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Two-Year-Olds’ Appreciation of the Conventionality of Novel
Labels in Indirect Word Learning Contexts

By

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ABSTRACT

Two-year-olds’ ability to learn the meaning of a novel label using intentional cues and their appreciation of the conventionality of object labels versus desires was examined in two studies. In each study, children played a finding game with an experimenter during which they were indirectly taught a piece of information about a target object. Children in the first experiment heard an indirect intentional cue as to the meaning of a novel label. Children in the second experiment heard an intentional cue of the experimenter’s affections towards a target object. Children used the speaker’s intentional cue to learn the correct meaning of a novel label and generalised the meaning of the novel label to a second object that was a member of the same category as the target object. Furthermore, children appreciated that the meanings of object labels acquired indirectly are conventional, however, an individual’s desires are not.
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TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval page</td>
<td>ii</td>
</tr>
<tr>
<td>Abstract</td>
<td>iii</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>iv</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>v</td>
</tr>
<tr>
<td>List of Tables</td>
<td>vi</td>
</tr>
<tr>
<td>List of Figures</td>
<td>vii</td>
</tr>
<tr>
<td>CHAPTER ONE: INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>The Role of Socio-Pragmatic Cues in Word Learning</td>
<td>1</td>
</tr>
<tr>
<td>The Development of Intentionality</td>
<td>3</td>
</tr>
<tr>
<td>Infants’ Use of Emotional Expression to Uncover Intention</td>
<td>4</td>
</tr>
<tr>
<td>Intentionality and Word Learning</td>
<td>5</td>
</tr>
<tr>
<td>Summary</td>
<td>9</td>
</tr>
<tr>
<td>Children’s Understanding of Conventionality</td>
<td>9</td>
</tr>
<tr>
<td>Summary</td>
<td>12</td>
</tr>
<tr>
<td>The Present Research</td>
<td>13</td>
</tr>
<tr>
<td>CHAPTER TWO: EXPERIMENT 1</td>
<td>14</td>
</tr>
<tr>
<td>Method</td>
<td>16</td>
</tr>
<tr>
<td>Results</td>
<td>27</td>
</tr>
<tr>
<td>Discussion</td>
<td>33</td>
</tr>
<tr>
<td>CHAPTER THREE: EXPERIMENT 2</td>
<td>34</td>
</tr>
<tr>
<td>Method</td>
<td>36</td>
</tr>
<tr>
<td>Results</td>
<td>38</td>
</tr>
<tr>
<td>Discussion</td>
<td>42</td>
</tr>
<tr>
<td>CHAPTER FOUR: GENERAL DISCUSSION</td>
<td>43</td>
</tr>
<tr>
<td>Future Research and Conclusions</td>
<td>46</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>49</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1: Experiment 1: Number of Participants that Made Correct and Incorrect Target Choices on the Comprehension Task and the Generalisation Task as a Function of Group ..................................................28

Table 2: Experiment 1: Number of Participants Showing Total Comprehension and Any Learning as a Function of Group ...............................................................31

Table 3: Experiment 2: Number of Participants that Made Correct and Incorrect Target Choices on the Comprehension Task and the Generalisation Task as a Function of Group...........................................................39

Table 4: Experiment 2: Number of Participants Showing Total Comprehension and Any Learning as a Function of Group .................................................................41
LIST OF FIGURES

Figure 1: Example of the First Set of Unfamiliar Objects.................................18

Figure 2: Example of the Second Set of Unfamiliar Objects..............................19
INTRODUCTION

Consider the following situation: a young child is at the zoo looking at the birds in the exhibit and hears her parent say, “Look! An ostrich!” If the child does not know what an ostrich is, how might she learn the meaning of that new word? When hearing a novel word, a child must first be able to identify the correct referent of the new word, and then be able to generalise the meaning of the new word, if appropriate, to other exemplars or situations. A key component of this inductive process is the understanding that the meanings of words are shared by members of a linguistic community and thus can be generalised across different contexts. Despite the apparent complexity of the word learning task, however, young children are amazingly adept word learners. For example, between the ages of 18 months and 6 years, children acquire approximately five to six new words a day (Anglin, 1993; Carey, 1978, 1982). Yet we still do not fully understand the processes involved in young children’s word learning and why they are so proficient at it early in development. Therefore, the goals of the present studies were to examine 2-year-olds’ use of social cues in word learning and to examine whether they appreciate shared meaning of new words.

The Role of Socio-Pragmatic Cues in Word Learning

Over the past 20 years, a great deal of empirical attention has been devoted to understanding how word learners acquire the meanings of novel words. Researchers have demonstrated that word learners can use multiple sources of information to correctly identify the meaning of a new word, including word learning constraints or biases (e.g., mutual exclusivity), socio-pragmatic cues (e.g., eye gaze), lexical form class information
(e.g., nouns vs. adjectives), and object characteristics (e.g., shape) (see Akhtar & Tomasello, 2000; Baldwin & Moses, 2001; Bloom, 2000; Hollich, Hirsh-Pasek, Golinkoff, 2000; Woodward & Markman, 1998 for reviews). For example, evidence indicates that word learners bring various constraints or biases to the word learning task, which facilitate word learning by reducing the number of possible referents for a new word (Hollich et al., 2000). One such bias is the Mutual Exclusivity Bias, which states that children assume that an object can only have one label associated with it (Markman, 1989). Although much research has provided support for the existence of constraints such as the Mutual Exclusivity Bias (e.g., Markman & Wachtel, 1988), these constraints cannot account for situations where children are presented with multiple unfamiliar cues and are required to determine the correct referent of a novel word. However, research indicating that children are able to use intentional cues provided by a speaker to learn the meaning of a new word can account for word learning in situations where children are shown multiple unfamiliar objects (e.g., Akhtar & Tomasello, 2000). Of particular interest to the current research are the socio-pragmatic cues that children use in word learning.

Research on the role of socio-pragmatic cues in early word learning is typically grounded in the social-pragmatic view of language development, which emphasises the importance of social-cognitive skills and cultural learning for language acquisition (Bruner, 1975, 1983; Tomasello, 1992). According to this view, it is the social interaction between a language learner and a speaker that is the underlying force in language acquisition (e.g., Akhtar & Tomasello, 2000; Baldwin & Tomasello, 1998). Briefly,
advocates of the social-pragmatic account propose that infants must enter into a state of joint attention with the speaker to learn the meaning of a novel word (Akhtar & Tomasello, 2000). Joint attention occurs when two individuals are focused on exactly the same aspect of their environment and are both aware of this joint attentional focus (Tomasello, 1995). During this period of joint attention, infants have the opportunity to determine what a speaker is attending to, and thus they can then make the appropriate association between an unfamiliar word and its correct referent. Although supporters of the social-pragmatic viewpoint do not ignore the existence of other processes that may play a role in word learning, such as syntax information, they feel that it is the social process of joint engagement with a speaker that provides the basis for word learning to occur (Akhtar & Tomasello, 2000).

An inherent component of the social-pragmatic account is the early understanding of intentionality. Much research has been devoted to uncovering when children develop an understanding of intentionality (for a review see, Carpenter, Nagell, & Tomasello, 1998). This research will be reviewed briefly below.

The Development of Intentionality

Recent research suggests that the beginnings of the ability to understand intention emerges by the time infants are 12 months of age (Carpenter et al., 1998). There are two key aspects of this understanding. First, infants must realise that animate beings are intentional agents with goals, beliefs, and desires that may not be consistent with their own (Tomasello, Kruger, & Ratner, 1993). Second, infants must possess at least a rudimentary understanding of means-end reasoning, which is the understanding that
others will act in ways that will enable them to reach their goals (Tomasello et al., 1993). Carpenter et al. (1998), for example, suggest that 8-month-old infants' ability to monitor an individual's eye gaze and adjust their focus to follow into that individual's gaze direction may be an indication of an early understanding of means-end reasoning. Thus, it has been suggested that in their first year, infants possess a basic understanding of the minds of other individuals (Carpenter et al., 1998). Although much research has documented infant behaviours that may be evidence of an early understanding of intentionality, such as eye gaze following, (see Carpenter et al., 1998), it is unclear specifically how young children may begin to identify with the intentions and beliefs of other individuals. Two recent lines of research have examined young infants' understanding of others' intentions: one focusing on emotional understanding and another on word learning.

**Infants' Use of Emotional Expression to Uncover Intention**

Recent research has demonstrated that older infants are able to use cues such as an individual’s emotional expression to predict that individual’s subsequent behaviour (Poulin-Dubois, 1999). For example, Repacholi and Gopnik (1997) found that by 18 months of age, infants could attend to and understand another individual’s desires and underlying intentions. In their study, an experimenter either expressed enjoyment towards a food that the infants themselves preferred (e.g., goldfish crackers) and disgust towards another (e.g., broccoli) or enjoyment towards a food that was incongruent with the infant’s preference (e.g., broccoli) and disgust towards another (e.g., goldfish crackers). When asked to give the experimenter the food she wanted, 14-month-old infants were
unable to inhibit responding with their preference and gave the experimenter what they themselves most liked (e.g., goldfish crackers). However, the 18-month-olds gave the experimenter the type of food she desired, regardless of whether or not it was consistent with their own preference (e.g., goldfish crackers/broccoli). Thus, by 18 months of age, infants are able to monitor the desires of another person and understand that the desires and intentions of another individual may be different from their own.

Other research has demonstrated that infants can rely on an experimenter’s affective behaviour towards objects to guide their own future behaviour (Repacholi, 1998). For example, Moses, Baldwin, Rosicky, and Tidball (2001) explored 12- and 18-month-old infants’ ability to use referential cues provided by an experimenter to uncover the intended referent of an emotional outburst. They found that 18-month-olds and, to a lesser degree, 12-month-olds were able to use an experimenter’s eye gaze to uncover the intended referent of an emotional display (e.g., pleasure or disgust), regardless of whether or not the infants were focused on the target object at that particular time.

In summary, by at least 12 to 18 months of age, and possibly younger, infants are able to use the emotional expressions of another individual to accomplish the following: to guide future actions of others (e.g., Repacholi & Gopnik, 1997), to guide their own future behaviour (Repacholi, 1998), and to uncover the intended referent of an emotional response (Moses et al., 2001).

Intentionality and Word Learning

A second line of research has focused on young children’s ability to use intentional cues provided by a speaker to learn the meaning of a new word. Researchers
have demonstrated that young children can attend to an adult’s intentional behaviours as a part of the word learning process. For example, Baldwin (1993a) found that infants 19 and 20 months of age would ignore the temporal contiguity between the presentation of a novel label and a non-target object and use referential cues provided by a speaker (e.g., eye gaze) to correctly map the novel label onto the target object. In one condition, an experimenter looked into a first bucket, provided a novel label for the object (e.g., “It’s a modi!”), and then handed the child an object from a second bucket. In a second condition, infants were handed the object from the first bucket immediately following the presentation of the novel label. When asked for the referent of the novel label, infants in both conditions correctly identified the target object as the referent of the novel word. Thus, this experiment demonstrates that infants do not require immediacy in word learning; speakers’ intentional cues are more salient. In a more recent investigation, Baldwin et al. (1996) found that infants as young as 15 months resist making incorrect word-object mappings when novel labels are introduced without accompanying referential cues, even when their attention is focused on a second object that could also serve as a possible referent. This provides additional evidence indicating that infants see intention as important more so than temporal covariance between a novel label and an unfamiliar object. Other researchers have provided further evidence indicating that word learners can use their referential knowledge to learn new words when the target object is not perceptually present (e.g., Akhtar & Tomasello, 1996; Tomasello, Strosberg, & Akhtar, 1996) and to learn the meaning of new action words as well as object labels (e.g., Akhtar & Tomasello, 1996).
A great deal of research has been conducted to examine specifically how such young children are, in fact, able to uncover the direction of a speaker’s focus (e.g., see Baldwin, 1993a, 1993b; Tomasello & Akhtar, 1995). Through such studies, researchers have demonstrated that word learners attend to multiple cues, including a speaker’s eye gaze, an object’s relative novelty in the discourse situation, and a speaker’s notice of an impending event, when mapping an unfamiliar word onto an unfamiliar referent.

For instance, research has demonstrated that infants can attend to eye gaze cues and they will subsequently switch their attention to a different object in a word mapping task. Baldwin (1993b) examined 14- to 19-month-old infants’ abilities to switch their focus from one object to another, depending on the speaker’s eye gaze direction. In one condition, the experimenter looked towards and provided the label for the object in her hand (e.g., “It’s a toma”), while infants were focused on a different object in their own hands. In a second condition, the experimenter looked at and labeled the object that infants were attending to. Although 14-month-olds did not perform consistently when they were later asked to pick out the referent of the novel label (e.g., “Point to the toma”), by 19 months of age infants could consistently use eye gaze information to map the novel term onto the correct object, regardless of whether the object was the same one they were looking at or not. Baldwin thus concluded that infants as young as 19 months can switch their focus from the object in their possession and make correct word-object mappings based on an experimenter’s referential behaviour.

In addition to using eye gaze cues in word learning, researchers have also found that young children are able to use discourse novelty (e.g., Akhtar, Carpenter, &
Tomasello, 1996). It is well known that individuals tend to talk about and express interest in new things. Akhtar and her colleagues (1996) found that 24-month-olds are remarkably able to use contextual novelty, from both their own and another person’s perspective, as a cue to map novel words onto a correct referent.

Lastly, studies conducted by Tomasello and colleagues (Tomasello & Barton, 1994; Tomasello et al., 1996) have provided evidence indicating that word learners are able to use a speaker’s statement about an impending event (e.g., “Let’s find the toma”) as an intentional cue to learn the meaning of a new word. For example, in Tomasello and Barton (1994, Study 4), an experimenter played a finding game with 24-month-olds using four novel objects. During this game, an experimenter would provide a language model (e.g., “Let’s find the toma”) before finding a target object. Before finding the other non-target objects no language model was provided (e.g., “Let’s see what’s in here”). In one group, the target object was found directly after the language model was provided and in a second group, the experimenter visibly rejected a non-target object (e.g., she frowned) before finding the target object. The findings indicate that 24-month-olds were able to make correct word-object mappings regardless of whether the target was found directly preceding the language model. These findings have been replicated with 18-month-olds, using a similar procedure (Tomasello et al., 1996).

Other research has demonstrated that children can also use intentional cues to learn the meaning of new action words (e.g., Poulin-Dubois & Forbes, 2002; Tomasello & Akhtar, 1995), learn the meaning of novel labels when the cues conflict with object salience (Baldwin, 1993a; Moore, Angelopoulos, & Bennett, 1999), and to distinguish
between “intentionally” introduced versus “accidentally” introduced novel words (Tomasello & Barton, 1994).

Summary

The research presented above provides evidence that young word learners are able to use referential cues such as eye gaze (e.g., Baldwin, 1993b), discourse novelty (Akhtar et al., 1996), and notice of an impending event (e.g., Tomasello & Barton, 1994) to establish correct word-object mappings. Researchers suggest that the ability to learn new words using such referential cues may be evidence of a deeper emerging understanding of another person’s underlying intentions (e.g., Akhtar et al., 1996; Baldwin, 1993a; Diesendruck & Markson, 2001). Thus far, it has been shown that young children can use numerous types of cues to learn new words. However it remains unclear whether word learners appreciate the role of language as a shared, conventional, communicative system when it is acquired indirectly. That is, we still do not know if young children understand that the meaning of words taught indirectly can be shared by a speaker not physically present when the word was introduced.

Children’s Understanding of Conventionality

The Principle of Conventionality was first discussed by Clark (1983), who proposes that, “For certain meanings, there is a conventional word or word formation device that should be used in the language community.” (p. 820). She argued that words are conventional, or rule-based, in that they are used to convey meaning and that all individuals who share the same language will share a common understanding of the meaning. Thus, conventionality provides all individuals who share a common language
with more efficiency and accuracy when trying to convey meaning during communication with others (Clark, 1992). Therefore, in order to fully acquire a language, word learners must develop an understanding of the specific conventions associated with their language.

To learn the conventional meaning of words, word learners are required to monitor consistencies in the situations that govern certain word use and use those consistencies to uncover the correct meanings of words (Clark, 1983, 1992, 1993). Thus, inherent in the principle of conventionality is the notion that words are used in the same manner consistently across different contexts and situations. In fact, Clark asserts that until word learners recognise that there is consistency across situations of word use and their meaning, complete acquisition of language may be a difficult feat. Despite this seemingly difficult task, and although they may be erroneous in their initial judgements making errors such as overextensions (calling all four-legged animals “dogs”), word learners do rapidly develop an understanding of the correct and conventional uses of words (Clark, 1983). For example, Clark (1983, 1992, 1993) indicated that young word learners’ spontaneous repairs to previously incorrect word choices and their tendency to ask adults for the names of objects are two behaviours that indicate an early awareness of conventionality and their quest to learn the conventional forms of their language.

Researchers have recently provided evidence indicating that young children possess at least a basic understanding of the conventionality of language in infancy and this understanding continues to develop during the preschool years (e.g., Clark, 1993; Diesendruck & Markson, 2001; Namy, 2001; Namy & Waxman, 1998; Woodward &
Hoyne, 1999). For example, recent research has examined the types of symbols that infants believe convey meaning in a conventional manner (Woodward, 2000).

Woodward and Hoyne (1999) explored 13- and 20-month-olds’ understanding of the conventionality of words and non-linguistic sounds. Infants were taught either a novel word or a novel sound (e.g., a whistle) as the meaning of a novel object. In a subsequent comprehension test (e.g., “Show me a ___”), the 13-month-olds who heard the novel sound were just as likely to select the target object as those who heard a novel word. In contrast, the 20-month-olds who heard the novel label chose the target object in the comprehension test. This study suggests that between the ages of 13 months and 20 months, infants begin to develop the understanding that words are conventional tools used to convey meaning, but novel sounds associated with an object are not conventional. Additionally, research conducted by Namy (Namy, 2001; Namy & Waxman, 1998) indicates that infants aged 17 and 18 months will accept gestures, non-verbal sounds, and pictures to define object categories, but 26-month-olds will not. Thus, it appears that there is a developmental progression in children’s acceptance of certain forms of communication, such as gestures, as symbols.

Diesendruck and Markson (2001) conducted a series of studies indicating that, by the time children are 3 years of age, they possess an intricate understanding of the type of information that is conventional. In one study, children were taught the referent of a novel label (e.g., “This is a zev”) and were later asked for the referent of a second novel label (e.g., “Give me the jop”) by a puppet speaker who was absent when the first label was taught. The researchers found that children were more likely to choose the second
object that had not previously been labelled as the referent of the second label. However, when children were taught a new fact for one of the objects (e.g., “My uncle gave me this one”) and were later asked for the referent of a second fact (e.g., “Which one’s from Mexico?”), children’s judgements differed on the basis of the speaker’s knowledge. That is, children were more likely to select the second object as the referent of the second fact when the requester was present during the information phase and had explicit knowledge of the fact than when he was not. Thus, it appears that by 3 years of age, children understand that while word meaning is conventional, other information such as facts are not.

Summary

Taken together, the above studies provide evidence that by 17 months of age infants begin to understand that language is a conventional tool used by members of a shared linguistic community to communicate (Namy, 2001; Namy & Waxman, 1998). By 20 months of age infants are able to distinguish between object labels and object noises to correctly map the label onto the unfamiliar object (Woodward & Hoyne, 1999) and by 3 years of age children are aware that while labels are conventional, facts are not (Diesendruck & Markson, 2001). However, it remains unclear how well children 2 years of age understand that the meanings of words are conventional, while other types of information may not be. If word learners do possess a strong understanding of the conventionality of language, it may be indicative of a more conceptual understanding of language and its use as a communicative tool at an early age. Additionally, the above studies explored conventionality in explicit word naming paradigms when children are
required to identify the referent of a novel label. It remains unclear when children understand that the meanings of words acquired indirectly are also conventional.

**The Present Research**

The present research provides an examination of two existing literatures discussed in the previous sections: the ability of 2-year-olds to learn new words using intentional cues and their understanding of conventionality. As discussed earlier, some investigators (e.g., Tomasello, 1992) argue that young children’s pragmatic understanding is sufficiently powerful to solve the inductive problem of word learning. In order to assess this claim fully, it is necessary to demonstrate that word learners can use socio-pragmatic cues to establish word-referent mappings independent of the original learning situation. Recall that the theory behind the reliance on socio-pragmatic cues is that word learners use these cues to infer the referential intent of the speaker, and then map the novel label onto the aspect of the discourse that they perceive the adult to be labelling. In previous studies, the speaker who “labelled” the object was typically the speaker who requested the referent of the label in comprehension or in production tests. Note, however, if children can use socio-pragmatic cues to establish word-referent mappings, then these mappings should exist independently of the adult who labelled the object. In the present studies, I examined whether toddlers would maintain correct word mappings beyond the initial learning context when the word mapping was acquired indirectly by using social-pragmatic cues.

It is also unclear whether 2-year-olds understand that the meanings of new words learned indirectly abide by the same principle of conventionality, as do words that are
learned in other word learning contexts. Furthermore, it has yet to be documented whether 2-year-olds understand that while object labels are conventional and can be generalized to other individuals other pieces of information, such as one’s desires, are not. Recall that Diesendruck and Markson (2001) found that 3-year-olds could differentiate between the conventional nature of object labels and the non-conventional nature of factual information. The current research investigates whether children 2 years of age appreciate that the meanings of new words learned indirectly are conventional, but that desires are specific to each individual.

**EXPERIMENT 1**

The goals of Experiment 1 were as follows: first, to examine 2-year-olds’ ability to learn new words indirectly and second, to examine 2-year-olds’ appreciation that object labels learnt indirectly are conventional. In this study, 24- to 27-month-olds played a finding game similar to that used by Tomasello and Barton (1994, Study 4) in one of four conditions. In the *same speaker condition*, the same speaker provided a language model before finding the target object (“Where’s the *mido*? Let’s find the *mido*.”) and then asked for the referent in the subsequent comprehension and generalization tasks (“Show me the *mido*”). In the *different speaker condition*, the one speaker provided the language model while a second speaker requested the referent of the novel label in the comprehension and generalization tasks. In the two control conditions, no language model was provided during the finding game. That is, the experimenter merely said, “What’s in here? Let’s see what’s in here. Let’s see what’s in here” before finding all of the objects. In the *same speaker control condition*, the same
individual who played the finding game also asked for the referent of the novel label in
the comprehension and generalization tasks. In the different speaker control condition,
one speaker played the finding game while a second speaker requested the referent of the
novel label in the comprehension and generalization tasks. The control conditions were
conducted to ensure that object salience or object preference could not account for the
performance of participants in the experimental conditions. That is, the control
conditions were used to ensure that children were not simply choosing the first object the
experimenter found or were choosing a particular object because of a preference for that
object.

If 2-year-olds can map a novel label onto a target object using indirect cues, more
children in the same speaker condition should correctly choose the target object as the
referent of the novel label in the comprehension and generalization tasks than in the same
speaker control condition. Furthermore, if 2-year-olds appreciate that novel labels
acquired indirectly are conventional then children in both the same speaker and different
speaker conditions should consistently map the novel label onto the correct referent. In
sum, it was expected that more children in both experimental conditions would correctly
choose the target object in the comprehension and generalization tasks than the number
of children in the control conditions. If the resulting performance of the participants in
both of the experimental conditions was comparable, this would indicate that 2-year-olds
possess the understanding that novel labels are conventional tools used by members in
the same speech community to communicate.
Method

Participants

Eighty-eight toddlers aged 24- to 27-months participated in this study. Participants were contacted by telephone using the Language and Cognitive Development Laboratory’s volunteer participant pool. Volunteers were recruited through advertisements in local newspapers, television stations, and pamphlets distributed in regional health clinics throughout the city of Calgary, Alberta. Ethical clearance was granted to leave brochures explaining the research program at the health clinics, and parents could either call the laboratory or leave their name and number in a drop box at each of the clinic locations. All participants were from homes in which English was the primary language spoken. Eleven additional children were tested, but removed from the final sample for the following reasons: experimenter error ($n = 2$) and excessive fussiness ($n = 9$). Children were randomly assigned to one of the four following conditions: Same Speaker ($n = 22$, 13 males and 9 females, mean age = 2.12 years, $SD = 0.05$), Different Speaker ($n = 22$, 13 males and 9 females, mean age = 2.15 years, $SD = 0.07$), Same Speaker Control ($n = 22$, 11 males and 11 females, mean age = 2.12 years, $SD = 0.08$), and Different Speaker Control ($n = 22$, 11 males and 11 females, mean age = 2.15 years, $SD = 0.09$). Ten additional children were tested during a pilot phase. At the end of the testing session, participants received a Child Scientist certificate and a small prize as a token of appreciation.
Stimuli

Eight unfamiliar objects and eight familiar objects were used in this study. The unfamiliar objects consisted of two exemplars of each of the following objects: an oddly shaped rattle, a hand drum, a noisemaker, and castanets (see Figure 1). The two exemplars of each object type differed from one another only in colour (see Figure 2). Prior to beginning the experiment, the researcher asked the parent if his/her child was familiar with the name of any of the objects. If a child knew any of the objects, an alternate unfamiliar object (an odd whistle) was available. The familiar objects served as distractor objects and included a miniature toy puppy, two toy cars, two dinosaurs, a pony, and a slinky.

The finding game apparatus consisted of four white steel miniature lunch boxes mounted to a piece of plexi-glass. The dimensions of each box were 5.5” x 4” x 2.5”. The boxes were glued 6” apart and the dimensions of the plexi-glass were 8” x 40.5”. A stopwatch was used throughout the session and a cafeteria tray was used during the comprehension and generalisation tasks. A video camera mounted on a tripod was used to tape sessions for coding purposes. Lastly, to ensure that there was equality between groups on vocabulary size, the parents of each participant completed The MacArthur Communicative Development Inventory: Words and Sentences (Fenson et al., 1993).

Procedure

Testing took place in the Cognitive Development Laboratory at the University of Calgary. The session began with a brief warm-up period during which the parent completed the consent form and the experimenter showed the parent the unfamiliar
Figure 1. Example of the first set of unfamiliar objects.
Figure 2. Example of the second set of unfamiliar objects.
objects to ensure that the child did not know the name of any of the objects. None of the children in the study had a label for any of the objects, thus no replacements were made. At this time, parents were also instructed not to talk during the experiment, until the elicited production task where the parent was asked to help the experimenter encourage the child to produce a label for the target object.

Children were told that they were going to play a game with the experimenter and were taken into the testing room with their parents. Participants were seated on either a booster seat or on their parent’s lap at a rectangular table directly across from the experimenter. The session consisted of three phases: the script training phase, the finding game, and the novel label testing phase.

*Script training.* Out of view of the child, the experimenter randomly placed one of the unfamiliar objects from the first set in each of the boxes and then closed the lids. The experimenter then placed the apparatus on the table in front of her so the child could see all of the boxes. The experimenter opened the box farthest to her right and said, “Let’s see what’s in here.” She then removed the object (e.g., the rattle), demonstrated what it did (e.g., shook it), and then passed it to the child. Children were allowed to play with the object for 10 seconds. The experimenter then slid the apparatus to the child and requested that they place the object back in the box (e.g., “Okay, now you put it back.”). The experimenter repeated this script training for the remaining three objects. After the last object had been introduced to the child, the researcher removed the apparatus from the table and gave the toddler a distractor toy to play with (e.g., a toy car) while she set
up for the finding game. The order in which each distractor object was presented was randomized across participants.

Finding game. The finding game consisted of four rounds of a finding game and proceeded in the same manner for both the same speaker and different speaker conditions. Pilot testing indicated that four rounds of the game were sufficient to establish an object-word mapping and short enough to maintain the attention of 24- to 27-month-olds.

In the first round, the experimenter placed the target object (e.g., the noisemaker) in the first box on her right-hand side. The remaining three non-target objects were randomly placed in the other boxes. Once the researcher placed all of the objects in the boxes and closed their lids (approximately 15 seconds), she took the distractor toy away from the child and said, “Hey (child’s name), let’s play another game.” The researcher then placed the apparatus back on the table in front of her. In the first round, the target object was the first object found. While maintaining eye contact with the child, the experimenter said, “Where’s the mido? Let’s find the mido. Let’s find the mido.” The experimenter proceeded to open the first box to her right, held up the object (e.g., the noisemaker), smiled and said, “Oh!” while demonstrating what it did (e.g., spun it). The experimenter then passed the object to the child to play with for 5 seconds. After that time elapsed, the researcher retrieved the object and placed it back in its box. She then looked the child in the eye and said, “What’s in here? Let’s see what’s in here. Let’s see what’s in here.” She opened the second box from her right, held up the object (e.g., the hand drum), smiled and said, “Oh!” She again demonstrated what the object did and then
gave the object to the child to play with for 5 seconds. She proceeded to find the non-target objects in the third and fourth boxes in the same manner as in the previous trial. Note that each time the experimenter ‘found’ an object, her affective and verbal response remained exactly the same, regardless of whether or not it was a target or non-target object. All that differed was whether the experimenter provided the language model before finding one of the objects. The first round was completed when the experimenter placed the last object back in the final box. The experimenter removed the apparatus from the table and gave the child a distractor toy to play with (e.g., a toy dinosaur). At this time, the experimenter shifted the unfamiliar objects down one box to her left. After all of the objects were switched (approximately 15 seconds), the researcher took the distractor toy away from the child and said, “Let’s play another game”, and the next round of the finding game began.

The procedure described above was repeated for three additional rounds of the finding game. In the second round, the target object (e.g., the noisemaker) was in the second box from the right of the experimenter and the non-target object that was in the last box in the first round (e.g., the rattle) was then in the first box for the second round. For the third round, the target object was shifted to the third box and the non-target objects were also shifted one box to the left of where they were for Round 2. In the fourth round, the target object was shifted to the last box and the non-target objects were shifted over one more box. Thus, across all four rounds, each object was ‘found’ in each location.
At the end of the fourth round, the researcher removed all of the objects from the boxes and placed them on the table in front of the participant in a random order. At this time, the participant played with the four objects for 15 seconds. After this play period, the experimenter put all of the objects out of participants’ view in an opaque container and gave them the remaining distractor toy (e.g., the slinky) to play with for 30 seconds. Children were always given the slinky at this time because pilot testing indicated that they were least likely to get bored with the slinky during the full minute play time.

For children in either the same speaker control or the different speaker control conditions, the finding game followed the same procedure, however the experimenter did not provide a language model before finding any of the objects. In other words, the experimenter said, “What’s in here? Let’s see what’s in here. Let’s see what’s in here” before finding every object. Thus, the participant did not hear the novel word at all during the training task.

Once the finding game was over, the experimenter told the child that she needed to go and check on her friend. For children in the same speaker and same speaker control conditions, the experimenter said that she would come back to play with them some more. For children in the different speaker or the different speaker control conditions, she told them that her friend was going to come in and play with them some more. The experimenter then left the room. While the experimenter was out of the room, children played with the slinky.

**Novel label testing phase.** There were three tests of children’s novel label mapping: a comprehension test, a generalization test, and an elicited production task.
The generalization and elicited production tasks were included to provide multiple measures of children’s learning of the novel label. Thus, enabling greater insight into children’s word mapping abilities. In both the *same speaker* and the *same speaker control* conditions, the same experimenter re-entered the room after 30 seconds. She then retrieved the distractor toy from the child and looked into the bucket where all of the objects were and said, “Oh, look at all of these”. She then placed the four unfamiliar objects from the finding game in a random order on a tray on the table in front of her. Being cautious to maintain eye contact with the child, the experimenter said, “Show me the *mido*. Give me the *mido*.” She then slid the tray in front of the child so that the child could either point to or touch the target object. After a choice was made, the experimenter put all of the non-target objects back into the bucket and performed the novel label generalization task.

In the *same speaker* and *same speaker control* conditions, the same experimenter then placed the second set of unfamiliar objects in a random order on the cafeteria tray. This set of objects differed in colour from those used in the finding game. The experimenter then placed the tray on the table in front of her and while maintaining eye contact with the participant asked, “Show me the *mido*. Give me the *mido*.” The experimenter slid the tray in front of the child so that a selection could be made. After a choice was made, the experimenter put the objects out of the child’s view and performed the elicited production task.

To test production of the novel label the experimenter held up the target object and said, “What’s this? What’s this called?” If the child did not respond initially, the
researcher repeated the question. If the child continued not to respond, the researcher prompted the parent and the parent asked the child what the object was called. The experimenter put the target object away and then completed the non-target elicited production task. The experimenter held up a non-target object from the first set of objects and asked, “What’s this? What’s this called?” If the child did not respond initially, the researcher repeated the question. If the child continued not to respond, the researcher prompted the parent and the parent asked the child what the object was called. This task was completed to ensure that if children produced the novel label that they were not calling every object the “mido”. After completion of the non-target elicited production task, the experimenter told the participant that he/she was done playing the game, and thanked him/her for his/her help.

The comprehension, generalization, elicited production, and non-target elicited production tasks were all conducted in the same manner described above for children in the different speaker and the different speaker control conditions, but by a different experimenter. That is, the second experimenter who was present during the warm-up phase entered the room 30 seconds after the first experimenter left and administered these tasks.

Parents were asked to complete The MacArthur Communicative Development Inventory: Words and Sentences (MCDI; Fenson et al., 1993) to provide an indication of each participant’s productive language development. All the MCDIs were completed either after testing was finished or at home. Inventories completed at home were completed either before the testing session and parents brought it with them, or after the
session and mailed back approximately one week later. Six of the checklists were not returned. Children’s productive vocabulary ranged from 4 to 674 words ($M = 370.17$ words, $SD = 182.10$). In the same speaker condition, children’s productive vocabulary ranged from 17 to 606 words ($M = 384.75$ words, $SD = 178.39$). In the different speaker condition, children’s productive vocabulary ranged from 51 to 674 words ($M = 366.15$ words, $SD = 183.99$). In the same speaker control condition, children’s productive vocabulary ranged from 4 to 656 words ($M = 345.25$ words, $SD = 182.10$). In the different speaker control condition, children’s productive vocabulary ranged from 25 to 656 words ($M = 383.23$ words, $SD = 163.20$). A between-groups analysis of variance indicated that the four groups did not differ significantly in their productive vocabulary size, $F(3, 78) = 0.202, n.s.$

Scoring

The object chosen in response to the comprehension and generalisation questions was coded as either correct or incorrect. That is, if children chose the target object in the comprehension and generalisation tasks, they received a score of 1 for each task. If participants did not choose the target object on either the comprehension or generalisation task, they received a score of 0 for that task. If the participants produced the novel label in response to the elicited production question they were given a correct score for production. If participants did not produce the correct label they received score of 0.

In order to establish inter-rater reliability, 20% of the data ($n = 18$) was coded a second time from the videotapes. The coder recorded which object the child picked in the comprehension and generalization tasks. Kappa was used to establish the level of
agreement between the experimenter and the coder. Kappa is based on percent agreement (i.e., whether the experimenter and the coder both rated one participant as choosing the same object), with an additional correction for chance (Sattler, 2002). The two raters were found to be in almost perfect agreement, with Kappas ranging from .5 (a disagreement on one trial out of two) to 1.0 with a mean of .94.

**Results**

In order to examine possible group differences on the comprehension, generalisation, and elicited production tasks, a series of chi-square analyses were conducted. Unless otherwise specified, a probability of less than or equal to 0.05 was used as an index of statistical significance for all analyses. The number of participants in each condition who correctly chose the target object in both the comprehension task and the generalization task are presented in Table 1. As expected, significantly more children in the same speaker condition than in the same speaker control condition correctly identified the target object as the referent of the novel label in the comprehension test, \( \chi^2(1) = 5.87, p = .015 \). Also as expected, significantly more children in the different speaker condition than in the different speaker control condition correctly chose the target object on the comprehension test, \( \chi^2(1) = 5.22, p = .02 \). Therefore, more children in both the experimental conditions correctly chose the target object in the novel label comprehension task than in the respective control groups.

Next, chi-square analyses were completed to examine differences between the same speaker and different speaker groups on performance on the comprehension test. As predicted, the number of children in the same speaker condition who correctly
Table 1

*Experiment 1: Number of Participants that Made Correct and Incorrect Target Choices on the Comprehension and Generalisation Tasks as a Function of Group*

<table>
<thead>
<tr>
<th>Measure and participant responses</th>
<th>Same speaker</th>
<th>Different speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>(n = 22)</td>
<td>(n = 22)</td>
</tr>
<tr>
<td>Comprehension task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Correct</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>Generalisation task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Correct</td>
<td>12</td>
<td>4</td>
</tr>
</tbody>
</table>
identified the target did not differ significantly from the number of children in the
different speaker condition on the comprehension task, $\chi^2(1) = 0.10, n.s.$ Thus, in both
experimental groups, the majority of the children chose the target object as the referent of
the novel label in the comprehension test, indicating that the majority of children in both
groups established correct word-to-object mappings$^1$.

Second, group differences on the generalisation task were examined using chi-
square analyses. As predicted, the number of children who correctly generalised the
novel label in the same speaker condition differed significantly from the number of
children in the same speaker control condition, $\chi^2(1) = 6.29, p = .012$. Also as predicted,
the number of children who correctly generalised the novel label in the different speaker
condition differed significantly from the number of children in the different speaker
control condition, $\chi^2(1) = 4.54, p = .03$. Therefore, the majority of the children in both of
the experimental conditions, but not in the control conditions, generalised the novel label
to the correct object.

As expected, a comparison of the same speaker and different speaker conditions
revealed no statistically significant differences on performance on the generalisation task,
$\chi^2(1) = 0.09, n.s.$ Thus, the majority of the children in both the same speaker and
different speaker conditions were able to make correct word-object mappings in the
generalisation task. This indicates that, regardless of whether the speaker requesting the

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$^1$ A 4-way chi-square analysis indicated a significant difference between groups on comprehension and
generalisation, $\chi^2(3) = 11.33, p = .01$ and $\chi^2(3) = 11.14, p = .01$. 
referent of the novel label was present during the finding game, children generalized the novel label to the appropriate object.

Additional analyses were conducted using two composite measures: *total comprehension* and *any learning*. Children were given a score of 1 on the *total comprehension* measure if they correctly chose the target object on *both* the comprehension task and the generalisation task. Thus, this was a conservative measure of children’s ability to correctly match the target object with the novel label. Children were given a score of 1 on the *any learning* measure if they correctly chose the referent of the novel label on any of the comprehension, generalisation, or the elicited production tasks\(^2\). The number of children scoring 0 and 1 on the *total comprehension* and *any learning* measures is presented in Table 2. Chi-square analyses were conducted to explore group differences on these measures. The number of children who correctly chose the target object on both the comprehension and generalisation tests differed significantly between same speaker and the same speaker control conditions, \(\chi^2(1) = 5.35, p = .02\), with more children in the same speaker condition showing total comprehension than in the control condition. Similarly, the number of children who correctly chose the target object on both the comprehension and generalisation tests differed significantly between different speaker and the different speaker control conditions, \(\chi^2(1) = 4.70, p = .03\), with more children in the different speaker condition showing total comprehension than in the control condition. The chi-square analysis

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\(^2\) Because performance on the elicited production task was so minimal, this was the only analysis that the data from the elicited production task was used.
Table 2

Experiment 1: Number of Participants Showing Total Comprehension and Any Learning as a Function of Group

<table>
<thead>
<tr>
<th>Measure and participant responses</th>
<th>Same speaker</th>
<th>Different speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>Control</td>
</tr>
<tr>
<td>Total comprehension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>Correct</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Any learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Correct</td>
<td>17</td>
<td>7</td>
</tr>
</tbody>
</table>
comparing the total comprehension for toddlers in the same speaker and different speaker experimental conditions was not statistically significant, $\chi^2(1) = 0.36$, n.s. Consistent with the hypotheses, the number of participants who correctly selected the referent of the novel label in both the comprehension and generalisation tasks in the same speaker and different speaker conditions did not differ, but was greater than the number of children showing total comprehension in the respective control conditions.

Chi-square analyses were conducted to examine differences between groups on the any learning measure. Significantly more children in the same speaker condition chose the target object on any of the three word mapping tasks than in the same speaker control condition, $\chi^2(1) = 9.17$, $p = .0025$. Similarly, significantly more children in the different speaker condition chose the target on any of the three word mapping tasks than in the different speaker control condition, $\chi^2(1) = 5.32$, $p = .02$. Therefore, as was expected, the number of participants who responded correctly on either the comprehension or generalisation tasks, or produced the novel label in both of the experimental conditions differed significantly from the number of children showing any learning in the respective control groups. There was no significant difference between the number of children demonstrating any learning in the same speaker condition versus the different speaker condition, $\chi^2(1) = 0.00$, n.s. Thus, a similar number of children in both the experimental conditions showed evidence of any learning, thus indicating that 2-year-olds appreciate that novel labels acquired through indirect means are conventional.

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3 A 4-way chi-square analysis revealed a significant difference between groups on total comprehension and any learning, $\chi^2(3) = 10.72$, $p = .01$ and $\chi^2(3) = 14.82$, $p = .002$, respectively.
Discussion

Experiment 1 was conducted to examine 24- to 27-month-olds' appreciation of the conventionality of novel labels when the labels are acquired indirectly. The results of this experiment yielded two main findings. First, the results indicate that 2-year-olds can learn the correct meaning of new words indirectly, and second, that 2-year-olds show evidence of learning the meaning of the novel label independently from who taught them the meaning, thus indicating an appreciation of conventionality.

The finding that 24- to 27-month-olds were able to map the novel word onto the target object using an indirect socio-pragmatic cue indicates that they use cues to uncover a speaker's underlying intentions to learn the correct meaning of a new word. More importantly, the performance on the generalisation task indicates that children were able to generalise the new word beyond the initial exemplar. These findings are consistent with the results of previous studies conducted by Tomasello and colleagues (e.g., Tomasello & Barton, 1994; Tomasello et al., 1996). In a word learning context similar to the one used in this experiment, Tomasello and Barton (1994) found that 24-month-olds could attend to a speaker's statement of an impending action to find the referent of a novel object and use it as a cue to learn the meaning of the new word. The current study extends the findings of Tomasello and Barton indicating that 2-year-olds can generalise the meaning of a new word learnt indirectly beyond that of the initial target object.

The finding that 24- to 27-month-olds were able to generalise the novel label taught to them indirectly to a second speaker suggests that they possess an understanding that the meanings of object labels are conventional. That is, even when the different
speaker was not present during the finding game, children were able to correctly identify the referent of the novel label. Recall that researchers have previously suggested that by late infancy children possess a basic understanding of the uniqueness of words as referential symbols whose meaning is shared (Clark, 1993; Namy, 2001; Namy & Waxman, 1998; Woodward & Hoyne, 1999). The findings from this experiment provide further support for the development of the understanding of conventionality suggesting that by 24 months of age children may understand that individuals will share a common understanding of the meaning of novel labels even in indirect word learning contexts.

Although it appears that the children in this experiment possess an understanding of the conventionality of language, it is possible that children in this study were merely generalising the information learned to another individual. That is, 2-year-olds may possess the propensity to generalise any information learnt as a default strategy without possessing the conceptual understanding of the conventional nature of the linguistic system. Thus, Experiment 1 may not have been a sufficiently stringent test of children’s understanding of the conventionality of object labels. In Experiment 2, I examined whether children would generalise one speaker’s desires to another.

**EXPERIMENT 2**

In Experiment 2, 24- to 27-month-olds’ appreciation that certain information, such as an individual’s desires, should not be extended to a second individual was examined. Researchers have suggested that by 2 years of age, children possess a basic understanding of the conventionality of language (e.g., Clark, 1993). However, it has yet
to be established whether or not they possess the understanding that while language is conventional, one’s desires are not.

The procedure of Experiment 2 was similar to that of Experiment 1 with one exception: rather than providing a language model during the finding game, the experimenter provided children with a cue to her underlying affective intentions towards a target object (e.g., “Let’s find the one I like”). As in Experiment 1, there were two experimental conditions: the same speaker condition and the different speaker condition. In the same speaker condition, the same speaker introduced her desires before finding the target object and asked for the referent in the subsequent comprehension and generalisation tests (“Show me the one I like”). In the different speaker condition, one speaker introduced her desires towards the target object while a second speaker requested the referent of her desires (“Show me the one I like”) in the comprehension and generalisation tests. Unlike Experiment 1, two control conditions were not included in this study because the results of Experiment 1 suggest that neither object preference or salience issues were affecting the results.

If 24- to 27-month-olds possess the understanding that desires are individual specific, it was expected that children in the same speaker condition would choose the object that the first experimenter said she liked. In contrast, children in the different speaker condition should respond randomly if they understand that desires are not commonly shared amongst individuals. That is, they should appreciate that simply because one experimenter liked a particular object, a second experimenter should not necessarily like the same object. Compared with the findings of Experiment 1, the
findings of Experiment 2 would provide stronger evidence that 2-year-olds possess the understanding that while labels are conventional and are shared by many individuals, desires are not.

Method

Participants

Forty children aged 24 to 27 months participated in this study. Participants were recruited in the same manner as in the first experiment. As in Experiment 1, all participants were from homes in which English was the primary language spoken. Children were randomly assigned to one of two of the following conditions: Same Speaker ($n = 20$, 11 males and 9 females, mean age = 2.12 years, $SD = .07$) and Different Speaker ($n = 20$, 11 males and 9 females, mean age = 2.10 years, $SD = .07$). At the end of the testing session participants received a Child Scientist certificate and a small prize as a token of appreciation. None of these children had participated in Experiment 1.

Materials and Stimuli

The unfamiliar objects, distractor objects, and finding game apparatus used in this experiment were identical to those used in Experiment 1.

Procedure

The procedure was similar to that of Experiment 1, with four exceptions: (1) rather than providing a novel label during the finding game, the experimenter indicated that she wanted to find the object she liked, (2) due to experimenter availability, the second experimenter in Experiment 2 was different from Experiment 1, (3) in the
comprehension and generalization tasks the experimenter asked for the one she liked, and (4) because a novel label was not provided, there were no elicited production tests.

The script training and finding game proceeded in the same manner as in Experiment 1. However, as stated previously, instead of providing a novel label during the finding game, before finding the target object in every round the experimenter said, “Where’s the one I like. Let’s find the one I like. Let’s find the one I really like.” Before finding the non-target objects, the experimenter merely said, “What’s in here? Let’s see what’s in here. Let’s see what’s in here.” The comprehension and generalization tasks proceeded in the same manner as in Experiment 1, however instead of asking for the referent of the novel label, the experimenter asked for the referent of her desires (e.g., “Show me the one I like. Give me the one that I like.”).

As in Experiment 1, parents were requested to complete the MCDI to provide an indication of their child’s language development. All the MCDIs were completed after testing or at home. Inventories completed at home were completed either before the testing session and parents brought it with them, or after the session and mailed back approximately one week later. Only two of the checklists were not returned. Children’s productive vocabulary ranged from 21 to 710 words ($M = 403.39$ words, $SD = 180.27$). In the same speaker condition, participants’ productive vocabulary ranged from 221 to 710 words ($M = 470.95$ words, $SD = 129.59$). In the different speaker condition, participants’ productive vocabulary ranged from 21 to 620 words ($M = 328.33$ words, $SD = 201.56$). There was a significant difference between the groups on productive vocabulary, $F(1, 35) = 6.59, p < .05$. However, given that the task was not a language
learning task, it is not likely this difference between groups in productive vocabulary affected children’s performance.

Scoring

The method of scoring was identical to that used in Experiment 1. As in Experiment 1, 20% of the data (n = 8) was coded a second time from the videotapes. The coder recorded which object the child picked in the comprehension and generalization tasks. Kappa was used to establish the level of agreement between the experimenter and the coder. The two raters were found to be in perfect agreement (Kappa = 1).

Results

As in Experiment 1, chi-square analyses were conducted to examine group differences between the same speaker and different speaker conditions on the comprehension and generalization tasks. For all analyses, a probability less than or equal to 0.05 is indicative of statistical significance. The number of children who correctly chose the target object in the comprehension and generalization tasks is presented in Table 3. As was expected, the number of children who correctly chose the target object in the same speaker condition differed significantly from the number of children in the different speaker condition who chose that object on the comprehension task, \( \chi^2(1) = 8.64, p = .003 \). This indicates that children in the same speaker condition correctly encoded the experimenter's desires towards the target object. Also as expected, a statistically significant difference was found between the number of participants who correctly chose the target object in the same speaker condition and the number of participants in the different speaker conditions on the generalisation task, \( \chi^2(1) = 3.96, p \).
Table 3

*Experiment 2: Number of Participants that Made Correct and Incorrect Target Choices on the Comprehension and Generalisation Tasks as a Function of Group*

<table>
<thead>
<tr>
<th>Measure and participant responses</th>
<th>Same speaker ($n = 20$)</th>
<th>Different speaker ($n = 20$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehension task*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>Correct</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Generalisation task**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Correct</td>
<td>10</td>
<td>4</td>
</tr>
</tbody>
</table>

*χ²(1) = 8.64, $p = .003$.  
**χ²(1) = 3.96, $p = .047$.  

(continued on next page)
= .05. Thus, more children in the same speaker condition generalised the experimenter’s desires to a member of the same kind as the target object than did the children in the different speaker condition.

As in Experiment 1, additional analyses were completed using the two composite measures: total comprehension and any learning. Recall that total comprehension assessed whether children performed correctly in both the comprehension task and the generalisation task. Any learning was a measure of those participants who answered correctly in either the comprehension task or the generalisation task. The number of children scoring 0 and 1 on the total comprehension and any learning measures is presented in Table 4. As predicted, the number of children showing total comprehension in the same speaker condition differed significantly from the number of children in the different speaker condition, $\chi^2(1) = 4.44, p = .04$. This indicates that more children in the same speaker condition identified the correct object that the experimenter liked in both the comprehension and generalisation tasks than did the children in the different speaker condition. Also as expected, the number of children showing evidence of any learning in the same speaker condition differed significantly from the number of children in the different speaker conditions, $\chi^2(1) = 12.91, p = .0003$. Thus, a larger number of children in the same speaker condition were more likely to give the experimenter the target object in either the comprehension or the generalisation task than the number of children in the different speaker condition. These results indicate that, as predicted, children in the different speaker condition did not choose the same object that the first speaker liked as the object the second speaker liked.
Table 4

Experiment 2: Number of Participants Showing Total Comprehension and Any Learning as a Function of Group

<table>
<thead>
<tr>
<th>Measure and participant responses</th>
<th>Same speaker (n = 20)</th>
<th>Different speaker (n = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total comprehension*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Correct</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Any learning**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Correct</td>
<td>18</td>
<td>7</td>
</tr>
</tbody>
</table>

*χ²(1) = 4.44, p = .035.

**χ²(1) = 12.91, p = .0003.
Discussion

The goals of Experiment 2 were to explore 24- to 27-month-olds’ ability to encode a speaker’s desires towards a target object, as well as their appreciation of the individual specificity of desires. Two major findings emerged from this experiment: (1) 2-year-olds are able to encode a speaker’s desires towards a target object, and (2) 2-year-olds understand that a second speaker may not share the same desires towards a certain object as the first speaker.

As predicted, children in the same speaker condition were able to encode the first speaker’s intention towards an unfamiliar object (e.g., “Let’s find the one I like”). This is evident because children in the same speaker condition were able to consistently give the experimenter the unfamiliar object that she claimed to “like” in the comprehension and generalisation tests. These findings are consistent with previous research where it has been established that infants as young as 18 months are consistently able to encode an individual’s desires (Repacholi & Gopnik, 1997; for a review see, Poulin-Dubois, 1999). More importantly, children in the same speaker condition gave the experimenter the object that she liked in response to both the comprehension and generalisation questions substantially more often than did the children in the different speaker condition. That is, as hypothesised, children in the different speaker condition did not tend to give the second speaker the same object that the first speaker “liked” more than any of the other objects in the comprehension and generalisation tests. Therefore, it appears that 24- to 27-month-olds possess the understanding that each individual holds their own desires and
that their desires may be different than those of another individual. Thus, children possess an understanding that desires are not conventional.

**GENERAL DISCUSSION**

The present studies were designed to examine 2-year-old children’s ability to learn new words using intentional cues and their appreciation of the conventionality of object labels versus desires. In two experiments, children aged 24 to 27 months played a finding game with an experimenter during which they were taught indirectly a piece of information about a target object. In Experiment 1, the experimenter provided an indirect intentional cue as to the meaning of a new word (e.g., “Let’s find the *mido*”). In Experiment 2, the experimenter provided an indirect intentional cue expressing her affections toward a target object (e.g., “Let’s find the one I *like*”). In both experiments, children were subsequently asked for the referent of the novel label (e.g., “Show me the *mido*”, Experiment 1) or the referent of the experimenter’s desires (e.g., “Show me the one that I *like*”, Experiment 2). Children were also asked whether the novel label or the experimenter’s desires could be generalized to another member of the same object category as the target object. The comprehension and generalisation tasks were administered either by the same experimenter who played the finding game with the participants (same speaker condition) or by a second experimenter who was not present during the finding game (different speaker condition).

The results of these studies yielded two major insights into the nature of 24-month-olds’ word learning abilities. First, the present findings provide incremental evidence that 2-year-olds can rely on intentional cues to learn the meaning of a new
word. In Experiment 1, 2-year-olds used the language model provided by a speaker to make correct word-object mappings and to generalise the novel label to a second object that was a member of the same object category as the target object. These findings are consistent with a large body of existing research indicating that 2-year-olds are adept at using numerous intentional cues to learn the meaning of new words (for example see, Akhtar et al., 1996; Akhtar & Tomasello, 1996; Baldwin, 1993a, 1993b; Tomasello & Barton, 1994; Tomasello et al., 1996). The present findings add to this body of evidence by demonstrating that 2-year-olds can identify the correct referent of a novel label when it is taught indirectly, regardless of who taught them the meaning of the novel label. That is, 2-year-olds can form a reliable word-object mapping in situations where the experimenter requesting the referent of the novel label was different from the one who taught them the meaning of the new word. Thus, children's word-object mappings established using intentional cues appear to be reliable across different contexts.

Second, the present studies indicate that that 24- to 27-month-olds appreciate that the meaning of an object label learnt in an indirect word learning situation is shared between two individuals. Moreover, they also possess the appreciation that desires are specific and not necessarily shared between two individuals. Thus, by 2 years of age children possess an understanding that while object labels are conventional and can be generalised to another individual, an individual's desires are not conventional and cannot be generalised to another person. The notion that 2-year-olds appreciate the conventionality of indirectly taught novel labels is consistent with previous research indicating an early understanding of conventionality in explicit word learning contexts.
(e.g., Diesendruck & Markson, 2001). The present findings extend this research by providing evidence indicating that children appreciate the conventional nature of novel labels in indirect word learning contexts as well as in explicit labelling contexts. Moreover, this research provides evidence indicating that the development of the understanding of the shared nature of object labels occurs by the time children are 24 months of age.

When considered in conjunction with other recent empirical work, the results of the present studies add to our understanding of the children’s appreciation of conventionality during late infancy and early childhood. As described earlier, by late infancy, children understand that labels are conventional symbols for objects whereas non-verbal information and gestures may not be (e.g., Namy, 2001; Namy & Waxman, 1998; Woodward & Hoyne, 1999). The present findings indicate that 2-year-olds understand the shared nature of indirectly taught novel labels and the individual specificity of indirectly taught desires. By three years of age, children’s understanding of conventionality is even more developed. For example, children are able to distinguish between the conventional shared nature of object labels and the non-conventional nature of factual information (Diesendruck & Markson, 2001). Furthermore, Diesendruck (2002) recently found that 3-year-olds understand that conventionality is language specific. In this study, children who were told that a speaker was monolingual adhered to the principle of conventionality and presumed that a second novel label referred to a different object that had not been previously labelled. On the other hand, children who were told that a second speaker was bilingual did not consistently map the second label
onto the second object. Thus, children understood that the second label could have been the conventional term for the already labelled object, but in a different language. Thus, by 3 years of age children possess an intricate understanding of the types of information (labels vs. facts) and circumstances (monolingual vs. bilingual) that are conventional. In conjunction with the previously existing findings, the findings of the current research are indicative of a developmental progression of children’s understanding of conventionality beginning in infancy and continuing through to the preschool years.

Although the findings appear to provide a clear pattern of findings, there are limitations of the current research. First, one limitation is the small number of measures that were used to examine children’s learning of the novel label. A greater number of measures may have provided further insights into the extent of children’s performance. Second, although it is unlikely, the significant difference between conditions on children’s MCDI scores in Experiment 2 may have influenced children’s performance. However, recent research indicates no correlation between children’s MCDI scores and early social-cognitive abilities (Carpenter et al., 1998).

**Future Research and Conclusions**

The findings of this research have provided important insights into 2-year-olds’ abilities to learn new words using intentional cues and their understanding of conventionality. However, there are many issues regarding word learning in indirect situations and the development of conventionality yet to be explored. For example, the developmental progression of the word learning abilities outlined in the current research remains to be specified. That is, it is unclear if children younger than 24 months are able
to learn the meaning of new words in a context similar to that used in the current research and, furthermore, if they possess the understanding that these new words are conventional. If 18-month-olds do not understand that label meanings are shared between members of the same language community, then this would support the developmental progression of an appreciation of the conventional nature of words, as suggested by Namy (Namy, 2001; Namy & Waxman, 1998).

It would also be interesting to explore the extent of 24-month-olds’ understanding of conventionality. Future studies could examine how well 2-year-olds understand that facts are also non-conventional pieces of information. Furthermore, it would be interesting to examine the influence that different types of facts may have on the conventionality judgements of 2-year-olds. Previous investigations using facts have not explored this issue (for example see, Behrend, Scofield, & Kleinknecht, 2001; Diesendruck & Markson, 2001; Waxman & Booth, 2000). Some statements of factual information such as “this is made in Mexico” are perhaps more conventional than are other more personal facts such as “my dad gave this to me”. If children possess an intricate understanding of conventionality, they should be able to make more fine tuned discriminations between commonly known facts and personal facts.

Lastly, it would be interesting to conduct a study similar to the current research with children with autism. It has been suggested that children with autism’s impairment in language may be due to their accompanying deficits in social functioning, particularly their inability to understand theory of mind (for a discussion of this issue see Bloom, 2000). If word learning is a social phenomenon, as many researchers have suggested
(e.g., Akhtar & Tomasello, 2000; Baldwin & Tomasello, 1998; Bloom, 2000; Tomasello et al., 1993), then children with autism should show a marked deficit in their abilities to learn new words using inferential cues provided by a speaker. However, children with autism may not necessarily possess a similar deficit in their understanding of the rules that govern the use of language. Thus, it would be interesting to explore whether children with autism appreciate the conventional nature of object labels.

In summary, the current research examined the ability of 2-year-olds to learn the meaning of a new word using intentional cues provided by a speaker and their appreciation of the conventional nature of object labels learned indirectly. The findings of this study are twofold: 2-year-olds can learn the correct meaning of a new word using an intentional cue provided by a speaker, and they appreciate that while the meanings of object labels acquired indirectly are conventional, one’s desires are not. Thus, the current research contributes to the existing word learning literature by indicating that by 2 years of age, children possess an appreciation of one of the basic rules governing language use. That is, 2-year-olds understand that words are conventional tools used by members of the same linguistic community to communicate.
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