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Details in Testimony: How Hedge Words Influence People's Perceptions of Victim Testimony Credibility

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Details in Testimony: How Hedge Words Influence People's Perceptions of Victim Testimony
Credibility

A Thesis Presented in Partial Fulfillment of the Requirements
For the Masters in Forensic Psychology

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Abstract

The purpose of this study was to examine whether hedge words and the age of a memory can influence the way participants (mock jurors) perceive an alleged sexual assault victim's credibility. Prior research has demonstrated many issues that can affect the accuracy of memory for childhood events such as childhood amnesia, fragmented and distorted memories, false memories and source monitoring errors and the way in which jurors' decisions can be swayed based on verbal cues to confidence. Here, we further investigated whether jurors' decisions are sensitive to the age of the memory—an event that happened in the recent or distant past—and the use of hedge words, that is, how confident adults appear in their memory. To determine juror perceptions of trial testimony credibility, in Study 1 participants read a mock direct examination transcript and answered questions regarding the claimant's credibility and the defendant's guilt. In Study 2 participants read a mock direct examination transcript followed by a cross-examination transcript. They then answered questions regarding the claimant's credibility and the defendant's guilt. Results from Study 1 showed participants found the testimony more believable when the memory was distant (15 years prior) as opposed to recent (4 years prior). Results from Study 2 demonstrated that participants found the testimony less credible and believable when there was a presence of hedge words. Indeed, participants were less likely to find the defendant guilty and gave a lower trauma severity rating when there was a presence of hedge words. We suggest that the cross-examination made participants more sensitive to the presence of hedge words, yielding a sense of uncertainty that led the participants to believe the testimony was not credible.

Details in Testimony: How Hedge Words Influence People's Perceptions of Victim Testimony Credibility

While scholars have demonstrated that adults cannot accurately recall rich details of memories from early childhood, jurors often expect such details when evaluating testimony credibility (Hayne, 2003; Pillemer, 1998; Bruce et al., 2005; Wells, Morrison, & Conway, 2013). Previous studies have found that jury members are more likely to believe a claimant's testimony and render the defendant guilty when the claimant is confident (Thomas et al., 2015; Paivia et al., 2011; Smith & Schwarz, 2016). For example, Howe (2011) conducted an analysis of court cases within the US and UK involving memories from early childhood. In his review, he found that jurors often appeared to consider claimants' confidence in their memory as evidence of accuracy, even if they were objectively too young to form accurate event memories (under 2-years old at the time). Other studies have also shown that jurors are not attuned to the factors that influence memory accuracy. Instead, jurors focus on the presence of 'concrete' memories and vivid detail and disregard the fact that memories deteriorate over time (Howe, 2013; Paivia et al., 2011; Strange & Hayne, 2013; Schwarz & Smith, 2016). In our study, across two experiments, we manipulated the presence or absence of hedge words in combination with either a distant (15 years prior) or recent (4 years prior) memory to test whether participants' perceptions of overall credibility changed.

Verbal Cues to Confidence

Our conversations in our daily lives teach us that there are linguistic ways of demonstrating our confidence. Indeed, verbal cues can be useful when determining a claimant's credibility and have been shown to influence what jurors remember over time (Thomas et al., 2015). Liu and Foxtree (2012) conducted a two-part study in which they tested the effects hedge

words have on memory recall ability. They had participants act as both storytellers and listeners; expanding on a time they spent a substantial amount of money. Their findings demonstrated that hedge words, or words that portray a sense of uncertainty, can influence listeners to pay close attention to the statement (testimony) at hand. They also found that statements, including hedge words, are more likely to be remembered, even if the actual hedge words themselves are not. Based on these findings, we could infer that the presence of hedge words in direct testimony will encourage jurors to recognize that the memory is uncertain and potentially unreliable.

Although Liu & Foxtree's (2012) research has implications for people's tendency to recall statements involving hedge words, we were unable to find extensive research examining the effect of hedge words concerning people recognizing memory errors in testimony. However, we suspect that testimony that includes hedge words, as indicators of uncertainty and implications of memory errors will encourage jurors to believe the testimony is not credible. If mock jurors are either familiar with or made aware of the fact that memory errors occur and that memories deteriorate over time, especially when combined with hedge words, they should be more critical in their credibility assessment of the victim's testimony. That is the issue we address here.

False Memories and the Repression Controversy

In the early 1900's, Sigmund Freud introduced the term repression. Freud defines repression as a mental block on a particular experience that hides it from conscious recall (as cited in Strange, Clifasefi & Garry, 2007). Although Freud proposed that the repressed memories lie dormant in people's subconscious, he argued they would demonstrate signs of interpersonal and psychological issues long before they made any attempt at recovering their memories (as

cited in Strange et al., 2007). Freud believed that repressed memories, usually involving childhood sexual abuse, would later be remembered after the person experienced a trigger—such as a similar event or another person’s suggestion—but only with the help of supportive psychoanalytic techniques.

Unfortunately, Freud provided no criteria on how to determine if someone was actually abused and had repressed their memories of the experience, except his confident assertions. In the 1990s, repressed and then recovered memories became the central evidence in criminal cases across the United States. For example, Strange et al. (2007) describe women who had no memory of being abused but presented life struggles similar to abuse survivors, being encouraged to believe they were victims of horrific childhood sexual abuse. With no evidence except their new memories, these women pursued criminal cases against their alleged perpetrators; many were convicted. However, there is currently no evidence to support the concept of repressed memories. Instead, research from two lines of inquiry has suggested an alternative explanation for these women’s memories: that they were victims of suggestive therapeutic techniques.

Childhood Amnesia

With women coming forth with sexual abuse allegations from when they were under three years old, experts in the psychological field sought out a reasonable explanation. The concept of childhood amnesia provided substantial evidence that full event memories and the type of details being recalled were likely impossible to be accurately remembered. Childhood amnesia is the inability of children to record and retain events from infancy and their early childhood (Pillemer, 1998; Strange, Wade, & Hayne 2008). Freud believed that children were

unable to encode autobiographical memories before the age of six or seven (Bruce et al., 2005). Instead, most studies show the first fragments of memory can be recalled from as early as three or four. Hayne (2003) conducted a literature review analyzing data examining the decline of childhood amnesia. She was interested in whether there was evidence to support any of the major theoretical explanations that had been offered to account for childhood amnesia, such as cognitive development, social skills, and language ability. Based on the progression of social and neurological development, Hayne concluded that the earliest age of memory encoding could occur at the age of three. Why? Because children need linguistic skills to encode, store and access memories in adulthood. During the earliest years of childhood, when children are still unable to adequately verbalize their thoughts and experiences, the chances of encoding an accurate event memory in a way that it can be accessed as an adult, are minimal. Without linguistic ability, specific details cannot be reliably stored in a child's memory. While we know that children can encode memories they have experienced based on their ability to learn, they do not use language. Therefore, as adults, we cannot access those memories because we use language to encode, store and retrieve our memories. Hence, based on the ability to utilize language as a retrieval cue during childhood, the age at which an event is experienced ultimately determines how true an adult's memory recall is likely to be.

Interestingly, people tend to have “fragments” of memory, from earlier in their childhood. In their study, Bruce et al. (2005) investigated whether a child's first encoded memories are full event memories or just fragments. A fragmented memory, such as the smell of play doh, an old nursery rhyme, or watching the vacuum as your mother cleaned, is a small portion of a recollection that has no association with a particular event. Bruce et al. asked participants to recall two types of memories, a memory they truly remembered, and another they

only know happened from external sources, but do not have a full memory for. They found that the earliest childhood memories were generally fragments, but once childhood amnesia was over (around the age of six), people were able to recall accurate and detailed event memories.

These fragmented memories may be particularly problematic in cases of recovered memories. Even the smallest fragment of a traumatic childhood event could provide enough contexts for reconstructing an entire memory based on suggestion or inference. The problem thus lies in the possibility of falsely accusing someone of sexual abuse, when the case relies on the memory as the primary evidence.

False Memories and Source Monitoring Errors

In 2011, Simons and Chabris (2011) conducted a national telephone survey to question the general public's perceptions on how memory works. Experts know that memories are not stored as video recordings, neatly filed in our brains. Unfortunately, 63% of the general public supported such a claim (Simons & Chabris, 2011). Moreover, 48% said memory was permanent. In fact, memories are stored based on a person's schemas, experience, and beliefs that later impact the constructive process of recalling memories (Simons & Chabris, 2011). Indeed, to determine whether or not the memories we recall are true, a person must be able to identify the *source* of those memories. The source-monitoring framework explains that people do not actually encode their experiences with a label or tag, indicating where and when the memory occurred and with whom (Johnson, Hashtroudi & Lindsay, 1993). Thus, people often have difficulty pinpointing the exact source of their memory and differentiating between true and false memories. In his review, Lindsay (2008) explains that heuristic and systematic source monitoring can help weed out particularly obscure or impossible memories based on reality

monitoring. Heuristic source monitoring is our primary instinct when assessing the grounds of reality for a particular memory, whereas systematic source monitoring is the secondary assessment in which to analyze specific qualitative details of a memory and cross check the plausibility based on one's current experiences. Overall, the source-monitoring framework explains that when we talk about our memories, they become open to suggestion and outside information. Source monitoring (SM) errors cause problems later on because we cannot distinguish post-event information from the actual experience. Therefore, a source monitoring error is when one mistakes or cannot differentiate the source of the memories' information, for example, what one experienced versus what one was told happened. In summary, then, individuals' environments, current life experiences, and suggestions made explicitly or implicitly by their peers can ultimately alter their memories of certain events (Lindsay, 2008).

To examine the possibility and ease of implanting false memories during therapy, as opposed to patients recovering 'repressed' memories, researchers began simulating the therapeutic environment. That is, they used suggestive techniques to implant an entirely false memory from the participant's childhood. Loftus and Pickrell (1995) were the first to test this possibility by designing what has become known as the 'lost in a mall' experiment. They gave participants information about four memories that they allegedly experienced during childhood and then asked to elaborate on them in detail. Unknown to the participants, amongst the true memories that had been supplied by a family member, each participant read an entirely false memory about getting lost in a mall. After three interviews, Loftus and Pickrell demonstrated that 25% of participants were easily guided to imagine fragmented or entire memories of being lost in the shopping mall, including specific details of the experience.

In a mega-analysis, Scoboria, Wade, Lindsay, Azad, Strange, Ost, & Hyman (2016),

reviewed eight false memory implantation studies, including Loftus and Pickrell (1995). Problematically, authors had used different criteria to define “false memory.” Thus, Scoboria et al.’s goal was to develop a reliable coding scheme to assess what proportion of people were likely to develop a false memory. By combining the data from all eight studies, the researchers were able to classify the participant’s responses to the false memory into six categories. The participants accepted, rejected, had no memory what so ever, and had a partial false memory, full false memory or a robust false memory of the suggested event. Consistent with results from previous implantation studies, around one-half (46.1%) of the participants believed the false memory, and two-thirds (69.7%) generally accepted the false memory. Moreover, 11.1% of participants were classified as having developed a robust memory, 10.8% developed a full memory, and 8.5% developed a partial false memory. The remaining 69.6% fully rejected having a memory, showed signs of acceptance but no true recall, or showed no evidence of acceptance at all. Overall, the review provides further support that suggestion with evidence (e.g. a photo, or interpersonal information) often leads to implanting a false memory and retaining it as a true event memory.

Combining the false memory literature with childhood amnesia, Strange, Wade, and Hayne (2008) conducted an experiment to test whether childhood amnesia would make it more likely adults would develop a false memory. They had two target ages that the false event supposedly occurred, two and ten years old. They began by asking their participants to recall as much information as they could remember about six specific events (provided by their parents along with age-specific photographs). One of the events, a hot air balloon ride, was entirely false, but not impossible for the participants to have experienced. Their results found that participants were more likely to encode false memories of the hot air balloon if they were allegedly two years

old at the time it occurred. However, their results also showed that once a false memory was accepted, the amount of detail the participant reported did not vary based on the age group. Consistent with what we know about childhood amnesia, the Age 2 group was more susceptible to encoding the false memory and recalling false details than the Age 10 group, largely because the amount of information they could recall about their true memories was similar to the false memory.

In summary, how do researchers typically explain why people develop false memories? The answer is a failure in SM. For example, if someone was abused as a child, he or she may have scattered memories of an uncle being present during bath time, which would aid in a confabulation of other details. Seemingly, even if the uncle had never been present during the bath, but the mother insisted she caught him walking past the bathroom, the person may preserve that information and translate it into the current memory recall. In this study, what we wondered was whether SM errors and wrongful beliefs about memory storage could essentially impact a victim's testimony credibility.

Credibility and Believability

To find a victim credible, the recollection must be perceived as true. While the victims may be recalling memories they constructed over several years, or compiled based on other people's input; jury members will often believe a highly confident witness. Jurors must use their judgment and experiences to decipher between true and false, or distorted, memories. Even the slightest bit of distortion could significantly alter the way a claimant recalls an entire experience and should, therefore, be considered when jurors are assessing credibility. Howe (2013) examined alleged abuse cases from early childhood that were brought to court. He found that

adult recall from childhood often incorporated parts of true events, such as where it happened and with whom, but it was the person's current life experiences that aided in restructuring the way an event was remembered, potentially distorting an entire memory (Howe, 2013). He also provided several examples of highly detailed accounts which, based on empirical evidence, cannot be real. For example, one of Howe's subjects claimed that during her alleged childhood abuse she, "defendant ejaculated inside her and that no contraception was used during this (or any other) alleged rape experience(s)" (p. 13).

Of course, if a case goes to trial, the claimant would be expected to testify about the incident they allege they experienced during childhood. Even with some knowledge of memory errors, we know that jurors are persuaded by testimony that contains detailed recollections (Howe, 2013). This is extremely important when the primary evidence against the defendant is coming from testimony based on distant memories (Howe, 2013). Generally, these types of cases only involve the perpetrator and the victim and, more likely than not; their testimony will be contradictory. The decision of who is more reliable or credible thus lies with the jury members. When jury members are listening to victims' testimony and evaluating their credibility and essentially the defendants' guilt, it is crucial that they fully understand a person's ability to recall memories accurately based on the age of the memory.

Some details that adults claim to be able to recall are implausible. For example, Strange and Hayne (2013) conducted a study to assess the accuracy of adult recollections of specific details. Critically, they tested these assumptions by considering what children can encode and report soon after an event. The logic being that if children cannot remember the detail soon after an event, adults should not be able to remember it many years later. They ran a two-part study with children between the ages of 5-6 and 9-10. In the first part of their study, the authors re-

analyzed data from a set of previously published studies. Their goal was to determine whether children would "spontaneously" recall qualitative characteristics such as the weather, how long they were there, what their teacher was thinking and how they felt. Essentially, they were testing whether children actually encode the temporal and qualitative details that adult's later claim to recall from childhood in court cases.

The children were brought to a local firehouse to experience a unique event and were questioned one to two days later on their experience to test whether they retained specific qualitative information. They found that even in the span of only two days, children did not encode the type of details often reported by adults later on. While the children were able to retain a vast amount of information about their trip to the firehouse, they rarely referenced, for example, the time of day, the weather, or what they wore. In the second part of the study, Strange and Hayne (2013) recruited a new sample of 5-6-year-olds and 9-10-year-olds. Again, they took those children on a visit to a firehouse and one to two days later asked specific questions about the time of day, what they were wearing that day, and what the fireman said during the trip. Here, they found that the 9-10-year-olds were able to recall certain aspects such as the weather, how they felt, how long the trip was and what mode of transportation they took when directly questioned. The 5-6-year-olds however, were generally less likely to remember qualitative characteristics at all, suggesting that 5-year olds and under would not encode that information at all. Therefore, while jurors may be swayed by detailed memories, those details may not be accurate.

Wells, Morrison, and Conway (2013) conducted a similar study where adults were asked to remember two of the earliest positive and negative memories from their childhood. The participants were asked to mention specific details such as who was there, what the significance

of the memory was, the location, time, and day. Like Strange and Hayne (2013), Wells et al. (2013) found that overall, even 'detailed' reports of one's earliest memories generally did not include intricate qualitative or temporal details.

An additional study by Smith and Schwarz (2016) asked mock jurors to read about an assault occurring one-year prior, which included verbatim statements between the attacker and the victim, where the victim was hurt, and the clothing that both parties wore. The participants then had to rate how extreme the assault had been (how "brutal" and how hurt the victim was on a 1-5 Likert scale). They found that jurors inferred a more traumatic experience when the testimonial report was from a distant rather than a recent event. Indeed, the participants advised harsher punishments for testimony's recalling distant events (Smith & Schwarz, 2016). Given that memory fades over time, these participants assumed that good memory for a distant event suggested the event was especially significant. However, if an adult can recall specific details entailing chronological or emotional information of a very early childhood event, such detailed information should *reduce* the person's credibility (Howe, 2013; Strange, et al., 2008). In other words, if adults can recall the specific time each period of an assault occurred, their specific age at the time of occurrence should be considered in regards to whether those details are plausible (Howe, 2013).

Overview of the Present Research

While research has shown that memories of very early childhood are rarely accurate and that jurors are typically not attuned to the factors that lead to memory distortion, researchers have not yet tested whether the presence of hedge words or implied uncertainty impacts people's perceptions of credibility. Furthermore, we do not know how the presence of hedge words

influences people's judgments of testimony when the event occurred in the past or more recently. To determine whether mock jurors are more likely to view a claimant's testimony as credible, we had participants read a claimant's direct examination, and we manipulated whether participants read uncertainties such as, "I think, maybe, perhaps." We also tested whether participants would view the testimony differently depending on when the event happened 4 or 15 years prior.

We had competing predictions on how these manipulations would influence people's perception of the claimant's testimony credibility when recalling a distant memory (15 years prior), opposed to a recent memory (4 years prior). On the one hand, hedge words might boost the credibility of a statement by demonstrating that the claimant is aware of memory limitations and is recalling to the best of his/her ability, thereby improving trust. Therefore, the jury may find the claimant's testimony to be credible and the defendant guilty. On the other hand, if people do not view hedge words as a sign of honesty about their memories, then they might assume that hedge words indicate that the claimant is, at best, uncertain of his/her accusation or, at worst, completely falsifying their testimony. This uncertainty would then potentially lead the jury to perceive the claimant's testimony as non-credible and the defendant to be innocent. By using hedge words as verbal indicators of uncertainty about a recent or distant memory, people and jurors should be able to assess the validity of memory-based evidence and how it will contribute to the defendant's guilty or innocent verdict.

Study 1

Method

Research Design

We employed a 2 (age of memory: recent, distant) x 2 (hedge words: present, absent) experimental design to examine juror perceptions of details in testimony. Specifically, we

manipulated the age of the memory (the event ostensibly occurred 4 or 15 years earlier) and the presence or absence of hedge words in the claimant's testimony (such as: I think, pretty much, um, he might have, or something, kind of, must have, kinda remember, something like, -ah, -um, like, probably, about, sometime around, maybe, I guess, and sort of). Thus, there was a total of four conditions: a recent memory with hedge words; a recent memory without hedge words; a distant memory with hedge words; a distant memory without hedge words.

Participants

A total of 201 participants were recruited and completed the study via Amazon's Mechanical Turk (mTurk). However, we excluded 18 participants for failing to follow instructions, such as whether or not they maximized their screen, if they spoke to anyone during the survey, used a search engine and stopped midsession to take a break. After these exclusions, our final sample included 183 participants. The demographic makeup of the sample was as follows: there were 77 males; 104 females; and two participants choosing "other." Participants were 22 to 78 years old ($M = 41.32$, $SD = 13.24$). All but two participants resided in the United States of America for most of their life, with 1 participant reporting Canada and the other England. Similarly, all but 2 participants who currently reside in Germany, live in the United States of America. The majority of the participants completed higher education; one person did not finish high school, 75 finishing just high school, 75 had a Bachelor's degree and 31 completed a masters or Ph.D. An advertisement with a brief description of the study was posted on the mTurk website (<https://www.mturk.com/mturk/welcome>; See Appendix A). Participants were paid \$0.60. To ensure a diverse and representative sample, we only stipulated that participants must be 18 years of age or older and have access to the Internet.

Procedure

We first introduced participants to the purpose of the study. We explained that the purpose of the research was to understand how people perceive courtroom testimony, particularly regarding a sexual assault case. We told participants that the results of this study might inform theory and affect courtroom procedure in the future. We then provided participants with a consent form and instructed them to click “next” if they were willing to proceed (See Appendix B). They were then randomly assigned a participant code to ensure their confidentiality and were also randomly assigned (via the randomizer on Qualtrics) to their condition. Participants were placed in one of four conditions: a recent memory with hedge words; a recent memory without hedge words; a distant memory with hedge words; a distant memory without hedge words. The participants who were in either of the recent conditions viewed a testimony that was from four years prior, where the participants in the distant conditions viewed a testimony that was from 15 years prior. Seemingly, participants who were in the hedge words conditions viewed additional text embedded in the testimony such as, "I think, maybe, kind of, perhaps," where the participants without hedge words did not. Participants read a mock direct exam transcript of a sexual assault and then answered questions about the testimony. We also asked participants to complete the Belief's about Memory questionnaire and some demographic information. Upon completion of the entire study, participants from were paid for their time.

Materials

Direct-Exam Transcript. We created a mock trial transcript describing the prosecution of a sexual assault (See Appendix C). Importantly, participants only read the direct examination of the claimant by the prosecutor. The claimant was a 19-year-old girl who alleged that her uncle had sexually assaulted her at a party years prior. The transcripts differed in regards to how long

ago the event happened (4 or 15 years earlier) and whether or not the claimant used hedge words in her description of the event (See Appendix D). In total, there were four versions of the transcript corresponding to the four conditions in the study.

Measures

Claimant Testimony Credibility/Defendants Likelihood of Guilt. To determine whether hedge words (e.g., present or absent) and the age of memory (e.g., four years ago or 15 years ago) contributed to the participants' overall perception of the claimant's testimony credibility and the defendant's likelihood of guilt, the participants answered five questions. We asked participants to rate the *credibility* of the claimant's testimony on a 1 (Very Non Credible) – 7 (Very Credible) Likert scale, the *believability* of the claimant's testimony rated on a 1 (Very Unbelievable) – 7 (Very Believable) Likert scale, the likelihood of her uncle's guilt on a 1 (Very Guilty) – 7 (Very Innocent) Likert scale. Finally, we also asked participants to judge whether the assault occurred: yes or no.

Beliefs about Memory.¹

To determine whether participants had any prior knowledge regarding cognitive psychology, particularly memory errors, we included a Beliefs about Memory Questionnaire developed by Garry, Loftus, and Brown (1994). The questionnaire seeks to understand participants' predetermined understandings and feelings about memories. For example, participants read the statement, 'Nothing is ever truly forgotten,' and selected whether they strongly agreed, agreed, were neutral, disagreed or strongly disagreed. Prior knowledge regarding the unreliability of memories and rate of deterioration should affect the way

¹ Beliefs about Memory was not included in analyses.

participants perceive the claimant's memory, ultimately finding the testimony not credible. (See Appendix E).

Hypothesis

Hypothesis 1: We predicted that there would be no difference in credibility or likelihood of guilt judgments for either distant or recent memories overall, but that there would be differences when hedge words were present. We predicted that participants in the hedged conditions would perceive the testimony as less credible and be less likely to indicate that they believed the defendant committed the assault.

Results

Recall that our primary research question was whether the temporal distance of the event being recalled, in combination with the presence or absence of hedge words, would influence jurors' perceptions of testimony credibility. We ran a series of 2 x 2 ANOVA on each of our measures: the credibility of the claimant's testimony; the believability of their testimony; and the likelihood of her uncle's guilt. Lastly, we ran a logistic regression to test whether people's opinions on whether or not the assault actually occurred were affected by our manipulated variables.

Credibility

We first examined participants' credibility ratings with a 2 (age of memory: recent, distant) x 2 (hedge words: present, absent) ANOVA. We found no main effects for hedge words, $F(1,179)=.713, p=.400, \eta^2=.004$, or the age of memory $F(1,179)=3.20, p=.075, \eta^2=.018$. There was no interaction between the presence of hedge words and the age of memory, $F(1,179)=.197, p=.657, \eta^2=.001$. See Table 1 for all means and standard deviations.

Believability

We next ran a 2 (age of memory: recent, distant) x 2 (hedge words: present, absent) ANOVA to assess the perceived believability of the claimant's testimony. Here, we found a significant main effect of our age of memory manipulation, $F(1,179)=4.71, p=.031, \eta^2 =.026$. To clarify, our participants found the claimant's testimony to be more believable when her recollection was from the distant past, compared to the recent past. In other words, participants found her testimony more believable when the assault occurred 15 years ago, when she was four-years-old ($M = 5.83, SD = 1.41$), compared to when it occurred four years ago when she was 15 ($M = 5.33, SD = 1.68$). There was no main effect for the presence of hedge words, $F(1, 179) = .134, p=.715, \eta^2 =.001$, nor was there a significant interaction between age of memory and presence of hedge words, $F(1,179)= .014, p=.907, \eta^2 <.001$. See Table 1 for all means and standard deviations.

Likelihood of Guilt

We also ran a 2 (age of memory: recent, distant) x 2 (hedge words: present, absent) ANOVA to assess the likelihood of guilt. Again, there was no main effect of hedge words, $F(1, 179)= 2.12, p=.147, \eta^2 =.012$ or age of memory, $F(1,179)= 1.32, p=.251, \eta^2 = .007$, on people's perceptions of guilt. There was also no significant interaction found between the presence of hedge words and the age of memory, $F(1,179)= .183, p=.670, \eta^2 =.001$. See Table 1 for all means and standard deviations.

TABLE 1
 Mean proportion and standard deviations of responses to questions in each condition

<i>Condition</i>	<i>Question Type</i>		
	<i>Credibility of Testimony</i>	<i>Believability of Testimony</i>	<i>Likelihood of Guilt</i>
Recent Hedge	5.17 (1.58)	5.36 (1.55)	2.72 (1.44)
Recent No Hedge	5.46 (1.72)	5.30 (1.81)	2.46 (1.59)
Distant Hedge	5.67 (1.28)	5.89 (1.91)	3.13(2.10)
Distant No Hedge	5.76 (1.38)	5.78 (1.61)	2.64 (1.89)

Overall Defendants Guilt

To determine whether the four conditions significantly differed overall in their determination of the accused's guilt, we ran a logistical regression. Our results indicated there was not a significant difference between conditions on whether participants believed that the assault occurred. Participants in the hedge condition were no more likely than the no hedge condition to believe the assault occurred, p -value = .954, OR = .972, 95% CI [0.37, 2.53]. Similarly, participants in the distant condition were no more likely than the recent condition to believe the assault occurred, p -value = .201, OR = .490, 95% CI [0.16, 1.46]. There was also no significant interaction between hedge and age of memory, p -value = .611, OR = .652, 95% CI = [.13, 3.38]. See Table 2 for responses per condition.

TABLE 2
Responses to questions per condition

<i>Condition</i>	<i>Question Type</i>	
	<i>Did the Assault Occur?</i>	
	<i>Yes</i>	<i>No</i>
Recent Hedge	36	11
Recent No Hedge	35	11
Distant Hedge	41	4
Distant No Hedge	39	6

Discussion

The purpose of Study 1 was to determine whether participants' judgments of a claimant's credibility, believability and ultimately the defendant's guilt would be influenced by the presence or absence of hedge words and the age of the memory. Our results yielded one main effect for the believability of the testimony, in which a young girl claimed to have been sexually assaulted by her uncle at a party. Although there were no other significant main effects or interactions, the findings appear to support the notion that detailed testimony can lead to higher juror perceptions of credibility and believability. Overall, the results showed high ratings in both believability and credibility, across all conditions. However, there was no difference between the ratings of the defendant's guilt, meaning almost the same amount of participants found the defendant innocent and guilty, across all conditions.

Participants, however, did not seem to use the presence of hedge words or the age at which the memory was encoded as indicators of a victim's credibility. Of course, it is possible

that participants did not recognize that the hedge words signified uncertainty, or perhaps they simply did not notice the hedge words at all. Of course, in a court of law, the defendant's attorney would do all they could to highlight any hedge words. Thus, in Experiment 2, we added a cross-examination by the defendant's attorney to highlight the claimant's uncertainty.

Study 2

Method

Research Design

Study 2 was a replication and extension of Study 1. The design was identical except a cross-examination testimony was added. The age of memory remained 4 or 15 years prior and the hedge words used were in the form of, "might have seen, maybe, I think, probably, I believe, kinda, something like, quite, sort of, almost, pretty, fairly and but I guess I cant remember everything exactly".

Participants

Participants were recruited online through John Jay College's Research Experience Program (administered via the SONA system). A total of 249 participants were recruited and completed the study. However, we excluded 18 participants for failing the first attention check, which was typing the word 'sugar.' Additionally, we excluded 47 participants for failing the second attention check. Lastly, we excluded 50 participants for not following instructions, e.g. taking notes or talking to someone during the survey. After these exclusions, our final sample included 134 participants for Part 2. The demographic makeup of our sample was as follows: there were 35 male participants and 99 female participants. Participants' ages ranged from 19 to 57 years old ($M = 21.78$, $SD = 4.99$). 126 participants completed high school, 7 finished their Bachelor's degree, and 1 participant completed Masters or Ph.D. Participants were from various

ethnic backgrounds with 12 participants from African American/African/Black/Caribbean descent, 12 Asian/Pacific Islander, 26 Caucasian, 76 Hispanic/Latino, 1 Native American, 3 Multi-Racial, 2 other and 2 who did not respond. A posting with a brief description of the study was posted online via SONA (See Appendix F) where users could view and then choose to complete the study for research credits (2 per study). The inclusion criteria involved being 18 years of age or older and having access to the Internet. The rationale for broad inclusion criteria was to increase the likelihood of having a diverse and representative sample.

Procedure

Our procedure was exactly the same as Study 1 with the only exception of including a cross-examination transcript immediately after the direct-examination transcript.

Materials

Direct-Examination Transcript. We used the same Direct Examination as Study 1.

Cross-Examination Transcript. We additionally created a mock cross-examination (See Appendix G), where the claimant was being examined by the defense. There were four editions of the transcript, each dependent upon the condition. The participants all read about the girl who was sexually assaulted being questioned on her memory capabilities and the event that occurred. The transcripts differed in regards to how long ago the event happened (4 or 15 years prior) and whether or not there was a presence or absence of hedge words (See Appendix H). The cross-examination was added to highlight points of uncertainty and the potential for memory errors in the claimant's direct examination testimony. The defense attorney asked the same questions regardless of condition, but the claimant's responses varied by condition.

Measures

Claimant Testimony Credibility/Defendants Likelihood of Guilt. Our measures were

the same as Study 1, except a few additional questions. After answering whether or not they believed the assault occurred, they rated their confidence in their response on a 1 (Not at all Confident – 5 (Very Confident) Likert scale. If the participant selected ‘yes’ to the question regarding whether or not the assault occurred, they were also presented with an additional two questions assessing how traumatic the assault was, rated on a 1 (Not at all Traumatic) – 5 (Very Traumatic) Likert scale and the appropriate prison sentence being either 1-2 years, 3-5 years, 6-10 years, 11-15 years or 16+ years.

Scales

Implicit Memory Scale.

Due to the inability to measure the beliefs about memory, we removed it and added the Implicit Memory Scale developed by Niedzwienska et al., (2007). The scale was primarily included to determine whether participants had any prior knowledge regarding cognitive psychology, particularly memory errors. Much like the Beliefs About Memory scale, this questionnaire aims to understand participants’ predetermined understandings and feelings about memories. For example, participants read the statement, “If one could scan the human brain, it would be possible to access all the events from a person’s life” and selected a categorical response whether they felt the statement was, “definitely false, false, not true, true, definitely true.” Prior knowledge regarding the unreliability of memories and rate of deterioration should affect the way participants perceive the claimant’s memory, ultimately finding the testimony not credible (See Appendix I).

Hypotheses

Hypothesis 1: We hypothesized that participants would perceive testimony involving distant memories as less credible, especially when hedge words are present.

Hypothesis 2: Compared to distant memories, we predicted that participants would perceive recent memories as more credible and be less likely to indicate that the defendant committed the assault if hedge words were not present.

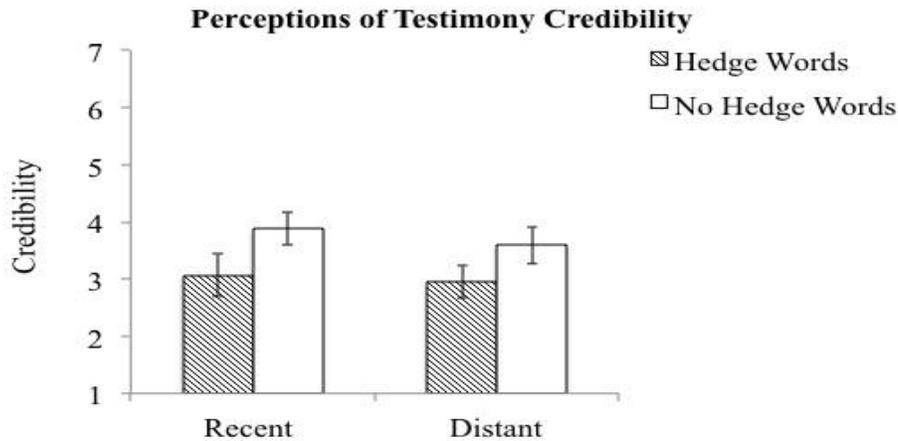
Results

To examine whether the presence of a cross-examination sensitized participants to the claimant's use of hedge words and the age of a memory, we ran a series of 2 x 2 ANOVAs on each of our measures: the credibility of testimony; believability of testimony; and the likelihood of guilt. We ran a logistic regression to test peoples' overall opinion as to whether the assault occurred or not and ran an additional ANOVA analyzing the participant's confidence in their responses. If participants thought that the assault did occur, they were presented with two additional questions; thus, we also ran 2 X 2 ANOVAs to analyze how traumatic the participants viewed the assault, and the prison sentence they felt would be most suitable.

Credibility

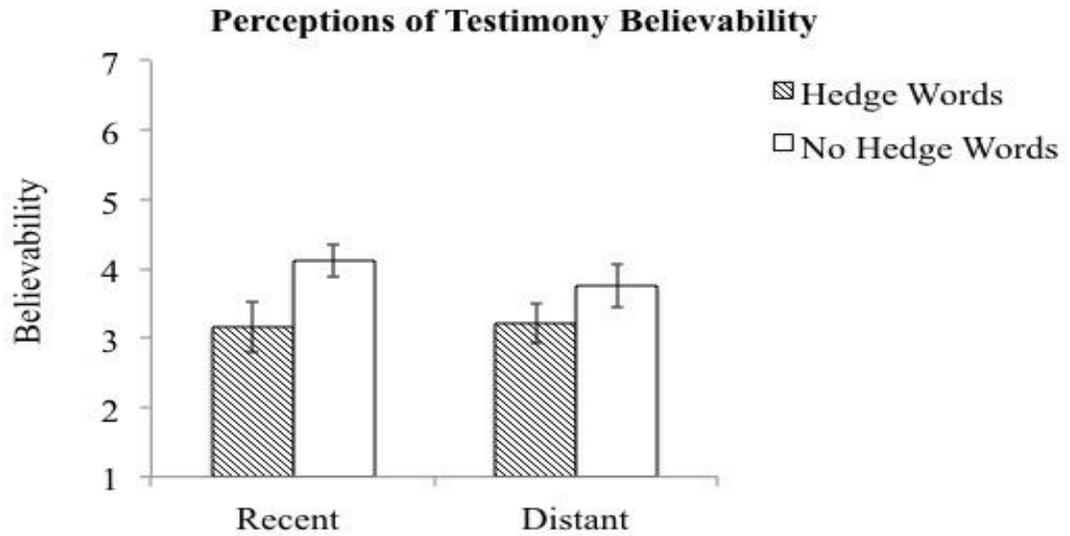
We ran a 2 (age of memory: recent, distant) x 2 (hedge words: present, absent) ANOVA to assess the credibility of testimony. Here, we had a significant main effect of our hedge words manipulation $F(1, 127)=22.45, p<.001, \eta^2 =.15$. When there were hedge words present people viewed the testimony as less credible ($M = 3.0, SD = 0.97$), as opposed to when there was an absence of hedge words ($M = 3.71, SD = 0.89$). There was no main effect of a recent versus a distant recollection, $F(1,127)=1.97, p =.164, \eta^2=.015$. There was also no significant interaction between a recent or distant recollections and hedge words, $F(1,127)=.008, p =.931, \eta^2< .001$. To measure whether having prior beliefs and knowledge of memories affected credibility judgments, we used The Implicit Memory score as a covariate. It had a significant effect on credibility, $F(1, 127)=8.04, p=.005, \eta^2 =.06$ which was prior knowledge of memories influencing the credibility

rating.



Believability

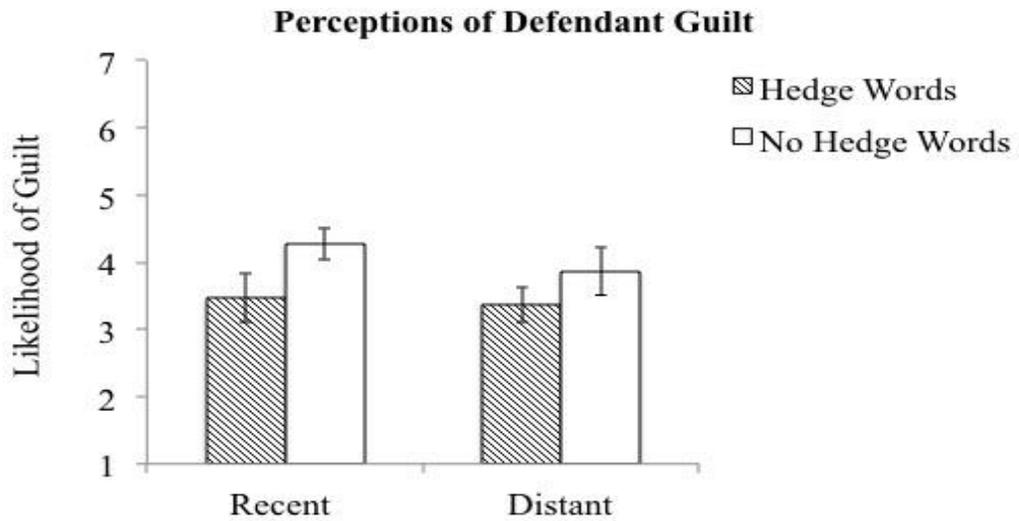
We also ran a 2 (age of memory: recent, distant) x 2 (hedge words: present, absent) ANOVA to assess the believability of testimony. We had a significant main effect of our hedge words manipulation $F(1, 127)=25.89, p<.001, \eta^2 =.169$. When there were hedge words, present people viewed the testimony as less believable ($M = 3.20, SD = 0.94$), as opposed to when there was an absence of hedge words ($M = 3.91, SD = 0.84$). There was no main effect of a recent versus distant recollection, $F(1, 127)=.792, p=.375, \eta^2=.006$. There was also no significant interaction between a recent or distant recollections and hedge words, $F(1, 127)=1.17, p =.281, \eta^2=.009$. The Implicit Memory score did not significantly affect believability $F(1, 127)=2.60, p=.110, \eta^2 =.020$.



Likelihood of Guilt

A 2 (age of memory: recent, distant) x 2 (hedge words: present, absent) ANOVA was used to assess the likelihood of the defendant’s guilt. We had a significant main effect of our hedge words manipulation $F(1, 127)=19.97, p<.001, \eta^2 =.136$. When there were hedge words, present people viewed the defendant's likelihood of guilt as lower ($M = 3.41, SD = 0.90$), as opposed to when there was an absence of hedge words ($M = 4.03, SD = .92$). There was no main effect of a recent versus distant recollection, $F(1, 127)=3.53, p =.062, \eta^2=.027$. There was also no significant interaction between a recent or distant recollections and hedge words, $F(1, 127)=.302, p =.583, \eta^2=.002$. The Implicit Memory score did, however, significantly influence

participants to find the defendant less likely to be guilty, $F(1, 127)=14.85, p<.001, \eta^2 =.105$.



Did the Assault Occur

We performed a logistic regression to test whether participants believed the assault had actually occurred. One hundred and fourteen people said yes, 20 people said no to this question. There were no significant predictors for any of the measures, perhaps because the majority of our participants (85%) thought the assault occurred, regardless of condition. See Table 3 for responses per condition.

TABLE 3
Responses to questions per condition

<i>Condition</i>	<i>Question Type</i>	
	<i>Did the Assault Occur?</i>	
	<i>Yes</i>	<i>No</i>
Recent Hedge	24	6
Recent No Hedge	26	0
Distant Hedge	36	5
Distant No Hedge	28	9

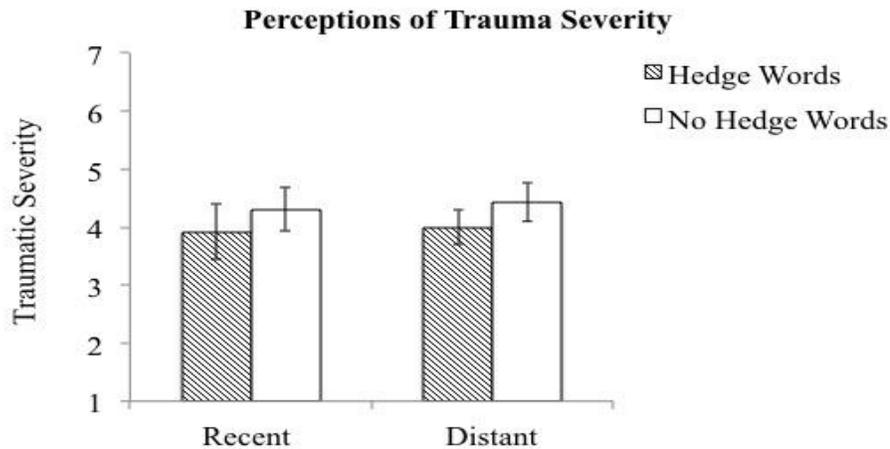
Confidence in Response

We ran a t-test to determine whether people's confidence differed depending on whether they thought the assault occurred or not. There was no significant difference $p = .309$.

How Traumatic Was the Experience?

The 114 people, who said 'yes' the assault occurred, answered two additional questions. We ran a 2 (age of memory: recent, distant) x 2 (hedge words: present, absent) ANOVA to assess how traumatic the participants believed the experience was for the claimant. We had a significant main effect of our hedge words manipulation $F(1, 108) = 6.08, p = .015, \eta^2 = .053$. When there were hedge words, present people viewed the experience as less traumatic ($M = 3.97, SD = 0.99$), as opposed to when there was an absence of hedge words ($M = 4.37, SD = .88$). There was no main effect of a recent versus distant recollection, $F(1, 108) = .096, p = .757, \eta^2 = .001$. There was also no significant interaction between a recent or distant recollections and hedge

words, $F(1, 108) = .036, p = .850, \eta^2 < .001$. The Implicit Memory score significantly effected how traumatic the experience was believed to be, by rating it more severe $F(1, 108) = 8.66, p = .004, \eta^2 = .074$.



Severity of Punishment

Lastly, we ran an ordinal regression to assess the proper prison sentence for the defendant. The presence of hedge words did not change the severity of the punishment, $p = .330$. Participants in the distant condition had greater odds (OR = 3.13, 95% CI = 1.62, 6.0) of thinking that the defendant deserved a more severe punishment, $\chi^2(1) = 11.74, p = .001$. The Implicit Memory score did not significantly affect punishment severity, $p = .933$. See Table 4 for severity ratings per condition.

TABLE 4
Ratings of Severity Per Condition

<i>Condition</i>	<i>Question Type</i>				
	<i>Severity of Punishment</i>				
	1-2 years	3-5 years	6-10 years	11-15 years	16+ years
Recent Hedge	0	8	10	4	8
Recent No Hedge	2	12	6	1	5
Distant Hedge	0	6	11	13	11
Distant No Hedge	0	4	13	8	12

General Discussion

The overall purpose of this research was to examine whether participants’ perceptions of testimony credibility was influenced by the age of a memory (recent or distant) and hedge words (present or absent). The analyses of both Study 1 and 2 found that participants are not attuned to memories’ tendency to deteriorate over time. However, when participants were told through a cross-examination and overtly shown points of uncertainty within the direct examination, as done in Study 2, participants were influenced by the uncertainty the presence of hedge words demonstrated, regardless of the age of the memory.

In Study 1, it was hypothesized that there would be no difference in credibility or likelihood of guilt judgments for either distant or recent memories overall, but that there would be differences when hedge words were present. We further predicted that participants in the hedged conditions would perceive the testimony as less credible and be less likely to indicate that they believed the defendant committed the assault. Based on the results, participants did not

prove a noteworthy indication of recognizing hedge words as a sign of uncertainty. Credibility, believability, likelihood of guilt and whether the defendant committed the assault were not influenced by the presence or absence of hedge words within the direct examination testimony. Note, also, that the age of the memory did not significantly affect the ratings of credibility, likelihood of guilt and whether or not the assault occurred. The only one of our measures, which rated the believability of the testimony, was affected by the age of the memory. Participants found that the distant testimony, 15 years prior, was more believable than testimony from 4 years prior in coherence to similar findings by Smith and Schwarz (2016).

To further test the influence of hedge words and the age of memory, in Study 2 we added a cross-examination. Our goal in adding a cross examination was to help participants recognize the potential memory errors within the direct examination, by drawing attention to the claimant's use of hedge words (Liu & Foxtree, 2012). Although the direct examination alone was not able to significantly influence the participants' perceptions of the testimony, we predicted a cross examination that insinuated doubt by highlighting on the usage of hedge words would foster more skepticism. Thus, we hypothesized that participants would perceive testimony involving distant memories as less credible, especially when hedge words are present. However, our results demonstrated no effects of the age of memory – contrary to Study 1's main effect on participants rating of believability. In other words, participants responses were overall unaffected by the age of the recollection.

How do we explain the failure to find an effect? Perhaps, because the participants themselves were not the subjects of the memory recall, they were unable to recognize the implications of memories deteriorating or changing over time, especially from childhood (Strange & Hayne, 2013). However, recall that a similar study was conducted in which mock

jurors read about an assault occurring one year prior (Smith & Schwarz, 2016). This particular assault testimony included verbatim statements and specific details about clothing and assault wounds. Results rating the extremity of the assault found that jurors rated the experience more traumatic when the memory was from a distant rather than a recent event. In correspondence with our results favoring longer sentence time when the assault was from the distant past, the participants in Smith and Schwarz also advised harsher punishments for testimony's recalling distant events. Identifying that memory does fade over time, these participants assumed that good memory for a distant event suggested the event was especially significant (Smith & Schwarz, 2016). Therefore, alternatively, the participants in Study 1 may have believed that based on the claimant's ability to retain such a distant memory, it must have been especially traumatic and significant, rating it more believable (Smith & Schwarz, 2016).

We suggest, then, that jury members involved in cases relying on historical memories should be provided with the insight that, overly vivid memories from the distant past may not be accurate (Howe, 2013; Strange & Hayne, 2012; Paivya et al., 2011; Smith & Schwarz, 2016). Therefore, any case involving a distant or greatly detailed memory should be evaluated with caution when considering the plausibility.

Second, we predicted that participants would perceive recent memories as more credible and be less likely to indicate that the defendant committed the assault if hedge words were not present. The addition of the cross-examination did alter our results. Participants found the testimony less credible, believable and the defendant's likelihood of committing the assault lower when hedge words were present. However, there was no interaction between the hedge words and the age of memory. With the inclusion of a cross examination, the attorney was able to highlight and pinpoint areas of 'uncertainty' within the claimant's direct testimony. The

particular points he accentuated were those that included hedge words, such as "I think, maybe, kind of." We suggest then that participants needed the defense attorney to highlight the uncertainty in the cross examination to make sense of what hedge words might suggest.

We believe that highlighting uncertainty might also draw jurors' attention to the possibility of memory errors in the case of historical events. Research has demonstrated that memories deteriorate over time and source-monitoring errors are extremely common, in small and large (Simons & Chabris, 2011; Lindsay, 2008). Moreover, prior research has concluded that memories are frequently faulty, even more so the older they are (Howe, 2013; Paivia et al., 2011; Strange & Hayne; 2013; Schwarz & Smith, 2016). Research on childhood amnesia also indicates that the specific details adults claim to recall from childhood are often implausible or explained by other means, such as photographs (Pillemer, 1998; Strange et al., 2008; Bruce et al., 2005; Hayne, 2003).

In conclusion, our analysis of juror's perceptions of testimony credibility suggests the ability of hedge words to indicate uncertainty when that uncertainty is highlighted. Therefore, we recommend that the courts provide jurors with general insight on the reality of how memory works. While prosecuting attorneys may disagree, knowledge of these influential factors could provide a more fair and just trial for both the claimant and the defendant.

Limitations and Areas for Future Research

While our study was able to show the impact that hedge words have on jurors' perceptions of testimony credibility, of course, there were limitations to our design. One of our biggest limitations was the fact we created our own trial testimony and sexual assault account. Since the materials were not from a real trial, they lacked length, detail, interjections from the

opposing party and other additional information that would be included in a real case. While this helped us examine our chosen variables, it might not be ecologically valid. While we made our best efforts to make the testimonies as close to real as possible, the mere fact of them being ‘mock’ could have made it easier to pick up on our manipulations, such as hedge words. With the vast amount of information included in a real case testimony, hedge words may be so lost in the length or detail, that they might not be noticeable at all. It is possible the effect we observed would disappear with different materials.

Another crucial limitation is that sharp attorneys would not let their claimants testify and respond to questions in an “unsure” way. In our direct examination, the testimonies including hedge words portrayed the claimant as unsure – marked by expressions such as, "kind of, I think, maybe." While this was essential for our own research, in a real court case, a claimant would be coached before trial to avoid using any hedge words or phrases to insinuate uncertainty. Seemingly, while a defense attorney might act in accordance with our cross examination, pointing out the claimant's uncertainty, again, the claimant’s attorney would have prepped her beforehand. Essentially, while we all use such phrases in our daily language, especially if we are second guessing ourselves or recalling something from the distant past, a discerning counsel would make sure the client remained credible and would not produce ‘unsure’ testimony.

Furthermore, what is a recent or distant event is somewhat subjective. Of course, fifteen years ago is a distant memory for most of us, but not if one is 100-years old. Indeed, 4 years may not seem recent. Therefore, another limitation for this study is the issue of a 4-year prior memory being too old to really count as recent. Perhaps, a recent memory would only be classified to the general public, as 1-year prior and anything beyond 1 year ago would be considered distant. If so, then our manipulation would not have been particularly salient. In the future, a preliminary

survey could be given as to what people consider recent and distant in intervals, for example, 6 months – 1 year, 1 year – 3 years, 3 years – 5 years, and so on. This could better ensure that temporal distance manipulations are in accordance with the general public's beliefs.

On top of the need for a temporal distant change, we also did not definitively separate the age of memory from the concept of infantile amnesia. Essentially, the implications of childhood amnesia are separate from concerns about the validity of a memory that is 4 versus 15 years old. Our claimant was 19 regardless of condition but either experienced a memory 4 years prior when she was 15 years old, or 15 years prior when she was four years old. The problem with these age choices is that we did not distinguish between whether or not the participants were influenced by the actual temporal distance or the age at which the claimant would've been assaulted.

Lastly, another limitation of our study is the general weakness in reliability and validity of self-report measures, which may have decreased the likelihood of finding more significant differences between condition groups. Participants in Study 1 completed a Beliefs about Memory questionnaire and participants in Study 2 completed an Implicit Memory scale. Since these measures are self-report surveys, people may lie or be influenced by other external factors such as other people or using the Internet for answers. Since the surveys are self-administered on the Internet and a researcher did not directly ask questions to the participants, it is easy for participants to intentionally or unintentionally invalidate their responses. To lower the possibility of self-reporting impacting our results, we included several attention checks throughout the research study. These attention checks allowed us to ensure participants were paying attention and reading each question before selecting an answer. Any participant who failed an attention check was excluded from our analysis. We also included several questions that asked whether the participant took notes, spoke to someone during the survey, maximized their screen and or

stopped during the test. If the participant selected 'yes' to any of these questions, they were also excluded from analysis to avoid any invalid responses.

Moreover, there is indefinitely room for future research to extend upon our current findings. Future research should focus particularly on the age of memory manipulation. While we initially thought the age of memory would yield more significant results than hedge words, such as finding the testimony not credible because the memory was too distant, it did not (Strange & Hayne, 2012; Howe, 2012; Pillemer, 1998; Wells et al., 2013;). It may be helpful to further examine the actual age of the memory to determine whether people are overall not attuned to memories weakness over time or if our choice of temporal distance was not effective. More so, future research could delve into the age of the claimant at the time of the assault on top of the temporal distance. There could be significant differences of whether people are influenced more by the claimant's age at the time of the assault or how many years passed between the assault and the recollection. Researchers could alter the age of the memory, changing the recent event to 1-year prior but maintain the distant event as 15 years prior. The inclusion of more hedge words in each testimony may also alter results. These suggestions may further determine whether participants are more affected by signs of uncertainty– or if a change in the age of the memory would significantly hinder the claimant's credibility.

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Appendix A
Study listing on Amazon Mechanical Turk:

Name of Study: Perceptions of Trial Testimony

Description: An experiment on criminal justice topics. You will be asked to read a mock court trial transcript of a teenage girl reporting a sexual assault and answer questions about the incident. Participation in the experiments should take roughly 1 hour. Anyone over the age of 18 is eligible.

Appendix B

CITY UNIVERSITY OF NEW YORK

John Jay College of Criminal Justice

*Department of Psychology***CONSENT TO PARTICIPATE IN A RESEARCH PROJECT****Project Title:** *Perceptions of Trial Testimony***Principal Investigator:** DERYN STRANGE, PHD

Associate Professor

John Jay College of Criminal Justice

10.65.14NB

524 West 59th Street, New York, NY 10019

(212) 484-1345

Site where study is to be conducted: John Jay College of Criminal Justice (Online platforms)

Introduction/Purpose: You are invited to participate in a research study because you are 18 years of age or older. The study is conducted by Justine Rayborn and Kristyn Jones under the direction of Dr. Deryn Strange. The purpose of this research is to understand how people perceive courtroom testimony, particularly regarding a sexual assault. The results of this study may inform theory and affect courtroom procedure in the future.

Procedures: Approximately 400 people are expected to participate in this study. You will complete the study at a time convenient to you online. You will be asked to read a mock court trial transcript of a teenage girl reporting a sexual assault and be asked to answer some questions and give us your thoughts about that court trial transcript. This session is expected to take about 45 minutes to complete.

Possible Discomforts and Risks: It is important to note that your participation will involve reading a court trial transcript about the report of a sexual assault made by a teenage girl. Please do not participate in this study if you think that you may be adversely affected by reading this material. Please also note that you may stop participating at any point. If you are at all upset as a result of participation, a searchable database of mental health services throughout the country is available at the following address: <http://store.samhsa.gov/mhlocator>

Benefits: There will be no direct benefits to you. However, participating in the study will help us to discern how the public perceives court trial transcripts involving a sexual assault.

Voluntary Participation: Your participation in this study is voluntary, and you may decide not to participate without prejudice, penalty, or loss of benefits to which you are otherwise entitled. If you decide to leave the study, please contact the principal investigator Dr. Deryn Strange (dstrange@jjay.cuny.edu) to inform her of your decision.

Costs: Participation in this study will involve no cost to you, the participant.

Payment for Participation: As compensation for your participation, upon completion of the session, you will receive either a) two research credits (equivalent to 1 hour) via SONA or b) \$0.60 via Amazon Mechanical Turk. You will receive this credit (prorated) even if you discontinue your participation.

Confidentiality: The data obtained from you will be collected as written data. Once you begin the study, you will be provided a participant code, unrelated to your name, to store your responses accordingly. Your participation in this online survey involves risks similar to a person's everyday use of the Internet, and confidentiality will be maintained to the degree permitted by the technology used. We will ask you to record your Student ID or Mturk ID in Qualtrics so that you can receive course credit or payment, but your name will not be linked directly to your survey responses. When we download the data set from Qualtrics, we will store it on a password-protected computer accessible only to the PI and trained research assistants as well as the Institutional Review Board. You will never be identified in our research project or any other presentation or publication, and only aggregate data will be presented. All of your data will be stored in a password-protected file in a secured and locked laboratory.

Contact Questions/Persons: If you have any questions about the research now or in the future, you should contact the Principal Investigator Dr. Deryn Strange, (212) 484 1345 or dstrange@jjay.cuny.edu. If you have any questions about your rights as a research participant or if you would like to talk to someone other than the researchers, you can contact CUNY Research Compliance Administrator at 646-664-8918.

Statement of Consent:

"I have read the above description of this research, and I understand it. I have been informed of the risks and benefits involved, and all my questions have been answered to my satisfaction. Furthermore, I have been assured that the principal investigator of the research study will also answer any future questions that I may have. I voluntarily agree to participate in this study.

By agreeing to this form I have not waived any of my legal rights to which I would otherwise be entitled."

Please click next to give your consent and begin the study.

Appendix C

Direct Examination

C: Please state your name for the record

P: Samantha Dean

C: What's your date of birth?

P: February 2, 1996

C: And, that makes you how old today?

P: I am 19

C: I'm going to ask you to tell the judge about an incident that occurred in August of 2011/2005, during your summer break. Do you remember that summer break?

P: Yes

C: Was there something significant that occurred during that time period?

P: Yes.

C: Can you tell the judge what happened at that time?

P: Yes. Well, it was my mom and dad's 25th anniversary, and they were having a barbecue in our backyard. [I think] most of the guests were my parent's friends and there was some family. We were all in bathing suits, [I think], near the pool. Well, I [pretty much] remember wearing a bathing suit because it was getting late and then me and my mom went inside to change. I went up to my room and then [um] my Uncle Freddy was standing in the hallway. [I think] [he might have] been using the bathroom upstairs [or something]. He was [kind of] slouched to the side like he had been drinking a lot. He was trying to say something to me, but I [must have] ignored him and kept walking to my room. And I was sitting on my bed when [um] he opened my door and walked over to

me. I [kinda remember] knowing something was wrong right away, and he said [something like] it'll be our little secret and he made me spread my legs and [-ah, -um] he put his fingers inside me.

C: How old were you at the time 4/15.

P: So what were you wearing when he walked into your room?

C: [I think] I still had my bathing suit on.

P: Did your bathing suit stay on or did it come off at any time?

C: Part of it came off.

P: Which part?

C: My bottoms.

P: And how did that happen?

C: He [must have] taken them off when he started touching me.

P: What do you mean by "touching"?

C: He put his finger inside me.

P: What emotions were you feeling when he came into your room and did this?

C: I was really scared.

P: Did you scream or try to get away?

C: I couldn't scream because he told me [like] that if anyone heard me that he'd hurt my family, but I [probably] was trying to get away, but he was holding me down by my arms.

My wrists were really sore the next day.

P: Did you share your room with anyone at the time?

C: No.

P: And where was everyone else during the incident?

C: I don't know.

P: But they weren't near your room when it happened?

C: I don't know. My door [must have] been closed so no one could see.

P: About how long did this go on for?

C: [About] 10 minutes.

P: And what time of day did this occur?

C: [Sometime around] 7. It was dark outside.

P: Can you describe the layout of the room?

C: My bed was in the corner of the room and [um] I had a desk under the window. And I [think] I can remember a green chair by my closet.

P: You said your mom came inside the house with you to change. Where did she go when you guys were inside?

C: Her room, [I think].

P: Where is her room in relation to yours?

C: Hers was downstairs, and mine was upstairs.

P: Did anyone else have a room upstairs?

C: No there was just a guest room.

P: So prior to this event, did you experience any sexual abuse by your uncle?

C: No but sometimes he would [maybe] give me weird looks.

P: What kind of looks?

C: Just looks that [I guess] made me feel uncomfortable.

P: So you said that your uncle looked drunk when you saw him in the hallway. How were you aware that he was drunk?

C: Like I said, he was [like sort of] slouched over and then I could smell alcohol on his breath.

P: Was there any other touching other than what you described?

C: No.

P: Did your uncle talk at all during this time?

C: Only after he was done - to threaten me. He said [something like] he'd hurt my family if I ever told.

P: What happened after he said that?

C: He walked out, and I stayed there. My mom came in [maybe] a little bit later looking for me.

P: Did you tell her what happened?

C: No. I was scared that he'd really harm my family.

Appendix D

Hedge Words Used in Direct Examination Testimony

I think

Um

Pretty much

Or something

He might of

Kind of

Must Have

Kinda Remember

Like

Probably

Must Have

About

Sometime around

Maybe

I guess

Sort of

Something like

15. Memories of physical trauma are sometimes "stored" in the muscles of the body.

SD D N A SA

16. "Forgetting" something just means you can't find the place where the information is permanently stored.

SD D N A SA

17. By using special therapeutic techniques, some people can remember things that happened while they were in their mother's womb.

SD D N A SA

18. Things we see on television can blend with our memories of truly experienced events.

SD D N A SA

19. Memory records and stores all of our experiences since birth.

SD D N A SA

20. A pretty good rule of thumb for determining the accuracy of a person's memory for an event is the amount of detail he/she uses when reporting the memory.

SD D N A SA

21. Memories of painful experiences are sometimes pushed into the unconscious.

SD D N A SA

22. Nothing is ever truly forgotten.

SD D N A SA

23. We usually only remember the basic gist of typical experiences.

SD D N A SA

24. The muscles and skin of the body can remember and store whatever experiences the mind chooses to forget.

SD D N A SA

25. A "spotty" or "fragmented" portion of childhood memories usually means something traumatic has occurred.

SD D N A SA

26. Memory is usually not very good for traumatic or stressful situations.

SD D N A SA

27. Some athletes are so highly skilled that their muscles remember what to do and how to move.

SD D N A SA

28. Things we read about can accidentally get confused with truly experienced events.

SD D N A SA

29. Very traumatic events can sometimes be pushed out of a person's awareness.

SD D N A SA

30. Newborn memories can sometimes be recalled with the proper therapeutic techniques.

SD D N A SA

31. Lost memories for unpleasant experiences reside in the unconscious, where they often cause a lot of emotional damage.

SD D N A SA

32. People often fill in the gaps in their memory with events that 'make sense' but never actually occurred.

SD D N A SA

33. It is not unusual for people to have accurate memories of events for the first few days after birth.

SD D N A SA

34. If we really focus our attention on remembering, it is possible to retrieve memories of especially important but frightening events, such as baptism or circumcision.

SD D N A SA

44. With self-help books, videos, or other materials:

1 **2** **3** **4** **5** **6**

45. Do you know someone personally who has had therapy to recall previously unremembered events?

Yes___ No___

Thank you. This is the end of the beliefs about memory survey.

Appendix F

Project Title: Perceptions of Trial Testimony

Description: You will be asked to read a mock court trial transcript of a teenage girl reporting a sexual assault and answer questions about the incident. Anyone over the age of 18 is eligible to participate.

Estimated Time: 1 hour

Compensation: 2 credits

Appendix G

Cross Examination

DEFENSE: Good morning, Ms. Dean.

MS. DEAN: Good morning.

DEFENSE: My name is Zachary Cawley. I'm the Defense for Mr. Lowry. I'm going to be asking you some questions. Is that okay?

MS. DEAN: That's all right.

DEFENSE: I'll start by asking you when the sexual abuse occurred. You're testifying about sexual abuse that occurred (4/15) years ago. Is that correct?

MS. DEAN: Yes.

DEFENSE: And how old are you today?

MS. DEAN: I am 19.

DEFENSE: So, you were (4/15) when these events took place?

MS. DEAN: Yes.

DEFENSE: So would you say this happened a long time ago?

MS. DEAN: No I wouldn't say that. [Yes I would say that].

DEFENSE: OK. Let's see if you can recount the details for us so that we can better understand what happened.

DEFENSE: How do you know Mr. Lowry?

MS. DEAN: He is my uncle.

DEFENSE: How regularly did you see Mr. Lowry (4/15) years ago?

MS. DEAN: I [might have seen] saw him once or twice a year for family holidays [maybe].

DEFENSE: Are you sure you can remember the event exactly as it happened?

MS. DEAN: Yes, [I think] I can.

DEFENSE: Even though it occurred when you were (4/15) years old?

MS. DEAN: Yes, I [probably] can.

DEFENSE: Let's continue, then. You state that Mr. Lowry touched you in your bedroom at home?

MS. DEAN: Yes. [I believe] that's what happened.

DEFENSE: Where on your body did he touch you?

MS. DEAN: My private areas.

DEFENSE: Could you be more specific and describe the events to the jury?

MS. DEAN: Well, I [kinda] remember knowing something was wrong right away when he entered my room after I had been alone in my room for [maybe] 10 minutes. He came up to me and said [something like] it'll be our little secret and he made me spread my legs, and he put his fingers inside me.

Q: Did Mr. Lowry undress you?

A: Well, yes. [I think] I [probably] had changed out of my bathing suit.

Q: Miss Dean, are you sure of the events? You stated that you were in your room for "[like] 10 minutes" and then Mr. Lowry entered your room. Is that correct?

MS. DEAN: I'm [quite] certain that's how it happened.

DEFENSE: How did Mr. Lowry seem when you saw him in your room?

MS. DEAN: Well, he was [probably] drunk because I [sort of] remember him smelling like alcohol.

DEFENSE: But you didn't actually see him consuming alcohol, correct?

MS. DEAN: No, but he was [might have been] slurring his words and wobbling as he walked.

DEFENSE: So could you just have assumed he was intoxicated?

MS. DEAN: No [maybe]. He just smelled bad, like alcohol.

DEFENSE: Okay. Did you move forward or try to push him away?

MS. DEAN: I'm [almost] certain I did.

DEFENSE: Are you saying you couldn't leave the room?

MS. DEAN: I couldn't

DEFENSE: Are you able to remember whether someone else may have noticed he was alone with you in your room?

MS. DEAN: I'm [pretty] sure my mom was in her room, and he [probably] closed my door.

DEFENSE: So no one would have been able to hear anything was happening?

MS. DEAN: I'm [fairly] certain. And he was [probably] covering my mouth, so I couldn't scream and I know I was struggling, but he was much stronger than me.

DEFENSE: Again, you testified that this happened (4/15) years ago, which is quite some time ago. Is it possible that things did not happen as you say they did?

MS. DEAN: I know he touched me. [but I guess I can't remember everything exactly.]

DEFENSE: No further questions.

Appendix H

Hedge Words Used in Cross-Examination Testimony

Might have seen

Maybe

I think

Probably

I believe

Kinda

Something like

Quite

Sort of

Almost

Pretty

Fairly

But I guess I can't remember everything exactly

Appendix I

Implicit Memory Scale

1. Each event that a person can recall really happened.
2. If one could scan the human brain, it would be possible to access all the events from a person's life.
3. It is enough to have an unclear image of an event to be sure that one has really experienced it.
4. Hypnosis makes possible the recollection of events that someone was not able to recall.
5. All experiences are permanently stored in memory, but not all of them can be retrieved.
6. Sometimes a memory of an event is a mixture of what really happened and what we thought that might happen.
7. Events that are not remembered at the moment can be recovered with special psychological techniques.
8. If someone has a very clear image of an event, it must have happened to him/her.
9. Recalling events is like playing back a tape recorder.
10. Sometimes memories of events encompass what really happened as well as our fantasies and imaginations.
11. Hypnosis enables us to recall events from early childhood.
12. At times we think that we remember some events whereas they did not take place.
13. In the future scientists can create a method that will enable them to decode the entire past of a person.
14. Only those events that a person has really experienced can be later vividly and completely imagined.
15. Each time we recall an event we do it in a slightly different way.
16. If someone can imagine an event in detail s/he must have experienced it.
17. Frequent attempts to recall an event can result in believing in something that did not happen.
18. All experiences are permanently stored in memory, but the paths that lead to them fade away.
19. If someone can form a mental image of an event s/he must have seen it before.

20. The memories of events that we experienced undergo constant changes.
21. Sometimes we recall events that did not happen.
22. A psychologist can retrieve from our memory the recollections of events we were not aware of.
23. All our experiences are stored in memory and sometimes they just pop-up in our minds.
24. Each memory is composed of what really happened and what we made up ourselves.
25. Something that we recall after a long time may differ from what we have encoded only in the amount of information and details.
26. Sometimes the details that do not correspond to reality slip into our memories of events.
27. Memory is like a video camera that records all experiences of an individual.
28. If someone can imagine an event, it means that s/he has experienced it.
29. Sometimes elements of movies or stories creep into memories of real events.
30. There are such vivid memories from childhood that one can be absolutely sure that they are exact copies of reality.
31. The memory of an event changes each time we recall it.
32. When you very often dwell on a fictitious event, it may produce a feeling that it really happened.
33. An event that we recall at the moment can differ substantially from the one that we have encoded .
34. Some memories are so vivid that one can be absolutely sure that they are an accurate copy of reality.
35. Hypnosis is a very good method for recovering memories from the distant past.
36. Recalling events is like solving a puzzle in which some elements are retrieved, and other elements are made up.