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## Young children's understanding of the epistemic and deontic meanings of *ask* and *tell*



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### ABSTRACT

The verbs *ask* and *tell* can be used both epistemically, referring to the flow of information, and deontically, referring to obligations through polite requests or commands. Some researchers suggest that children's understanding of deontic modals emerges earlier than their understanding of epistemic modals, possibly because theory of mind is required to understand epistemic modals. In the current study, 184 children aged 3–6 years were presented with vignettes depicting epistemic and deontic *asking* and *telling* and were asked whether the speaker *asked* or *told*, followed by first-order theory-of-mind tasks. An emergence of both epistemic and deontic understanding was found at 5 years of age, and both were correlated with children's theory-of-mind understanding. These findings are consistent with arguments that both epistemic and deontic understanding implicate theory-of-mind awareness and provide insight into the developmental trajectory of children's understanding.

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## Introduction

The verbs *ask* and *tell* have both epistemic and deontic meanings. When used epistemically, *ask* and *tell* refer to the flow of information, distinguishing between ignorant conversationalists who ask (e.g., “Did you play with the puppy?”) and knowledgeable conversationalists who tell (e.g., “I played with the puppy”) (Stephany, 1995). *Asking* implies that the speaker is acquiring knowledge, whereas *telling* implies that the listener is transmitting knowledge. When used deontically, *ask* and *tell* refer to obligations and distinguish between polite requests through asking (e.g., “Can we please play with the puppy?”) and commands through telling (e.g., “You have to play with the puppy”) (Stephany, 1995). *Asking* implies that compliance is voluntary, whereas *telling* implies that compliance is obligatory. Some researchers have suggested that children’s understanding of deontic terms emerges earlier than their understanding of epistemic terms, and it has been argued that this may be attributable to the theory-of-mind understanding that underlies understanding of epistemic terms. This study examined the emergence of children’s understanding of the epistemic and deontic uses of *ask* and *tell* and the relation between that understanding and their explicit false belief understanding.

### Review of the epistemic–deontic distinction

Modal terms are used to express ability, possibility, obligation, and permission (e.g., can, could, able to, may, might, shall, should, must, have to, will, would). In general, when modals are used in an epistemic sense, they qualify the certainty of one’s knowledge, whereas when they are used in a deontic sense, they refer to obligation and permission (Fletcher, 1983; Stephany, 1986). For example, the modal *must* has both epistemic and deontic meanings (Papafragou, 2001); if one says, “Because it’s after 9, my son *must* be in bed,” one can be speaking epistemically, referring to the certainty of one’s knowledge, or deontically, referring to the obligation of bedtime.

The epistemic–deontic distinction of modularities has been of interest to researchers in cognitive and language development for some time. Many researchers argue that children first use deontic modals before epistemic modals, as seen in children’s language production (Bliss, 1988; Kuczaj & Maratsos, 1975; Öztürk & Papafragou, 2015; Perkins, 1983; Shatz & Wilcox, 1991; Shepherd, 1982; Stephany, 1986; Wellman & Woolley, 1990; Wells, 1979). Early research by Wells (1979) showed that, for 14- to 45-month-olds, deontic modal expressions were primary, followed by epistemic utterances. Perkins (1983) confirmed this deontic to epistemic shift in 6- to 12-year-olds. Again, more recent evidence by Öztürk and Papafragou (2015) showed that toddlers use the deontic modals *must* and *may*, whereas the same modals in epistemic utterances do not emerge until 4 or 5 years of age. This earlier use of deontic terms has been found to be universal across all languages, with epistemic modality lagging behind deontic modality in language acquisition (Papafragou, 2001). However, the earlier acquisition of deontic modals might not suggest that deontic modals are easier to understand but rather suggest that they are more salient. Noveck et al. (1996) suggested that given children’s interactions with others, children may have more occasions to use modals in a deontic sense. That is, they may be more inclined to comment on obligation and permission than on the knowledge state of others.

Empirical work has examined whether deontic primacy is also present for children’s *understanding*, and results are conflicting. Some researchers suggest that children’s understanding of deontic modals precedes their understanding of epistemic modals (Bascelli & Barbieri, 2002; Noveck et al., 1996; Pieraut-Le Bonniec, 1980), whereas others have found the opposite (Bloom et al., 1989; Byrnes & Duff, 1989; Hirst & Weil, 1982; Shtulman & Phillips, 2018). It is worth noting that these studies used varying methodologies, and their inconsistent findings may be due to flaws and difficulties with the tasks (e.g., differing complexity of epistemic and deontic tasks; Hirst & Weil, 1982).

As a rationale for the deontic primacy, researchers have argued that epistemic utterances may be more difficult to understand insofar as they implicate reasoning about knowledge and belief (e.g., Papafragou, 1998; Pérez-LeRoux, 1998; Wellman & Woolley, 1990). Children’s correct use of epistemic modals may depend on their understanding of the differences between knowledge and ignorance and between true beliefs and false beliefs. In line with this perspective, researchers have found that children’s production (in naturalistic play; Hughes & Dunn, 1998) and comprehension (in an experimental

task; Moore et al., 1990) of epistemic terms are significantly correlated with false belief understanding (San Juan & Astington, 2012).

Although researchers have established the relationship between epistemic modals and theory of mind, they have begun to theorize that deontic reasoning may also be related to mental state understanding (Núñez, 2011; Núñez & Harris, 1998; Papafragou, 2001; Wellman & Miller, 2008). Wellman and Miller (2008) explained that obligations and permissions overlap with reasoning about desires. Permissions allow actors to comply with an action if they desire, whereas obligations require actors to comply regardless of their desires. In addition to these theoretical arguments, there is evidence that young children's deontic reasoning about moral dilemmas (e.g., reasoning about social obligations and ought to's) is related to their theory of mind understanding (e.g., Killen et al., 2011; Lane et al., 2010; Ochoa et al., 2020). Hence, there may be a relation between children's understanding of deontic terms (obligations and permissions) and beliefs and desires (theory of mind). No study has tested this experimentally, clearly demonstrating the need for further investigation.

### *Ask and tell*

The verbs *ask* and *tell* provide an opportunity to examine the epistemic–deontic distinction given that they have both epistemic uses when referring to the flow of information and deontic uses when referring to obligation and permission. However, children's acquisition of the epistemic and deontic meanings of *ask* and *tell* have largely been overlooked.<sup>1</sup> Two studies have examined children's comprehension of the deontic meaning (Bock & Hornsby, 1981; Makoid, 1977). In an unpublished manuscript, Makoid (1977) presented 4- to 6-year-olds with utterances that varied with respect to whether the speaker used the word *please* and either an interrogative (e.g., “Can you . . .”) or an imperative, and by 5 years of age children were adept at choosing *ask* when speakers used *please* with an interrogative and choosing *tell* when speakers simply used an imperative. Bock and Hornsby (1981) found that when 3- to 6-year-olds were instructed to either *ask* or *tell*, children more often used the word *please* and an interrogative (e.g., “Can I have the plate?”) if they were in the *ask* condition, compared with the *tell* condition, demonstrating an understanding that there is a difference between the deontic *ask* and *tell* instructions.

Stolzenberg et al. (2017) examined 6- to 11-year-old maltreated children's understanding of the epistemic and deontic uses of *ask* and *tell* and found that when asked whether speakers were *asking* or *telling*, even the youngest children performed well. Any difficulties children experienced with the terms were related to the way in which they were asked, with forced-choice questions leading to improved performance and yes/no questions eliciting confusion because of children's conflation of *telling* with *saying*. No research has examined the age at which children's understanding of the epistemic meaning of *ask* and *tell* emerges and how their understanding compares with their understanding of the deontic meaning of the terms.

### *The current study*

We examined the emergence of epistemic and deontic understanding of the verbs *ask* and *tell* as well as their relation to theory-of-mind understanding. Children (3- to 6-year-olds) were presented with vignettes depicting *epistemic asking* (e.g., “Did you play with a puppy?”) and *epistemic telling* (e.g., “I played with the puppy”) as well as *deontic asking* (e.g., “Can we PLEASE play with the puppy?”) and *deontic telling* (e.g., “You HAVE TO play with the puppy”) and were asked a forced-choice question about whether the speaker *asked* or *told*. Participants then completed first-order theory-of-mind tasks and the Woodcock–Johnson picture vocabulary task.

We expected an emergence of understanding of both epistemic and deontic uses of *ask* and *tell* during these early childhood years (Bock & Hornsby, 1981; Makoid, 1977). Furthermore, we expected

<sup>1</sup> Although work by Chomsky on *ask* and *tell* generated a great deal of research (Chomsky, 1969; Kessel, 1970; Olds, 1968; Tanz, 1983; Warden, 1981), this line of research focused on a different problem: the distinction between *ask* and *tell* in subject-omitted wh- clause sentences (e.g., “Tell him what to wear” vs. “Ask him what to wear”). This research found that uses of *ask* and *tell* with subject-omitted sentences was not well understood until 8 years of age.

children to have a better understanding of deontic uses of *ask* and *tell* compared with epistemic uses (Papafragou, 2001). Consistent with past research, we also expected that children's theory-of-mind understanding would be more highly correlated with their epistemic understanding (Moore et al., 1990) compared with their deontic understanding (Wellman & Miller, 2008).

## Method

### Participants

A total of 184 children aged 3–6 years ( $M_{\text{age}} = 60$  months,  $SD = 13.85$ , range = 36–83; 49% boys), including 46 3-year-olds ( $M_{\text{age}} = 42$  months,  $SD = 3.32$ , range = 36–47; 57% boys), 44 4-year-olds ( $M_{\text{age}} = 55$  months,  $SD = 3.94$ , range = 48–59; 48% boys), 45 5-year-olds ( $M_{\text{age}} = 66$  months,  $SD = 3.19$ , range = 60–71; 49% boys), and 49 6-year-olds ( $M_{\text{age}} = 78$  months,  $SD = 3.45$ , range = 72–83; 45% boys), participated in the current study. A power analysis was conducted (G\*Power 3.0.10;  $\alpha = .05$ , power = .90), indicating that a sample size of 164 participants was necessary to detect a medium effect size. Participants were recruited from the community using a database of families interested in participating in research studies. Socioeconomic status (SES) was measured using total household income, where the majority of participant families (68.5%) reported an income over \$75,000 (4% of families did not report total household income). Parents were also asked to report their child participants' ethnicity, with 85% indicating Caucasian, 2% African Canadian, 1% Latinx, 0.5% Asian, 0.5% South Asian, 0.5% Native American, and 10% other (0.5% did not report child ethnicity). Parents gave consent and children provided assent prior to beginning the study. The Brock University research ethics board approved the current study.

### Materials and procedure

Children in this study were tested individually in a quiet testing space. To begin, children completed the *ask/tell* story task using a modified methodology from Stolzenberg et al. (2017). Experimenters presented children with a series of vignettes on a laptop computer screen paired with stories about parent–child conversations. All vignettes included a picture of a parent, a child, and a target object. All stories were one sentence long and included one character speaking to the other character. First, to familiarize children with the need to listen carefully to the scenarios and questions, and to teach them that their task was to assess the appropriateness of the words used, the experimenter read two practice scenarios involving the use of the words *give* and *take*. The words *give* and *take* were used in place of *ask* and *tell* because they reflect a distinction of receiving and providing—much like *asking* and *telling*—which allowed a similar test without practice regarding the terms of interest.

The experimenter introduced the activity and indicated that she would read a story in which sometimes the characters in the story would be *giving* and sometimes the characters would be *taking*. Next, children were told that the experimenter first would want to know what the story character said in the story and then would want to know whether the story character was *giving* or *taking*. The first practice story included a picture of a mommy, a boy, and an apple, and the story involved *giving* (the mommy comes home from work and says to the boy, "Here's an apple"). The second practice story included a picture of a daddy, a girl, and a banana, and the story involved *taking* (The girl hands her daddy a banana, and the daddy says "Thanks!"). Following each story, children were asked two questions, including a recall question to ensure attention and comprehension (e.g., "What did the mommy/daddy say?"), followed by a forced-choice question (e.g., "Did the mommy/daddy give or take?"). Before asking the forced-choice question, the story and recall question were repeated until children demonstrated an understanding of what the story character said (i.e., correctly recalled or paraphrased).

Next, children were told that the experimenter would read more stories, but now the people in the story would be *asking* or *telling*. Children were read 16 stories about a parent–child conversation, including 4 *epistemic–ask* stories (e.g., the boy says to the mommy, "When you were little, did you play

with a puppy?”), 4 *epistemic–tell* stories (e.g., the boy says to the mommy, “When you were at work, I played with a puppy”), 4 *deontic–ask* stories (e.g., the boy says to the mommy, “Now that you’re home, can we PLEASE play with the puppy?”), and 4 *deontic–tell* stories (e.g., the boy says to the mommy, “Now that you’re home, you HAVE TO play with the puppy”). The target objects discussed in the stories included a puppy, a piano, crayons, a soccer ball, cards, a bird, chalk, jump rope, a kitten, drums, blocks, a skateboard, a violin, paint, a computer, and a lizard. After the first 8 scenarios, the experimenter gave a brief reiteration of the instructions to remind children that sometimes the person would be *asking* and sometimes the person would be *telling*. The order of the 8 epistemic and 8 deontic stories was counterbalanced between participants, and half the stories involved a parent (mommy or daddy) speaker or child (girl or boy) speaker. Following each story, children were asked two questions. First, children were asked a recall question (e.g., “What did the boy say?”). If children failed to answer the question, the experimenter repeated the story and asked the recall question again. If children still did not respond, they were prompted with the beginning of the speaker’s sentence (prior to the verb of interest; e.g., “When you were little”) to further communicate the goal of the task. Next, children were asked a forced-choice question (e.g., “Did the boy ask or tell?”). The order of *ask* and *tell* in the first forced-choice question was counterbalanced between participants, where half the participants were first asked, for example, “Did the [story character] *ask* or *tell*?” and half were first asked, for example, “Did the [story character] *tell* or *ask*?” Following the first forced-choice question, the order of *ask* and *tell* was alternated for each of the 16 stories.

### Theory of mind

Next, to assess first-order theory of mind, children were presented with two interactive stories. First, children completed a contents false belief task (Gopnik & Astington, 1988), where children were presented with a Play-Doh container that contained stickers. Before revealing the true contents of the container, children were asked what they thought was inside (control question). The contents were then revealed, and children were asked what they thought was in the container before it was opened (Target Question 1) and what another character who had never seen inside the container would think was inside the container (Target Question 2). Next, children completed a change of location task (Wimmer & Perner, 1983). In this story, Mary puts her ball into a bucket and leaves the room, followed by Jane moving the ball into a box, and then Mary returns to look for her ball. Children were then asked where Mary would look for her ball (Target Question 1), where Mary thought the ball was (Target Question 2), where the ball was now (Control Question 1), and where Mary put the ball in the beginning (Control Question 2). Children who correctly answered the control questions were given 1 point for each correct target question (up to 2 points per story).

### Vocabulary

Finally, participants completed the Picture Vocabulary Scale of the Woodcock–Johnson Test of Cognitive Ability (WCJ; Schrank et al., 2014), which assesses children’s receptive vocabulary. Children were presented with a series of pictures and asked to label each picture. The task was terminated when six consecutive pictures were incorrectly labeled. Children received 1 point for each correctly identified picture. Scores could range from 0 to 54. Because of time constraints, one child was not administered the scale and so was excluded from analyses. Finally, all children received a small toy as compensation for completing the study.

### Coding

To assess children’s responses to the free recall questions, we transcribed children’s responses and two research assistants coded all responses for accuracy. Accuracy was defined as a verbatim recall or a correct paraphrase. Inaccurate responses were defined as being off topic, including incorrect subject matter, or children recalling the speaker’s statement using the wrong conversational verb (e.g., recounted an *asking* scenario with a description of *telling*). Accuracy scores were created by summing children’s performance across speakers (i.e., two child scenarios and two parent scenarios) for each of the four scenarios (epistemic–ask, epistemic–tell, deontic–ask, and deontic–tell), resulting in a score of 0–4. Proportion scores were then created for each scenario by dividing the accuracy score by 4.

Children’s forced-choice responses were also coded as accurate or inaccurate. Accurate responses included when children chose *ask* to epistemic–ask and deontic–ask scenarios and chose *tell* to epistemic–tell and deontic–tell scenarios. Inaccurate codes reflected when children chose *tell* to epistemic–ask and deontic–ask scenarios and chose *ask* to epistemic–tell and deontic–tell scenarios. Accuracy scores were again created by summing accurate scores across all speakers, followed by proportion scores that were created for each scenario type by dividing the accuracy score by 4.

For all coding categories, interrater reliability was measured. Two coders independently coded 20% of the transcripts, and all variables had a minimum reliability of  $\kappa = .80$ .

**Results**

Preliminary results indicated that children’s performance did not vary by gender, ethnicity, or income. The order of *ask/tell* presentation (which was counterbalanced across participants) had no effect on children’s responses. In addition, the speaker (parent/child) did not influence children’s response accuracy. Therefore, these variables are not considered further.

Children’s performance on cognitive measures was typical for their developmental stage. The overall mean for WCJ raw vocabulary score was 22.45 ( $SD = 4.23$ ). Children’s mean accuracy (out of 4) for the theory of mind task was 2.48 ( $SD = 1.48$ ). See Table 1 for correlations with all predictors in this study.

*Recall performance*

First, we examined children’s performance on the recall questions to ensure that children were attending to and understanding the vignettes. Children had little difficulty in quoting the target speakers (proportion correct: epistemic–ask  $M = .95, SD = .14$ ; epistemic–tell  $M = .96, SD = .13$ ; deontic–ask  $M = .96, SD = .13$ ; deontic–tell  $M = .96, SD = .14$ ) and did so without prompting in 83% of the cases.

To determine whether scenario type and/or age influenced children’s accuracy on the attention/comprehension recall questions, we conducted a repeated-measures analysis of variance (ANOVA) on children’s accuracy to the free recall questions with both verb (*ask* or *tell*) and modality (epistemic or deontic) entered as repeated within-participants factors. Age in months and children’s WCJ raw vocabulary scores were entered as continuous variables. Only WCJ raw scores predicted free recall performance,  $F(1, 180) = 6.85, p = .010, \eta^2_p = .04$ , such that children’s free recall performance increased with higher WCJ scores.

*Epistemic/Deontic and ask/tell understanding*

Next, we examined the developmental trajectory of children’s ability to accurately distinguish between the different modalities (i.e., epistemic and deontic) for the verbs *ask* and *tell*. We conducted a repeated-measures ANOVA on the proportion of children’s accurate responses with modality (epi-

**Table 1**  
Pearson correlations between all predictor variables.

|                    | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9 |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|---|
| 1. Age (months)    | –     |       |       |       |       |       |       |       |   |
| 2. WCJ             | .62** | –     |       |       |       |       |       |       |   |
| 3. Theory of mind  | .57** | .46** | –     |       |       |       |       |       |   |
| 4. Epistemic–Ask   | .28** | .27** | .20*  | –     |       |       |       |       |   |
| 5. Epistemic–Tell  | .30** | .28** | .24** | –.11  | –     |       |       |       |   |
| 6. Epistemic total | .43** | .41** | .33** | .62** | .72** | –     |       |       |   |
| 7. Deontic–Ask     | .34** | .28** | .29** | .49** | –.09  | .27** | –     |       |   |
| 8. Deontic–Tell    | .26** | .27** | .24** | –.03  | .49** | .36** | –.03  | –     |   |
| 9. Deontic total   | .43** | .39** | .37** | .30** | .31** | .46** | .65** | .74** | – |

Note. WCJ, Woodcock–Johnson.

\*  $p < .007$ .

\*\*  $p < .001$ .

temic or deontic) and verb (ask or tell) entered as within-participants variables and children’s age (in months) and WCJ raw scores entered as continuous variables. There was a significant main effect of age,  $F(1, 180) = 19.53, p < .001, \eta_p^2 = .10$ , and WCJ raw scores,  $F(1, 180) = 9.72, p = .002, \eta_p^2 = .05$ , suggesting a positive developmental trend of understanding, whereby older children and those with high language scores demonstrated higher accuracy across all scenarios. However, there were no significant effects of either modality,  $F(1, 180) = 0.04, p = .84, \eta_p^2 = .001$ , or verb,  $F(1, 180) = 0.65, p = .42, \eta_p^2 = .004$ , suggesting a similar developmental trajectory for children’s understanding for both modalities (epistemic:  $M = .63, SD = .20$ ; deontic:  $M = .64, SD = .20$ ) and both verbs (ask:  $M = .68, SD = .26$ ; tell:  $M = .60, SD = .30$ ) within our sample.

Comparison of children’s performance with chance

Given the positive developmental trend across scenarios observed above, we more closely examined the emergence of understanding by assessing whether children’s accuracy in successfully identifying both epistemic and deontic forms of asking and telling was consistently different from chance at each age (Fig. 1).

The 3-year-olds were not significantly different from chance in identifying epistemic or deontic uses of ask and tell (epistemic–ask:  $M = .55, SD = .25$ ; epistemic–tell:  $M = .53, SD = .31$ ; deontic–ask:  $M = .58, SD = .28$ ; deontic–tell:  $M = .49, SD = .28$ ),  $ps > .075$ . In contrast, the 5-year-olds (epistemic–ask:  $M = .64, SD = .35$ ; epistemic–tell:  $M = .70, SD = .35$ ; deontic–ask:  $M = .72, SD = .33$ ; deontic–tell:  $M = .65, SD = .34$ ),  $ps \leq .010$ , and 6-year-olds (epistemic–ask:  $M = .77, SD = .31$ ; epistemic–tell:  $M = .77, SD = .35$ ; deontic–ask:  $M = .86, SD = .26$ ; deontic–tell:  $M = .70, SD = .38$ ),  $ps < .001$ , were consistently above chance in accurately identifying epistemic and deontic uses of both ask and tell. At first glance, the 4-year-olds seemed to show an emergence of understanding whereby they were significantly above chance in accurately identifying uses of ask (epistemic:  $M = .61, SD = .35$ ; deontic:  $M = .65, SD = .31$ ),  $ps \leq .035$ , but their accuracy was slightly below chance when identifying tell (epistemic:  $M = .47, SD = .37$ ; deontic:  $M = .45, SD = .36$ ),  $ps > .345$ . This pattern of results suggests a potential ask bias. More specifically, it is possible that this pattern reflects a tendency for the 4-year-olds in our sample to assume asking rather than any meaningful differential emergence of modality or verb understanding.

To control for the tendency to call a statement ask, and to test for a modality difference, we created scores for epistemic and deontic performance (i.e., collapsed accuracy across ask and tell) (Fig. 2) and confirmed that children’s performance was not different across modalities.

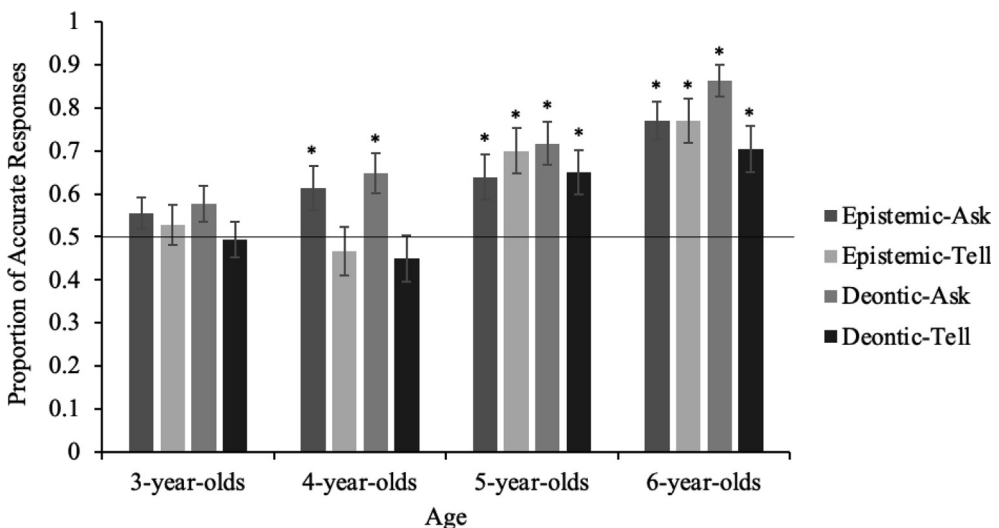
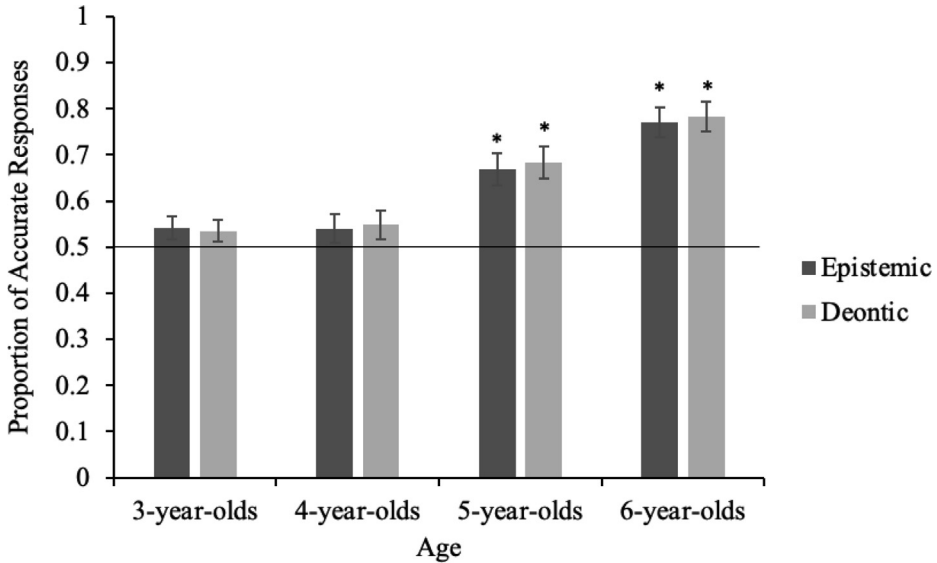


Fig. 1. Children’s mean accuracy compared with chance across modalities and verbs. Error bars show standard errors. \* $p \leq .035$ .





**Fig. 2.** Children’s mean accuracy compared with chance across modalities (epistemic and deontic). Error bars show standard errors. \* $p < .001$ .

The 3-year-olds (epistemic:  $M = .54, SD = .17$ ; deontic:  $M = .54, SD = .15$ ) and 4-year-olds (epistemic:  $M = .54, SD = .21$ ; deontic:  $M = .54, SD = .20$ ) demonstrated chance-level responding for both modalities,  $ps > .10$ . Above-chance performance clearly emerged at 5 years of age for both epistemic scenarios ( $M = .67, SD = .23$ ) and deontic scenarios ( $M = .68, SD = .24$ ),  $ps < .001$ , and performance remained significantly above chance for the 6-year-olds (epistemic:  $M = .77, SD = .23$ ; deontic:  $M = .78, SD = .23$ ),  $ps < .001$ . Collapsing across ages, there was no significant difference between epistemic performance ( $M = .63, SD = .23$ ) and deontic performance ( $M = .64, SD = .23$ ),  $p = .675$ . Lastly, we confirmed that children’s performance on epistemic stories and deontic performance were significantly correlated ( $r = .46, p < .001$ ) (Table 1).

*Theory-of-mind performance*

Finally, we addressed our goal of measuring whether theory-of-mind understanding could account for variability in children’s understanding of epistemic and deontic modalities of the verbs *ask* and *tell*. First, we conducted a repeated-measures ANOVA on the proportion of children’s accurate responses with modality (epistemic or deontic) performance entered as a repeated within-participants factor and children’s age (in months), WCJ raw vocabulary scores, and theory of mind scores entered as continuous variables. There were no effects of modality,  $F(1, 179) = 0.14, p = .71, \eta_p^2 = .001$  (epistemic:  $M = .63, SD = .20$ ; deontic:  $M = .64, SD = .20$ ). However, there were main effects of age,  $F(1, 179) = 10.46, p = .001, \eta_p^2 = .06$ , WCJ,  $F(1, 179) = 7.48, p = .007, \eta_p^2 = .04$ , and theory-of-mind performance,  $F(1, 178) = 4.43, p = .037, \eta_p^2 = .02$ , on children’s overall accuracy, suggesting that with age and theory-of-mind development children were more accurate in identifying both epistemic and deontic modals. The relation between theory-of-mind performance and understanding did not differ between epistemic and deontic scenarios ( $z = .56, p = .286$ ) (see Table 1).

**Discussion**

The goal of the current study was to assess children’s understanding of epistemic and deontic uses of *ask* and *tell*. Children were presented with vignettes of parent-child conversations and asked a

forced-choice question about whether the speaker *asked* or *told*, followed by measures of theory of mind. An emergence of understanding for both epistemic and deontic uses of *ask* and *tell* was found at 5 years of age, and there was no evidence that deontic understanding emerged earlier than epistemic understanding. Furthermore, epistemic and deontic understanding were similarly related to theory of mind understanding. There was an unexpected bias among 4-year-olds to choose *ask* over *tell*.

Children's ability to distinguish between deontic asking and telling by 5 years of age is consistent with Makoid's (1977) unpublished manuscript in which children were asked to choose between *ask* and *tell*. Ours is the first study to examine children's understanding of epistemic asking and telling, and children's epistemic performance was similar to their performance on the deontic scenarios.

A large literature suggests a deontic advantage in which children use and understand the deontic modality before the epistemic modality (Bascelli & Barbieri, 2002; Bliss, 1988; Kuczaj & Maratsos, 1975; Öztürk & Papafragou, 2015; Shatz & Wilcox, 1991; Shepherd, 1982; Stephany, 1986; Wellman & Woolley, 1990). However, we did not find this advantage; instead, we found that children's understanding of epistemic and deontic uses of *ask* and *tell* develop in tandem. Whereas previous researchers have found an earlier acquisition of deontic modals, these findings might suggest that deontic modals are easier to understand but rather might suggest that they are more salient in children's everyday lives (see Noveck et al., 1996). Furthermore, although some researchers have found a deontic primacy in children's understanding, others have found the opposite, possibly due to methodological issues (e.g., inconsistencies across the deontic and epistemic tasks; Hirst & Weil, 1982). Our study presented children with simplified epistemic and deontic tasks that were similar in nature, reducing demands on the children, and we found that children's understanding developed in tandem.

Furthermore, we found that the development of children's false belief understanding predicted their performance on the epistemic and deontic tasks, such that as children's theory-of-mind understanding improved, so did their ability to accurately distinguish between epistemic and deontic uses of *ask* and *tell*. In the past, researchers have largely examined the relationship between children's epistemic understanding and theory of mind (Hughes & Dunn, 1998; Moore et al., 1990), whereas some researchers have theorized that deontic understanding may be related as well (Núñez, 2011; Núñez & Harris, 1998; Papafragou, 2001; Wellman & Miller, 2008). For example, Wellman and Miller (2008) suggested that reasoning about obligations and permissions (deontic reasoning) overlaps with the ability to reason about others' desire-based psychological concerns (theory of mind). Furthermore, experimental tasks used to explore the relationship between epistemic understanding and theory of mind often used epistemic modals that have deontic uses as well (e.g., *must* and *may*; Moore et al., 1990), suggesting that there may be an overlap in children's epistemic and deontic understanding and theory of mind. Ultimately, our findings support both lines of work, showing that children's epistemic understanding of *ask* and *tell* requires the ability to reason about the speaker's knowledge and beliefs, and their deontic understanding of *ask* and *tell* requires the ability to reason about desires (i.e., obligations and permissions), both rooted in theory of mind understanding.

Although theory of mind is one mechanism to explain the developmental trajectory of children's understanding, there are other factors to consider that may aid children's ability to distinguish between epistemic and deontic *asking* and *telling*. For example, *asking* involves a rising intonation, whereas *telling* does not. Researchers have found that around 4 years of age children become sensitive to the intonational cues of speaker certainty and use this information to differentiate among epistemic modals (Hübscher et al., 2017; Moore et al., 1993). In addition, *asking* anticipates a response, whereas *telling* does not. Children may learn these rules to help disambiguate *ask* from *tell*. Differences also exist in the epistemic and deontic distinctions of *ask* and *tell*. For example, as seen in the current study, deontic uses of *ask* and *tell* include modals (e.g., *can*, *have to*), whereas epistemic uses of *ask* and *tell* do not and are instead expressed as inferences. The use of modals may increase the complexity of deontic statements (Dack & Astington, 2011) because understanding that the speaker is asking/telling the child must also include understanding the modal that is being used. However, it is also possible that the use of modals may alert children to the differences between *ask* and *tell* and improve children's ability to distinguish. Another example of the differences between epistemic and deontic uses involves reference to time; epistemic uses refer to the past, forming assertions about prior actions, whereas deontic uses are forward looking, forming assertions about future actions. In the future, researchers

should consider all aforementioned differences to explore what factors children rely on to distinguish between epistemic and deontic uses of *ask* and *tell*. This work might offer insight into the emergence of children's understanding and help to identify factors that may assist children in identifying the differences.

An unexpected *ask* bias was found in 4-year-olds; they were below chance at identifying *tell* (i.e., incorrectly identified *tell* as *ask*) and in turn labeled both *ask* and *tell* as *asking*. This may reflect a positivity bias given children's early recognition that *asking* is more polite than *telling* (Bock & Hornsby, 1981). In the past, researchers suggested that young children hold positivity biases whereby they process information selectively to avoid negative assumptions and maintain optimistic views of the self and others (Boseovski, 2010; Lyon et al., 2013; Mezulis et al., 2004).

## Conclusion

Ultimately, the findings from this study suggest that epistemic understanding and deontic understanding of *ask* and *tell* develop in tandem, emerging by 5 years of age. Furthermore, both epistemic and deontic understanding were related to theory of mind, suggesting a greater developmental similarity between epistemic and deontic understanding than is often appreciated.

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