

The Effects of Question Types and Individual Differences on Children's Reports of a Stressful Event

Seungjin Lee[†]

University of North Carolina at Chapel Hill

This study examined the effects of question types and several individual differences on children's remembering of a stressful experience. 63 children ranging in age from 4 to 10 years who had visited a private dental clinic and undergone a minor operative dental procedure were evaluated through hierarchically structured interview protocol. Overall, older children showed superior total recall and provided more information than younger children particularly in response to general probes. More interestingly, some individual characteristics specific to each child, namely negative dental history, parents preparation for the event and children's social emotional behavior characteristics were strongly associated with children's recall by open-ended questions much more than closed and yes-no questions both for older and younger children. Finally, the importance of questions types and individual differences for further understanding of children's reliable testimony in forensic context were discussed in depth.

Key words : feature centrality, temperament, negative prior experiences, parental preparation in advance, children's testimony

[†] Corresponding author : Department of Psychology, University of North Carolina at Chapel Hill, CB #3270, Davie Hall, Chapel Hill, NC, USA, 27599-3270, 070-8227-3919, sjmagiclife@gmail.com

Introduction

Children's memory researchers have long struggled with the question of why children remember some events better than others and certain features of events better than others. One of the major candidate determinants of whether an event will be remembered accurately or with significant errors is the intensity of stress that the child experiences as the event unfolds as well as the types of questions to elicit children's remembering. Standardized guidelines for good interviewing practice such as NICHD protocol have recommended avoiding to use leading questions (Lamb, Orbach, Hershkowitz, Esplin, & Horowitz, 2007) and yet many investigative interviewers in forensic settings tend to employ them (Peterson & Grant, 2001). Thus understandings how different question types would influence or bias children's responses across ages have been explored. Most memory investigations employ three types of memory questioning: free recall, cued recall, and recognition. During a free recall procedure, the participant is asked to recall as much as they can about the event in question without prompting or cueing (e.g., Tell me as much as you can about the dental visit). In cued recall, however, the researcher provides participants with cues to help them remember the event. (e.g., What did the dentist or helper put around your neck). Lastly, in recognition tasks participants are asked yes/no questions related to the event or

are shown pictures of people or objects and asked to decide if they were present during the event(e.g., Did the dentist or helper put a paper towel around your neck?). According to the categorization of Poole and Lamb (1998), specific questions ask about a particular detail or concept and often can be answered in a single word (e.g., What color was her hair?). Other researchers (Peterson & Biggs, 1997) divide this group of questions into two types: "Wh" questions (e.g., what, when, where) and forced-choice questions. Forced-choice questions refer to specific questions that have a limited number of response alternatives and can include multiple-choice and yes-no questions. Peterson and Grant (2001) refer to yes-no and multiple-choice questions as forced-choice questions. If one does not differentiate between the type of questioning used to elicit children's recollections of distressful events, then overall, children's accuracy for distressful events has been reported to be quite good. Merritt, Ornstein, and Spicker (1994) found that children aged 3-7 years remembered approximately 88 % of the features of a VCUG procedure. Similarly, Peterson and Bell (1996) found that children (2-13) who experienced a traumatic injury remembered 67 % of the details of the event. Four-to-eight year-old children were found to recall, on average, 89% of the details of a dental filling procedure (Vandermass, Hess, & Baker-Ward, 1993). Chen Zeltzer, Craske, and Katz (2000) found slightly lower accuracy rates for a lumbar puncture with

overall accuracy at 65% in pediatric cancer patients aged 3-18 years. The authors suggested that the lower accuracy rates in their study may be due to participant differences. That is, children with cancer experience multiple types of procedures, whereas children in other studies may experience only one aversive or traumatic event over the course of the study. Because children's memories are more accurate for events that are unique and distinctive (Howe, 2000), pediatric cancer patients may have formed "scripts" for some of the frequently experienced procedure, which may serve to decline accuracy (e.g., Ornstein, Merritt, Baker-Ward, Gordon, Furtado, & Principe, 1998). Although these studies report good-to-excellent recall rates among young children, it is noteworthy that accuracy rates included responses to both free recall and specific (yes/no) questions. Use of specific questions has been found to elicit unreliable information from children, particularly preschoolers, because children typically have a response bias when answering them. This response bias may be due to conversational dictates that suggest that children should try to answer questions and be cooperative, so some children frequently say "yes" to yes/no questions (Poole & Lamb, 1998). For example, Poole and Lindsay (1995) asked children yes/no questions about science demonstrations they had experienced and completely novel demonstrations. The children erroneously responded "yes" to 62% of the questions about demonstrations they had never

experienced. Similarly, Peterson and Biggs (1997) and Peterson, Dowden and Tobin (1999) found that when preschool-aged children answered yes/no questions about traumatic injuries, a 'yes' responses was likely to be correct whereas a "no response" was equally likely to be wrong or right. That is, children were biased towards making one of the two responses, usually "yes" and the authors of the studies stated that interviewers and researchers cannot count upon a yes/no responses being veridical because of this response bias. Similar results have been produced in other studies as well (e.g., Peterson & Grant, 2001). Indeed, studies have found that children answer "yes" to apparently inappropriate questions such as "is red heavier than yellow" (Hughes & Grieve, 1980). Thus, high error rates for "yes" responses suggest that researchers should avoid relying solely on children's answers to yes/no questions and other question types should also be considered (Poole & Lamb, 1998). When we re-examine the above-mentioned studies and only consider responses to open-ended questions, the accuracy rates are 65% (Merritt et al., 1994), 33% (Peterson & Bell, 1996) and 12% (Vandermass et al., 1993). The accuracy rates actually drop when we exclude specific questions, which seem against the literature that states that open-ended recall tends to be greatly accurate (Poole & Lamb, 1998). However, the drop is likely due to the fact that, because the yes/no questions employed were not counterbalanced such that half of the correct responses were

“yes” and half “no”, when children exhibit response bias (“yeah- saying”) accuracy rates would erroneously increase. This type of counterbalancing problem may also have been present in the Chen et al. (2000) study. They examined responses to specific yes/no questions only. Additionally, the correct responses to all of the specific questions in these studies was “yes”, rather than dividing the questions such the half would be correctly answered by “yes” and half by “no”. Consequently, the actual accuracy rates from these, and other, studies remain unclear, given that we do not know to what extent the children were acquiescing and responding “yes” to the specific questions asked; that is, exhibiting a response bias.

As such, a number of researchers have studied the effect of questions on recall, there has been no study to explore the effects of question types and individual differences in children’s memory of a stressful event across ages. Initial research examined the relation between recall and personality characteristics, such as imaging, introversion/extroversion, and need for approval (Marks, 1972). However, more recent endeavors have explored the linkage between memory and temperament or “expression of behavior” (Thomas & Chess, 1977) as a means of understanding why witnesses vary in the accuracy and quantity of information reported about a crime. Ornstein, Shapiro, Clubb, Follmer, and Baker-Ward (1997) proposed that certain temperament characteristics affect eyewitnesses’ perception and attention to

an event as it unfolds (e.g., activity level, emotional intensity, persistence), whereas other dimensions (e.g., adaptability, approach/withdrawal, distractibility) impact on their adjustment to the interview context and hence the extent of their reports. In addition, results from suggestibility studies in the adult eyewitness literature support this contention. For example, Shapiro, Blackford and Chen (2005) reported that shy, highly active, or emotionally intense adults who were given incorrect leading suggestions demonstrated high levels of suggestibility for peripherally related crime features, whereas distractible, emotionally intense, or withdrawn adults produced high rates of suggestibility for the victim’s appearance. High rates of suggestibility were also found in the suspect’s appearance with shy or distractible adults and in bicycle features with non-persistent adults. Palmer, Brandt, Chen and Shapiro (1998) found that easy-going witnesses who have irregular personal regimens demonstrated low recall levels for central features; whereas, difficult witnesses who are slow-to-adapt to new situations demonstrated low recall levels for peripheral details. As such, temperament does seem to affect encoding and retrieval of events and to mediate their responses to open-ended and incorrect leading questions. and there has not been examined the way in which these individual differences including temperament would be associated with children’s recall by features or information details.

Thus, the present research examined how

question types are affected several individual difference factors in children's remembering of a stressful experience. Children received a minor operative dental treatment such as having a tooth filled, or sealed to protect against cavities and then given one and one memory interview. It was predicted that older children were expected to show superior recalls of both central and peripheral features and provide more information than younger children in response to general probes(i.e., open-ended question). It was also predicted that various individual difference factors were predicted to affect children's memories of the stressful event; children who have an easy temperament would accept a stressful event more easily, which would lead them to be more comfortable in the context, thereby enabling them to obtain more information during the event, which ultimately would facilitate better remembering across ages. In addition, children who have an easy temperament would also accept an interview situation more easily, which would lead them to be more relaxing to talk about what they experienced spontaneously during the general probes (i.e., higher opened ended recall).

Method

Design and Participants

This research was carried out at a private

Dental Clinic located in a metropolitan area in Seoul, South Korea. The sample was composed of 63 children (35 boys and 28 girls) who were patients at this clinic and ranged in age from 49-132 months ($M = 86.41$, $SD = 18.65$). No child was excluded because of gender or socioeconomic status. The parent or guardian who accompanied the child (55 mothers, 3 fathers, 4 grandmothers, 1 grandfather) also participated by providing background information as well as informed consent. In general, the participating children had histories of receiving limited preventive dental care, and all were scheduled for minor operative procedures such as sealant or filling. One pediatric dentist who is the director of the private clinic saw the children. One interviewer obtained the children's reports who had advanced training in psychology.

Measurements

Child Behavior Questionnaire

Temperament was assessed with the "very short" form of the Child Behavior Questionnaire (Putnam & Rothbart, 2006), an abbreviated version of the standard CBQ that has been widely used in previous research (e.g., Murphy, Eisenberg, Fabes, Shepard, & Guthrie, 1999). Indices of internal consistency, interrelater reliability, criterion validity, and longitudinal stability are comparable for this version of the CBQ and the original standard form of the

instrument, at least for white, middle-income samples. Following the standard directions, the parents rated each of 36 items on a scale from 1 (extremely untrue) to 7 (extremely true) to describe their children's reactions during the past 6 months, with 12 items contributing to the measurement of each of three broad dimensions of temperament: Negative Affectivity, Surgency/Extraversion, and Effortful Control.

Memory questionnaires

Memory Interview. Twenty standard components ("features") of the dental visit were identified on the basis of consultation with the faculty of the dental clinic and refined through pilot testing (Baker-Ward, Ornstein, Quinonez, Milano, Langley, Lee, & Morris, 2009). Following procedures used in previous research (e.g., Ornstein, Baker-Ward, Gordon, Pelphrey, Tyler, & Gramzow, 2006), the interview protocol was hierarchically structured, with the child's retention of each of typical features elicited through a series of increasingly specific probes. The first question was very general ("Tell me what happened during your visit to the dentist"), so that children could provide free recall. If the child provided a nonspecific response (e.g., "The dentist fixed my teeth") the interviewer followed up with nondirective prompts (e.g., "Tell me more about that") until no additional information was forthcoming. At that point, a series of increasingly specific questions were presented. For example, the child

was first asked a structured but relatively open-ended question such as "What did the dentist use to fix your teeth?". A number of possible target features could be offered in response to this question, including descriptions of the use of a special light to dry fillings, the extraction of a tooth, and so on. Children who did not provide information about a specific feature were then asked a yes/no question (e.g., "Did the dentist use the tooth pillow (mouth prop) to keep your mouth open?"). The specific questions addressing each feature included an item for which the correct answer was "yes" and an item for which the right response was "no." These items were listed in the protocol in the order in which the actions they referenced transpired during the dental visit, and were generally asked in the same order for each participant.

Given variations in treatment associated with different procedures, participants had different numbers of applicable features, as verified by a check-list completed by the researcher who video-recorded the procedure. The possible present-features of the dental procedure were divided into central features (i.e., treatment-stage items) and peripheral features (i.e., preparation-stage items) based on the item centrality in the dental procedure. The examples of the features are listed in **Table 1**. On average, 12.09 (SD= 0.59, range=11-14) central features and 8.32 (SD=0.54, range=7-9) peripheral features were presented.

Table 1. Types of Features that Occur During the Children's Dental Treatments

Types of Features	Name	Description
Central Features	Sucking saliva	Tool used that sucks saliva
	Mouth prop	Dentist puts a mouth prop to keep the child's mouth open
	Jelly on gums	Dentist puts jelly on the child's gums (hot cream)
	White or silver filling	Dentist uses white or silver filling
	Special light	Special light used to dry filling (laser gun)
	Metal pliers	Dentist uses metal pliers to pull the child's tooth out
Peripheral Features	White gown, goggles	Dentist wears a white gown and goggles
	Rubber gloves	Dentist wears a rubber gloves
	Chair up and down	Chair moves up and down before and after the procedure
	Towel	Dentist put a paper towel around a child's neck

Individual Difference Measures

Background Questionnaire. The adult family member who accompanied the child to the dental clinic completed a brief background questionnaire to confirm the child's exact age, provide some demographic information about the child's and family's background (e.g., child's date of birth, parents' occupations and education level). In addition, it was included the questions to indicate whether or not the child had an unpleasant past dental visit. As an indicator of preparation for the dental visit, the parents also responded to the question, "Did you discuss the dental visit with your child before you came to the dentist today?" by selecting on of four options (i.e., "Yes, briefly; yes, in some detail; yes, extensively; no.").

The adult family member who accompanied the child to the dental clinic completed a standard assessment of child temperament, as

described below. In addition, the accompanying relative filled out a brief background questionnaire to confirm the child's exact age, provide some demographic information, and indicate whether or not the child had an unpleasant past dental visit. As an indicator of preparation for the dental visit, the parents also responded to the question, "Did you discuss the dental visit with your child before you came to the dentist today?" by selecting on of four options (i.e., "Yes, briefly; yes, in some detail; yes, extensively; no.").

Procedure

The parents of children scheduled for the dental operative procedures such as sealants or fillings were approached prior to their appointments to provide them with information about the research project and to discuss possible

participation in the study. A researcher obtained written consent from the parents and verbal assent from the children before the scheduled procedures. Written consent was also obtained from the participating dentist. The children's involvement in this study in no way affected their treatment. The entire dental procedure was video recorded for subsequent analysis, and a researcher also kept an independent record for each child of the specific components of the treatment that were administered. While children were receiving treatment, the parents, who remained in the waiting area of the clinic, completed background questionnaire.

The majority of the dental procedures were completed within about 30 minutes, although in some cases the treatment required up to 40 minutes. Immediately following the procedure, the children were asked to play in a playroom for about 10 minutes to calm them down. The children were then escorted to a separate room in the clinic for their individual interviews. The interviewer first established rapport with the child through conversation, then conducted the memory interview, following the protocol described above.

The entire memory interview was also video-recorded for subsequent analyses. Following the completion of the reports, children were given a simple debriefing and the opportunity to ask questions about the interview. The entire interview procedure required less than 30 minutes.

Scoring

Procedures used in previous research (Ornstein et al., 2006) were followed to quantify the children's memory for the dental procedures. The video records of the interviews were inspected to determine the percentage of present features (i.e., those included in each child's treatment) reported as a function of level of questioning (open-ended, Wh-, and yes-no). One researcher coded all of the data, whereas a second coded 25%, and inter-rater reliability was determined for each type of question and each type of feature. The average percentage of agreement across the present features was 100% for responses coded at the open-ended level; 95%(range = 90%-100%), for the wh-responses; and 97%(range = 90% -100%), for the yes/no items. Mean inter-rater reliability was 97% for the absent features. The pre-identified features of the dental procedure were organized into two categories central and peripheral features based on the item centrality in the dental procedure. Thus, central accuracy was computed as the total number of central features mentioned divided by the total number of accurate features mentioned. Peripheral accuracy was computed as the total number of peripheral features mentioned divided by the total number of accurate features mentioned.

With regard to the individual difference variables, the scoring of the temperament data followed the guidelines of Putnam and Rothbart

(2006). In addition, the parents' ratings of the children's prior negative experiences at the dentist and of the amount of preparation for the treatment were derived from the Background Questionnaire. Previous dental history was scored 0 if children had no previous unpleasant dental experience in contrast scored 1 if children had previous unpleasant dental experiences. Parental advance preparation was scored 0 if children had none or little advance preparation by parent in regards to the dental visit, in contrast, scored 1 if children had some or extensive advance preparation by parent in regards to the dental visit.

Results

Children's recall by ages

According to preliminary analyses, a series of immediate analyses indicated no differences in recall as a function of gender, parent's education and income levels. They were therefore excluded as variables of interest. Clearly, the children aged 7 years and older recalled a considerable amount of information during general probes (i.e., open-ended recall). Thus, it was beneficial to merge the children into two age groups: younger (4-, 5-, and 6-year-olds) and older (7-, 8-, 9-, and 10-year-olds). In addition, the younger age group is preschool-aged children and the older age group is school-aged children. As has been consistently demonstrated in past research (Ornstein et al., 2006), older children provided more information and reported a

Table 2. Descriptive Statistics for Recall of Feature Type and Level of Questioning by Younger/Older Age Groups.

Types of Recall and Feature Centrality	Age Groups (n)	Mean (SD)
Open-Ended recall_Central Features	Younger ^a (28)	.64 (.10)
	Older ^b (35)	.85 (.05)
Open-Ended recall _Peripheral Features	Younger (28)	.15 (.23)
	Older (35)	.40 (.22)
Specific recall _Central Features	Younger (28)	.12 (.12)
	Older (35)	.30 (.03)
Specific recall _Peripheral Features	Younger (28)	.14 (.20)
	Older (35)	.31 (.23)

Note. Younger^a children = 4- to 6-year-olds, older children^b = 7- to 10-year-olds.

Open-Ended recall: children's responses from general probes, Specific recall: children's responses from yes/no questions.

greater proportion of the features of the dental treatment in response to general probes (i.e., open-ended recall), presented in Table 2. In this study, one-way analyses of variances yielded significant age effects in recalls both for central and peripheral features in response to general probes, $F_s(1, 62) \geq 11.34, p_s < .01$ respectively, indicating that overall and consistent with the previous literatures, older children spontaneously recalled more than younger children both for central and peripheral features.

Relation between parental preparation and negative dental experience and children's recall

Advanced parental preparations for the dental visits and the previous negative dental experiences were strongly correlated with children's recall especially in response to general probes as presented in Table 3. Children who

had not had unpleasant dental experiences previously exhibited higher recall of both central and peripheral features than children who have had unpleasant dental experiences in response to the general probes. Moreover, more advance discussion of the dental visit was associated with higher recall of both central and peripheral features than children who had little discussion about the visit in advance in response to the general probes. Overall, children's spontaneous recall for both central and peripheral features were associated with the individual differences in terms of parental preparations of the children for the dental visits in advance and the previous negative dental experiences. None of children's recall in response to the specific questions was related to these individual difference variables, indicating that children's responses of forced-choice questions were not associated with the extent of parental preparations of the children for the event and the quality of previous

Table 3. Correlations Coefficients for Negative Dental Experiences and Parental Preparation in advance and Children's recall.

Types of Recall and Feature Centrality	Age Group	Negative dental experiences	Parental preparations in advance
Open-Ended recall_Central Features	Younger ^a	-.38**	.35**
	Older ^b	-.41**	.40**
Open-Ended recall_Peripheral Features	Younger	-.40**	.23*
	Older	-.44**	.27*

Note. Younger^a children = 4- to 6-year-olds, older children^b = 7- to 10-year-olds.
Open-Ended recall: children's responses from general probes. * $p < .05$, ** $p < .01$.

negative experiences.

Relation between children's behavior characteristics and recall

To what extent are children's behavior characteristics (i.e., temperament) related to the type of information children recalled about the dental procedure? Based on parental report, some of children's behavior characteristics differences were strongly correlated with children's recall especially in response to general probes as presented in **Table 4** below.

One of the temperament dimensions- effortful control, which involves inhibitory control, attention focusing, low intensity pleasure, and perceptual sensitivity capacities- was positively correlated with the older children's recalls of central features in response to the general probes, $r = .35$, $p < .05$, indicating that older children who tended to have higher effortful control judged by their parents was associated

with spontaneous superior recall of central features in response to the general probes. Another temperament dimension negative affectivity, which involves discomfort, fear, anger/frustration, sadness, and falling reactivity-was negatively correlated with the younger children's recall of central features in response to the general probes, $r = .38$, $p < .05$, indicating that younger children who tended to have higher negative affectivity judged by their parents was associated with lower recall of peripheral features in response to the general probes.

No other subfactor of temperament, such as surgency, was associated with any outcome of children's memory performance. In addition, none of children's recall in response to the specific questions was related to children's behavior characteristics, indicating that children's responses of forced-choice questions were not associated with children's behavior individual differences.

Table 4. Correlations Coefficients for Children's Behavior Characteristics and Children's recall.

Types of Recall and Feature Centrality	Age Groups	Negative Affectivity	Effortful Control
Open-Ended recall_Central Features	Younger ^a	-	-
	Older ^b	-	.35*
Open-Ended recall_Peripheral Features	Younger ^a	.38*	-
	Older ^b	-	-

Note. Younger^a children = 4- to 6-year-olds, older children^b = 7- to 10-year-olds.

Open-Ended recall: children's responses from general probes. * $p < .05$, ** $p < .01$.

Discussion

The overall results for the current study replicated and extended previous findings. The findings confirmed older children showed superior recalls of both central and peripheral features and provide more information than younger children in response to general probes which is consistent with previous literatures. Age differences were not evident in the children's responses to specific recall (i.e., responses in yes-no questions), but this result should not be interpreted as indicating that developmental differences in memory performance were not relevant in considering the children's responses to forced-choice questioning. The interview was administered in such a way that yes-no questions were only asked about features that did not come up during the free recall questioning. In addition, before discussing the results of children's recall according to when the items were used, it should be noted that peripheral features were exposed during the whole dental procedure and central features were exposed only when needed during the treatment. Thus, the duration of exposure time differed between the two categories and that would have been the main reason for their influences on children's remembering. Regardless, central features were recalled better than peripheral features in response to general probing across ages.

A second question addressed by the present research was, "To what extent are individual

differences related to the type of information children recalled?" Several individual differences were associated directly or indirectly with variation in the children's remembering not limited to children's developmental levels: children's behavior characteristics (i.e., temperament), presence of the previous negative experiences, and extent of the children's advance preparation for the event by parents. As consistent with the hypothesis, it was found that the presence of child's previous negative dental experiences and the extent of parental preparation were positively correlated with children's memory performance, indicating that previous experience and parents' preparations do matter for children's remembering. However, caution should be warranted in interpretation of these results, given that our measures of previous negative dental experience and the extent of advance parental preparation were rough. Analyses were based only on parental reports, which may not have been completely accurate, and there is no knowledge of the extent to which previous traumatic dental experiences affected children, what specific information parents provided, or the methods they used to soothe the children. Thus, no specific contents of the parents' preparations of children for the dental procedures are known; we merely know that a discussion prior to the visit took place. Whatever the content, such discussions positively affected children's remembering of the event. Given these findings, further studies should investigate in depth the

effects of prior traumatic dental experiences and the specific information that may be provided by parents to soothe their children as they prepare for dental treatment.

Finally, certain positive temperament traits (i.e., effortful control) were associated with the older children's superior recall of central features in response to the general probes. In contrast, certain negative temperament traits (i.e., negative affectivity) were associated with the younger children's lower recall of peripheral features in response to the general probes. Temperament may explain differences that have been observed in children coping with similar stressful situations, in keeping with the theory that experience encoding can vary substantially from child to child. For example, children with high EAS (Emotionality Activity Sociability Scale reported by parent) shyness scores displayed more disruptive behavior prior to dental treatment under general anesthesia than those with low scores (Quinonez, Santos, Boyar, & Cross, 1997). The association between temperament and better recall may be that children scoring high on negative emotionality might be more wary of their surroundings and therefore have a better remembrance of what happened during the session. Increased arousal is suggested to lead to increased memorability (Fivush, 1998).

Based on the current study's results, future research should test well-focused hypotheses that specify interactions between clearly delineated aspects of memory performance and particular

dimensions of temperament. In addition, those relations should be explored for how they affect children's remembering across age, such as examining how effortful control may influence older children's memory performance but how negative affectivity might be a central variable on younger children's remembering.

All the findings have applied implications. This study replicated open-ended questions yielded higher recall for central features than peripheral features across ages. These results suggest that wide cognitive sets facilitate accurate responses when information is salient to the event, but not when information is secondary to the event. This idea is also consistent with "cognitive effort" in that it is easier to recognize rather than recall details and minor actions in a crime. In addition, this study demonstrated the importance of examining central and peripheral recall rather than overall recall. Police and others in the legal field should be aware that open-ended questions are best suited for eliciting accurate information about the crime needed to establish guilt of the suspect, but may not yield high quantity of peripheral information needed to build witness credibility. Moreover, this investigation suggested that certain positive/negative individual traits might contribute to higher/lower accuracy of central/peripheral information about a stressful experience when different types of questions are asked across ages. Those information on how individual difference factors influence children's

memory performances by item centrality may help forensic interviewers develop a comprehensive understanding of children's psychological functioning for eliciting eyewitness testimony. Finally, police may consider developing and using a standardized, open-ended questionnaire for particular abuse that child may have experienced such as sexual abuse, as a preliminary source of data collection without providing interviewer's misinformation and/or suggestible questions.

References

- Baker-Ward, L., Ornstein, P. A., Quinonez, R., Milano, M., Langley, H., Lee, S., & Morris, C. (2009). *Children's Memory for a Dental Procedure: The Impact of Stress and Coping on Remembering*, poster presented in Cognitive Developmental Society in San Antonio.
- Chen, E., Zeltzer, L. K., Craske, M. G., & Katz, E. R. (2000). Children's memories for painful cancer treatment procedures: Implications for distress. *Child Development, 71*, 933-947.
- Fivush, R. (1998). Children's recollections of traumatic and nontraumatic events. *Development and Psychopathology, 10*, 699-716.
- Hughes, M., & Grieve, R. (1980). On asking children bizarre questions. *First Language, 1*, 149-160.
- Howe, M. L. (1997). "Children's memory for traumatic experiences." *Learning & Individual Differences, 9*(2), 153-174.
- Lamb, M. E., Orbach, Y., Hershkowitz, I., Esplin, P., & Horowitz, D. (2007). A structured forensic interview protocol improves the quality and informativeness of investigative interviews with children: A review of research using the NICHD Investigative Interview Protocol. *Child Abuse & Neglect, 31*(11-12), 1201-1231.
- Marks, D. (1972). Individual differences in the vividness of visual imagery and their Functions. In P. W. Sheehan (Eds.) *The Function and Nature of Imagery*. London: Academic Press.
- Merritt, K. A., Ornstein, P. A., & Spicker, B. (1994). Children's memory for a salient medical procedure: Implications for testimony. *Pediatrics, 94*(1), 17-23.
- Murphy, B. C., Eisenberg, N., Fabes, R. A., Shepard, S., & Guthrie, I. K. (1999). Consistency and change in children's emotionality and regulation: A longitudinal study. *Merrill-Palmer Quarterly, 45*, 413-444.
- Ornstein, P. A., Baker-Ward, L., Gordon, B. N., Pelfrey, K. A., Tyler, C. S., & Gramzow, E. (2006). The influence of prior knowledge and repeated questioning on children's long-term retention of the details of a pediatric examination. *Developmental Psychology, 42*, 332-344.
- Ornstein, P. A., Merritt, K. A., Baker-Ward, L., Gordon, B. N., Furtado, E., & Principe, G. F. (1998). Children's knowledge, expectation, and long-term retention. *Applied Cognitive Psychology, 12*, 387-405.
- Ornstein, P. A., Shapiro, L. R., Clubb, P. A.,

- Follmer, A., & Baker-Ward, L. (1997). The influence of prior knowledge on children's memory for salient medical experiences. In N. L. Stein, P. A. Ornstein, B. Tversky, & C. Brainerd (Eds.), *Memory for everyday and emotional events* (pp. 83-111). Mahwah, NJ: Lawrence Erlbaum Associates.
- Palmer, C., Brandt, C., Chen, C.-F., & Shapiro, L. R. (1998). *The relationship of temperament and memory in children*. Paper presented at the Great Plains Conference, Lincoln, Nebraska.
- Peterson, C., & Bell, M. (1996). Children's memory for traumatic injury. *Child Development, 67*(6), 3045-3070.
- Peterson, C., & Biggs, M. (1997). Interviewing children about trauma: Problems with "specific" questions. *Journal of Traumatic Stress, 10*, 279-290
- Peterson, C., Dowden, C., & Tobin, J. (1999) 'Interviewing preschoolers: Comparisons of Yes/No and Wh- questions', *Law and Human Behavior, 23*, 539-555.
- Peterson, C., & Grant, M. (2001). Forced-choice: Are forensic interviewers asking the right questions? *Canadian Journal of Behavioral Science, 33*, 118-127.
- Poole, D. A., & Lamb, M. E. (1998). *Investigative interviews of children: A guide for helping professionals*. Washington, DC: American Psychological Association.
- Poole, D. A., & Lindsay, D. S. (1995). Interviewing preschoolers: effects of nonsuggestive techniques, parental coaching, and leading questions on reports of nonexperienced events. *Journal of Experimental Child Psychology, 60*, 129-154.
- Putnam, S. P., & Rothbart, M. K. (2006). Development of Short and Very Short forms of the Children's Behavior Questionnaire. *Journal of Personality Assessment, 87*(1), 103-113.
- Quinonez, R., Santos, R. G., Boyar, R., & Cross, H. (1997). Temperament and trait anxiety as predictors of child behavior prior to dental anesthesia for dental surgery. *Pediatric Dentistry, 19*(6), 427-431.
- Shapiro, L. R., Blackford, C., & Chen, C. F. (2005). Eyewitness memory for a simulated misdemeanor crime: The role of age and temperament in suggestibility. *Applied Cognitive Psychology, 19*, 267-289.
- Thomas, A., & Chess, S. C. (1977). *Temperament and development*. New York: Brunner/Mazel.
- Vandermass, M. O., Hess, T. M., & Baker-Ward, L. (1993). Does anxiety affect children's reports of memory for a stressful event? *Applied Cognitive Psychology, 7*, 109-127.

1 차원고접수 : 2012. 1. 12.
 심사통과접수 : 2012. 2. 29.
 최종원고접수 : 2012. 3. 19.

질문 유형과 개인차 변인이 스트레스 경험에 대한 아동 진술에 미치는 영향

이 승 진

노스캐롤라이나대학교

본 연구는 스트레스 반응이 자연스럽게 유발되는 소아 치과 진료를 경험한 아동들을 대상으로 아동 회상 보고의 정확성에 인터뷰 질문의 유형과 아동 개인차 변인들이 미치는 영향을 살펴보고자 하였다. 4-10세 아동 63명은 소아 치과 진료에 관한 자유 회상 질문, 폐쇄형 질문, 선택형 질문들이 위계적으로 구성된 기억 인터뷰에 참여하였다. 전반적으로 나이든 아동들이 어린 아동들보다 모든 유형의 질문에서 우수한 기억 회상을 보였다. 보다 흥미로운 결과는 사전 경험의 특성, 치과 진료에 대한 부모의 준비 정도, 아동의 기질과 같은 개인차 특성들이 연령과 무관하게 자유 회상적 질문에 의한 아동의 응답과 가장 높은 상관을 보였다. 이는 면담의 질문 유형에 따라 아동의 개인차 변인들이 회상 정확성에 미치는 영향에 차이가 있음을 함의한다. 본 연구 결과를 바탕으로 아동 수사면담시 개방형 질문의 중요성 및 아동 개인차 변인들의 신중한 고찰의 필요성이 논의되었다.

주요어 : 정보 특성의 중심성, 기질, 부정적 사전 경험, 부모의 준비성, 아동 증언