict children to differentiate between two statements, particularly when made by an expert informant. However, in retrospect, providing the colour of a pig is arguably not as helpful as providing its super ordinate category, because the colour is less informative about the nature of the object in question. Consequently, higher helpfulness scores were associated with more informative responses (super ordinate categories vs. colour) as opposed to the discrepancy between informants' knowledge and statement.

To solidify the conclusions made regarding the helpfulness data, I examined helpfulness ratings of another study, where the same children rated the helpfulness measures of an expert, and a generic adult (non-expert) who provided the same type of

responses as the current study. The dependent variable was the total helpfulness measure, and the independent variables were the knowledge state of the informant (expert vs. non-expert) and the statement (colour vs. super ordinate category). The helpfulness data supported our current findings. Doubling the number of responses yielded a significant main effect of informant $F(1, 36) = 4.2, p = .04$ and statement $F(1, 36) = 29.6, p < .001$. There were no significant interactions. First, the main effect of informant indicates that children were more likely to rate the expert as helpful ($M = 2.16, SD = .15$) than the non-expert ($M = 1.79, SD = .15$). Second, children were more likely to rate the informant who provided the super ordinate category as helpful ($M = 2.16, SD = .15$) compared to the one who stated the color ($M = 1.79, SD = .15$). Hence, I have reason to believe that the unanticipated findings are robust. Additional information concerning the pilot study is presented in Appendix C.

Previous information-seeking studies which obtained children's justifications suggest that children are sensitive to an informant's knowledge state when justifying erroneous responses. Numerous other studies suggested that children perceive an unreliable informant as being silly (Contin & Camras, 1984; Eskritt et al., 2008; Grice, 1975; 1989; Siegal, 1999; Siegal & Surian, 2004), implying the informant's attempt to amuse. In the present study, children also provided justifications as to why the expert did not provide the conventional object label. They rationalized the expert's responses by stating that: "he forgot the names"; "he wanted to teach her the colours first" and "they *are* both animals!" Despite the discrepancy between the expert's knowledge level and quality of his response, children's justifications provided no evidence that they interpreted

the expert's verbal behaviour as intent to mislead Uzma. This represents either a ceiling effect of helpfulness, where children perceive *any* informant who provides *any* response as helpful, or that the manipulation was not strong enough for children to evaluate the expert as unhelpful. It is also possible that the measure of helpfulness was not sensitive enough to assess children's perceptions adequately. Unfortunately, we were not able to obtain justifications for the non-expert's responses. A comparison of justifications made for the non-expert and the expert could have clarified whether children were more lenient towards a non-expert who violates linguistic expectations.

Overall, it appeared challenging for children to attribute unhelpful intent to an adult. As proposed by Clark (1993), children may be biased in assuming that all adults are helpful. They may have an entrenched belief that informants had positive intentions towards Uzma and consequently rated them as helpful. Hence, it is possible that I encountered ceiling effects for the helpfulness scores, in that children perceived all informants as helpful. Nevertheless, although initially children may have perceived both informants as equally helpful, their responses resulted in different helpfulness ratings for the informant who provide the colour and the one who provided the super ordinate category. This suggests that children's perception of helpfulness is responsive to the quality of responses provided by the informant, regardless of his expertise.

Knowledge. As expected, at the beginning of the study, children perceived the story expert as more knowledgeable about the familiarization objects than the non-expert.

Based only on their profession, they expected the story expert to know more about particular object and consequently provide better responses. This finding fits with the literature showing that early in development, children learn that knowledge is not distributed equally (Danovitch & Keil, 2004; Keil, 2006) and identify the type of knowledge stereotypic professionals (e.g., doctors and car mechanics) have (Lutz & Keil, 2002). Also supporting my hypothesis, following the test-task, children continued to perceive the expert informant as more knowledgeable about the familiarization objects than the non-expert.

I found a trend that children perceived the informant who provided the super ordinate category as more knowledgeable than the one who provided the colour, when I had expected children to rate the non-expert as less knowledgeable than the expert. It is possible that children are sensitive to the informativeness of a response when evaluating a speaker's knowledge. As mentioned previously, stating the super ordinate category of an object is arguably more informative than stating the colour.

Finally, I found a decrease in the post-test knowledge scores of the expert, following the manipulation. I hypothesized that children would re-evaluate informants' knowledge after the informants' statements. Specifically, I predicted a decrease in the expert's knowledge score and an increase in the non-expert's. Children anticipated the expert to be more knowledgeable about the familiarization objects and expected him to provide the conventional object label for items associated with his domain of expertise. When he failed to do so, they re-evaluated his level of knowledge. These results show that children's evaluation of knowledge is impressionable: if an expert fails to provide the

best answer based on his knowledge, then he is perceived as less knowledgeable. Interestingly, this reasoning did not occur in both directions: the non-expert's knowledge scores remained constant. That is, even when the non-expert provided the super ordinate category, he was not perceived as more knowledgeable in the post-test knowledge ratings compared to the pre-test knowledge ratings. Explaining this finding is a plethora of research demonstrating that negative information weights more heavily than positive information. For instance, adults are more likely to attend to negative information and weight it more heavily when forming first impressions of strangers (Baumeister et al., 2001 for a review). It is possible that children's initial perception of ignorance for the non-expert weighted more heavily than the expert's knowledge and inappropriate responses (Baumeister et al., 1991; Koenig & Jaswal, in press). Early on, children might have labelled the non-expert negatively, (as ignorant) and did not re-assess their first impression of him, regardless of the content of his response.

To my knowledge, no other study has specifically examined children's perceptions of knowledgeability and willingness to help. Interestingly, the helpfulness results and post-test knowledge converge: children evaluate the content of particular statements, and the informants who make them differently. Namely, children perceived the informant who provided the super ordinate category as more helpful and somewhat more knowledgeable than the one who provided the colour. This trend suggests that children assess the content informant's responses, independently from their knowledge states when evaluating knowledge and helpfulness. Supporting this possibility, research suggests that children are sensitive to the magnitude of errors made by informants.

Although Einav and Robinson (2009) did not assess perceptions of knowledgeability or helpfulness, the researchers demonstrated that children are more likely to seek information from an informant whose responses were “more correct” or have a “smaller magnitude of error”. The authors introduced children between the ages of four and seven to two informants whose responses varied in terms of magnitude of error. For instance, when shown a picture of a butterfly, the least-reliable informant responded with another animal name: “I think it’s a cat” whereas the most-reliable informant responded by another insect: “I think it’s a bee”. They found that four-year-olds are more likely to trust and endorse statements made by an informant who was most reliable (albeit not entirely correct) in the past. Comparatively, in the present study, it is possible that children rated the informant who provided the “least erroneous” (super ordinate category) answer, as more helpful and more knowledgeable than the one who provided the colour.

These results also support children’s sensitivity to the Quantity maxim of conversation, but do not suggest that they associate the violation of this maxim with unwillingness to help. The purpose of conversational maxims is to ensure cooperation within an exchange: both interlocutors must adhere to these rules in order for the exchange to be meaningful and free of misunderstandings. Children are less likely to seek information from informants who have violated these maxims (Eskritt et al., 2008) which suggests that they may perceive these individuals differently. In the present study, both informants violated the Quantity maxim when labelling the familiarization objects, however only one was knowledgeable about them. Children did not differentiate between informants’ knowledge state and statement; instead, they appear to evaluate

knowledgeability and helpfulness solely on the informants' statement. In other words, children did not reason as I had anticipated, they did not compare an informant's knowledge to his statement when evaluating knowledge and helpfulness and they did not perceive violations of the Quantity maxim as uncooperative behaviour.

Characteristics Underlying Information Seeking Behaviour

I examined whether children's perceptions of helpfulness and knowledge predicted information seeking behaviour for novel objects that were either related, or unrelated to informant's domain of expertise.

When seeking information about novel objects related to one of the informants' domain of expertise, children consistently selected the informant to whom the novel object was associated. Both the knowledge attribution scores and the information seeking data showed that children identified the domain to which the novel object was associated, and used this information to guide their selection. Contrary to my hypothesis, when selecting an informant to label the related objects, children's perceptions of helpfulness and knowledgeability did not predict their choice of informant. It is possible that children did not perceive the non-expert as an alternative source of information or they did not perceive the expert's violations as important enough to discredit him entirely. Hence, violations of linguistic expectations do not influence children's information seeking for objects that are associated with the informants' domain of expertise, as children continue to rely on informants' profession, regardless of knowledge and helpfulness scores.

When seeking information about novel objects that were *unrelated* to either of the informants' domain, the expert's knowledge marginally predicted information the selection of the expert informant. Although this finding must be interpreted with caution, children were more likely to seek information from the story expert informant they rated as more knowledgeable. It also shows that despite the expert's violation of linguistic expectations, children's perception of the non-expert's helpfulness or knowledge was not associated with information seeking behaviour. Children did not perceive the non-expert as a more reliable source of information, even if the objects were unrelated to either of the informant's domain of expertise.

I hypothesized that children would become mistrustful of an expert who violated linguistic expectation, and would consequently seek information about unrelated novel objects from a non-expert. However, children did not select the non-expert to label the novel unrelated objects, even when he provided the response that was rated as more helpful or associated with higher knowledge scores (i.e., the super ordinate category). I identified two explanations for this finding. The first possible explanation is that children's initial impression of the non-expert as not knowledgeable (about the familiarization objects) was overextended to novel objects that were unrelated to his (or the story expert's) expertise. A recent study by Koenig and Jaswal (in press) explored the extrapolation of children's interpretations of knowledge and ignorance. The authors demonstrated that an individual who is incompetent in one domain is not sought for information in a completely different domain. Koenig and Jaswal (in press, Study 2) referred to this phenomenon as the "pitchfork effect" of ignorance. In their study, three-

and four-year-olds were introduced to two informants: one who was not knowledgeable about dogs (ignorant informant), and another neutral informant whose knowledge of dogs was ambiguous (neutral informant). During familiarization, the ignorant informant's statements were wrong (e.g., referring to the dogs as cats), and the neutral informant expressed a personal opinion about the dog (e.g., "I like that one"). In the test task, children selected an informant to identify novel dog breeds and artefacts. For both novel objects and artefacts, four-year-olds consistently avoided the informant who was ignorant about dogs and selected the neutral informant above chance. Even if the ignorant informant was misinformed about dogs (but not artefacts) children did not seek information from a source that they previously identified as being weak, or untrustworthy. Similarly, in the present study, it is possible that children generalized their initial perception of the non-expert's ignorance onto other unrelated knowledge domains and selected the expert to label novel unrelated objects.

The second possible explanation for the children's mistrust of the non-expert is that although both informants had an obvious domain of expertise, only one of the two informants had the opportunity to demonstrate his knowledge, by labelling objects in the familiarization stage. In other words, the non-expert did not have an opportunity to display his willingness to provide accurate information, when he is knowledgeable. Other studies have included a trial where both informants provide reliable information – demonstrating that they have the ability and willingness to so (Einav & Robinson, in press). If the non-expert had the opportunity to display his willingness to provide

complete information *if* he was knowledgeable – children might have evaluated him as a worthy source to explore when labelling novel unrelated objects.

Limitations

A number of changes to the procedure may have enhanced my findings. First, I did not obtain a pre-test assessment of helpfulness. Based on my observations during piloting, children tended to expect all informants to be very helpful to Uzma. I removed the pre-manipulation helpfulness rating early in the piloting stage, as I believed it to bias children's future ratings. Specifically, children might have wanted to maintain their evaluations consistent throughout the testing by rating both informants as helpful before and after. However, during the demonstration session, children differentiated between an unhelpful response (stating the colour of the lychee) and a more helpful response (stating that it is a fruit, called lychee). Also children rated the informant who provided the super ordinate category as more helpful than the one who provided the color. Hence, despite their initial perception of everyone being willing to help Uzma, children evaluated some responses as more helpful than others.. A pre-manipulation helpfulness measure would have allowed me to calculate a difference score, to determine whether a particular statement (colour vs. super ordinate category), or knowledge state (expert vs. non-expert) led to a *change* in perceptions of helpfulness. Second, additional familiarization trials might have been necessary for children to evaluate the expert informant's helpfulness.

Third, children in this study responded to informants' behaviour towards a third party. Their perceptions of helpfulness and information seeking behaviour could have been different if they were motivated to learn the identity of the familiarization objects as

opposed to observing the informants responding to a foreign child. Future studies could use unfamiliar novel objects during the familiarization phase, and remove the third person in order to facilitate children's evaluation of helpfulness.

This study contributes to the current literature on children's perception of informants as well as information seeking behaviours. First, I demonstrated that more informative responses are associated with perceptions of helpfulness, regardless of the knowledge state of the speaker. Specifically, a speaker who provided the super ordinate category was generally perceived as "medium" or "a lot" helpful whereas the one who provided the colour was rated as "a little bit" helpful. Second, an expert who failed to provide the conventional label of an object associated with his domain is perceived as less knowledgeable. This supports the notion that children have specific and impressionable expectations of individuals they seek information from, especially knowledgeable ones. Thirdly, I have some evidence that children tend to extrapolate from their perceptions of knowledge and seek information about unrelated novel objects from expert informants who they rate as more knowledgeable.

Children frequently rely on others to learn about the world and must think critically about whom to probe in order to receive the best information possible. They must identify and select an informant who is knowledgeable but also willing to share his knowledge. Underlying these decisions are expectations as to the quality and form of the information provided. This research suggests that children evaluate informants who violate those expectations differently, and refer to those evaluations when seeking information. That is, children's perception of informants' knowledge and willingness to

help is suggestible to violation of linguistic expectations and perceptions of knowledge in particular influence information seeking decisions.

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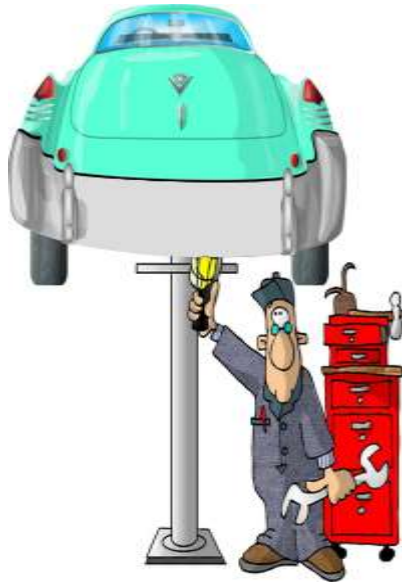
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APPENDIX A



Car Mechanic

(Expert in Cars)



Farmer

(Expert in Animals)



“Uzma”

Foreign Child learning English

APPENDIX B



Training Item: Lychee



Novel objects associated with Car Mechanic: muffler and car brake



Novel objects associated with the Farmer: platypus and exotic monkey



Unrelated Novel Objects: two massagers

Appendix C

The same procedure as the present study was used for the pilot study from which the additional helpfulness ratings were extracted. The same children participated. The stimuli consisted of 8.5 cm X 5.5 cm colour images of each informant cards. The informants were a builder (expert in building things) and a generic adult who works but does not have a specific expertise. The familiarization objects were a hammer and a saw, both objects associated with the builder (expert). There was no information seeking task. Instead, children were asked to share stickers with both informants.



Generic Adult



Builder