

*University of Southern California Law
School*

Legal Studies Working Paper Series

Year 2017

Paper 211

Relations between attorney temporal structure
and children's response productivity in cases
of alleged child sexual abuse

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Abstract

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Methods. In this study, we coded criminal court transcripts involving child witnesses (5–18 years) for narrative structure in attorney questions and productivity in children's responses. Half of the transcripts resulted in convictions, half in acquittals, balanced across key variables: child age, allegation severity, the child's relationship to the perpetrator, and the number of allegations.

Results. Prosecutors and defence attorneys varied substantially in their questioning tactics. Prosecutors used more temporal structure in their questions and varied their questioning by the age of the child. These variations had implications for children's response productivity.

Conclusions. Results indicate that temporal structure is a novel and viable method for enhancing children's production of case-relevant details on the witness stand.



Relations between attorney temporal structure and children's response productivity in cases of alleged child sexual abuse

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How children report about past experiences is of great importance within the legal system. Witness testimony is heavily relied upon, particularly in criminal trials. In some of the most heinous crimes involving child witnesses, such as those concerning allegations of sexual abuse, children's testimony may be the *only* available evidence. A major focus of research at the interface of psychology and law, as such, has focused on identifying factors that influence children's ability to report their past experiences (London & Ceci, 2012). This focus, though, has primarily concerned factors that affect children's reports in forensic settings. Children must also provide evidence in court in response to attorneys'

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questions, and far fewer studies have focused on how children provide such responses and how different attorney questioning behaviours affect those responses. This study extends this small but important body of research. We developed a comprehensive coding scheme to examine attorneys' use of temporal structure in their questions and children's response productivity on the stand. We then tested the relations between temporal structure in attorney questions and children's response productivity both at the case level and at the individual question level, the latter to estimate both unidirectional and bidirectional effects.

Temporal structure can be indexed through indicators that place an event relative to other events in the child's life (e.g., 'Tell me about the time that was *near your last birthday*') or those that locate individual event components relative to each other (e.g., 'Tell me what happened [*next, first, etc.*]') (Buckner & Fivush, 1998; Fivush, Haden, & Adam, 1995; Kulkofsky & Klemfuss, 2008; Peterson & McCabe, 1991).

Adult-provided structure while reminiscing, including temporal structure, influences how and how much children report about their past (e.g., Clarke-Stewart & Beck, 1999; Fivush & Fromhoff, 1988; Leichtman, Pillemer, Wang, Koreishi, & Han, 2000; McGuigan & Salmon, 2004; Peterson, Jesso, & McCabe, 1999; Reese & Newcombe, 2007). Benefits of adult-provided structure have emerged, most consistently, when the event under discussion is clearly delineated (e.g., parents and children select an event that is salient and recent) and when the topics are those that the child is comfortable discussing (e.g., a recent birthday party). Much of this work has been conducted with preschool-aged children. However, when discussing a negative event, children, particularly those who are older, may be reluctant to disclose or elaborate on their experiences and may only do so with additional prompting, guidance, or structure from an adult (Goodman & Quas, 1995; Lyon *et al.*, 2014; Orbach *et al.*, 2000; see Talwar & Crossman, 2012 for a review).

This idea – that structure provided by adults is beneficial for children's memory reports – has extended into guidelines for interviewing child witnesses, who are often being asked to recount negative or stressful prior experiences. Indeed, such structure is embedded in the National Institute of Child Health and Human Development (NICHD) protocol, perhaps the most widely cited and comprehensive forensic interviewing protocol available at present. The NICHD protocol includes open-ended questions that explicitly provide temporal structure and guidance for children (e.g., 'Then what happened', 'Think back to that [day/night] and tell me everything that happened from [some preceding event mentioned by the child] until [alleged abusive incident as described by the child]') (Lamb, Orbach, Hershkowitz, Esplin, & Horowitz, 2007). Studies testing the effects of the protocol on children's productivity have consistently revealed benefits in terms of the amount of substantive detail the children provide, with these benefits emerging across ages ranging from 4 to 6 years through adolescence (e.g., Lamb *et al.*, 2003; Orbach & Lamb, 2000; Orbach *et al.*, 2000; Sternberg, Lamb, Orbach, Esplin, & Mitchell, 2001). Thus, the provision of structure, and specifically temporal structure, via open-ended prompts can be a useful tool for encouraging complete and accurate reports from children of all ages in forensic interviews.

However, the courtroom setting is vastly different than a forensic interview, and other adult-child conversational settings, making testifying in court challenging for children (e.g., Goodman *et al.*, 1992). They are asked to provide detail about what was likely a negative, emotional, and personal experience in a courtroom full of strangers and the accused. Because of the stress, confusion, and complexity of the courtroom, children likely rely heavily on structure from the individual questioning them to guide the conversation. Moreover, on the stand, attorneys ask primarily closed-ended and

suggestive questions (Stolzenberg & Lyon, 2014a), in contrast to forensic interviewing protocols (e.g., the NICHD protocol) which recommend interviewers ask open-ended questions, including those that explicitly provide temporal structure to guide children's responses (e.g., Lamb *et al.*, 2007). Attorneys' questions, as well, are often complex and difficult for children to understand, thereby affording little opportunity for children to provide a narrative response (e.g., Zajac & Hayne, 2003). Indeed, the majority of children's responses on the stand are minimal – often only 'yes' or 'no' (Klemfuss, Quas, & Lyon, 2014) and may or may not be demonstrative of children's actual knowledge or even understanding of the question (Fritzley & Lee, 2003; Waterman, Blades, & Spencer, 2004).

Given that attorneys rarely provide structure for children by asking the types of open-ended questions commonly seen in other adult–child conversations, it is important to ascertain whether attorneys still provide structure via temporal structure in their questions and second, how attorneys' questions affect children's productivity. Prior research has not directly explored these issues. It is likely, though, that there is wide variation in use of temporal structure across attorneys and cases, just as there is wide variation in attorney question complexity and question type (e.g., Evans, Lee, & Lyon, 2009; Klemfuss *et al.*, 2014; Zajac & Hayne, 2003). These variations may affect both children's responses and case outcomes.

Furthermore, defence and prosecuting attorneys have opposing goals, and these goals are evidenced in the types of questions they pose to child witnesses (Klemfuss *et al.*, 2014; Mueller & Kirkpatrick, 2012; Zajac, Gross, & Hayne, 2003; Zajac & Hayne, 2003). On the one hand, it can be argued that both defence attorneys and prosecutors should be motivated to create a cohesive (and therefore, plausible and understandable) story through their questions to child witnesses. Prosecutors likely wish to increase the plausibility that an abuse event (or events) actually occurred, whereas defence attorneys should be motivated to create a plausible alternate story to abuse.

On the other hand, although prosecutors should be invested in creating a cohesive narrative from children, defence attorneys may wish to do just the opposite. Legal guidelines for defence attorneys advise them to ask questions to minimize and control a witness's responding (Mueller & Kirkpatrick, 2012). During cross-examination, attorneys are permitted to use leading questions, and defence attorneys are motivated to discredit the child's earlier statements. Not surprisingly, defence attorneys ask a higher proportion of suggestive questions than prosecutors (e.g., Klemfuss *et al.*, 2014; Zajac & Hayne, 2003; Zajac *et al.*, 2003). Another potential method for discrediting child witnesses is to ask questions with *minimal* temporal structure, for example, by switching topics and failing to cue children about which event, or event element, they are referencing (Davies & Seymour, 1998; Hanna, Davies, Henderson, Crothers, & Rotherham, 2010; Zajac *et al.*, 2003).

In this study, we were interested in exploring variations in the level of temporal structure provided by attorneys and examining whether this related to the productivity of children's responses in actual cases of alleged child sexual abuse. Of particular interest was the estimated directionality of effects in individual question and answer pairs. For example, we explored whether questions that contained temporal structure in the form of explicit temporal prompts would be more likely to be followed by children's productivity and whether children's productivity was more likely to be followed by greater temporal structure in attorney questions. Our sample was carefully selected to consist of equal numbers of cases ending in convictions and acquittals, and these subsamples were matched on key variables that might be expected to affect case outcome. Our specific hypotheses were as follows: (1) defence attorneys would provide less temporal structure

than prosecuting attorneys; (2) children would be most productive when asked questions with more temporal structure; (3) temporal structure and child productivity would vary by the age of the child witness; (4) although temporal structure is likely driving these effects, we hypothesized that there may be a reciprocal relationship between attorney provision of temporal structure and children's responses (Gilstrap & Ceci, 2005).

Method

Transcripts

The sample was selected from a dataset of 223 transcripts from felony child sexual abuse cases that went to trial in Los Angeles County between 1997 and 2001. All selected cases involved female victims under the age of 18 at the time of trial. Cases were removed if the defendant declined representation. We first selected all possible acquittals that fit our criteria given that there were far fewer; we then selected convictions that matched on the following characteristics (1) the age of the child providing testimony ($M_s = 12.10, 11.86$; $SD_s = 2.95, 2.92$), (2) the severity of the abuse allegations ($modes = \text{genital-genital intercourse}$), (3) the relationship of the alleged perpetrator to the victim/witness ($modes = \text{neighbour/stranger/other}$), and (4) the number of incidents charged (71% multiple incidents in each sample). This resulted in a total sample of 42 cases, 21 acquittals, and 21 convictions.

Coding

Only abuse-relevant questions posed by the attorneys to the child witness, and the resulting child responses, were coded. Questions asked by the judge, questions posed to the judge or other officer of the court, and questions that were not relevant to the alleged abuse (e.g., those asked to establish competency, or directives like 'would you please speak louder') were excluded. Attorney questions were coded for the amount of temporal structure provided. Children's responses to each attorney question were coded for the amount of information provided. Consistent with prior dyadic research, only one question was coded per attorney-child turn (e.g., Sternberg, Lamb, Esplin, & Baradaran, 1999). However, children could provide multiple pieces of information in response and therefore could receive multiple codes for each turn (e.g., Reese & Fivush, 1993). Separate coders coded for attorney temporal structure and for children's responses to minimize potential bias. The primary coders of the child response data were blind to the study hypotheses.

Attorney temporal structure

Attorney temporal structure codes were identified based on the amount of temporal context they provided. Five levels were identified based on those used in previous relevant research (Davies & Seymour, 1998; Hanna *et al.*, 2010; Kulkofsky & Klemfuss, 2008; Zajac *et al.*, 2003). At the highest level were Sequencing questions. These included terms explicitly linking multiple event elements in time. The second level was comprised of Temporal Cue questions. These placed an individual event in time, but did not explicitly connect event elements. At the mid-point of the continuum were Event Consistent questions. These neither added temporal structure, nor detracted from it and thus were considered neutral. Next were Temporal Asking questions, which requested temporal

information from children rather than provided it. Prior research has shown that children often have considerable difficulty providing such details (e.g., Wandrey, Lyon, Quas, & Friedman, 2012). The final, or lowest, level was comprised of Event Change questions that explicitly skipped between time points, interrupting the temporal flow of the conversation. Each is described in detail below.

1. *Sequencing*: A question or statement that maintains the current conversation topic and uses at least one temporal marker (next, then, after, before, second, third, etc.) to cue the child to the sequence of event components.

Ex:

Attorney: *And then what happened?*

2. *Temporal Cue*: A question or statement that locates a single event in a general timeline, and thus, represented a moderate level of scaffolding.

Ex:

Attorney: *Tell me about the incident that happened on August 3rd.*

3. *Event Consistent*: Statements or questions that maintain the conversational topic from the immediately previous child response and/or the immediately previous attorney question. These questions provide no temporal structure for children, but also do not detract from the temporal flow of the conversation, and thus are considered neutral on our scale of temporal structure. Ex:

Child: Because he did something bad.

Attorney: *What did he do that was bad?*

4. *Temporal Asking*: A question or statement that requires the child to locate an event in a general timeline. Although this type of question attempts to add contextual information to the joint narrative, provision of temporal information is challenging, particularly for children and often results in incorrect responses that are likely to detract from the temporal structure of the conversation (Wandrey et al., 2012).

Ex:

Attorney: *What time of year was it when this happened?*

5. *Event Change*: A statement or question in which the attorney changes the specific event from his or her immediately previous question, or from the child's immediately previous response. These questions detract substantially from the temporal flow of the conversation because they dramatically shift the course of the conversation.

Ex:

Attorney: Did you ever go and tell somebody what had just happened?

Child: No.

Attorney: *Prior to that occurrence, did you like Mr. Duval?*

Child productivity

Child responses were divided into propositional phrases, defined as unique subject–verb pairs according to procedures employed in prior studies of narrative development (e.g., Fivush et al., 1995; Peterson & Biggs, 1998; Principe, DiPuppo, & Gammel, 2013). Each phrase was then coded for productivity, meaning, the child provided detail additional to what was required by the question, and this detail was not repeated from the attorney's question or the immediately previous child response. For example, a child who was asked 'Then what happened?' and responded 'I left and I went to my godsister's room and I made a lot of noise for her to wake up' would be coded as three propositional phrases, two of which are productive ('I went to my godsister's room' and 'I made a lot of noise. . .').

Reliability

Coders independently scored approximately 20% of the transcripts ($N = 1,175$ questions; $N = 3,294$ child response propositions, distributed across child age and case outcome) for the level of attorney temporal structure and children's productivity. In the rare cases when an attorney attempted multiple questions within a single turn, only the final complete question was coded. This resulted in a single attorney temporal structure code per conversational turn. Children's answers were unitized into propositional phrases prior to coding for productivity. Given that the phrases were unitized and then coded, Cohen's kappa was the most appropriate method to establish inter-rater reliability (see Quera, Bakeman, & Gnisci, 2007). Reliability was substantial for both temporal structure (Cohen's $\kappa = .74$) and productivity codes (Cohen's $\kappa = .77$), $ps < .001$. In addition, because temporal structure was scored on a continuum, a correlation was calculated to determine whether the coders agreed about the general level of temporal structure. The association was nearly at ceiling, $r = .995$, $p < .001$. Disagreements were discussed with the primary researcher and resolved before the final coding was completed.

Results

Preliminary analyses

Descriptive details

Attorneys asked an average of 179.17 ($SD = 212.30$) abuse-relevant questions per case, although the range (12–1,177 questions) was substantial. Defence attorneys asked, on average, 73.38 ($SD = 149.40$) questions, and prosecutors asked, on average, 105.79 ($SD = 84.21$) questions. Both attorneys asked Event Consistent questions most frequently, followed by Temporal Cue, Sequencing, and Event Change questions. Very few were Temporal Asking (defence $M = 3.24$; prosecutors $M = 3.88$; See Table 1). The average number of child productive, abuse-relevant utterances per case was 54.59 ($SD = 143.39$). Children gave productive responses to defence attorney's questions, on average, 18.29 times per case ($SD = 49.62$) and to prosecutor's questions 35.79 times per case ($SD = 95.26$) (See Table 1 for productivity to each question type separately for defence attorneys and prosecutors).

Temporal structure by question type

Because prior work has shown that variations in question type (WH, option posing, suggestive) directly impact children's response productivity, we examined whether the

Table 1. Questions and productivity by attorney type (per case)

Temporal structure category	Attorney questions		Child productivity	
	Defence attorneys <i>M (SD)</i>	Prosecutors <i>M (SD)</i>	Defence attorneys <i>M (SD)</i>	Prosecutors <i>M (SD)</i>
Sequencing	8.81 (20.86)	14.5 (14.37)	3.37 (5.96)	10.64 (33.63)
Temporal Cue	9.55 (17.58)	14.95 (15.21)	3.18 (8.74)	4.29 (10.18)
Event Consistent	45.12 (96.23)	64.29 (52.35)	11.2 (30.87)	18.55 (49.11)
Temporal Asking	3.24 (10.41)	3.88 (4.62)	1.12 (3.06)	1.25 (3.00)
Event Change	6.64 (9.72)	8.14 (7.77)	1.81 (5.49)	2.51 (6.15)

different question types varied in level of temporal structure. (Results concerning the frequency of attorneys' use of the different question types can be found in Klemfuss *et al.* (2014).) In other words, of interest was whether, for example, temporal structure was consistently higher when WH questions were asked (as might be expected from forensic interviewing protocols) and lower when suggestive questions were asked. Also of interest was whether these relations varied by attorney type. A Question Type (3) \times Attorney Type (2) ANCOVA, controlling for child age and case, was conducted predicting question temporal structure. The Question Type \times Attorney Type interaction was significant, $F(2, 7334) = 3.22, p = .040$, but given that the effect size was quite small, $\eta^2 = .001$, this was likely due to the large N . The interaction was likely driven by the lower mean temporal structure score when defence attorneys asked suggestive (EMM [SE] = 1.78 [.035]) rather than WH questions (EMM [SE] = 2.11 [.050]). The small size of the difference suggested that question type differences were not contributing, in a substantial manner, to attorneys' use of temporal structure in their questioning strategies.

Hierarchical linear modelling

Hierarchical linear modelling analyses were conducted to investigate how attorney temporal structure and children's response productivity varied within and between court cases. Attorney temporal structure was entered as an increasing continuous scale representing the level of structure provided (1 = Event Change, 2 = Temporal Asking, 3 = Event Consistent, 4 = Temporal Cue, 5 = Sequencing). Data were analysed at the question level (Level 1) and the case level (Level 2) with an average of 179 questions being nested within 42 cases. The variables of interest at level 1 included the attorney who asked each question (prosecution or defence) and the number of productive responses children provided to each question. At level 2, of interest was how child age, case outcome, and number of abuse incidents (one or multiple) related to attorney temporal structure. A quadratic term for age was further included because we were unsure how, or whether, attorneys might modify their temporal structure based on the age of the child.

Table 2 presents the composite model with all main effects and cross-level interactions. Results support the prediction that child age and attorney type interact to predict temporal structure, but this association was better explained by the quadratic age term and its interaction with attorney type, $b = -.01, p = .003$ (Figure 1). For prosecutors, there was an inverted u-shaped relation between the quadratic function of age and temporal structure, such that prosecutor's temporal structure was highest when questioning children between ages 10 and 13, $b = -.03, p = .044$. Defence attorney temporal structure, on the other hand, did not vary by child age.

In terms of children's productivity to attorney temporal structure, there was a marginally significant interaction between attorney type and child productivity ($p = .058$) such that children produced more information as the quality of prosecutor temporal structure increased ($b = .092, p < .001$), but their responses to defence attorneys did not vary by temporal structure (See Figure 2).

Sequential analyses

In the aforementioned analyses, we examined correlational relations between attorney temporal structure and children's productivity. Our assumption, though, is that a primary reason why temporal structure is important stems from its potential effects on productivity. The opposite, though, that children's productivity influences attorney

Table 2. HLM results for attorney temporal structure

Fixed effects	Coefficient (SE)	95% CI
Child age	.031 (.085)	-.134, .197
Child age ²	-.001 (.004)	-.008, .006
Attorney (prosecutor)	-.720 (.461)	-1.623, .183
Attorney (prosecutor)*age	.181* (.072)	.040, .322
Attorney (prosecutor)*age ²	-.008* (.003)	-.014, -.003
Outcome (conviction)	-.030 (.078)	-.183, .123
Outcome (conviction)*attorney (prosecutor)	.032 (.057)	-.080, .144
Child productivity	.039 (.025)	-.010, .088
Attorney (prosecutor)*child productivity	.053 [†] (.028)	-.002, .108
Multiple abuse incidents ^a	-.136 [†] (.074)	-.280, .008

Random effects	Estimate	95% CI
Random intercept variance (σ_0^2)	.037 (.010)	.021, .064
Residual variance (σ_c^2)	.946 (.015)	.917, .977

Model fit statistics	Unconditional means model	Full model
Log-likelihood	-10562.99	-10502.07
AIC	21131.98	21030.13
BIC	21152.76	21120.16

Note. Based on 7,521 questions within 42 cases. The dependent measure is the continuous attorney temporal structure scale, where 1 = Event Change, 2 = Temporal Asking, 3 = Event Consistent, 4 = Temporal Cueing, and 5 = Sequencing.

^aOne incident is the reference group.

[†] $p < .10$, * $p < .05$.

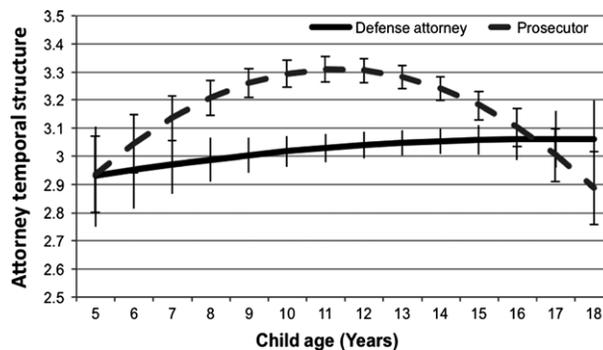


Figure 1. Attorney temporal structure by child age for defence attorneys and prosecutors. Note. Temporal structure was entered as a continuous variable, where 1 = Event Change, 2 = Temporal Asking, 3 = Event Consistent, 4 = Temporal Cueing, and 5 = Sequencing. Error bars represent standard errors.

temporal structure, was also possible. Therefore, we conducted a series of sequential analyses to approximate causal relations between attorney temporal structure and children's productivity at the individual question and response levels. Specifically, we

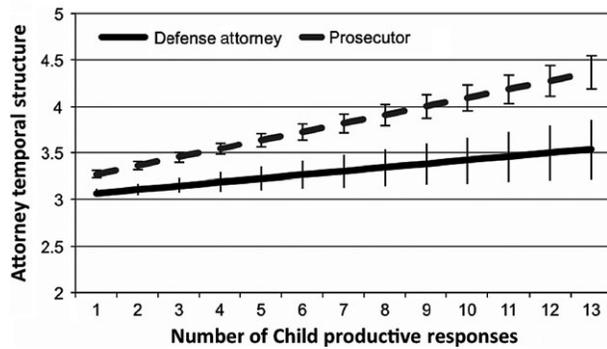


Figure 2. Marginal interaction between child productivity and temporal structure by attorney type. Note. Temporal structure was entered as a continuous variable, where 1 = Event Change, 2 = Temporal Asking, 3 = Event Consistent, 4 = Temporal Cueing, and 5 = Sequencing. Error bars represent standard errors.

examined (1) the probability of producing at least one additional detail after each attorney temporal structure level and (2) the probability of an attorney's temporal structure question appearing after a child produced at least one additional detail. For each analysis, temporal structure levels of interest included Event Change, Temporal Asking, Event Consistent, Temporal Cue, and Sequencing. Consistent questions were included as the baseline comparison group given that these questions were the most basic and frequently used form.

Following previous research, Yule's Q values were calculated for question–response and response–question pairs within each of the 42 transcripts to determine the likelihood of question–response and response–question patterns while accounting for differences in base rates (Gilstrap & Ceci, 2005). Sign tests were used for all cases with nonzero Yule's Q values to determine whether the Yule's Q values across transcripts were significantly different from chance.

Children were more likely than not to provide additional details following sequential questions, that is questions that contained the highest level of temporal structure (mean $Q = .17$). Sign tests revealed that the number of cases in the direction of the group mean was greater than chance: 30/42, $p = .008$. No other temporal structure category predicted children's productivity, and children's productivity did not predict the temporal structure level of the following attorney question.

Next, lag 2 analyses were conducted to determine (1) whether a question's temporal structure level predicted the subsequent question's temporal structure level, regardless of the intervening child response and (2) whether a child's productivity on a given response predicted subsequent productivity, regardless of the level of intervening attorney question. Again, consistent questions were used as the comparison group for relevant analyses. Attorneys were somewhat perseverative in their questioning styles. Temporal Asking questions were likely to be followed by Temporal Asking questions (mean $Q = .36$); this was true for the majority of cases: 30/42, $p = .008$. Event changing questions were also likely to be followed by event changing questions (mean $Q = .23$), which was true for the majority of cases: 29/41, $p = .020$. Sequencing and Temporal Cue questions were no more likely than chance to be followed by a question of the same temporal structure level and children's responses across turns were not related to each other.

Discussion

The present study was the first to examine the extent to which attorneys scaffold the in-court testimony of child witnesses by asking temporally cohesive questions about alleged abuse. Findings suggest that the amount of temporal structure attorneys provide varies in important ways based on the attorney's role (prosecutor vs. defence attorney) and on the age of the child. Provision of temporal structure was largely independent of the type of question asked (WH, option posing, or suggestive). Critically, children's provision of new details varied depending on which attorney asked the question and the amount of temporal structure provided in the question. Finally, results indicate that attorney questions affected children's responses and affected attorneys' subsequent questions, but attorneys did not tailor their questions to children's response productivity. More specifically, while attorneys did not consistently ask temporally structured questions, they were consistent with respect to whether they asked event changing questions, which undermine narratives, and Temporal Asking questions, which research suggests are difficult for young children. Each of these findings is discussed in more detail, along with a description of the theoretical and practical implications.

First, in terms of attorney temporal structure, regardless of question format (WH, option posing, or suggestive), prosecutors asked the highest proportion of questions with the highest quality temporal structure – Sequencing questions containing temporal markers, for example, 'What happened *next*', 'Then what happened'. Defence attorneys, on the other hand, were more likely to ask questions that were lowest in temporal structure – event changing questions. The latter finding is in line with previous research on attorney topic switching (Davies & Seymour, 1998; Hanna *et al.*, 2010; Zajac *et al.*, 2003) and both sets of findings are in line with differing attorney goals in relation to alleged child victims. Namely, prosecutors are invested in highlighting children's strengths as witnesses and encouraging them to provide the details of their experiences when those details best contribute to the child's allegation. Given that previous research has demonstrated that defence attorneys also provide less structure for children through the types of questions asked (e.g., more suggestive, fewer WH; Klemfuss *et al.*, 2014; Mueller & Kirkpatrick, 2012; Zajac & Hayne, 2003; Zajac *et al.*, 2003) and that these question types are largely independent of provision of temporal structure, child witnesses may be at a double disadvantage when being questioned by defence attorneys.

Prosecutors also have additional access to the child before they take the stand and thus are best suited to assess children's strengths as witnesses and to tailor their questions to those strengths. Defence attorneys, on the other hand, are encouraged to limit children's responses and create inconsistencies in children's reports in order to diminish their credibility (Mueller & Kirkpatrick, 2012). Thus, not surprisingly, defence attorneys did not vary their temporal structure by child age. Nor was there a linear relation between prosecutors' use of temporal structure and children's age. However, there was evidence for a quadratic relation, reflected in the fact that prosecutors increased their temporal structure as children approached 10 years of age, but then decreased temporal structure with older children. This finding was unexpected, and needs to be replicated, but seems to suggest that prosecutors believe younger children are incapable of providing much detail on the stand even when they are provided with temporal structure. This perspective is in line with California Evidence Code, Section 767, which allows attorneys to ask leading questions of children under 10 years old specifically because they are believed to be less capable of providing information freely (e.g., via narrative). Prosecutors may also believe that adolescents require less temporal structure to produce cohesive narrative accounts of

their experiences. Although this view may be correct in general, it is not clear whether adolescents can spontaneously provide more details and more Sequencing information than younger children in a stressful courtroom setting. Future research should focus more directly on developmental differences by studying more narrow age bands to further unpack these and other potential age effects.

As prosecutors increased the temporal structure in their questions about alleged abuse children became increasingly likely to produce additional details in their responses. This finding is in line with previous research demonstrating that children's reports of past experiences are shaped by structure provided by adults in adult-child conversations (Nelson & Fivush, 2004). In the present study, structure was conceptualized in a novel way by capturing attorneys' specific use of temporal context to cue children to the topic of interest and to encourage a cohesive representation of abuse allegations.

The relation between temporal structure and productivity is particularly important given that it suggests that, by simply encouraging children to answer questions in a cohesive temporal order, and temporally cuing them to the specific event of interest, prosecutors are able to elicit additional detail from children about alleged abuse. This type of temporal structure may also help children navigate the otherwise complex and confusing topics and linguistic structure of questions asked in court, which could lead to more accurate and consistent responding. In ongoing work, we are exploring this possibility through experimental manipulation of temporal structure questions to examine the effects on the provision of accurate detail in children's responses. Scaffolding through the use of temporal structure and cues may be particularly important in the context of in-court testimony given that attorneys are reluctant to use traditional means of scaffolding such as asking open-ended questions (Klemfuss *et al.*, 2014). Attorneys may be concerned that using open invitations (e.g., 'Tell me everything that happened') may elicit a narrative that is out of their control. Attorneys may also be concerned that these invitations could induce an objection from the opposing attorney because they 'call for a narrative' (Mueller & Kirkpatrick, 2012). Sequencing questions and Temporal Cue questions are unlikely to be objectionable despite their potential for eliciting detail.

Finally, the results of this study suggest a causal direction in the relations between attorney temporal structure and children's productivity. Individual Sequencing questions were more likely than not to elicit productivity from children, whereas this was not the case for other temporal structure categories. And importantly, there was no evidence for the reverse association. Children's productivity did not predict attorneys' subsequent questions, and further, there was some consistency in attorney's questions from turn to turn. Both Temporal Asking and event changing questions were more likely to be followed by questions of the same type than by basic Event Consistent questions, but this was not true for the other temporal structure types. Thus, while attorneys showed some consistency in their use of low temporal structure, they did not consistently show patterns of high temporal structure (e.g., Sequencing or Temporal Cueing questions). Children's responses, on the other hand, were not consistently productive. If a child produced additional detail on one turn, it did not predict whether they would do so again on the next. Thus, even on the witness stand, where children are often limited in their responses by stress, fear, shame, and confusing and constraining questions, adult temporal structure relates to, and may predict, children's provision of details. Further, these findings suggest that attorney behaviour is unaffected by the in-court performance of the child witness. Attorneys appear to tailor their questions to their preconceptions of how they expect the child to respond rather than the child's actual performance.

Limitations

As with any study analysing transcripts of actual court cases our research design was necessarily correlational. While this precluded us from making causal conclusions, it allowed us to study attorney strategies and child responding within the unique courtroom context. It also afforded the opportunity to examine the relations between attorney temporal structure and children's productivity on actual case outcomes. However, surprisingly, attorney temporal structure and children's response productivity were unrelated to outcomes in the present study. Potential effects of attorney questioning and child responding on jury decision-making may have been outweighed by other evidence in the case (see Stolzenberg & Lyon, 2014b).

Although the study was correlational by design, we were able to estimate some directionality by conducting sequential analyses of individual question–response, question–question, and response–response pairs. However, future research is needed that examines the impact of these temporal structure techniques on children's responding in an experimental context. This work should also explore the impact of temporal structure on children's accuracy in a laboratory setting where ground truth is known in order to determine whether temporal structure better enables children to comprehend and answer questions appropriately.

Conclusions

The findings of this study demonstrate a previously unexplored, but theoretically and practically important means through which adult conversational partners impact children's reports of past experiences. This study showcased the importance of scaffolding children via temporal context, particularly when children are faced with reporting about challenging, complex subject matter, such as sexual abuse. Attorneys who are interested in maximizing the productivity of their child witnesses but who are concerned about the objection 'calling for a narrative' should capitalize on their witness's capabilities by providing temporal structure in their questions on the stand.

Acknowledgements

This research was supported in part by the National Science Foundation (SES-1228638) and the National Institute of Health (HD047290).

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Received 4 March 2015; revised version received 16 April 2016