

Children's acquiescence to polysemous implicature questions about coaching: The role of parental support

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ABSTRACT

Children may be asked questions with subtle and implied meanings. The present study examined whether, and under what conditions, 5- to 10-year-old children affirmed polysemous implicature questions that implied coaching, when in fact no coaching occurred. Participants ($N = 161$) were presented with vignettes about a transgression where the child disclosed to a supportive or unsupportive parent, and were asked three polysemous implicature coaching questions (e.g., "Did the mom *practice* with the boy/girl what to say?"). Overall, children acquiesced to implied coaching questions, when in fact no coaching occurred (39% of the time), though acquiescence rates decreased with age and improved false-belief understanding. Furthermore, children were more likely to acquiesce when the mother was supportive, and when the question more subtly suggested coaching. These findings provide novel evidence of the developmental trajectory of children's understanding of polysemous implicatures and the underlying social-cognitive mechanisms, with implications for questioning children in investigative contexts.

Introduction

When children allege sexual abuse, their report becomes central to assessing whether the crime occurred. Attorneys, particularly during cross-examination, may be motivated to imply that children have been coached, as a method for suggesting that children have made false allegations. Problematically, attorneys may be likely to do so by asking indirect questions (Lyon & Stolzenberg, 2015; Stolzenberg & Lyon, 2014). Children's limited understanding of attorneys' motives to undermine their credibility may lead to unintentionally acquiescing, even when coaching or other suggestive techniques have not occurred. Given the implications of suggested coaching in a legal context (e.g., the allegations will be perceived as false), and the lack of research examining children's understanding of these questions, the current study examined how children understand and respond to implied coaching questions.

Implied coaching questions may be particularly difficult for young children, as they require an understanding of attorneys' motives. For example, consider the question "Did your mom help you remember?" Young children are likely to have a positive perception of their mother

and of how she can help (e.g., Britton & Britton, 1971; Kagan & Lemkin, 1960) and are unlikely to recognize that the attorney could be implying something else, such as insinuating that the child's mother may have influenced the child through questioning (Lyon & Stolzenberg, 2015). Henceforth, such statements will be called polysemous implicatures; polysemous refers to the multiple meanings behind statements (Klein & Murphy, 2001) while an implicature is a statement that implies meaning beyond the literal sense of the statement (Grice, 1975). There are a number of ways that attorneys may utilize polysemous implicatures to subtly suggest that children's reports are the product of influence. For example, simply asking a child about the number of people who have spoken to the child about abuse, implies influence (Lyon & Stolzenberg, 2015). There is evidence that coaching questions occur within courtroom investigations. For example, attorneys are instructed to ask children to specify the various adults involved in questioning them (Bailey & Rothblatt, 1971) and whether adults questioning them "helped them remember," or "practiced" regarding what might happen during testimony (Myers, 1998). A study by Stolzenberg and Lyon (2014) found that defense attorneys overtly asked whether others had influenced their

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story in only 21% of cases; prosecutors did so in 26% of cases. There is also evidence that attorneys ask coaching questions in subtler ways. St. George et al. (2021) found that in a sample of 64 child sexual abuse testimonies, 601 lines of questioning (9% of all lines of questioning) were about suggestive influence. Of these, 67% were indirect accusations that subtly implied coaching. Though this work provides evidence that coaching questions occur in child investigations, experimental research is needed to examine children's recognition and performance on implied coaching questions.

Theory of mind

To fully assess the developmental trajectory of children's understanding of polysemous implicatures, it is important to examine the cognitive skills that may be supporting their understanding. Given that children must consider the intentions of the questioner to successfully answer polysemous implicatures, these questions are essentially an expression of theory of mind. Theory of mind is the ability to interpret another's mental states such as beliefs, desires, or emotions (Premack & Woodruff, 1978). Understanding that someone may have a different intention than the child's own may assist children in understanding that a statement can hold two different meanings, in turn improving children's ability to understand polysemous implicatures. One aspect of theory-of-mind understanding that may be particularly important for understanding polysemous implicatures is false-belief understanding. The ability to attribute false beliefs, or recognize that others can have beliefs about the world that are divergent from their own, develops from first-order to second-order belief understanding. First-order false-belief understanding requires children to reason about one person's belief (Where does Tom think the ball is?), while second-order false-belief understanding requires children to reason about one person's belief about another person's belief (Where does John believe that Tom thinks the ball is?). First-order theory-of-mind understanding develops during the preschool years (see meta-analysis by Wellman, Cross, & Watson, 2001) with second-order understanding beginning to emerge around 6 years of age, yet undergoing steady development into adolescence (Sullivan, Zaitchik, & Tager-Flusberg, 1994; Wimmer & Perner, 1983).

Banerjee and Yuill (1999) demonstrated that children's second-order theory-of-mind understanding was related to their ability to understand that a protagonist may make false claims to present themselves positively. Furthermore, researchers examining the development of deception, a speech act in which the literal meaning conflicts with the intention and beliefs of the speaker, find that children's deceptive abilities are significantly related to theory-of-mind development (e.g., Talwar, Gordon, & Lee, 2007; Williams, Moore, Crossman, & Talwar, 2016). Given that theory-of-mind understanding plays a role in children's understanding of speech acts where the speaker's intentions and literal statement conflict, children's theory-of-mind understanding may play an integral role in children's understanding of polysemous implicatures (where a speaker's intention [e.g., implying coaching] differs from their literal statement [e.g., asking about helping]).

Current study

Researchers have yet to examine the developmental pattern of children's understanding of polysemous implicatures. Given the implications in investigative contexts, the current study examined whether 5- to 10-year-olds acquiesce to polysemous implicatures about coaching, when in fact, coaching did not occur. This age range was selected in line with the field study by St. George et al. (2021), which found that implied coaching questions were being asked to child witnesses from 5- to 12 years of age. Additionally, we examined several factors that may influence the rate of acquiescence. Specifically, we were interested in whether parental support offered by a parent during a disclosure (e.g., mom believes and encourages reporting versus does not believe child's allegations and discourages reporting), the type of polysemous

implicature (i.e., helping the child remember, practicing what to say, or telling the child what to say), and children's false-belief understanding, influenced children's likelihood of acquiescence.

It was predicted that children's acquiescence to polysemous implicatures would decrease with age, whereby older children would begin to understand the implication of the questions and refute the inquiries. Furthermore, given that parental nurturance is associated with children's positive perceptions of their parent (Britton & Britton, 1971; Kagan & Lemkin, 1960), such as how they can help, it was predicted that children would be more likely to acquiesce to questions when a parent offered support (e.g., "I believe you. You need to tell a policeman.") compared to when parents were unsupportive (e.g., "I don't believe you. Don't tell anyone else about that."). In addition, it was expected that the subtlety and positive nature of the implicature would influence children's acquiescence across the three polysemous implicatures. For example, polysemous implicatures range from subtler (e.g., coaching through assistance) to more explicit suggestions of coaching (e.g., coaching through explicitly telling a child what to say). Furthermore, *helping* which is prosocial (e.g., Warneken & Tomasello, 2015) and *practicing* which improves performance (e.g., Ericsson, 2006) have positive associations, whereas *telling* is associated with a command (e.g., Stolzenberg, McWilliams, & Lyon, 2017) which is more negative. Therefore, subtler and more positive polysemous implicatures (*helping*, *practice*) were expected to result in more acquiescence, because children may be less able to identify these questions as implying coaching, compared to less subtle and more negative forms (*telling*). Finally, given the important role that theory of mind development plays in children's understanding of intentions, it was expected that with increased performance on false-belief tasks, children would be less likely to acquiesce to polysemous implicature questions.

Method

Participants

One-hundred and sixty-one children ($M_{age} = 7$ years, 9 months, $SD = 21$ months, 45% males) participated in this study, including 54 children ages 5 to 6 years old ($M_{age} = 5$ years, 9 months, $SD = 7$ months, 48% males), 54 children ages 7 to 8 years old ($M_{age} = 7$ years, 9 months, $SD = 7$ months, 41% males), and 53 children ages 9 to 10 years old ($M_{age} = 9$ years, 9 months, $SD = 7$ months, 45% males). Participants' age was grouped, given that 5- and 6-year-olds typically perform similarly on theory of mind tasks, whereas second-order theory of mind develops around 7 to 8 years of age. An additional 13 participants were excluded for not completing the tasks ($M_{age} = 7$ years, 1 month, $SD = 25$ months, 38% males). Participants were recruited from a local Science Centre in a very large and diverse urban area, which a wide variety of families had access to via public transportation. This study was approved by the University ethics board. Written consent was obtained by all parents and verbal assent from all children.

Materials and procedure

All participants were tested in a designated testing area in a local Science Centre. First, children were taken through a series of eight vignettes (see example in Appendix), animated with images to illustrate each vignette in PowerPoint, where an adult committed a transgression causing harm to a child protagonist (4 physical harm, e.g., hitting the child; 4 vandalism/theft, e.g., stealing the child's bike). The gender of the protagonist was matched to the child. The child protagonist then told their Mom what happened ("The boy tells his mom that the man stole his bike"). In half of the vignettes, the Mom was supportive (the Mom said: "I believe you. You need to tell a policeman. I want you to tell him the truth.") and in the other half the mother was unsupportive (the Mom said: "I don't believe you. Don't tell anyone else about that. Don't tell lies."). Throughout each vignette, children were asked three wh-

memory check questions about the transgression, the child's disclosure, and the mother's support (e.g., "What did the mom say?"). All participants passed the memory check questions. Finally, children were asked three polysemous implicature questions, including (1) Did the mom *help* the girl/boy remember what happened? (2) Did the mom *practice* with the girl/boy what to say? (3) Did the mom *tell* the girl/boy what happened? The order of the polysemous implicature questions were counter-balanced between participants. The proportion of participants' affirmative (i.e., yes) responses was calculated for each polysemous implicature question type (help remember, practice, tell) by dividing the number of affirmative responses by the total number of questions ($n = 8$).

After concluding the vignette task, all children completed two false-belief tasks with the same tester: one first-order (Sally-Anne task; Wimmer & Perner, 1983) and one second-order task (Chocolate Bar task; Sullivan et al., 1994).

In the first-order task, first Sally puts her ball into a basket and leaves the room, then Ann moves the ball from the basket into a box, and finally Sally returns to look for her ball. Participants were asked where Sally will look for the ball (Target Question 1), where Sally thinks the ball is now (Target Question 2), where the ball is now (Control Question 1), and where Sally put the ball in the beginning (Control Question 2).

In the second-order task, first Danny puts his chocolate bar in a drawer and goes outside, and then through the window, Danny sees Amy hide his chocolate bar in the toy chest. Participants were asked where the chocolate bar is now (Control Question 1), whether Danny knows that Amy hid his chocolate bar in the toy chest (Control Question 2), whether Amy knows that Danny saw her hide the chocolate bar (Target Question 2), and where Amy thinks that Danny will look for the chocolate bar (Target Question 2).

Children were given a score ranging from 0 to 2 for the number of correctly answered target questions in each task. If children failed the control questions for either task, they received a score of 0 (out of 2) for the corresponding task. Finally, children completed the Peabody Picture Vocabulary Test (receptive vocabulary) using the NIH Toolbox as a measure of children's language ability (Gershon et al., 2013).

Results

Preliminary analyses

First, we assessed differences in children's responses to the physical harm and vandalism/theft vignettes. Analyses revealed that the proportion of children's "yes" responses to the polysemous implicature questions were not significantly different for the physical harm vignettes ($M = 0.38$, $SD = 0.30$) and vandalism/theft vignettes ($M = 0.39$, $SD = 0.30$). As such, all analyses collapse across the type of adult transgression. We also confirmed that there were no order effects for Question Type, $F(5,139) = 0.725$, $p = .606$, $\eta^2 = 0.025$. Furthermore, children's age-corrected PPVT scores were not a significant predictor of performance on the polysemous implicature questions when included in the full model, $F(1,152) = 2.62$, $p = .107$, $\eta^2 = 0.02$, therefore this

measure was excluded to present the most parsimonious model.

We were also interested in examining the role of false-belief understanding in children's acquiescence to polysemous implicature questions. Children's performance across Question Type (Help, Practice, Tell) and Parental Support (Supportive, Unsupportive) was significantly correlated with children's performance on the first-order false-belief task, and second-order false-belief task (except Supportive-Help and -Practice), see Table 1. For children's performance on the first- and second-order false-belief tasks split on age, see Table 2.

Polysemous implicatures

Overall, across all polysemous implicature questions, children provided affirmative responses 39% of the time, demonstrating a general acquiescence to polysemous implicatures. A 3 (Age: 5- to 6-year-olds, 7- to 8-year-olds, 9- to 10-year-olds) by 3 (Question Type: Help Remember, Practice, Tell) by 2 (Parental Support: Supportive, Unsupportive) repeated-measures ANOVA was performed on the proportion of children's affirmative responses, with age group as the between-subject variables, and first- and second-order false-belief scores as continuous covariates. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated, $\chi^2(2) = 12.60$, $p = .002$, thus Greenhouse-Geisser correction was used for the repeated-measures effect of question type ($\epsilon = 0.93$). Results revealed a significant effect of first-order false-belief, $F(1,154) = 7.78$, $p = .006$, $\eta^2 = 0.05$, however, second-order false-belief was not significant, $F(1,154) = 2.47$, $p = .118$, $\eta^2 = 0.02$. There were no significant interactions with first- or second-order false-belief and any other variable, including age, question type, and parental support (all p 's > 0.07). The rate of affirmative responses was found to significantly differ by age, $F(2,154) = 5.41$, $p = .005$, $\eta^2 = 0.07$, and parental support, $F(1, 154) = 9.77$, $p = .002$, $\eta^2 = 0.06$. These main effects were qualified by a significant three-way interaction between age, question type, and parental support, $F(4,308) = 3.16$, $p = .014$, $\eta^2 = 0.04$. There were no other significant main effects or interactions, p 's > 0.05 (see Fig. 1). Follow-up repeated-measures ANOVAs were conducted on the proportion of children's affirmative responses, with age as the between-subjects variable and question type as the within-subjects variable, separately for supportive and unsupportive parents.

Supportive parent

When the parent was supportive, there was a significant main effect of age, $F(2,154) = 3.51$, $p = .032$, $\eta^2 = 0.04$, qualified by a significant

Table 2

Theory of mind and age descriptives: means (standard deviations).

	First-order false-belief	Second-order false-belief
5- to 6- years	1.39 (0.81)	1.09 (0.84)
7- to 8- years	1.66 (0.72)	1.57 (0.76)
9- to 10- years	1.92 (0.33)	1.88 (0.32)

Note. First- and second-order scores range from 0 to 2.

Table 1
Correlations.

	1.	2.	3.	4.	5.	6.	7.	8.
1. First-order false-belief	–							
2. Second-order false-belief	0.534**	–						
3. Supportive-Help	–0.254**	–0.142	–					
4. Supportive-Practice	–0.186*	–0.140	0.498**	–				
5. Supportive-Tell	–0.334**	–0.327**	0.556**	0.402**	–			
6. Unsupportive-Help	–0.353**	–0.369**	0.437**	0.335**	0.513**	–		
7. Unsupportive-Practice	–0.298**	–0.330**	0.298**	0.453**	0.411**	0.747**	–	
8. Unsupportive-Tell	–0.307**	–0.396**	0.384**	0.242**	0.644**	0.730**	0.605**	–

* $p < .02$.

** $p < .003$.

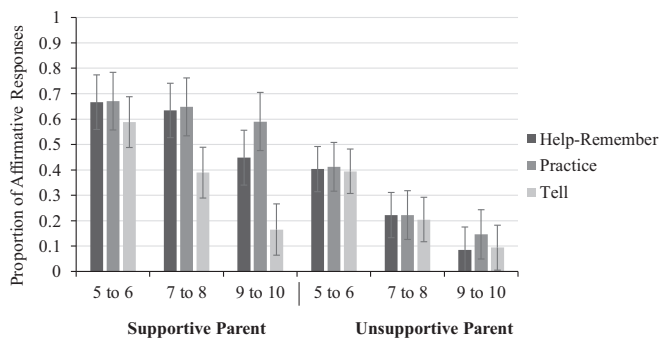


Fig. 1. Support \times Age \times Question Type, for the proportion of children's affirmative responses.

age by question type interaction, $F(4,308) = 3.56, p = .008, \eta^2 = 0.04$. There was no main effect of question type, $F(2,308) = 1.70, p = .185, \eta^2 = 0.01$. Pairwise comparisons revealed that for 5- and 6-year-olds, although there were high rates of affirming overall, there were no significant differences in children affirming Help Remember ($M = 0.67, SD = 0.41$), Practice ($M = 0.67, SD = 0.44$), and Tell ($M = 0.59, SD = 0.39$) questions, $ps > 0.05$. For 7- and 8-year-olds, children were significantly more likely to affirm the Help Remember ($M = 0.63, SD = 0.40$) and Practice ($M = 0.65, SD = 0.42$) questions compared to the more explicit Tell ($M = 0.39, SD = 0.37$) questions, $ps < 0.001$ (Help Remember and Practice were not significantly different, $p = .740$). For the 9- and 10-year-olds, children were significantly more likely to affirm the Practice ($M = 0.62, SD = 0.44$), followed by Help Remember ($M = 0.48, SD = 0.41$), followed by Tell ($M = 0.21, SD = 0.38$) questions (between Practice and Help Remember, $p = .022$; Help Remember and Tell, $p < .001$; Practice and Tell, $p < .001$), suggesting that with age children are less likely to assent to questions that imply coaching, though even the older children are susceptible to more subtle implied questioning (e.g., Practice questions).

Unsupportive parent

When the parent was unsupportive, there was a significant main effect of age, $F(2,154) = 5.21, p = .006, \eta^2 = 0.06$, where 5- to 6-year-olds ($M = 0.35, SD = 0.30$) were significantly more likely to affirm polysemous implicatures about the unsupportive parent, compared to 7- to 8-year-olds ($M = 0.22, SD = 0.29$) and 9- to 10-year-olds ($M = 0.16, SD = 0.30$). There was no main effect of question type or significant interaction, $ps > 0.05$.

Discussion

The current study assessed how children interpret, understand, and respond to implied coaching questions. Overall, we found that elementary aged children do acquiesce to implied coaching questions, when in fact no coaching occurred, though this decreased with age and improved false-belief understanding. Furthermore, children were more likely to affirm implied coaching questions when the mother was supportive, and when the question more subtly suggested coaching.

Given the legal implications of affirming coaching, when in fact no coaching occurred, we assessed children's acquiescence to three forms of implied coaching questions. Overall, children acquiesced to polysemous implicature coaching questions 39% of the time, though this was largely influenced by parental support, as well as the type of polysemous implicature.

In line with our predictions, when the parent was supportive, young children often acquiesced to polysemous implicature questions. Given that children likely have positive perceptions of a parent and how they can help (Britton & Britton, 1971; Kagan & Lemkin, 1960), the mother's

supportiveness was likely interpreted as aiding the child, leading to acquiescence to the polysemous implicature questions implying coaching. This is problematic, as young children are affirming questions with implied meanings, suggesting that the mother coached the child when in fact no coaching occurred. Promisingly, acquiescence does decrease with age, as the youngest children acquiesced to all polysemous implicatures at a higher rate (approximately 64% of the time) compared to the oldest children (approximately 40% of the time). Furthermore, the oldest children were less influenced by explicit polysemous implicature questions (when asked about the mother explicitly *telling* the child what to say, only acquiesced 17% of the time). However, even older children were subject to more subtle threats of implied meaning, acquiescing to subtler polysemous implicature questions (when asked about the mother *practicing* with the child what to say, acquiesced 59% of the time). These findings suggest that with age, children become less influenced by a parent's support and more aware of the implications of overt questions.

In contrast, when the parent was unsupportive, children were less likely to acquiesce across all forms of polysemous implicature questions (regardless of subtlety), and this continued to decrease with age. Notably, the oldest children only acquiesced to the implied coaching questions 11% of the time when the parent was unsupportive. Although children may have positive perceptions of their mother, this may have diminished from the lack of parental support, providing a more negative view of the parent and their willingness to aid (or coach) the child. Overall, these results suggest that support largely influences children's perceptions of adults' during the disclosure process; associating support (believing the child and encouraging them to report the transgression) with assistance (aiding the child with their disclosure). This is problematic, given that during investigations children are likely to interact with supportive adults, leading children to affirm questions that imply coaching when coaching did not occur. Notably, in this study parent support involved both a manipulation of belief/disbelief as well as encouragement/discouragement to disclose. This decision was made because in practice an expression of disbelief may, at times, follow with a request not to disclose. However, future research should examine whether belief alone influences children's perceptions of parent support and in turn their acquiescence to implied coaching questions or whether the encouragement to disclose plays a role in driving the effects.

Given the role that theory-of-mind might play in answering polysemous implicature questions, whereby children must consider the intentions or mental state of the questioner, we explored this social-cognitive process as a potential underlying mechanism for children's acquiescence to implied coaching questions. We found that first-order false-belief understanding was significantly related to children's acquiescence to polysemous implicatures suggesting that as children's theory-of-mind understanding improves, they are better able to reason about intentions and as such were less likely to acquiesce to polysemous implicature questions. Second-order false-belief understanding was not related to children's understanding of polysemous implicatures, possibly due to the simplicity of the task (i.e., reasoning about whether one person's intentions, specifically the mothers, conflict with their literal statement). Future studies examining more complex scenarios, such as children's perceptions of how others interpret polysemous implicature questions, should examine the influence of second-order theory of mind on children's understanding. However, results also revealed that age remained a significant predictor of children's acquiescence after including false-belief understanding in the model, suggesting that although theory of mind plays a role in children's understanding of polysemous implicatures, this process is not the only underlying mechanism. Researchers should examine other social and cognitive processes that may underlie the development of children's understanding (e.g., executive functions).

Altogether, the findings from this study offer insight into how children might interpret and respond to polysemous implicatures, with implications for both basic understanding of children's linguistic development and applications to forensic and legal investigations

involving children. First, these findings provide insight into the developmental trajectory of children's linguistic understanding of polysemous implicatures, indicating that performance improves with age, as well as the ability to take other's perspective and intentions into consideration (false-belief understanding). Second, these findings have important implications for informing questioning practices in investigative contexts, highlighting younger children's high rates of acquiescence to questions that imply coaching, which may lead to unintended, or problematic, miscommunications. Given that children have a positive perception of supportive people during the disclosure process, and in turn assent to questioning that implies coaching, their credibility becomes susceptible to subtle attacks by suggesting that their reports are the product of influence. Children's lack of understanding for the implied meaning of coaching questions suggests that these questions should be avoided altogether. This is particularly relevant in investigative contexts (e.g., child disclosures, forensic and courtroom interviewing), where children are questioned about their experiences. However, within the courtroom context, as seen in the field study by St. George et al. (2021), defense attorneys may be using polysemous implicature questions intentionally to threaten children's credibility. Therefore, the findings from the current study can help to warn prosecutors against the use of implied coaching questions and encourage prosecutors to follow-up on defense attorneys questioning during cross examination. These findings can also help to warn judges and jury members about the problematic nature of implied coaching questions to inform their legal decision-making. Furthermore, given that low socioeconomic status (SES) and maltreated children are typically delayed in linguistic and cognitive development (Font & Berger, 2015), the developmental trajectory is likely delayed and the consequences amplified in investigative contexts. Researchers must examine the performance of low SES and maltreated children on similar tasks to understand this potentially delayed developmental performance.

Although this study offers insight into the alarming rate of young children's acquiescence to implied coaching questions, it is worth noting that a "yes" response always suggests children believed coaching occurred, when in fact it did not. This methodology *could* be problematic if children demonstrated a yes-bias, as this would overestimate children's beliefs about whether coaching occurred. However, in the current study children's acquiescence varied as a function of support and polysemous implicature, demonstrating that children were sensitive to the manipulations and forming beliefs about whether coaching occurred. The field would benefit from using other methods for assessing children's understanding of implied coaching (i.e., beyond affirming a question), such as probing for elaboration (e.g., Why do you think the mom helped the boy remember?) or including vignettes where the mothers really did coach her child to make a false report. The field would also benefit from examining potential mechanisms for why children interpret parental supportiveness as helping. For example, children may draw on past experiences of parents scaffolding them in sharing their experiences. It may be helpful to assess how children's own parent-child conversation experiences influence their willingness to acquiesce to polysemous implicatures. Finally, although the current study demonstrates the problematic nature of polysemous implicature questions, particularly about coaching, researchers must examine productive alternative questions; ones that can both elicit accurate descriptions from children while also allowing attorneys to question children about potential suggestive influence.

Overall, the present investigation demonstrates the problematic nature of polysemous implicatures about coaching with elementary school aged children, providing evidence of the developmental trajectory of children's improved performance.

Declarations of interest

None.

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Appendix A

[Supportive Vignette]

Here is a man and here is a [girl / boy]. The man steals the [girl / boy]'s bike.

1) What happened with the man?

Here is the [girl / boy], later, with [her / his] mom. The [girl / boy] looked upset. The mom asked, "What happened?". The [girl / boy] tells [her / his] mom that the man stole [her / his] bike.

2) What did the [girl / boy] say to [her / his] mom?

After the [girl / boy] told [her / his] mom, the mom said: "I believe you. You need to tell a policeman. I want you to tell him the truth."

3) What did the mom say to the [girl / boy]?

Implicature Questions:

1. Did the mom help the [girl/boy] remember what happened."
2. Did the mom practice with the [girl/boy] what to say."
3. Did the mom tell the [girl/boy] what happened."

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