Pseudotemporal invitations: 6- to 9-year-old maltreated children's tendency to misinterpret invitations referencing "time" as solely requesting conventional temporal information

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Abstract

Forensic interviewers ask children broad input-free recall questions about individual episodes in order to elicit complete narratives, often asking about "the first time," "the last time," and "one time." An overlooked problem is that the word "time" is potentially ambiguous, referring both to a particular episode and to conventional temporal information. We examined 191 6-9-year-old maltreated children's responses to questions about recent events varying the wording of the invitations, either asking children to "tell me about" or "tell me what happened" one time/the first time/the last time the child experienced recent recurrent events. Additionally, half of the children were asked a series of "when" questions about recurrent events before the invitations. Children were several times more likely to provide exclusively conventional temporal information to "tell me about" invitations compared to "tell me what happened" invitations, and asking "when" questions before the invitations increased children's tendency to give exclusively conventional temporal information. Children who answered a higher proportion of "when" questions with conventional temporal information were more likely to do so in response to the invitations. The results suggest that children may often fail to provide narrative information because they misinterpret invitations using the word "time."

Pseudotemporal invitations: 6- to 9-year-old maltreated children's tendency to misinterpret invitations referencing "time" as solely requesting conventional temporal information

Forensic interviewers questioning children are universally encouraged to maximize their use of broad input-free requests for recall, also known as invitations (American Professional Society on the Abuse of Children [APSAC], 2012; Lamb et al., 2018; Newlin et al., 2015). Invitations include questions about "what happened" and requests for the child to "tell more" about previously mentioned content (Lamb et al., 2018). Children disclosing maltreatment often provide script reports, which provide details of what usually occurred without information about specific episodes. Although script reports can establish that maltreatment occurred, practitioners seek information about specific episodes in order to fulfill legal requirements and to assess the credibility of children's reports (Brubacher et al., 2014). Invitations seeking information about specific episodes tend to use the word "time," such as "the last time" (Sternberg et al., 2000) or "a time you remember really well" (Zajac & Brown, 2018). In what follows, we discuss the advantages and challenges of invitations, and highlight a previously unexplored problem with invitations that ask for episodic information using the word "time."

Potential Ambiguity of Invitations Referencing "Time"

Invitations are preferred because they elicit more accurate information than other question types, especially yes-no and forced-choice questions, and because they elicit more information per question than other question types when children are responsive (Lamb et al., 2018). Yes-no questions are questions that can be answered "yes" or "no" (e.g., "Was it dark?") and forced-choice questions are questions that provide optional answers using the word "or" (e.g., "Was it light or dark?"). However, children are more likely to be unresponsive to

invitations than yes-no and forced-choice questions (Wolfman et al., 2016). This may be because invitations often strike children as insufficiently specific (Lamb et al., 2018), because children may not appreciate the need for providing narrative information in response to recall questions (Fivush, 1993), and because productive responding in response to recall questions requires children to self-generate cues, which may be difficult (Schneider, 2015). These problems are compounded in the youngest children (3- and 4-year-olds), who fail to respond more productively to invitations than to direct (wh-) questions (Hershkowitz et al., 2012). A challenge for interviewers is to rephrase initially unproductive invitations without too quickly resorting to closed-ended questions.

An overlooked potential problem with invitations concerns the ambiguity of the word "time." Webster's dictionary notes that the definitions of time include "one of a series of recurring instances or repeated actions" and "a moment, hour, day, or year as indicated by a clock or calendar" (Merriam-Webster.com, 2021). The former definition is what is meant by the word "time" in most invitations; when one asks the child to tell about the "last time," one means the last episode or occasion, and one seeks narrative information about the sequence of events. The latter definition refers to conventional temporal information (such as a clock time or date) because it requires knowledge of culturally created conventions for measuring and marking time (Wandrey et al., 2012). Hence, a child who misconstrues the interviewer's reference to "time" as only asking for conventional temporal information would think that the interviewer was asking the child *when* the episode occurred rather than *what* occurred. We will refer to this misunderstanding as the pseudotemporal problem, invitations referencing "time" as pseudotemporal invitations, and children's exclusively conventional temporal responses to pseudotemporal invitations as pseudotemporal responses.

To our knowledge, the pseudotemporal problem has received only one mention in the literature, though it focused on problems with "do you remember" or "do you recall" questions rather than invitations. In a short piece, the linguist Gina Richardson described a 4-year-old child testifying about sexual abuse (Richardson, 1990). The attorney asked "Do you recall a time when you went to the hospital?" and the child shook her head "No," but then added "My daddy took me there" (p. 118). Richardson identified a similar problem with the use of the term "the day." An attorney asked another child sexual abuse witness, a 7-year-old, "Do you remember the day that you saw Bud give Janie the massage?' and the child responded "No, but I know that he did." The attorney followed up with "How do you know?" and the child responded "Because I was in there, I was--I was in there" (p. 118). In each case, the child's response suggested that they misinterpreted the question as asking *what time* the event occurred, whereas the attorney was asking whether the child remembered *the episode*.

The Dangers of Pseudotemporality

If children misconstrue invitations using "time" as only requesting conventional temporal information, this would be problematic for several reasons. First, children's responses to invitations will be less productive because they will give conventional temporal information when the interviewer seeks narrative information about the sequence of events. This problem might seem minor because an interviewer can follow-up a child's response with "tell me everything that happened." However, if a child only provides conventional temporal information in response to an invitation, the interviewer might assume that the child's limited responsiveness is due to motivational or memory difficulties, leading them to follow up with more direct questions. If this occurs, then the benefits of asking an invitation will be lost. Second, children who do not recall conventional temporal information may respond that they "don't remember,"

and they could be misunderstood as claiming that they had forgotten the event, rather than that they simply did not recall when the event occurred.

Third, because children often have difficulty in dating events, particularly repeated events, and learn about conventional temporal concepts over an extended period of time, the information they provide in response to pseudotemporal invitations is often likely to be incorrect. During their early grade school years, children exhibit greater awareness of conventional temporal information (about days, months, years, ages, etc.), in large part through explicit instruction in school (Tartas, 2001; Wandrey et al., 2012). However, learning about conventional time is a far cry from making judgments about the time events occurred. In order to estimate when events occurred, individuals must make inferences based on combining their knowledge about conventional time patterns with contextual information they can recall about the event (e.g., "it must have been winter because it was cold"; Friedman, 1993). In two studies examining 4- to 13-year-olds' ability to provide time of day, month or season information about events that had occurred approximately 2 to 3 months previously, children up to 13 years of age had considerable difficulty in recalling month or season information, and longer intervals led to greater error (Friedman, 1991; Friedman & Lyon, 2005). Wandrey and colleagues (2012) asked 6- to 11-year-old maltreated children to provide age, month, and season information about their first and last visits to court and changes in placement, and children performed poorly. For example, none of the younger children and only 20% of the older children could recall the last month they had visited court, which on average had occurred six months previously.

Age and Pseudotemporality

Children's tendency to fall prey to the pseudotemporal problem may vary with age, but the direction of the age effects is unclear. During the grade school years, children become better

able to overcome initial assumptions about the meaning of ambiguous words or the interpretation of ambiguous syntax (Beal & Flavell, 1984; Weighall, 2008). Relatedly, older children are more likely to request specification when questions are ambiguous (Henderson & Lyon, 2021). Hence, older children might be more capable than younger children of recognizing the ambiguity of invitations. At the same time, however, older children are more knowledgeable about conventional temporal information. When asked "when" questions, older children are more likely to respond with conventional temporal information (e.g., reporting that they get up at a certain time rather than "when my mommy tells me to" or "after I sleep"; Cairns & Hsu, 1978; Tartas, 2001). Hence, as they mature, children might become more aware of the ambiguity of the word "time" in interviewers' invitations but also might become more likely to interpret the word "time" as requesting exclusively conventional temporal information.

The Current Study

We suspected that several factors might influence the likelihood that children would give pseudotemporal responses. First, the phrasing of the invitation might matter. Rather than ask children to "tell me *about* the time" interviewers could ask children to "tell me *what happened* the time." The reformulated question need not resolve the ambiguity in order to be effective; the child who interprets "time" as referring to conventional temporal information can still do so, but the need for narrative information is made explicit when asked "what happened." We tested the effects of question phrasing in this study, varying phrasing between subjects. Children were asked about a trip to the park, a class trip, playing at school, doing their homework, visiting a dentist, and coming to the court building. They were asked invitations about "one time," "the first time," and the "last time." We predicted that children would be most likely to give pseudotemporal responses (either by giving solely conventional temporal information or

expressing their uncertainty about what time an event occurred) when they were asked to "tell about" a time (About invitations), compared to when they were asked "what happened" a time (Happened invitations).

Second, children might be particularly likely to give pseudotemporal responses if they have previously answered questions that clearly ask about time. Asking a series of overtly temporal questions might prime children to interpret questions with the word "time" as requesting conventional temporal information. Interviewers and attorneys often deliberately attempt to elicit conventional temporal information from children for legal reasons, including identifying the date of the alleged crime with sufficient specificity to give the defendant adequate notice, and identifying the age of the child at the time of the alleged abuse to identify the specific crime (Wandrey et al., 2012). Therefore, it is likely that a child asked for narrative information about a "time" will have been exposed to questions explicitly asking about time. We tested the effects of asking children a series of "when" questions (hereinafter When questions) before invitations between subjects, so that half of the children were asked "when" questions before the invitations (When priming), and half were asked the When questions after the invitations (No priming). We predicted that children would answer a greater number of invitations solely with conventional temporal location information if they were first asked the When questions.

Third, children who are generally inclined to respond to overtly temporal questions with conventional temporal information may be more likely to respond to pseudotemporal invitations with conventional temporal information. We tested this possibility within subjects by examining the correlation between the number of When questions that children answered with conventional temporal information and the number of invitations that children answered with conventional temporal information. As noted above, When questions can be appropriately answered with

conventional temporal information, with information placing the queried event within a sequence, or with both.

We enrolled 6-to 9-year-old maltreated children. As noted above, children during this age are learning about conventional temporal concepts, including clock time and calendar time, at the same time that they are increasingly aware of referential ambiguity (Beal & Flavell, 1984; Henderson & Lyon, 2021; Weighall, 2008). We predicted that older children would more likely provide conventional temporal location information in response to the When questions, but we did not make an age prediction regarding children's pseudotemporal responding to the invitations. We assessed maltreated children because of their obvious importance to forensic interviewers who question children about abuse.

Method

Participants

The sample included 191 6- to 9-year-old (M_{age} =7 .44, *SD* = 1.25) maltreated children. Fifty-one percent (*n* = 96) of the children were female. Sixty-two percent (*n* = 119) of the children were Latinx, 33% (*n* = 62) were African American, 5% (*n* = 9) were Caucasian, and less than one percent were Asian/Pacific Islander (*n* = 1). These percentages are comparable to the ethnicities of children receiving child welfare services in Los Angeles County, although Caucasians were under-represented (10%; Los Angeles County Department of Children and Family Services, 2022). Because the children included in the sample were not in the legal custody of their parents due to substantiated child maltreatment, the Presiding Judge of the Los Angeles County Juvenile Court provided consent for their participation. Children were ineligible if they were awaiting adjudication or contested disposition hearing on the date of testing (because they might be called to testify) or if they were incapable of communicating with the

researchers in English. There were similar numbers of children in each experimental conditions: invitation phrasing (About invitations $n = 93$, Happened invitations $n = 98$) and priming (When priming $n = 94$, No priming $n = 97$).

Procedure

A research assistant (RA) worked with courthouse personnel to identify all eligible children present in the courthouse that day. The RA then approached each eligible child individually in the shelter care area of court. The shelter care area of court is a large facility equipped with crafts, games, and a large outdoor play area. Once the child agreed to be part of a study, the RA escorted the child to our private testing room, described the study to the child, and obtained both verbal and written assent from the child. The study followed a 2 (invitation phrasing: About invitations vs. Happened invitations) x 2 (priming: When priming vs. No priming) between subjects design whereby participants were randomly assigned to two experimental conditions. For the invitation phrasing condition half of the children's invitations were phrased as "About...time" questions (About invitations) and the other half were phrased as "What happened" questions (Happened invitations). For the priming condition half of the children received the When questions first (When priming) and the other half received invitations first (No priming).

The RA told the child "[Child's name], this is the very first time we have ever met and I want to know more about you." Before asking the invitations, the RA said "To learn about you, I am going to ask you questions about places you've been, people you've seen, and things you've done." Before asking the When questions, the RA said "To learn about you, I am going to ask you some questions about when you do certain things." At the end of the procedure, children were debriefed and chose a small prize. If a child initially responded with a don't know response

or a request for clarification, the RA would ask "well, what do you think?" and repeat the question.

Invitations

Children were asked six invitations, inquiring into a trip to the park, a class trip, playing at school, doing their homework, visiting the dentist, and coming to the court building. The About invitations were phrased: "Tell me about [one/the first/the last] time you X," with no vocal emphasis. For example, "Tell me about the last time you went to the park." The Happened invitations were phrased: "Tell me what happened [one/the first/the last] time you X," with vocal emphasis on "what happened." The order of the three specific episodes inquired into (one time, first time, and last time) was counterbalanced using a Latin Square design. That is, children received one of three orders, such that each episode type appeared in each ordinal position across a third of the children: one-third of children received the order one time/first time/last time, one-third received the order first time/last time/one time, and one-third received the order last time/one time/first time.

When Questions

Children were asked 12 When questions, which explicitly inquired as to the timing of routine behaviors (e.g., "When do you put on your pajamas?"). The order of the When questions was determined using a Latin Square design. See the Appendix for the full list of invitations and When questions.

Coding and Analyses

Children's responses to invitations were conservatively coded as pseudotemporal only if the child responded *solely* with conventional temporal information or stated that they were not certain of or did not know what time the event occurred. If children gave both narrative

information and referred to conventional temporal information (e.g., "I went to the dentist *last year* because I had a cavity"), their response was not coded as pseudotemporal because they might be providing the conventional temporal information in order to enhance the narrative, and not due to misinterpretation of the invitation. Conventional temporal information included clock time (including seconds, hours, and minutes), calendar dates (i.e., days of the week, months, years, seasons, age, grade in school, holidays), or other specific location labels (i.e., today, tomorrow, yesterday). Children's responses to When questions were coded for whether they *included* conventional temporal information. This was because any reference to conventional temporal information, with or without narrative information, revealed an awareness of conventional temporal information. For all coding, two coders independently coded 20% of the transcripts. Interrater reliability was high with coders reaching $\kappa \geq .80$ for each coding category.

A Generalized linear mixed model (GLMM) examined whether invitation phrasing, priming, child's age, and any two-way interactions affected the likelihood that children gave pseudotemporal responses. Next, a similar GLMM replicated the previous model but also included the proportion of conventional temporal responses to when questions and any relevant interactions to determine whether it was related to children's pseudotemporal responses. A random effect of child was included to control for children's individual response proclivities.

Analyses were performed using the glmer function in the R package *lme4* with the bobyqa optimizer (Bates et al., 2015). Models were cross-validated in order to identify the best fit model, and it was determined by the Akaike Information Criteria (AIC), an estimator of the relative quality of a model for a given set of data (Vrieze, 2012). Adjusted means were computed using the *emmeans* function in the R package *emmeans* (Lenth et al., 2020). The best fit models

are reported below accompanied by the unstandardized fixed effect estimates (β), standard errors of the estimates (SE), and estimates of significance (Z and p values).

Results

To recap our primary hypotheses, we predicted that 1) children asked About invitations would give more pseudotemporal responses than children asked Happened invitations, and that 2) children asked When questions before invitations (When priming) would give more pseudotemporal responses than children asked When questions after invitations (No priming). We also predicted that 3) children who were more likely to give conventional temporal information in response to the When questions would be more likely to give pseudotemporal responses in response to the invitations.

Pseudotemporal Responses to Invitations

The primary analyses examined what factors determined whether children's responses were pseudotemporal. Therefore, we first excluded responses that reflected either awareness of the ambiguity of "time" or responses that could not be classified. Children explicitly recognized the ambiguity in the use of the word "time" in five cases (out of 1149 responses) by seeking clarification of whether conventional temporal information was requested (e.g., "Do you mean what day?"). In 13% of the responses (n = 148) it was unclear whether the child interpreted the question as temporal, either because the child gave a simple don't know response (which could reflect not knowing the time or not remembering the event; 5%, n = 52), gave both conventional temporal and narrative information (which could reflect adding conventional temporal information to enrich a narrative; 6%, n = 66), asked for clarification without providing a substantive response (1%, n = 11), or gave an off-topic response (2%, n = 19). Although the numbers were too small to test inferentially, children gave don't know responses to 6% (n = 32)

of the About invitations and 3% (n = 19) of the Happened invitations, suggesting a higher rate of don't know responding to the About invitations. Children gave a combination of conventional temporal information and narrative information to 5% (n = 29) of the About invitations and 6% (n = 33) of the Happened invitations.

Predictors of Pseudotemporal Responses

Preliminary analyses showed that pseudotemporal responses did not vary significantly by ethnicity (Latinx vs. African American), gender, or enumeration of the prompt (a time vs. first time vs. last time); thus these factors were excluded from the primary analyses. We only compared Latinx to African American children because the numbers of Caucasian (n = 9) and Asian-American (n = 1) children were very small.

First, we analyzed the relation between invitation phrasing, priming, and child's age on children's pseudotemporal responses. The percentage of the pseudotemporal responses across the four conditions (crossing phrasing and when/invitation order) is presented in Figure 1. The best fit model found main effects of invitation phrasing (B = 2.19, SE = 0.32, Z = 6.92, p < .001) and priming (B = -1.16, SE = 0.31, Z = -3.81, p < .001). Age was not significant (B = 0.005, SE = 0.13, Z = 0.04, p = .97). The main effect of invitation phrasing revealed that children asked About invitations were more likely to give pseudotemporal responses (31%, SE = 4.14) than children asked Happened invitations (5%, SE = 1.27; odds ratio = 8.5). The main effect of priming demonstrated that children in the When priming condition were significantly more likely to answer with temporal responses (21%, SE = 3.43) than children in the No priming condition (8%, SE = 1.90; odds ratio = 3.1). Notably, when children were asked Happened invitations with no priming, they gave pseudotemporal responses only 4% of the time, but when they were asked

About invitations after being primed with When questions, they gave pseudotemporal responses 43% of the time.

Next, we analyzed the relation between children's tendency to provide conventional temporal information in response to the when questions and their tendency to give pseudotemporal responses, controlling for the other factors in the previous model. The best fit model found that When questions emerged as a significant predictor ($B = 3.08$, $SE = 0.71$, $Z = 4.35$, $p < .001$), and the effects of invitation phrasing and priming remained significant. Children who gave more conventional temporal responses to When questions were more likely to give pseudotemporal responses to the invitations (Table 1). Hence, all three hypotheses were supported.

Age Effects

As noted above, age was not related to pseudotemporal responding. The rates were stable across age: 6-year-olds (26%), 7-year-olds (18%), 8-year-olds (22%), and 9-year-olds (25%). Although we did not make any prediction regarding the relation between age and pseudotemporal responding, we anticipated that older children would be more inclined to provide conventional temporal information in response to When questions than younger children, consistent with prior research (Tartas, 2001). As predicted, older children were more likely to respond with conventional temporal information than younger children, $r(189) = .25$, $p < .001$: 6-year-olds (46%), 7-year-olds (50%), 8-year-olds (57%), and 9-year-olds (61%).

Discussion

This study illustrated the danger of pseudotemporal invitations. There were several notable findings. First, maltreated 6- to 9-year-old children asked invitations about recent activities were several times more likely to respond solely with conventional temporal

information (such as a calendar date or clock time) if they were asked About invitations (e.g., "Tell me about the last time you went to the park") rather than Happened invitations (e.g., "Tell me what happened the last time you went to the park"). They misconstrued the intent of the invitations as requesting conventional temporal information rather than narrative information. We referred to these responses as pseudotemporal.

Furthermore, children were over twice as likely to give pseudotemporal responses to invitations using the word "time" if they were first asked a series of When questions, demonstrating that their interpretation of invitations as requesting conventional temporal information was influenced by prior questioning. Third, children who gave conventional temporal information in response to When questions were more likely to give pseudotemporal responses to invitations, suggesting that children who are more conversant with conventional temporal concepts are more prone to misinterpreting invitations. Fourth, with respect to age effects, older children were as likely to give pseudotemporal responses as younger children. However, older children were more inclined to give conventional temporal information in response to When questions than younger children, and this may have counteracted any growing awareness of referential ambiguity among the older children. Remarkably, of the over 1100 responses children gave to invitations, only five clearly signaled recognition that the use of the word "time" was referentially ambiguous by requesting that the interviewer clarify the focus of their question.

Because even the oldest children exhibited the same tendency to give pseudotemporal responses, an important question is at what age this tendency declines. Obviously it must, because if it did not decline, then adults would recognize the difficulty, and practice guides would warn against the problem, rather than assume that "the time" unambiguously refers to the

event. However, as we noted in the introduction, the pseudotemporal problem has gone unnoticed with the exception of Richardson's observations over thirty years ago (1990).

Implications for Practice

The results have significant implications for forensic interviewers who question children. When asking children to narrate individual episodes using the word "time," interviewers must be careful to phrase their invitations so that it is clear that they want the child to tell "what happened." Moreover, they should recognize that if children have been asked lots of temporal questions, they are more likely to interpret invitations referencing "time" as requesting conventional temporal information. When children are reticent in response to their invitations, either providing only conventional temporal information or stating that they don't remember, interviewers should be mindful of the possibility of miscommunication rather than reluctance or failing memory.

As noted in the introduction, when children respond to invitations with conventional temporal information, an easy fix is to follow-up with a "tell me what happened" question. Furthermore, if a child responds that they don't remember what time an event occurred, one can cure the misunderstanding with a rephrased question. However, if a child simply responds "I don't know" or "I don't remember," then it is impossible to distinguish between don't know responses attributable to pseudotemporal misunderstanding and don't know responses attributable to forgetting. We deliberately chose events that would have occurred relatively recently and that children would not have forgotten (and only 5% of children gave "don't know" responses), so that we could uncover unambiguous evidence of pseudotemporal responding. Notably, the few simple don't knows in our sample were twice as common in response to the About invitations, and these may have reflected misunderstanding. More distant

events, such as remote abuse events in trials, are more likely to elicit simple don't know responses, such that the difficulty of identifying pseudotemporal responding will increase.

Moreover, interviewers who ask "do you remember the time" questions are particularly likely to be misled by pseudotemporal responses, because "do you remember" questions tend to elicit unelaborated "no" responses from young children (Evans et al., 2017). When interviewers ask "do you remember the time…" and children simply answer "no," it will be unclear whether they don't remember the event or merely the time. This adds to the growing evidence that "do you remember" questions in general should be avoided, both because they elicit under informative and ambiguous responses (Ahern et al., 2017; Evans et al., 2014; 2017), and because their ambiguity is overlooked by adults (Wylie et al., 2019).

One might suppose that the pseudotemporal problem can be solved by asking children exhaustive invitations. Exhaustive invitations add the word "everything," (e.g. "tell me everything that happened"), and have been found to increase children's productivity (Henderson et al., 2020). For example, the revised NICHD protocol recommends that interviewers ask children "everything about the... time" questions (Lamb et al. 2018, p. 246) and Zajac and Brown recommend "all about the...time" (Zajac & Brown, 2018, p. 303). However, this may be insufficient. For example, if a child interprets "time" as "date," then asking the child to tell "everything [or all] about" the date may not solve the problem, because the child will still believe the question is focused on conventional temporal information. In contrast, asking "tell me what happened the time…" overcomes the difficulty by making it clear that however the child interprets the word "time" the interviewer is interested in what happened.

Limitations and Future Directions

We could not assess the accuracy of children's responses. Nevertheless, based on prior research, it appears highly unlikely that About invitations elicit more accurate information than Happened invitations and thus might be preferable to Happened invitations. Given children's difficulty in estimating temporal information about experienced events (Wandrey et al., 2012), it is quite likely that the pseudotemporal problem does not merely reduce the productivity of children's responses but reduces their accuracy as well when children attempt to provide solely conventionally temporal details. Because we questioned maltreated children recognized as such, and brought under the jurisdiction of juvenile court, they may have performed differently than maltreated children in general. For example, the children in our sample may have been questioned previously about maltreatment, and thus may have been exposed to questioning about conventional temporal information. Furthermore, our participants were almost exclusively Latinx and African-American, and although we identified no ethnic differences in performance, children of other ethnicities and backgrounds may respond differently.

It will be valuable to conduct observational work on children's forensic interviews and trial testimony in order to estimate how often the pseudotemporal problem occurs in the field. Richardson (1990) examined child sexual abuse trials, but did not quantify the problem, and her full study included only 13 trial transcripts (Richardson, 1993). In our pilot work we have come across clear evidence of the problem in forensic interviews. For example, a 7-year-old asked to "tell me about the time that you remember the most when Benny touched you," responded "six or seven or eight." When asked to "tell me about the last time that Benny touched you on the butt," the same child responded "I think I was, I forgot. I think it was Thursday or something, I don't know. I don't remember."

Further research may uncover other examples of pseudotemporal questions. First, interviewers frequently ask children to narrate the events of their last birthday as part of narrative practice (Whiting & Price, 2017). However, if interviewers ask "tell me about your last birthday," children may misinterpret the question as asking for the date of their birthday. Their reticent response may be misinterpreted by interviewers, and undermine confidence in the productivity of the birthday narrative. Second, when interviewers ask "when" questions, they are often asking for narrative information regarding the sequence in which events occurred, and children may misinterpret these questions as solely asking for conventional temporal information. Third, interviewers often ask time segmentation questions, in which the interviewer asks the child what happened during specified blocks of time. For example, "tell me what happened from the time you got up that morning until the time you went to bed that night" (Orbach & Lamb, 2000). Although the question is prefaced with "what happened," and thus emphasizes the need for narrative information, the repeated mention of "time" might throw children off. In one of our interviews 6-year-old Matthew responded to "[t]ell me everything that happened today from the time you woke up until the time you got here" with "I don't know what time I got here. I wasn't really looking." If these kinds of questions do in fact present pseudotemporal problems, the next step is to identify how to avoid them. It is possible that small changes will have large effects: one might drop the repeated mention of "time" (and simply say "until"), or one might substitute "time" with "moment" (though "moment" may be incomprehensible to younger children) (Lamb et al., 2018).

In conclusion, this study has highlighted a subtle problem with invitations that use the word "time" to reference events: children may misinterpret the questions as asking for conventional temporal information. Ironically, their interpretation turns a broad input-free

request for narrative information into a difficult and narrowly focused request for information that children are only beginning to understand, and which they have great difficulty in estimating. Fortunately, the problem can be reduced, at least with respect to the invitations tested here, by ensuring that one asks the child to report "everything that happened" before mentioning "time." The results illustrate how careful analysis of question wording can uncover unnoticed problems in eliciting complete and productive reports from child witnesses.

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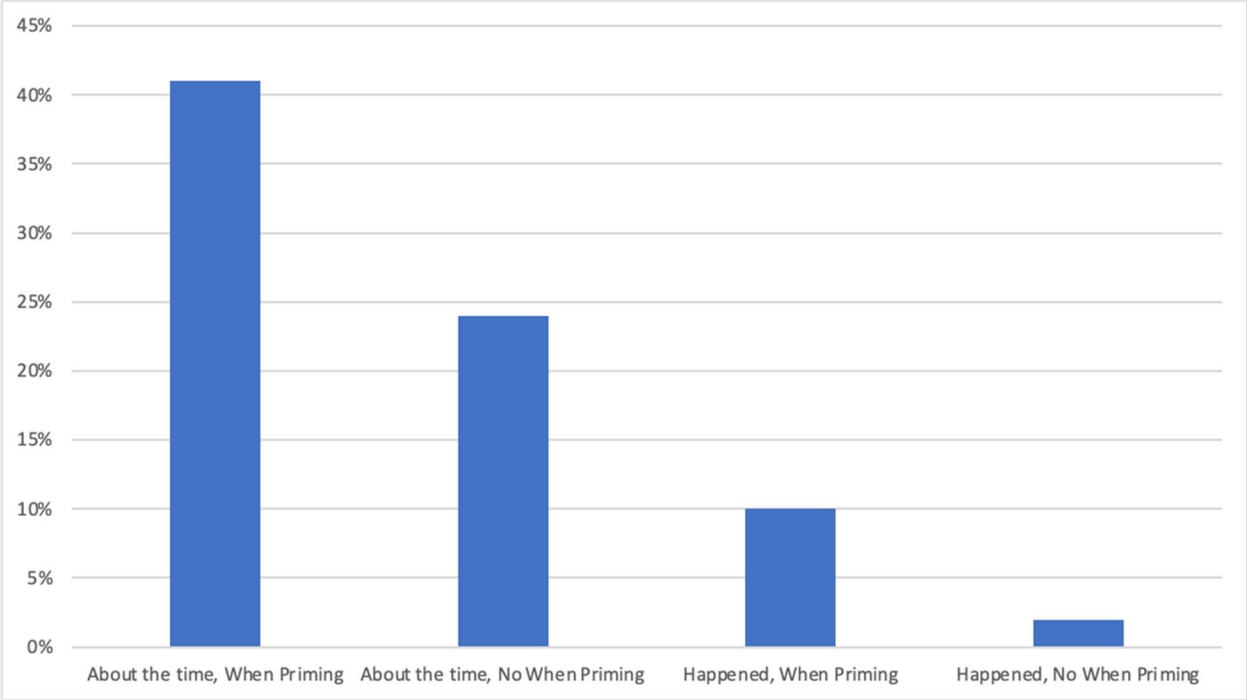
Table 1

Proportion of Pseudotemporal Responses to Invitations by Number of Conventional Temporal Responses to When Questions.

Number of When Conventional Temporal Responses	Proportion of Pseudotemporal Responses to Invitations		
	N	*M*	*SD*
0-2	19	0.04	0.06
3-4	21	0.14	0.18
5-6	46	0.20	0.22
7-8	60	0.23	0.28
9-10	37	0.25	0.30
11-12	8	0.29	0.23

Figure 1

Percentage of Pseudotemporal Responses by Invitation Phrasing (About vs. Happened) and Priming (When Priming vs. No Priming).



Appendix

Invitations

About Invitations

1. Tell me about [one/the first/the last] time you went to the park.
2. Tell me about [one/the first/the last] time you went on a class trip.
3. Tell me about [one/the first/the last] time you played at school.
4. Tell me about [one/the first/the last] time you did homework.
5. Tell me about [one/the first/the last] time you went to the dentist.
6. Tell me about [one/the first/the last] time you came to court.

Happened Invitations

1. Tell me WHAT HAPPENED [one/the first/the last] time you went to the park.
2. Tell me WHAT HAPPENED [one/the first/the last] time you went on a class trip.
3. Tell me WHAT HAPPENED [one/the first/the last] time you played at school.
4. Tell me WHAT HAPPENED [one/the first/the last] time you did homework.
5. Tell me WHAT HAPPENED [one/the first/the last] time you went to the dentist.
6. Tell me WHAT HAPPENED [one/the first/the last] time you came to court.

When questions

1. When in the year does the school start?

2. When does this school year end?

3. When do you eat dessert?

4. When did you eat breakfast today?

5. When do you use fireworks?

6. When did you last go to the doctor?

7. When do you go to recess?

8. When did they bring you here today?

9. When is Halloween?

10. When did you last have a fire drill at school?

11. When do you put on your pajamas?

12. When did you wake up today?