THE CONSISTENCY OF REPEATED WITNESS TESTIMONY LEADS TRIERS-OF-FACT TO OVER-RELY ON THE POWER OF A SINGLE VOICE

by

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Abstract

Are claims more credible when made by multiple people, or is it the repetition of claims that matters? Some research suggests that claims have more credibility when independent sources make them. Yet, other research suggests that simply repeating information makes it more accessible and encourages reliance on automatic processes—factors known to change people's judgments. In Experiment 1, subjects took part in a "misinformation" study: Subjects first watched a video of a crime and later read witness reports attributed to one or three different witnesses who made misleading claims in either one report or repeated the same misleading claims across all three reports. In Experiment 2, subjects who had not seen any videos read those same reports and indicated how confident they were that each claim happened in the original event. Subjects were more misled by—and more confident about—claims that were repeated, regardless of how many witnesses made them.

These findings led us to hypothesize that the repeated claims of a single witness are seen as consistent, while the claims of multiple witnesses are seen as having consensus. We tested this hypothesis in Experiments 3 and 4 by asking subjects who had not seen the video to read the reports that repeated the claims. In Experiment 3, half of the subjects read reports that contained some peripheral inconsistencies. In Experiment 4 all subjects read reports that contained inconsistencies, but half of the subjects were warned about the accuracy of the inconsistent reports. Later, everyone indicated how confident they were that each claim really happened. Warning subjects about the inconsistent reports (Experiment 4) led them to rate the repeated claims of a single witness—but not multiple witnesses—as less credible; A finding consistent with our hypothesis.

In Experiment 5, we tested an alternative explanation that a failure to attend to the source of the information may explain our findings by asking half of the subjects to complete a source monitoring component with their confidence test. We failed to find evidence for this explanation.

We conclude that subjects interpreted both the consistency of a single witness's repeated claims, and the consensus among multiple witnesses' converging claims, as markers of accuracy. Importantly, warning subjects about the accuracy of the inconsistent reports reduced subjects' confidence in the claims made by a single witness, but not multiple witnesses. These findings fit with research showing that repeating information makes it seem more true, and highlight the power of a single repeated voice.

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Table of Contents

Chapter 1

People who witness the same event will often remember it differently: a student remembers her teacher saying that the father of psychology is Freud, while another remembers it being Wundt; one person at the parade remembers hearing shots coming from the grassy knoll while another remembers hearing shots from the book depository; a witness testifies in court that the burglar fled the scene in an electrical company van—another remembers the van with a different company name. "I saw the burglar drive off in an RJ's electricians van," Aidan mistakenly reports to Emily, who remembers it as an AJ's electricians van. These differences can even lead people to be misled about what really happened: the father of psychology becomes Freud, the shots come from the grassy knoll, and Emily's memory contains RJ's electricians (French, Garry, & Mori, 2008; Gabbert, Memon, & Allen, 2003).[1]

We also know that repeated misleading claims do more damage to people's memories than claims made only once (Mitchell & Zaragoza, 1996; Zaragoza & Mitchell, 1996). What we do not know is the answer to two questions: Does one person who repeats misleading claims do more damage to people's memories than that same person making the claim only once? And when those misleading claims are repeated, does it matter how many people make those claims? For instance, suppose a witness (call him Aidan) tells other witnesses, "The burglar drove an RJ's electrician's van." Would Aidan's claim do more damage to another

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1 Portions of this thesis appeared in:

Foster, J. L., Huthwaite, T., Yesberg, J. A., Garry, M., & Loftus, E. F. (2012). Repetition, not number of sources, increases both susceptibility to misinformation and confidence in the accuracy of eyewitnesses. Acta Psychologica, 139, 320-326. doi:10.1016/j.actpsy.2011.12.004

But I have expanded on the introduction, data, analysis and discussion in this document.

witness's memory if Aidan states the claim once, or repeats it three times? By contrast, suppose that Aidan says, "The burglar drove an RJ's electrician's van." Later, another witness (Ben) also says the burglar drove an RJ's electrician's van, and still later a third witness (Cheryl) says the same thing. Would Aidan, Ben and Cheryl's converging claims damage another witness's memory more than if Aidan had simply repeated the same claim three times? Put another way, do claims do more damage when made by multiple sources, or is it the repetition of claims that matters? That is the question I address in this thesis.[2]

The Misinformation Effect

Nearly four decades of research shows that even the unrepeated, misleading claims of a lone eyewitness often damage memory. In a classic study, subjects watched a simulated auto accident in which a car stopped at a stop sign (Loftus, Miller, & Burns, 1978). Later, when they were asked questions about the accident, half of the subjects read a misleading detail in the stem of the question—that the car was stopped at a yield sign, rather than the stop sign. Later, everyone was asked to identify what they saw in the accident. Subjects who read the misleading details were more likely to falsely recognize a scene containing a yield sign than subjects who were not given the misleading detail. In short, subjects incorporated the misleading details from the question, into their memory reports of the event.

This finding, known as the *misinformation effect* (Tousignant, Hall, & Loftus, 1986), has been demonstrated in thousands of published studies from laboratories in many countries. As of 2012, 1,456 published papers contain the search terms

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2 Although the research in this thesis is my own, I conducted it in a lab and supervised a team comprised of research assistants and honors students. I also received advice and direction from my supervisors. Therefore, I often use the word "we" in this thesis to reflect that fact. As you will also see, I use the word "we" in a different context to refer to what is known (or not known) in the wider scientific community.

misinformation effect, *misleading postevent*, or *misleading information.*[3] This research shows that a range of both cognitive and social factors can influence people's susceptibility to misinformation.

For example, on the cognitive side, people who score low on measures of intelligence are more likely to be misled than people who score high (Zhu et al., 2010); children are more likely to be misled than young adults (Sutherland & Hayne, 2001; Exp. 2); and people given placebo alcohol are more likely to be misled than people who are told the drink is a placebo (Assefi & Garry, 2003).

Perhaps more interestingly, social factors also influence people's susceptibility to the misinformation effect. In one study, researchers asked subjects to watch a slideshow of a mock crime and then listen to a recording of a summary of the crime that contained misinformation (Vornik, Sharman, & Garry, 2003). The recordings were of a person using one of two different accents. Subjects who heard a socially attractive accent on the recording were more likely to be misled than subjects who heard a less socially attractive accent. Other social cues can affect people's susceptibility to misinformation as well. For example, people are more likely to be misled by their romantic partners than a stranger and less likely to be misled by people with a motivation to lie than people without a motivation to lie (Dodd & Bradshaw, 1980; French et al., 2008).

Taken together, these findings that both social and cognitive cues can affect people's susceptibility to misinformation suggests that both the number of times misleading claims are made, and the number of people making those claims, may affect people's susceptibility to misinformation. More specifically, the number of times a claim is made may make it more cognitively available—that is it comes to

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3 This figure was found using the PsycINFO database, and included the variant spelling post-event.

mind more easily—while the number of people making the claims may act as a social cue for accuracy.

The Source Monitoring Framework

How does misleading information cause people to make these memory errors? The most promising account involves the source monitoring framework, which describes the process by which people distinguish true and false memories (Johnson, Hashtroudi, & Lindsay, 1993; Lindsay, 2008). According to the source monitoring framework, people use the qualitative characteristics of memories—such as how vivid or clear the memory is—to distinguish the source of that memory. For example, when waking after a nightmare, people can draw on the characteristics of the dream (such as the smells, sounds, etc.), matching them up with the characteristics they expect from reality to recognize that they were not really being chased by whatever their imagination has created. What follows is that when the characteristics of a dream or other mental products rival those of reality, people may fail to distinguish between the two.

How does the source monitoring framework account for the misinformation effect? When given misleading post-event information and later asked what happened in the original event, people's memory of the misleading information may have qualitative characteristics that rival those of true memories. As a result, people confuse the misinformation for genuine experience. Research supports this idea: Asking people to identify the source of misinformation reduces the misinformation effect. In one study, subjects looked at a photo of a cluttered office space (Lindsay & Johnson, 1989). Later, they read a text about what was shown in the photo, but for half of the subjects, the text mentioned some items

that were not actually in the photo. Later, half of the subjects were asked to complete a *source monitoring test* in which they identified whether certain items were mentioned in the text only, seen in the photo only, completely new, or both mentioned in the text and seen in the photo. The other half of the subjects simply responded yes or no to whether they saw the item in the photo. They found that subjects given the source monitoring test more accurately recognized that the misled items were not from the photo than subjects who completed the standard—yes/no—recognition test. This finding demonstrates that the more effortful monitoring processes that the source monitoring test is thought to drive can reduce people's susceptibility to more heuristically driven source monitoring errors.

A failure to accurately monitor the source of a memory can lead to more than just belief in things that are not true. Memory implantation research has led people to remember entire fictitious events such as taking a ride in a hot-air-balloon, spilling a punch bowl at a wedding, and being attacked by a dog (Hyman, Husband, & Billings, 1995; Porter, Yuille, & Lehman, 1999; Wade, Garry, Read, & Lindsay, 2002). More importantly, the same source monitoring mechanisms thought to drive errors in belief, are also considered to be responsible for people remembering entire fictitious events.

In other words, we might think of these memory errors as source monitoring failures. But while failures in source monitoring may make people believe things that are not true, we rely on source monitoring for a variety of every day activities. More specifically, we use source monitoring to avoid inadvertent plagiarism, know whether your memory of turning off the iron was from this morning or yesterday morning, and to decide whether to trust other people's

memories (Brown & Murphy, 1989; Johnson, Bush, & Mitchell, 1998; Lindsay, 2008).

Trusting Multiple Sources

In fact, we sometimes put more trust in our own memories of an event when others remember it the same way. In one study, pairs of family members or friends were asked to think of an event that they each remembered differently (Ross, Buehler, & Karr, 1998). The pairs listed each step of the event and rated how confident they were in their memories of each step. People put more trust in their own memories of each step when their partner remembered that step the same way than when their partner did not.

Similarly, we put more trust in the overlapping portion of a group of other people's memories than the non-overlapping portion. In another study, subjects saw maps of where three different witnesses had reported seeing the body of a missing person (Harris & Hahn, 2009). The maps described a broad area (such as a neighborhood) rather than a specific location. Later, subjects reported the probabilities of where the person was located. The results showed that subjects put more trust in the areas where witnesses overlapped than the areas where they did not overlap.

Our trust in multiple witnesses who have reached a consensus is justified: Consensus among a group of people can be a good measure of what is true (de Puiseau, Aßfalg, Erdfelder, & Bernstein, in press). More specifically, multiple witnesses identifying the same suspect are generally more accurate than a single witness identifying the suspect (Clark & Wells, 2008). People seem to know this

principle intuitively, and put more faith in the claims of multiple witnesses than the unrepeated claims of a single witness (McAllister & Bregman, 1986).

Taken together, these findings suggest that the number of people making a misleading claim should affect people's susceptibility to misinformation over and above the number of times the claim is made.

The Power of Repetition

The Truth Effect.

We know from research on the truth effect that people tend to believe information is more likely to be true when they have seen that information before. Specifically, the more times people have seen that information the more true they will believe it is (Alter & Oppenheimer, 2009; Arkes, Boehm, & Xu, 1991; Dechêne, Stahl, Hansen, & Wänke, 2010; Kelley & Lindsay, 1993; Lindsay, 2008; Unkelbach, 2007; Unkelbach & Stahl, 2009). Why might people believe information is true simply because it was repeated? One explanation of the truth effect is that the repeated information becomes more cognitively available. This accessibility leads to feelings of familiarity—feelings that are often interpreted as truth (Kelley & Lindsay, 1993; Lindsay, 2008). As a result, repeated information feels more true than unrepeated information.

The research on the truth effect also suggests that the number of times a claim is made might be more important than the number of people who say it. When misleading information is repeated it may become more cognitively available, leading people to believe it is more true—regardless of how many people say it.

Repetition.

We also know that repetition affects more than just people's perceptions of truth. For example, simply repeating information can change the judgments a person makes about that information. Subjects in one study were asked to read aloud a list of names of non-famous people (e.g., Sebastian Weisdorf). The next day, subjects read another list of names containing both famous (e.g., Christopher Wren) and non-famous names. When subjects were asked to identify which names were famous and which names were not famous, the non-famous names from the day before became famous. In other words, people tended to mistakenly call a non-famous name famous if they had read the name the day before (Jacoby, Kelley, Brown, & Jasechko, 1989).

Repetition can even affect our financial choices. We know that people will like a stock more after repeatedly viewing news reports about it—even when those news reports are from the same day. In that study, subjects watched several news reports about a specific stock (Unkelbach, Fiedler, & Freytag, 2007). For half of the subjects, the same day's news report about the stock increasing in price was shown from a separate television channel. Later, subjects were asked how much they liked the stock. Unkelbach et al., found that as the number of news reports showing an increasing price repeated, subjects liked the stock more—even if the news reports simply repeated from the same day. Interestingly, this effect continued even when subjects were warned about the repetition of news reports from the same day.

Repetition can also change our personal memories. In one study, university students looked at photos of university campus locations both on their campus and from a completely novel campus in another state (Brown & Marsh, 2008). Later, these students looked at photos from both campus locations, and tried to

identify if they had ever visited any of those locations. The more times subjects had seen a photo from a novel campus, the more likely they were to falsely remember having visited that campus.

Finally, repetition can skew our sense of other people's approval (Weaver Garcia, Schwarz, & Miller, 2007). Subjects in one study read about the opinions of New Jersey homeowners who were in favor of putting more parks into their neighborhoods. Some subjects read only a single opinion from a single homeowner, while others read three opinions that were attributed either to three different homeowners or all to the same homeowner. Later, subjects reported what percentage of all homeowners they believed were in favor of the parks. Subjects believed those opinions were more prevalent among homeowners when they read three opinions than when they read only one opinion—even when subjects knew all three opinions were from the same homeowner's opinion being repeated. In other words, people believed that one person's opinion better represented the population's opinion when it was repeated than when it was not.

The feelings of familiarity that arise from repetition may likely increase people's susceptibility to misinformation. Indeed, feelings of familiarity are thought to be one driver of the misinformation effect: When people are exposed to misleading postevent information, that postevent information becomes familiar to them. Later, people cannot easily differentiate the sources of their feelings of familiarity. In other words, people cannot tell whether those misleading details feel familiar because they saw them, or because they heard about them later (Johnson et al., 1993; Lindsay, 2008). Considered as a whole, this research on the effects of repetition suggests that the number of times a claim is made might be more important than the number of people who say it.

Indeed, some research on the misinformation effect suggests that the number of different witnesses who report misleading information should not matter as much as the number of times they report that misinformation. For instance, repeated misinformation misleads people more than unrepeated misinformation; the likely explanation is that although people find repeated misinformation more familiar, they have no accompanying increase in their ability to monitor the source of that familiarity (Zaragoza & Mitchell, 1996).

Repetition From Multiple Sources

Zaragoza & Mitchell's (1996) findings also suggests that repetition and the number of sources repeating misinformation may both play an important role in people's susceptibility to misinformation. In other words, the number of times a claim is made and the number of people who say it might interact.More specifically, Zaragoza and Mitchell asked subjects to read misleading questions about a film, and found that subjects who were misled multiple times were more likely to incorporate that misinformation into their memory reports than subjects that were misled only once. But when the researchers repeated misinformation using multiple presentation styles (written, video, audio), subjects were even more misled than when they repeated misinformation using only one presentation style (Mitchell & Zaragoza, 1996).

However, Mitchell and Zaragoza's manipulation of presentation styles differs from a manipulation of the number of sources in important ways. Perhaps most importantly, is that their manipulation was not one that would warrant any change in the information's credibility. That is, presenting information in a variety of formats does not, in itself, make it more likely to be true. In contrast, a group

consensus—or information repeated from multiple sources—generally does make that information more likely to be true (Clark & Wells, 2008; de Puiseau et al., in press). In light of this difference, our research addresses how the number of sources—rather than the number of presentation styles—affects people's susceptibility to misinformation.

Other research shows that trustworthiness matters as well: Repeated information from a trustworthy source becomes more believable than repeated information from an untrustworthy source (Begg, Anas, & Farinacci, 1992; Unkelbach & Stahl, 2009). Taken together, this research suggests that if one person repeats a claim it might make that claim more misleading than were it not repeated—but if several people all make the same claim, it might trump repetition alone, making that claim more misleading still.

Overview

In our first two experiments, we explore whether what matters is the number of times information is given or the number of people who give that information. In Experiment 1, we asked if repeating misleading claims changes the way subjects report details about a witnessed event, regardless of how many witnesses repeat those claims.

In Experiment 2, we asked if repeating testimony changes the way subjects judge the credibility of the information they provide, regardless of how many witnesses repeat that testimony. To answer this question, subjects followed a similar method to Experiment 1, but did not witness the original event. Instead, they merely read witness descriptions of the event, and rated their confidence on

whether certain details in the reports were true. In Experiments 3 through 5, we explore the mechanisms that might drive the findings from Experiments 1 and 2.

Chapter 2

Experiment 1

The primary purpose of Experiment 1 was twofold: to determine if repeated, misleading claims change the way subjects report details about a witnessed event, and to determine if the number of witnesses repeating those misleading claims matters. To answer this question, subjects took part in an experiment using the misinformation paradigm (Loftus et al., 1978; Mitchell & Zaragoza, 1996; Takarangi, Parker, & Garry, 2006).

In Experiment 1, subjects first watched a video of an electrician who stole items while doing repairs at a client's house. Later, they read three eyewitness police reports—ostensibly written over three consecutive days—about the activities of the electrician. Sometimes, all three reports misled subjects about what happened in the video; other times only one of the three reports misled subjects. To manipulate how many witnesses wrote the reports, we told half the subjects that three different witnesses made these reports; we told the other half that the same witness made all three reports. For example, subjects read three witness reports from Day 1, Day 2, and Day 3: For half of the subjects, Eyewitness 5 made the Day 1 report; Eyewitness 9 made the Day 2 report, and Eyewitness 16 made the Day 3 report. The other half read the same reports—but all three reports were attributed to Eyewitness 9. Later, we asked everyone to take a surprise memory test to tell us what they saw in the event.

Method

Subjects

Sixty-four introductory psychology students completed the experiment as part of a course requirement.

Design

We used a 2 (report repetition: repeated, not repeated) x 2 (source: one witness, three witnesses) x 2 (item type: misled, control) mixed factors design manipulating repetition and source between subjects, and item type within subjects. Unless otherwise noted, subjects were evenly distributed between conditions in all experiments.

Procedure

We adapted materials from Takarangi et al. (2006). Subjects took part in groups of no more than five; as Figure 2.1 shows, the experiment proceeded in three phases.

Phase 1. In the first phase, subjects watched a 6 minute and 34 second video of an electrician named "Eric" stealing items from a client's house on individual laptops. There were two versions of the video, which were identical in all respects with the exception of eight digitally altered critical items (see Figure 2.1). Video version was counterbalanced across subjects. After watching the video, subjects completed a 15 minute Sudoku filler task.

Phase 2. In the second phase, subjects read three witness reports ostensibly written by subjects in a previous experiment. In fact, the experimenters had written the witness reports, which described the electrician's actions. Reports were prominently labeled as: 1) the transcript of a police interview; 2) a written police statement; and 3) the transcript of a followup police interview; each report was dated to show that they were completed across three consecutive days.[4]

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4 Samples of these witness reports appear in Appendix C.

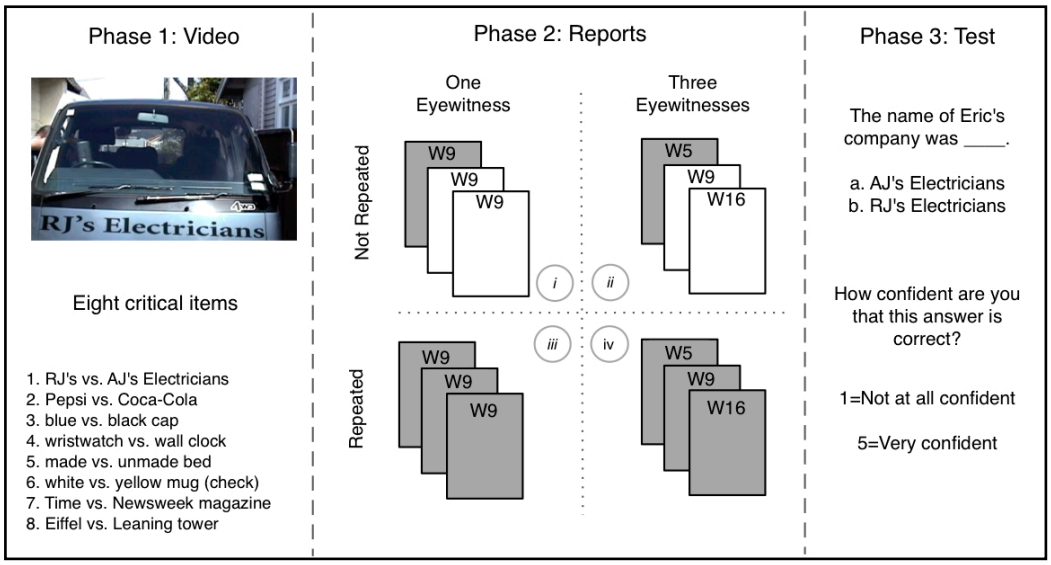

Figure 2.1. Illustration of Experiment 1 methods. In Phase 1, subjects watched a video of a mock crime containing eight critical items that were digitally manipulated between two versions. In Phase 2, subjects read three witness reports attributed to either one witness or three different witnesses. Some subjects read three reports with misleading details (the gray reports) while others read one report with misleading details and two control reports (the white reports) with no misleading details. In Phase 3, subjects took a surprise, two-alternative forced choice recognition test about what they remembered from the video and were asked to rate their confidence in their answer.

For each of the three reports, we prepared two versions: a control version and a misleading version. The control versions (indicated by the white reports in Figure 2.1) described all eight critical items generically—for example, the van that Eric drove was described only as a "blue van." The misleading versions (the gray reports in Figure 2.1) described four of the eight critical items inaccurately—the van, for instance, was described as a "blue AJ's Electricians van" when subjects had actually seen a blue RJ's Electricians van. The remaining four critical items were described only generically. In short, misleading reports misled subjects on four critical items (blue AJ's Electricians van; Time magazine), while the remaining four critical items—and all eight critical items in the control reports—did not give any specific details (blue van; magazine).

We counterbalanced combinations of movie version and witness reports so that—across the misleading reports—each item appeared twice as a misleading item and twice as a control item. In total, there were four versions of each

misleading report, plus a control version for a total of 15 versions [3 witness reports x (4 misleading versions + 1 control version)].

The middle panel of Figure 2.1 illustrates the two variables we manipulated in this phase: source and repetition. To manipulate source, we told half the subjects they would read three reports from three randomly selected witnesses; we told the other half that they would read three reports from one randomly selected witness. Subjects read the reports in the same order. When everyone had finished reading a report, the experimenter handed over the next one, emphasizing that it had come from either a different witness or the same witness. Each report was clearly labeled with a random witness number that either changed between each report, or remained the same on all three reports. To manipulate repetition, half of the subjects read two control reports and only one misleading report (to simplify the counterbalancing scheme, either the first or third report); the other half read three misleading reports.

In summary, there were four between-subjects conditions: 1) three witnesses, each making the same misleading claims across the three reports (subset *iv* in Figure 2.1); 2) one witness making the same claims across the three reports (*iii*); 3) three witnesses, only one of whom makes the claims in only one report (*ii*); and 4) one witness who makes the claims in only one report (*i*). After reading the three reports, subjects completed a three minute pattern-completion filler task.

Phase 3. In this final phase, subjects completed a surprise recognition test; a two-alternative forced choice recognition test asking about details from the movie. We instructed them that the questions were about their memory for the video. For the eight critical items, they chose between the correct and misled option; the remaining 12 items served as fillers. Subjects circled their responses and rated

their confidence on a five-point scale (1 = Not at all Confident, 5 = Very Confident).[5] Afterwards, they were debriefed.

Results and Discussion

Memory

Did repeating misleading claims change the way subjects reported details about the event—and if so, did the number of witnesses repeating those claims matter? To address these questions, we calculated each subject's mean accuracy for the eight critical items. We classified these data first by whether they were control or misled details, second according to the number of witnesses, and third according to how many reports contained those misled critical details. These results appear in Figure 2.2.

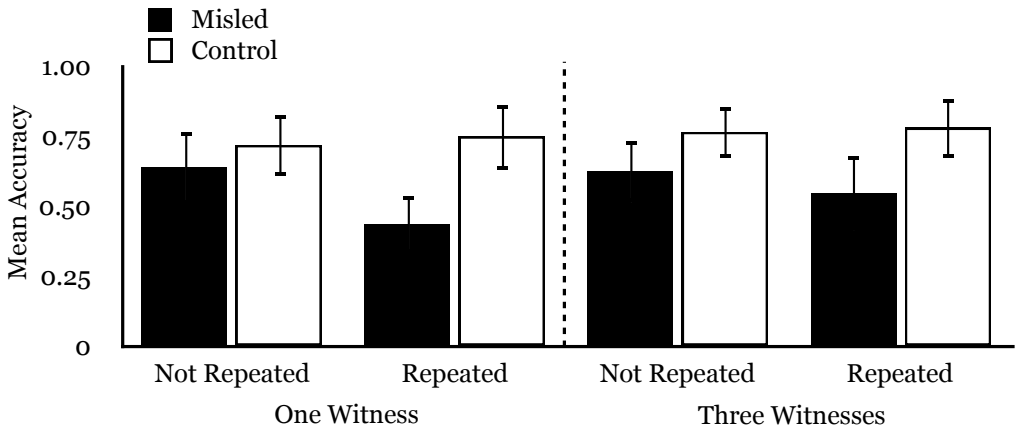

Figure 2.2. Mean Accuracy of Misled and Control Claims by Repetition and Number of Witnesses in Experiment 1. Error bars represent a 95% confidence interval.

Figure 2.2 shows three important findings. First, the white bars show that when subjects were not exposed to misinformation, they were accurate at remembering how the crime unfolded. Second, the comparison between the first and second black bars, as well as the third and fourth black bars, show that

5 The recognition test appears in Appendix D.

repetition mattered: When misleading claims were repeated, subjects were less accurate than when misleading claims were not repeated. Third, subjects were no less accurate about repeated misleading claims from three witnesses than they were about repeated misleading claims from a single witness. These results tell us that it was the repetition of misleading claims that mattered, not how many sources the repeated misinformation came from.

In other words, a 2 (report repetition) x 2 (source) x 2 (item type) ANOVA revealed a significant interaction between item type and report repetition, $F(1,60) = 5.35$, $p = .02$, $\eta_p^2 = .08$. Followup t-tests revealed that regardless of how many witnesses made the reports, repetition decreased accuracy in misleading claims ($M = 0.49$, $SD = 0.22$) relative to unrepeated misleading claims ($M = 0.63$, $SD = 0.22$), $t(62) = 2.53$, $p = .01$, Cohen's $d = 0.64$. There was no difference in the accuracy of control claims between the repeated ($M = 0.77$, $SD = 0.21$) and unrepeated ($M = 0.74$, $SD = 0.18$) conditions, $t(62) = 0.47$, $p = .64$, $d = 0.12$, and no tests of source were significant (all Fs ≤ 1.21).

Taken together, these results suggest that the number of people who made a claim did not matter as much as the number of times the claim was made. That is, if Aidan repeatedly tells Emily the incorrect name of the burglar's electrical company, Emily will be more misled than if Aidan had told her only once. Interestingly, if that claim were repeated it would make little difference if Aidan said it, or if Aidan, Ben, and Cheryl each had made the same claim once: either way Emily hears it three times and is similarly misled.

Confidence

Subjects were more confident about their responses to misled items ($M = 3.81$, $SD = 0.66$) than control items ($M = 3.55$, $SD = 0.66$), a finding well

documented in the misinformation effect literature (e.g., Takarangi et al., 2006). But their confidence did not depend on the number of times misinformation was repeated, nor the number of witnesses. In other words, a 2 (source) X 2 (repetition) X 2 (item type) ANOVA revealed a main effect of item type, $F(1,60) = 6.74$, $p = .01$, $\eta_p^2 = .10$. There were no other effects (all Fs ≤ 1.35).

Counterexplanations and Criticisms

One counterexplanation for our results is that subjects paid little attention to whether one or three witnesses repeated the statements. If so, our results might reflect the fact that they attended to the misleading claims, but not to who reported those claims. To address this hypothesis, we examined the data from subjects who read the misleading claims in only one report (n = 32). When reports were attributed to three witnesses, subjects were similarly accurate about specific claims appearing in the third ($M = 0.66$, $SD = 0.19$) and first ($M = 0.59$, $SD = 0.23$) reports $t(14) = 0.60$, $p = .56$, $d = 0.16$. However, when reports were attributed to one witness subjects were marginally less misled for misleading claims appearing in the third ($M = 0.75$, $SD = 0.19$) rather than the first ($M = 0.53$, $SD = 0.25$) report, $t(14) = 1.99$, $p = .07$, $d = 0.99$.[6] This finding fits with the idea that when a single witness made all three reports, a claim appearing for the first time in the third report seemed less trustworthy. They also suggest that subjects noticed whether repeated claims were made by one or three witnesses, yet noticing the source of these claims did not affect subjects' accuracy.

A critic might suggest that because subjects read about control claims three times, repetition improved memory for those items. In other words, reading "blue

6 This finding may also explain why subjects who read misleading claims attributed to one witness but only in one report (the first set of bars in Figure 2.2) showed no misinformation effect. When subjects read misleading claims in the third report, they were not misled; when other subjects read those misleading claims in the first report, they showed the typical misinformation effect. Averaging these data together, there was no overall misinformation effect.

van" three times cued subjects who saw a blue AJ's van to remember—correctly—that they had indeed seen a blue AJ's van. Such a mechanism, which is reminiscent of the testing effect (Roediger & Karpicke, 2006), would serve to make control performance unusually high. But even if the critic were correct, repeated references to control claims should have no effect on how well subjects remember the misled claims which did not contain these repeated, control, references.

Of course, it is one thing if repeating misinformation three times makes subjects less accurate about what they saw. Years of research on the misinformation effect has shown that people make these errors because of an inability to differentiate the sources of what they originally saw and what they later read (Johnson et al., 1993; Lindsay, 2008)—repeating misinformation may simply add more opportunities for people to make these types of errors. In other words, trying to distinguish between four sources—the original event and misleading information presented three times—may be more difficult than trying to distinguish between two sources—the original event and misleading information presented only once.

But it would be another thing if repeating that information changed people's beliefs about what happened when they never saw the crime unfold in the first place. On the face of it, judging what happened when you didn't see the crime would appear to be qualitatively different than remembering what happened when you did see the crime. Indeed, the source confusion thought to drive the misinformation effect should play little role in altering people's beliefs about what really happened because they did not see the crime; by definition, there is no original source with which to confuse the witness reports. But a different kind of

source monitoring error might lead people to put more stock into a single witness who repeats his claims than if he were to make the same claim only once. In one study, when one group of subjects read a New Jersey homeowner's repeated opinions about preserving open spaces, they thought his views more representative of the wider population of homeowners than another group who read his opinion only once (Weaver et al., 2007). The idea is that repeating claims makes them seem more familiar, more available, and more true (Kelley & Lindsay, 1993; Unkelbach, 2007). If a similar mechanism applies to people's confidence in eyewitness claims, we should see that the repeated claims of one witness are more credible to people who never saw the crime than if that witness simply states them once. We addressed this issue in Experiment 2.

Chapter 3

Experiment 2

In Experiment 2, subjects read the same three witness reports from Experiment 1, but did not witness the event. Thus, they could not know if claims about how the crime unfolded were true. After they read the witness reports, subjects reported their confidence that each claim was true.

Method

Subjects

Ninety six introductory psychology students participated for a course requirement.

Design

We used a 2 (report repetition: repeated, not repeated) x 2 (source: one witness, three witnesses) x 2 (item type: specific, control) mixed factors design, manipulating repetition and source between subjects, and item type within subjects.

Procedure

The procedure described below was the same as Experiment 1 with three exceptions: 1) subjects did not complete Phase 1—we omitted the video and the respective 15 minute filler task; 2) we changed the filler task between the reports and testing phases to 7 minutes; and 3) in the testing phase, subjects reported their confidence that the claim was true.

Because the reports no longer corresponded to a witnessed video, what we described as misleading claims in Experiment 1 were no longer misleading in

Experiment 2. As such, we call those claims specific claims in Experiment 2, because they specifically describe a critical detail.

Subjects began the experiment by reading the three witness reports, following procedures identical to those in Experiment 1. After reading all three witness reports, subjects worked on a filler task for 7 minutes. In the testing phase, they completed a 20 item test to assess what they thought had occurred during the crime. Each item claimed that a specific detail or action had occurred, and was followed by this question: "How confident are you that this statement is correct?" Four of the eight critical test items were the same as the specific detail mentioned in the witness reports. For example, subjects who read that Eric was driving an "AJ's Electricians van" were asked how confident they were that "The name of Eric's company was AJ's Electricians". The remaining four critical test items still asked about the specific version of the claim ("AJ's Electricians"), although subjects had read only about the control version of the claim in the reports (a blue van).[7] Thus, we would expect subjects to have lower confidence about control claims relative to their confidence about specific claims. Afterwards, they were debriefed.

Results and Discussion

Confidence in Repeated Claims

Did repeating claims make subjects more confident that they really happened —and if so, did the number of witnesses repeating those claims matter? To address this question, we calculated each subject's mean confidence that specific details or actions had taken place. We classified these data first according to whether the critical items were described in a specific or control level of detail in

7 A sample confidence test appears in Appendix D.

the reports, second according to how many witnesses the reports were attributed, and third according to how many reports contained critical items in a specific level of detail. These results appear in Figure 3.1.

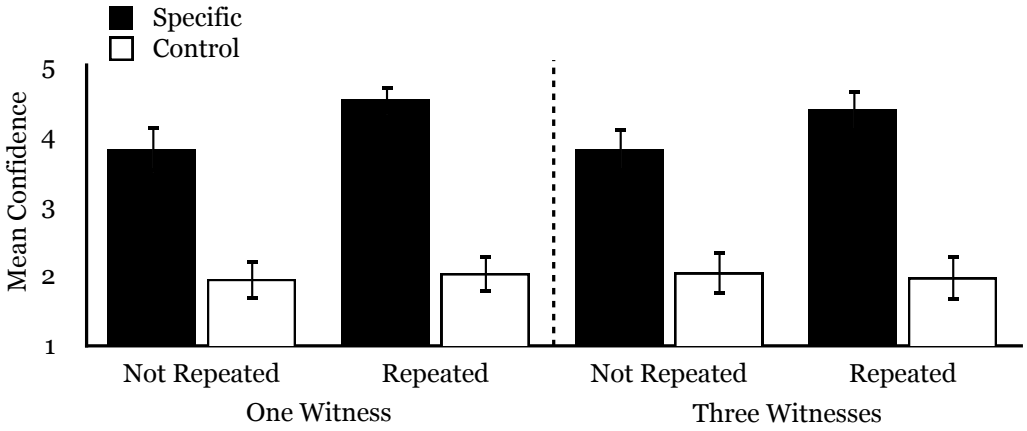

Figure 3.1. Mean Confidence Ratings of Specific and Control Claims by Repetition and Number of Witnesses in Experiment 2. Error bars represent a 95% confidence interval.

Figure 3.1 shows three important findings. The first is unsurprising: The white bars show that when subjects read only control claims in the reports, they were not very confident that the crime had unfolded in the specific way asserted in the test. Second, the comparison between the first and second black bars, as well as the third and fourth black bars, show that repeating claims mattered: When subjects read the same specific claim repeated, they were more confident that those claims were correct than when the claims were not repeated. Third, subjects were similarly confident about repeated claims regardless of the number of witnesses who made those claims. More specifically, subjects were no more confident about claims repeated by three different witnesses than they were about claims repeated by a single witness.

In other words, a 2 (report repetition) x 2 (source) x 2 (level of detail) ANOVA revealed a significant interaction between level of detail and report repetition, $F(1,92) = 11.50$, $p < .01$, $\eta_p^2 = .11$. Moreover, regardless of how many witnesses

made the reports, subjects were more confident about repeated specific claims (M = 4.44, SD = 0.63) than unrepeated specific claims (M = 3.80, SD = 0.75), $t(94)$ = 4.50, $p < .01$, d = 0.92. There was no difference in people's confidence in the control claims between the repeated (M = 2.00, SD = 0.71) and unrepeated (M = 1.99, SD = 0.70) conditions, $t(94) = 0.04$, $p = .97$, $d < 0.01$, and no tests of source were significant (all Fs < 1). Taken together, these results suggest that the number of people who made a claim did not matter as much as the number of times the claim was made.

Counterexplanation

As in Experiment 1, we tested the counterexplanation that subjects paid little attention to whether statements were made by one or three witnesses; the pattern of the data was consistent with that in Experiment 1. When reports were attributed to three witnesses, subjects were similarly confident about specific claims in the third (M = 3.94, SD = 0.85) and first (M = 3.67, SD = 0.63) reports $t(22) = 0.89$, $p = .38$, $d = 0.36$. However, when reports were attributed to a single witness, subjects were less confident when specific claims appeared in the third (M = 3.46, SD = 0.77) rather than the first (M = 4.15, SD = 0.64) report, $t(22) = 2.38$, $p = .03$, $d = 0.97$. These findings suggest that subjects did pay attention to whether repeated claims were made by one or three witnesses, yet noticing the source of these claims did not affect subjects' confidence.

Summary of Experiments 1 and 2

In two experiments, we asked if one person who repeats claims wields more influence on memory and confidence than that same person making the claim only once. The answer is yes. Across both experiments, the data converged on the important role of repetition. In Experiment 1, the misleading claims of a single

witness were more damaging to subjects' memories when that witness repeated them; in Experiment 2, the claims of a single witness were more credible when that witness repeated them.[8] In both experiments, one witness's repeated claims were as influential as three witnesses each making the same claims once. These findings fit with research showing that repeating information makes it more available—and seem more familiar, true, or even representative of a population (Kelley & Lindsay, 1993; Weaver et al., 2007; Unkelbach, 2007).

However, our results do not fit with those of Mitchell and Zaragoza (1996). When Mitchell and Zaragoza gave subjects misleading information in three presentation styles (written, video, audio), subjects were more misled than when they were given repeated misleading information in only one presentation style (e.g., audio). Their findings do not fit with ours as their source manipulation interacted with repetition, while our source manipulation did not.

But three important differences between the methods of this study and those of Mitchell and Zargoza's (1996) may explain this discrepancy. First, although Mitchell and Zaragoza used a source test—asking subjects to state whether they remember the information from the video or the postevent information—we used a standard recognition test, asking subjects to choose between the original and postevent information. Indeed, research on the effects of repetition have shown that people are more likely to use source information when engaged in deliberate, recollective based, processes such as during a source test than when using faster, recognition based, decision making such as during a recognition test (Begg et al., 1992; Unkelbach & Stahl, 2009). Second, when Mitchell and Zaragoza

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8 Experiment 2 was replicated using the online subject pool Mechanical Turk and web-based experiment software. See Appendix A for the replication.

manipulated presentation style, it may have interacted with repetition not because the source of the information became more trustworthy, but because it became more salient. By contrast, we manipulated only the generic name of the source (for instance, Witness 5 vs. Witnesses 5, 9, and 16). It may be that salience is what drove Mitchell and Zaragoza's subjects to be more misled. Finally, whereas we embedded our misinformation in a narrative, Mitchell and Zaragoza embedded their misinformation in questions. Although both approaches lead people to misremember the original event, they differ in a number of qualitative characteristics that may affect people's ability to do good source monitoring (Zaragoza & Lane, 1994). But clearly, the question of why broadly similar methods produced different patterns of results is an important one worthy of future research.

Why would one witness repeating a claim become just as credible as three witnesses? Two possible mechanisms may explain these surprising results. On the one hand, it may be that a single witness repeating claims is seen (correctly) as highly consistent—an attribute that makes the witness appear more credible (Brewer & Burke, 2002). By comparison, when multiple witnesses all converge on the same claim, the claim may become credible simply because many people made it (Harris & Hahn, 2009; Ross et al., 1998). In other words, one witness repeating a claim may make the claim more credible for a different reason than three witnesses each stating the same claim once does. Indeed, non-significant trends in our data lend support for this possibility: A closer inspection of Figures 2.2 and 3.1 suggests that subjects were slightly more misled by, and more confident about, claims repeated by a single witness than those repeated by three witnesses.

On the other hand, it may be that people do not account for the number of witnesses stating a claim. That is, when people determine the credibility of a claim, they might rely on heuristically driven monitoring processes—using the familiarity of the claims to determine their credibility—while forgoing more effortful monitoring processes that would help them scrutinize the source of the claims instead.

In Experiments 3 through 5, we explore how either consistency and consensus (experiments 3 and 4) or a failure to effectively monitor the source of the information (experiment 5) may explain our findings. In Experiments 3 and 4 we ask how the consistency of a single witness may inflate credibility, while in Experiment 5 we ask if increasing subjects' ability to monitor the source of the information will decrease subjects' reliance on the repeated testimony of a single witness.

Chapter 4

Experiment 3

In Experiments 1 and 2, we asked if the repeated claims of a single witness are as credible as the same claims made by multiple witnesses. Our findings suggest that what matters is repetition: Subjects found the repeated claims of a single witness as credible as claims made by multiple witnesses once each. In the following experiments, we address mechanisms that might drive this effect.

To get a handle on the mechanism, we first make a distinction between consensus and consistency. Consider the possibility that what gives rise to the credibility of multiple witnesses is the consensus of claims, whereas what gives rise to the credibility of a single witness is its consistency.

Consensus

As I discussed earlier, consensus among a group of people can be a good measure of what is true. Moreover, our faith in multiple witnesses makes sense. To the extent multiple witnesses are providing independent sources of information, they are less likely to all have the same wrong information than one witness would be (see also Dechêne et al., 2010). For example, if a witness to a crime reported that the burglar wore a uniform from "AJ's Electricians", then it may not be surprising to later find that the uniform was really from "RJ's Electricians." After all, people sometimes make mistakes. Conversely, had three independent witnesses all claimed the uniform was from "AJ's Electricians" then it would be surprising—although not unheard of—to find that the uniform was really from "RJ's Electricians." People might logically have a thought like this: "If all three

witnesses had been wrong, why would all three converge on the same wrong detail?"

Consistency

We also know that consistency matters when judging the credibility of the information a person provides. The psychology and law literature finds that jurors and judges alike believe that inconsistencies across a witness's repeated testimony is a sign that little of what the witness says is credible (Berman, Narby, & Cutler, 1995; Fisher, Brewer, & Mitchell, 2009; Uviller, 1993). More specifically, when one witness gives several accounts of a crime people find the testimony more credible when it is consistent than when it is inconsistent (Berman et al., 1995; Brewer & Burke, 2002). Similarly, when people hear the repeated, consistent, opinion of a single person they are more likely to believe that the opinion is held by others than if the opinion was never repeated (Weaver et al., 2007).

Taken together, the research on consensus and consistency offer two different mechanisms that would each lead to a similar effect of repetition regardless of how many witnesses repeated the information. More specifically, it may be that if three witnesses each report a claim once, then the claim gains credibility for a different reason than if one witness repeats the claim three times. This hypothesis suggests a way to understand the findings from Experiments 1 and 2 which show that subjects find the repeated claims of a single witness as credible as claims from multiple witnesses.

But what drove these findings is the focus of the next series of experiments. The research on consensus and consistency leads us to predict that highlighting inconsistent details across multiple witness reports should produce different effects depending on whether the reports are attributed to one witness or three witnesses.

If subjects see the overlapping claims of multiple witnesses as credible because there is a consensus, then highlighting inconsistencies should have little effect on the credibility of their overlapping claims. Conversely, if subjects see the repeated claims of a single witness as credible because of consistency, then highlighting inconsistencies should decrease the credibility of the repeated claims.

In Experiment 3, subjects first read the three witness reports that repeated specific details across the reports. For half of the subjects, we again attributed all three reports to a single witness. For the other half, we attributed the reports each to a different witness. Additionally, half of the subjects read reports that contained some peripheral inconsistencies. Later, everyone was asked how confident they were that certain claims were true of the crime. We hypothesized that the inconsistencies across witness reports would reduce the credibility of a single witness's repeated claims more than the claims made by multiple witnesses once each.

Method

Subjects

One hundred and twenty-eight introductory psychology students completed the experiment as part of a course requirement. Subjects completed the experiment in groups of 1 to 5.

Design

We used a 2 (source: one witness, three witnesses) x 2 (item type: specific, control) x 2 (consistencies: consistent, inconsistent) mixed factors design manipulating source and consistencies between subjects, and item type within subjects.

Procedure

The procedure described below was the same as Experiment 2 with two exceptions: 1) for all subjects, the critical—specific—claims were repeated across all three reports; and 2) for half of the subjects, the three reports contained three, non-critical, details that were inconsistent across the reports.

The reading phase of Experiment 3 was identical to that of Experiment 2 with the exception of our manipulation of consistency. For half of the subjects three—non-critical—claims were inconsistent between the three reports. For example, in one report, Eric is said to have taken a hammer out of his van, in another report it was a screwdriver he took out of the van, while in yet another report it was a wrench. For these subjects, three different items (the tool taken out of the van; the type of documents on the counter; where he put a ring) were inconsistent across the three reports. For other subjects, these three claims were consistent across all three reports.

Subjects completed a five minute pattern completion filler task after reading all of the reports. All subjects were then asked to complete the 20-item standard confidence test used in Experiment 2, and were later debriefed.

Results and Discussion

Recall that if the repeated claims of a single witness convey consistency while the repeated claims of multiple witnesses convey consensus, then adding inconsistencies across the witness reports should make subjects less confident about the repeated claims of a single witness than the repeated claims of multiple witnesses. To address this prediction, we calculated subjects' confidence test scores and display them in Figure 4.1.

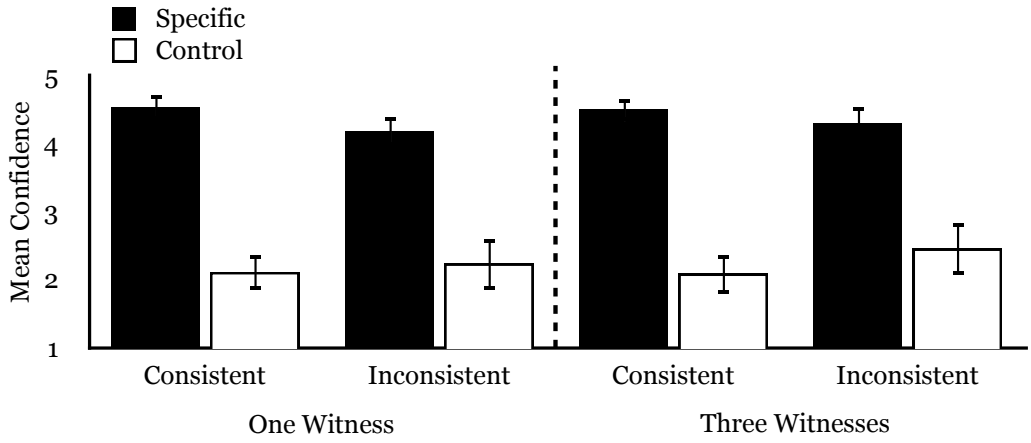

Figure 4.1. Mean Confidence Ratings of Specific and Control Claims by Consistency and Number of Witnesses in Experiment 3. Error bars represent a 95% confidence interval.

Figure 4.1 shows two important findings. First, the comparison between the first and second black bars, as well as the third and fourth black bars, show that adding inconsistencies to the reports mattered: Subjects who read reports containing inconsistencies were less confident about the repeated specific claims than subjects who read reports lacking inconsistencies. Second, this pattern was true regardless of the number of witnesses who made those claims. In short, and contrary to our prediction, the addition of inconsistencies similarly affected the credibility of claims made by a single witness and multiple witnesses.

In other words, a 2 (source) x 2 (item type) x 2 (consistencies) ANOVA found an item type x consistencies interaction, $F(1,124) = 5.77$, $p = .02$, $\eta_p^2 = .04$. Moreover, regardless of how many witnesses made the reports, subjects were less confident about specific claims from inconsistent reports ($M = 4.24$, $SD = 0.65$) than specific claims from consistent reports ($M = 4.51$, $SD = 0.48$), $t(126) = 2.71$, $p < .01$, $d = 0.48$. There was no difference in people's confidence about the control claims between the inconsistent ($M = 2.34$, $SD = 1.05$) and consistent ($M = 2.01$, $SD = 0.77$) reports, $t(126) = 1.51$, $p = .13$, $d = 0.27$, and no tests of source were significant, all Fs < 1.34. Taken together, these results suggest that damaging

the consistency of the reports reduced the credibility of the claims in those reports, but it did not matter how many witnesses had made those reports.[9]

Criticisms and Counterexplanations

Why did adding inconsistencies across the witness reports fail to make subjects less confident about the claims made by a single witness relative to the claims made by multiple witnesses? One counterexplanation is that our attempt to convey the inconsistencies in the reports was too weak. This counterexplanation may be true for three reasons. First, given the amount of information subjects were exposed to, they may not have noticed all of the inconsistencies. Second, given that the first report had no previous information to be inconsistent with, it would have been impossible for subjects to notice any of the inconsistencies until they read the second report. Third, the presence of inconsistencies alone may not have been enough for subjects to reflect on how those inconsistencies should affect their judgments of confidence. In other words, even if subjects did notice all of the inconsistencies, they may not have reflected on how that related to the items that are consistent. Indeed, the relatively small—but uniform—decrease in confidence when the reports contained inconsistencies suggests that at least one of these counterexplanations may be true.

In Experiment 4, we sought to address these counterexplanations by highlighting the inconsistencies across the three reports. We told half of the subjects that the overall accuracy of the three witness reports were in the bottom 10% of accuracy. In addition, subjects rated how accurate they believed each report was, and how accurate the three reports were combined, before

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9 We conducted a separate misinformation effect experiment using the same materials as Experiment 3. The findings of this experiment parallel those of Experiment 3, and appear in Appendix B.

completing the standard confidence test. If the pattern in Experiment 3 was driven by a failure to either a) notice the inconsistencies, or b) reflect on how those inconsistencies should affect their judgments of confidence, then Experiment 4 should show differential effects depending on whether the claims are attributed to one witness or three witnesses.

Experiment 4

Method

Subjects

Two hundred and fifty subjects accurately completed all phases of the experiment. They were recruited from Amazon's Mechanical Turk.

Mechanical Turk is an online subject pool in which workers can complete short tasks for a small contribution towards an Amazon gift voucher. Research on Mechanical Turk demonstrates that it can provide a subject pool as diverse as a university student population, and that the data from experiments conducted both in-lab and online using Mechanical turk are comparable (Buhrmester, Kwang, & Gosline, 2011; Germine, Nakayama, Duchaine, Chabris, Chatterjee, & Wilmer, 2012; Mason & Suri, 2011).[10] Because subjects were randomly assigned to conditions, the four between subjects conditions were not evenly distributed. After the removal of subjects who failed the requirements outlined in the results section below there were 60, 58, 46, and 58 subjects in the one witness/warning, one witness/no warning, three witnesses/warning, and three witnesses/no warning conditions respectively.

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10 Appendix A also demonstrates an experiment that is a replication of Experiment 2 using the Mechanical Turk subject pool. The results of that experiment, and Experiment 2 are highly similar.

Design

We used a 2 (source: one witness, three witnesses) x 2 (item type: specific, control) x 2 (inaccuracy warning: warning, no warning) mixed factors design manipulating witness and inaccuracy warning between subjects, and item type within subjects.

Procedure

The procedure described below was similar to the method used in Experiment 3, but was conducted online, and all subjects received the inconsistent reports. The experiment was programmed with Real Software's Real Studio Web Edition, it was displayed via the subject's web browser, and took approximately 15 minutes to complete. Subjects first responded to a few demographic questions (age, gender, and geographic location)[11] before reading the instructions.

We told subjects they would read three witness reports ostensibly written by other people in a previous experiment. Following our previous manipulation of source, we told half of the subjects that they would be reading all three of the reports made by a single witness, and the other half that they would be reading one report from each of three different witnesses. To manipulate attention to inconsistencies, half of the sample received this warning at the end of the instruction phase:

> *You should be aware that these reports were written by [an eyewitness/eyewitnesses] who participated earlier in this experiment, and whose overall accuracy was in the bottom 10%. That is, 90% of the eyewitnesses were more accurate overall in describing the crime than [this eyewitness/these eyewitnesses].*

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11 Mechanical Turk allows researchers to sample from only one country, or from all countries—there are no in-between options. Therefore, to restrict subjects to native English language speakers while maximizing sample size, we limited the experiment to people in the US.

After reading the instructions, everyone read the three witness reports used in Experiment 3 with the exception that all subjects received the inconsistent reports. An introduction screen between each report emphasized whether the report came from the same or a different witness than the last report.

Between each report, we asked subjects to rate "How accurate do you believe this witness is?" on a scale from 1 (not at all accurate) to 5 (very accurate). At the end of the third report and rating, we then asked subjects to consider the reports overall and rate "*How accurate do you believe [this witness was/these witnesses were]?*" using the same 1 to 5 scale. Then everyone completed a 5 minute number matching filler task.

In summary, there were four between-subjects conditions: 1) three witnesses with no inaccuracy warning; 2) one witness with no warning; 3) three witnesses with the warning; and 4) one witness with the warning.

Next, subjects completed the confidence test. The confidence test was identical to the confidence test used in Experiment 3, with the exception that items appeared one at a time.

Finally, we asked subjects to respond to five questions with the assurance that they would receive credit regardless of their responses: 1) Did you read all of the reports?, 2) Is English your first language?, 3) How many witness reports did you read?, 4) Did we tell you that all of the reports were written by the same witness, or that each of them was written by a different witness?, and 5) Did we tell you about the accuracy of the witness reports? If so, where did the witness(es) rank in terms of accuracy? These questions served to determine who read and followed the instructions. Afterwards, everyone was debriefed.

Results & Discussion

We removed one subject from the dataset who admitting to not reading all of the reports. We also removed another 27 subjects (11%) who, on the test, responded only 1 or 5 on 90-100% of their answers, a pattern suggestive of a response set. In the analyses we report here, the pattern of results was similar when these subjects were or were not in the dataset.

Warning Manipulation

Before turning to the main findings, we first verified that our warning manipulation was effective by first calculating the mean rating subjects gave about the overall accuracy of the reports, then classifying these data by whether subjects were in the one witness or three witnesses condition, and then by whether they received the inaccuracy warning. In line with our manipulation, we found that when we warned subjects about the witness's accuracy, they indeed believed the reports were less accurate. In addition, subjects believed the reports of three witnesses were more accurate than those of one witness.

Put another way, a 2 (source) x 2 (warning) ANOVA found a main effect of warning, $F(1,217) = 54.30$, $p < .01$, $\eta_p^2 = .20$; $M_{warning} = 2.94$, $SD = 0.95$ vs. $M_{no\ warning} = 3.78$, $SD = 0.71$). There was also a main effect of source, $F(1,217) = 18.99$, $p < .01$, $\eta_p^2 = .08$; $M_{one\ witness} = 3.14$, $SD = 1.02$ vs. $M_{three\ witnesses} = 3.66$, $SD = 0.72$). There was no interaction, $F(1,217) = 0.75$, $p = .39$, $\eta_p^2 < .01$.[12]

Confidence

To reiterate the hypothesis, recall that if the repeated claims of a single witness convey consistency while the repeated claims of multiple witnesses convey consensus, then subjects warned about the accuracy of the reports should find the

12 Due to a software malfunction, the dependent measure for this analysis was not recorded for one subject. Data from this subject was removed for this analysis only.

repeated claims of a single witness less credible than subjects who did not receive the warning. Conversely, subjects warned about the accuracy of the reports should not find claims made by multiple witnesses once each less credible than subjects who were not warned.

To address this prediction we calculated each subject's mean confidence ratings for the eight critical claims. We classified these data first by whether they were control or specific claims, second according to the number of witnesses who made those claims, and third according to whether subjects received the inaccuracy warning. These results appear in Figure 4.2

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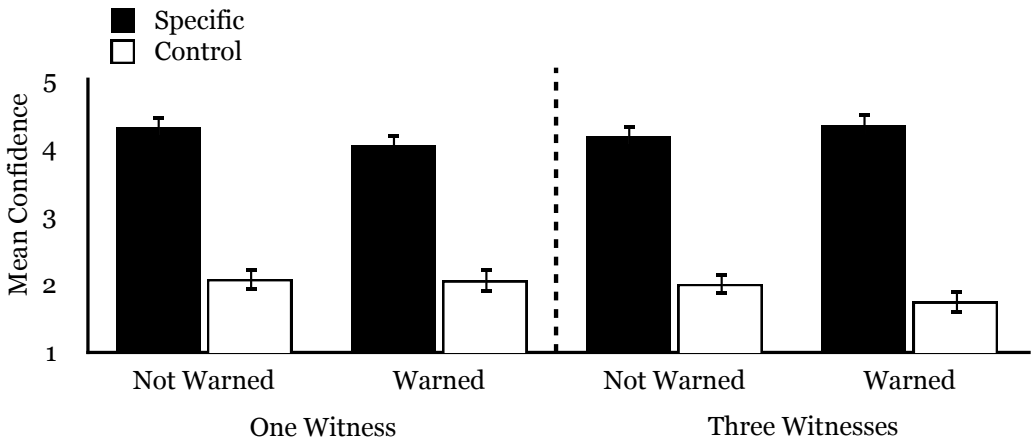

Figure 4.2. Mean Confidence Ratings of Specific and Control Claims by Number of Witnesses and Warning in Experiment 4. Error bars represent a 95% confidence interval.

Figure 4.2 reveals three important findings. First, comparing the black bars in the first and third position tells us that subjects were similarly confident about the repeated claims of a single witness and the repeated claims of multiple witnesses when subjects did not receive a warning about the accuracy of the reports. Second, the comparison between black bars on the left side of the dashed line tells us that when reports were attributed to one witness, warning subjects that the reports were inaccurate reduced confidence in the repeated, specific claims. And

third, the comparison between black bars on the right side of the dashed line tells us that, when reports were attributed to three witnesses, the warning did not reduce confidence in the specific claims. Most importantly, the warning led subjects to find the repeated claims of a single witness less credible than the claims made by multiple witnesses one time each.

In other words, a 2 (source) x 2 (item type) x 2 (warning) ANOVA found an source x item type x warning interaction, $F(1,218) = 7.22$, $p < .01$, $\eta_p^2 = .03$. Followup t-tests found that in the no warning condition subjects were similarly confident about the repeated, specific, claims made by a single witness and the claims made by multiple witnesses once each, $t(114) = 1.11$, $p = .27$, $d = 0.21$. But in the warned condition subjects were less confident about the repeated claims made by a single witness than the claims made by multiple witnesses, $t(104) = 2.51$, $p = .01$, $d = 0.49$. In addition, subjects in the three witnesses condition were similarly confident about the specific claims when they were warned and when they were not warned, but subjects in the one witness condition were less confident $t(102) = 1.26$, $p = .21$, $d = 0.25$, $t(116) = 2.41$, $p = .02$, $d = 0.45$ respectively.

In short, we found support for our hypothesis: Drawing subjects's attention to the inaccuracies in witness reports reduced the credibility of a single witness's repeated claims more than the claims made by multiple witnesses once each. This finding fits well with the consensus and consistency literature and suggests that because the credibility of the claims repeated by a single witness were built on the consistency of that witness, drawing attention to the inconsistencies between reports reduced the credibility of those claims. Conversely, the findings also suggest that because the credibility of claims made by multiple witnesses once

each were built on the consensus of independent sources, drawing attention to the inconsistencies between reports did not reduce the credibility of those claims.

Criticisms and Counterexplanations

A closer inspection of Figure 4.2 reveals that when given a warning, subjects found the control claims less credible in the three witnesses condition than in the one witness condition, $t(104) = 2.70$, $p < .01$, $d = 0.53$. How might we explain this change in the credibility of control claims? It may be that subjects in this condition were more wary of claims that none of the three witnesses mentioned because they knew that the witnesses were inaccurate, but did not believe they were inaccurate on the specific claims that had consensus. This may have resulted in subjects overcompensating with the control claims. Regardless of the reason, while subjects were less confident about control claims in this condition, they were also slightly (but non-significantly) more confident about specific claims. This finding suggests that our pattern of results cannot be explained simply as a shift in criterion.

A critic might say that because the warning was not about inconsistencies and was instead a broad warning about overall accuracy, then we cannot conclude that we drew subjects' attention to the inconsistencies, but rather to some general inaccuracy in the reports. But being inconsistent is—by definition—being inaccurate,[13] while being inaccurate does not necessarily mean being inconsistent. In other words, there are myriad ways to be inaccurate, and inconsistency is just one of them. Because the reports explicitly contained inconsistencies but no other inaccuracies, it seems reasonable to conclude that the warning drew subjects'

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13 In our experiment, we manipulated inconsistency by making reports contradict one another. It might be argued that inconsistency may have a broader definition that would encompass reminiscence—when people add details to later memory reports that did not contradict earlier reports. This latter definition would not be, by definition, inaccurate.

attention specifically to the inconsistencies. But let us consider for a minute that the critic is correct, and that the inconsistencies did not drive the results in Experiment 4. If so, then a broader explanation of the results—one explained at a more general level of inaccuracy—would suffice. A broader explanation would apply to inconsistencies and other forms of inaccuracy similarly. Accordingly, it is parsimonious to opt for the lesser of the two explanations: that inconsistencies decreased subjects' over-reliance on the repeated claims of a single witness. Of course, the question of whether any form of inaccuracy, rather than inconsistency alone, would reduce over-reliance is an important one worthy of future research.

A different explanation for our results is that they had little to do with inconsistency but rather had to do with the warning acting as a source monitoring cue. This source monitoring account might explain our findings in two ways. The first is relatively uninteresting: Without the inaccuracy warning, subjects might simply not notice how many witnesses make a claim—a weak explanation given our earlier work showing that people are sensitive to both the number of witnesses and the timing of their claims. The second process is more interesting: Although subjects notice and encode information about how many witnesses make the claims, they fail to use that information when assessing the credibility of the claims unless given a cue—such as our warning—to do so. In Experiment 5, we sought to address this source monitoring account of our results.

Chapter 5

Experiment 5

As I discussed in the introduction, research using the source monitoring framework has demonstrated that people sometimes use easy, heuristically driven, processes to judge the credibility of the source of information, while other times they use more effortful processing to do so (Johnson et al., 1993; Lindsay, 2008). It may be that people forgo these more effortful monitoring processes needed to recognize that the repeated claims of a single witness should be considered less credible than the claims of multiple witnesses. Instead, people may be using the familiarity of claims—a heuristically driven process—to judge the claim's credibility (Johnson et al., 1993; Lindsay, 2008).

Indeed, we know that previous encounters make information feel more familiar, which is often interpreted as truth (Alter & Oppenheimer, 2009; Arkes et al., 1991; Dechêne et al., 2010; Lindsay, 2008; Weaver et al., 2007). As a result, repeated information feels more true than unrepeated information, regardless of the source.

If this account is true, then encouraging people to use more effortful monitoring processes when judging the credibility of a claim should lead to different effects depending on whether claims were made by a single witness or multiple witnesses. More specifically, if people are relying on repetition—without using source knowledge—to judge credibility, then increasing their use of effortful monitoring processes should reduce the effects of repetition and instead focus their attention on the consensus among multiple witnesses.

Method

Subjects

The subjects were 75 introductory psychology students who completed all phases of the experiment as part of a course requirement, participating in groups of 1 to 5. One subject was removed due to an experimenter error, leaving 74 subjects in the dataset.

Design

We used a 2 (source: one witness, three witnesses) x 2 (item type: specific, control) x 2 (test type: standard, source) mixed factors design. We manipulated both source and test type between subjects, and item type within subjects.

Procedure

Experiment 5 used some of the same materials that had been used in Experiments 2 and 3, but half of the subjects completed a confidence test with a source monitoring component. In total, there were two important changes between Experiment 3 and Experiment 5: 1) the reports did not contain the three inconsistencies used in Experiment 3; and 2) half of the subjects completed a confidence test with a source monitoring component.

Subjects began by receiving the same instructions used in Experiments 2 and 3, and were asked to read the three witness reports, one at a time. We did not ask subjects to rate how accurate they believed the reports were.

In the testing phase, half of the subjects completed the standard confidence test used in Experiments 2 and 3. The other half completed the confidence test with a source monitoring component.[14] For each item in the source test, subjects first responded if they read about each claim in the witness reports. If they responded that they did not read about the claim, an arrow directed them to rate

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1414 A sample item from the source testt appears in Appendix D.

their confidence that the claim was true about the way the crime unfolded. If they responded that they had read about the claim in the reports, an arrow directed them to two separate two-alternative forced choice questions regarding 1) in how many reports they read that claim, and 2) how many witnesses reported the claim. Another arrow then directed subjects to rate their confidence that the claim was true.

Subjects also completed a manipulation check, reporting the number of witnesses who wrote the reports. We counterbalanced the order of the manipulation check, asking it at the very last part of the experiment but before debriefing, or just before the testing phase; there were no interactions with any measure as a function of this order (all $Fs \leq 1.02$). Afterwards, subjects were debriefed.

In summary, there were four between-subjects conditions: 1) three witnesses with a standard confidence test; 2) one witness with a standard confidence test; 3) three witnesses with a source test; and 4) one witness with a source test.

Results & Discussion

Before turning to our primary question, we carried out a manipulation check, examining the data to make sure that subjects knew how many witnesses reported each claim. To address this issue, we calculated the percentage of subjects who correctly answered the manipulation check question. In both the one witness and the three witnesses conditions, 100% of subjects correctly identified how many witnesses wrote the reports.

Even though subjects remembered how many witnesses authored their reports, we still do not know how well they remembered where they learned about each claim. In other words, we do not know if subjects could recognize that

any given claim was repeated. To address this source knowledge issue, we examined the data from subjects who completed the source test (n = 39). We then calculated—for each of the four repeated, specific, claims—their responses to the source questions.

Subjects were very accurate on the source test. More specifically, subjects correctly recalled that they read about each claim at rates higher than chance (chance = 0.50) both when the reports were attributed to a single witness (M = 0.95, SD = 0.13), and when reports were attributed to multiple witnesses (M = 0.87, SD = 0.26), $t(19) = 15.39$, $p < .01$, $d = 7.06$, and $t(18) = 6.30$, $p < .01$, d = 2.97 respectively. In addition, subjects were able to recognize that they read about the claims in all three reports at rates higher than chance (chance=.5 to read question x .5 to number of reports question = .25) both when the reports were attributed to a single witness (M = 0.78, SD = 0.30), and when reports were attributed to multiple witnesses (M = 0.70, SD = 0.31), $t(19) = 7.76$, $p < .01$, d = 3.56, and $t(18) = 6.35$, $p < .01$, $d = 2.99$ respectively. Finally, subjects were able to correctly remember how many witnesses had repeated those claims (one or three witnesses depending on which witness condition each subject was in) at rates higher than chance (chance = .25) both when the reports were attributed to a single witness (M = 0.66, SD = 0.39), and when reports were attributed to multiple witnesses (M = 0.67, SD = 0.30), $t(19) = 4.71$, $p < .01$, $d = 2.16$, and $t(18)$ = 6.10, $p < .01$, $d = 2.88$ respectively.

We now turn to our primary question: Would encouraging effortful source monitoring reduce subjects's confidence in the repeated claims of a single witness relative to claims made by multiple witnesses? To address this question, we calculated each subject's mean confidence ratings for the eight critical claims. We

classified these data first by whether those were control or specific claims, second according to the number of witnesses who made those claims, and third according to whether subjects completed the standard or source test. These results appear in Figure 5.1.

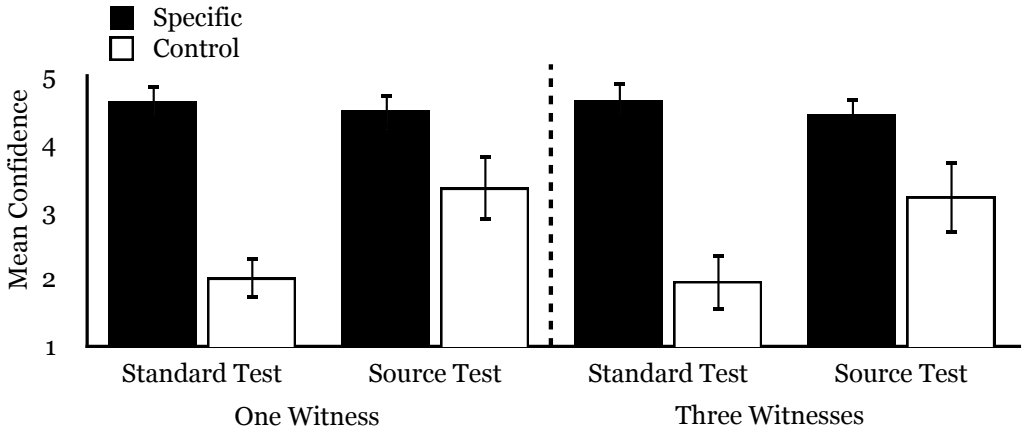

Figure 5.1. Mean Confidence Ratings of Specific and Control Claims by Number of Witnesses and Test Type in Experiment 5. Error bars represent a 95% confidence interval.

As the figure shows, the answer to our primary question is no: Encouraging effortful source monitoring did not have different effects on confidence about one versus three witnesses. A closer look at the figure reveals at least two important findings. First, comparing the black bars in the first and third position tells us that subjects were similarly confident about the repeated claims of a single witness and the repeated claims of multiple witnesses when completing the standard confidence test. And second, the comparison between the first and second black bars, as well as the third and fourth black bars, show that completing the source test mattered: Subjects who completed the source test became more confident on the control, unmentioned claims, but no less confident on the specific, repeated, claims than subjects that completed the standard confidence test.

In short, the source test did not affect subjects's confidence ratings of the repeated claims of a single witness, and while it did increase subjects's confidence in control claims, it did so similarly in both the one witness and three witnesses

conditions. But contrary to our source monitoring explanation, subjects who completed the source test continued to rate the repeated claims similarly regardless of how many witnesses made those claims.

In other words, a 2 (level of detail) x 2 (source) x 2 (test type) ANOVA found a significant interaction between item type and test type, $F(1,70) = 34.58$, $p < .01$, $\eta_p^2 = .33$. Moreover, regardless of how many witnesses made the reports, subjects were more confident about control claims when taking a source test (M =3.27, SD = 1.06) than when taking the standard confidence test (M = 1.99, SD = 0.74), $t(72) = 6.11$, $p < .01$, $d = 1.44$. In addition, subjects were similarly confident about the repeated, specific, claims regardless of whether they completed a source test (M = 4.46, SD = 0.53) or the standard confidence test (M = 4.63, SD = 0.53), $t(72) = 1.39$, p = .17, d =0.33. No tests of source were significant, all Fs ≤ 0.20.

Our hypothesis that subjects who completed the source test would find the repeated claims of a single witness less credible than the claims of multiple witnesses did not materialize, but we did find an overall increase in the credibility of unmentioned, control claims when subjects completed the source test, $t(72) = 5.99$, $p < .01$, $d = 1.41$. How might we explain these findings? One possibility is that the increased confidence in control claims is the result of a criterion shift. But a closer inspection of Figure 5.1 reveals there was a small, non-significant, trend of lower confidence in the specific claims when subjects completed the source test compared to when they completed the standard test. This trend suggests that the increased confidence in control items was not a result of a criterion shift.

A more likely explanation is that the increased confidence was a result of how we manipulated control items. More specifically, control items did appear in the reports, but in generic format. For example, subjects would have read multiple

times that the electrician read a magazine, but not that it was a Time magazine. In the source test, subjects may have remembered reading about a magazine on several occasions, even if they did not read about which magazine it was. This recognition could lead subjects to partially adjust their scores to reflect that they believed part, but not all, of the information in that claim (e.g., that it was a magazine, but not necessarily a Time magazine). An adjustment that may, in turn, inflate their credibility rating of the claim. Regardless of the reason for the increase in subjects's confidence in control claims, we did not find a similar increase in specific claims.

Summary of Experiments 3-5

Across three experiments, we found that subjects' overconfidence in the repeated claims of a single witness was driven by the fact that they interpreted repeated claims as consistent—an attribution known to inflate people's belief in the credibility of information (Berman et al., 1995; Brewer & Burke, 2002; Fisher et al., 2009; Uviller, 1993). In Experiment 3, we found that adding inconsistencies to the reports alone did not differentially affect the credibility of claims made by one witness versus three witnesses. However, in Experiment 4, we found that warning subjects about the inaccurate witness or witnesses did decrease confidence in the repeated claims of a single witness, but not the claims of multiple witnesses. In Experiment 5, we found no support for the source monitoring account of our findings. When we used a method known to increase effortful monitoring processes, subjects showed the same pattern as the unwarned

subjects from Experiment 4. This finding suggests the pattern of warned subjects from Experiment 4 was not simply the result of more effortful source monitoring.

Chapter 6

General Discussion

Review

In the first two experiments, we asked if one person who repeats claims wields more influence on memory and confidence than that same person making the claim only once. We found that the answer was yes. More specifically, in Experiment 1, subjects who read the repeated, misleading, claims of a single witness were less accurate than those who read the misleading claims only once. In Experiment 2, subjects who read the repeated claims of a single witness were more confident those claims were true than subjects who read the claims only once. These findings highlight the important role of repetition when judging credibility. Surprisingly, the repeated claims of a single witness were as misleading (Experiment 1) and as credible (Experiment 2) as the same claims made by multiple witnesses once each. In Experiments 3 through 5, we sought to explore why.

In our second series of experiments, we asked if the reason the repeated claims of one witness were as credible as claims made by multiple witnesses once each is that the consistency of a single witness leads subjects to believe the witness is more accurate. In Experiment 3, half of the subjects read reports containing peripheral inconsistencies. Contrary to our predictions, they continued to find the repeated claims of a single witness as credible as the same claims made by multiple witnesses. In Experiment 4, however, we told half of the subjects that the

witnesses were highly inaccurate—an alert that led those subjects to find the repeated claims of a single witness less credible than the same claims made by multiple witnesses. In Experiment 5, we asked if increasing subjects' likelihood of using effortful source monitoring accounted for these findings. Even in the face of a confidence test with a monitoring component, subjects continued to find the repeated claims of a single witness as credible as the claims made by multiple witnesses once each.

Consensus and Consistency.

These findings fit with the literature on consistency and consensus. Recall the hypothesis that subjects took the repeated, consistent, claims of a single witness as a marker that those claims were true (Alter & Oppenheimer, 2009; Arkes et al., 1991; Dechêne et al., 2010; Lindsay, 2008). Recall also the hypothesis that subjects took the consensus of multiple witnesses about the same claims as a marker that those claims were true (Berman et al., 1995; Brewer & Burke, 2002; Fisher et al., 2009; Uviller, 1993). Consistent with the literature on consistency and consensus, we found support for these hypotheses in Experiment 4: When we warned subjects about the accuracy of the inconsistent reports, they found the repeated claims of one witness to be less credible than claims made by three witnesses once each. Our research furthers this literature by showing that consensus and consistency both lead to similar levels of credibility. In addition, this research demonstrates that the over-reliance people have on the consistent, repeated, testimony of a single witness can be ameliorated by warning people about inconsistencies.

Source Test.

In Experiment 5, adding a source monitoring component to the confidence test did little to decrease the credibility of the repeated claims of a single witness relative to the same claims made by multiple witnesses. What might have caused this surprising finding? One possibility is that the type of monitoring that the source test encouraged—attending to the source of the repeated claims—may not be the type of monitoring error driving our effects. As a result, subjects continued to see the repeated claims of a single witness as credible, regardless of their ability to recognize, at test, that it was repeated. Of course the question of when people can and cannot use more effortful source monitoring to evaluate the credibility of information is an important one worthy of future research.

In addition, Experiment 5 should not be taken to suggest that source monitoring plays little role in assessing the credibility of repeated claims. It stands to reason that source monitoring has a primary role. Indeed, Experiment 5 showed that subjects were very good at monitoring both the source of the claims and whether they were repeated. In addition, Experiment 4 suggests that subjects did use their knowledge that the source came from either a single, or multiple, witnesses which led to similar credibility ratings for different reasons. Instead, the findings suggest that when people have no reason to question the credibility of a single witness's repeated claims, they use their knowledge of the source of the claims in a way counter to what intuition suggests: leading them to over-rely on the repeated claims of a single witness.

Counterexplanations

Our findings suggest that the credibility of claims repeated by a single witness is rooted in the consistency of that witness. As such, drawing attention to the

inconsistencies between reports reduced the credibility of those claims. A critic might argue that in Experiment 4, the "bottom 10%" warning did not cue subjects to the inconsistencies in the reports, but instead led them to better attend to the source of the claims when reading the reports. This explanation seems unlikely given the findings in Experiment 5 showing that subjects were very good at remembering both that the claims repeated and the source of those claims. It seems reasonable to assume subjects in all experiments would have demonstrated these high levels of accuracy had they been asked to. Therefore, this counterexplanation seems untenable.

Of course, in the real world, multiple witnesses provide richer source information than any we provided here. In court, for example, three different witnesses who take the stand will vary on a variety of dimensions, all of which triers-of-fact could use to distinguish the credibility of their claims later. Would triers-of-fact actually use these richer source cues, and show different patterns of remembering when testimony is repeated by one witness or by three witnesses? While some research suggests they would use these richer source cues, our findings suggest they would not unless given a reason to question the credibility of the source (Mitchell & Zaragoza, 1996). Overall, this is an important question that needs to be addressed before generalizing our findings to the real world.

Connections to the Wider Literature

Although these findings square with the literature on consensus and consistency, they do not square with other research. For instance, Weaver and colleagues (2007) found that when subjects read the same opinion from three different people, they were more likely to believe it represented the population's

opinion than when they read the repeated opinion of only one person. Recast in our framework, Weaver and colleagues found consensus was more important than consistency.

How do we reconcile these inconsistencies between Weaver et al.'s (2007) findings and ours? One possibility is that people see the opinions of others as less trustworthy than the memories of others. This possibility is quite rational: There are infinite opinions about some experience, but only one correct memory. For example, if Jennifer asks Owen about the movie The Godfather, Jennifer may not trust Owen's opinion that "it is the best movie ever made," but she would be more likely to trust his account of the plot. Therefore, Weaver et al.'s manipulation might be analogous to our warning manipulation: When people have a reason to question the credibility of information, then consistency becomes less influential than consensus. Of course, the question of when people will rely on or discount the consistency of repeated information is an important one worthy of future research.

Future Research

Although the results of this research showed that drawing subjects' attention to the inaccuracies of the inconsistent reports reduced their over-reliance on the repeated claims of a single witness, they do not tell us whether these effects were driven by social or cognitive factors. More specifically, the warning about the accuracy of the reports encompasses both social and cognitive aspects that might drive these effects.

Social.

We know from the social psychology literature that social aspects of witnesses —such as the relationship among witnesses, or the witness's motivation—can

influence people's susceptibility to misinformation (Dodd & Bradshaw, 1980; French et al., 2008). In Experiment 4, the "bottom 10%" warning conveys a similar social aspect: Accordingly, it may have acted as a social cue that the witness should not be trusted in general, while not influencing how credible subjects found claims made by multiple witnesses. If this explanation were true then other social cues should show similar patterns of results. Future research could address this issue by telling subjects that the reports were written by people with either neutral or vested interests. If the effects of repetition—that is, the difference between the credibility of repeated claims and the credibility of unrepeated claims—from a neutral witness are larger than the effects of repetition from a witness with vested interests, then we might conclude that our effects were driven by social aspects.

Cognitive.

We also know from the cognitive psychology literature that individual differences—such as intelligence, perception abilities, and memory capacity—can influence people's susceptibility to misinformation (Zhu et al. 2010). In one study, researchers asked people to take part in a misinformation study, and later completed a battery of cognitive tasks including measures of intelligence, perception, and memory. They found that people with higher intelligence, better perception skills, and better memory capacity, were less likely to falsely remember the post-event information than other people with lower intelligence, perception abilities, or memory capacity.

It may be that the "bottom 10%" warning helped aid people with lower skills on these measures to reduce their over-reliance on the repeated claims of a single witness. If this explanation were true, then we should find that people with higher

scores on these measures find the repeated claims of a single witness as more credible than people with lower scores on these measures.

In summary, continued research is needed to differentiate between the roles social and cognitive factors take in how credible people find the repeated claims of a single witness relative to claims made by multiple witnesses.

Final Remarks

Considered together, these experiments demonstrate an intriguing, robust phenomenon: that people overestimate the credibility of the repeated claims of a single witness, and that they do so, at least in part, because the information is consistent. These results have important real world implications. For instance, lawyers often draw the jury's attention to inconsistencies between reports in order to discredit witness testimony (Berman et al., 1995). But our findings suggest that although this technique may work to discredit the repeated testimony of a single witness, it would be much less effective in discrediting the overlapping claims of multiple witnesses.

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Appendix A

Experiment 2 was replicated online using subjects recruited from Mechanical Turk. Mechanical Turk is an online subject pool in which workers can complete short tasks for a small contribution towards an Amazon gift voucher. Research on Mechanical Turk demonstrates that Mechanical Turk can provide a subject pool as diverse as a university student population and that the data from experiments conducted both in-lab and online using Mechanical turk are comparable (Buhrmester, Kwang, & Gosline, 2011; Germine, Nakayama, Duchaine, Chabris, Chatterjee, & Wilmer, 2012; Mason & Suri, 2011).

Methods

Subjects

One hundred and seventy six subjects accurately completed all phases of the experiment. They were recruited from Amazon's Mechanical Turk.

Design

We used a 2 (report repetition: repeated, not repeated) x 2 (source: one witness, three witnesses) x 2 (item type: specific, control) mixed factors design, manipulating repetition and source between subjects, and item type within subjects.

Procedure

The method described below was similar to the method used in Experiment 2, but was conducted online. The experiment was programmed with Real Software's Real Studio Web Edition, it was displayed via the subject's web browser, and took approximately 15 minutes to complete. Subjects first responded

to a few demographic questions (age, gender, and geographic location), before reading the instructions.

We told subjects they would read three witness reports ostensibly written by other people in a previous experiment. Following our previous manipulation of source, we told half of the subjects that they would be reading all three of the reports made by a single witness, and the other half that they would be reading one report from each of three different witnesses.

After reading the instructions, everyone read the three witness reports used in Experiments 1 and 2. An introduction screen between each report emphasized whether the report came from the same or a different witness than the previous report. Then everyone completed a 5 minute number matching filler task.

Finally, we asked subjects to complete the confidence test. The confidence test was identical to the confidence test used in Experiment 2 with the exception that items appeared one at a time. Afterwards, everyone was debriefed.

Results and Discussion

We removed 43 subjects (24%) who, on the test, responded only 1 or 5 on 90-100% of their answers, a pattern suggestive of a response set.[15] In the analyses we report here, the pattern of results was similar when these subjects were or were not in the dataset.

As in Experiment 2, we asked if repeating claims make subjects more confident that they really happened—and if so, if the number of witnesses repeating those claims matters. To address this question, we calculated each subject's mean confidence that specific details or actions had taken place. We

15 We used a similar criteria for excluding subjects in Experiment 4, but only 11% of subjects matched those criteria in Experiment 4. The reason for this difference is that Experiment 4 used an instructional manipulation check to exclude subjects who did not read the instructions while this experiment did not. As such, many of the subjects using this response set in Experiment 4 had already been removed from the analysis for not reading the instructions, thus reducing the subjects matching this criteria to 11%.

classified these data first according to whether the critical items were described in a specific or control level of detail in the reports, second according to how many witnesses the reports were attributed, and third according to how many reports contained critical items in a specific level of detail. These results appear in Figure A.1.

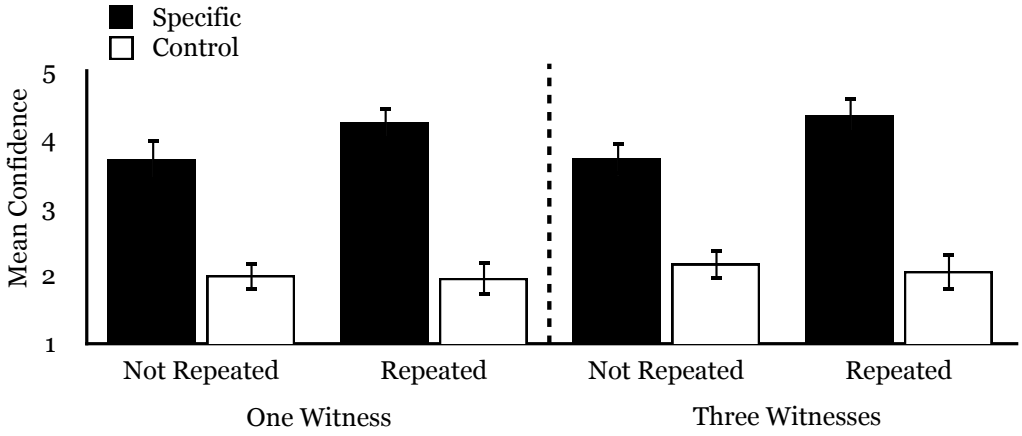


Figure A.1. Mean Confidence Ratings of Specific and Control Claims by Repetition and Number of Witnesses in Experiment for Appendix A. Error bars represent a 95% confidence interval.

Figure A.1 shows two important results that are nearly identical to those found in Experiment 2. First, the comparison between the first and second black bars, as well as the third and fourth black bars, show that repeating claims mattered: When subjects heard the same specific claim repeated, they were more confident that those claims were correct than when the claims were not repeated. And second, subjects were similarly confident about repeated claims regardless of the number of witnesses who made those claims. More specifically, subjects were no more confident about claims repeated by three different witnesses than they were about claims repeated by a single witness.

In other words, a 2 (report repetition) x 2 (source) x 2 (level of detail) ANOVA revealed a significant interaction between level of detail and report repetition, $F(1,129) = 14.64$, $p < .01$, $\eta_p^2 = .97$. Moreover, regardless of how many witnesses

made the reports, subjects were more confident about repeated specific claims (M = 4.29, SD = 0.66) than unrepeated specific claims (M = 3.71, SD = 0.80), $t(131)$ = 4.44, $p < .01$, d = 0.78. There was no difference in people's confidence in the control claims between the repeated (M = 2.00, SD = 0.69) and unrepeated (M = 2.10, SD = 0.69) conditions, $t(131) = 0.79$, $p = .43$, $d < 0.14$, and no tests of source were significant (all Fs ≤ 1.06). Taken together, these results replicate those found in Experiment 2.

Appendix B

We conducted a separate misinformation effect experiment using the same materials as Experiment 3, but first showed subjects a video of the crime.

Methods

Subjects

One hundred and twenty-eight introductory psychology students completed the experiment as part of a course requirement. Subjects completed the experiment in groups of 1 to 5.

Design

We used a 2 (source: one witness, three witnesses) x 2 (item type: misled, control) x 2 (consistencies: consistent, inconsistent) mixed factors design manipulating source and consistencies between subjects, and item type within subjects.

Procedure

The procedure described below was the same as Experiment 1 with two exceptions: 1) for all subjects, the critical—specific—claims were repeated across all three reports; and 2) for half of the subjects, we used the same inconsistent reports used in Experiment 3.

In this experiment, subjects began by watching the video of "Eric the electrician" and were then given a 15 minute filler task. After the filler task, subjects read the three reports described in Experiment 3. Half of the subjects read the consistent reports, the other half read the inconsistent reports.

Subjects then completed a 3 minute pattern completion filler task. All subjects were then asked to complete the 20-item standard confidence test used Experiment 1, and were later debriefed.

Results and Discussion

If the repeated claims of a single witness convey consistency while the repeated claims of multiple witnesses convey consensus, then adding inconsistencies across the witness reports should make subjects less misled by the repeated claims of a single witness than the repeated claims of multiple witnesses.

To address this hypothesis we calculated each subject's mean accuracy for the eight critical items. We classified these data first by whether they were control or misled details, second according to the number of witnesses, and third according to whether the reports were consistent or inconsistent, and display them in Figure B.1.

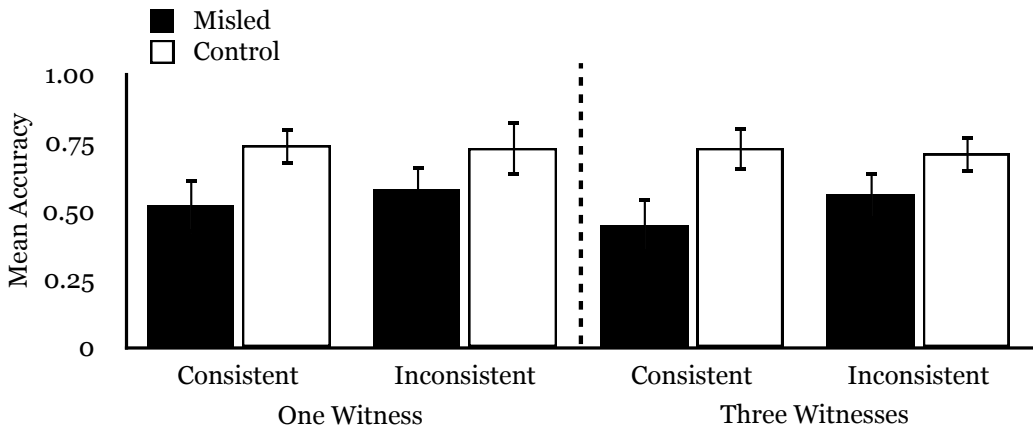


Figure B.1. Mean Accuracy of Misled and Control Claims by Consistency and Number of Witnesses in experiment for Appendix B. Error bars represent a 95% confidence interval.

Figure B.1 shows two important findings that are consistent with the findings of Experiment 3. First, the comparison between the first and second black bars, as well as the third and fourth black bars, show that adding inconsistencies to the reports mattered: Subjects who read reports containing inconsistencies were less

misled about the repeated misleading claims than subjects who read consistent reports. Second, this pattern was true regardless of the number of witnesses who made those misleading claims. In short, and contrary to our prediction, the addition of inconsistencies similarly affected how misleading the claims were when made by a single witness and multiple witnesses.

In other words, a 2 (source) x 2 (item type) x 2 (consistencies) ANOVA found a marginally significant item type x consistencies interaction, $F(1,124) = 2.72$, $p = .10$, $\eta_p^2 = .02$. Moreover, regardless of how many witnesses made the reports, subjects were marginally more accurate about misleading claims from inconsistent reports ($M = 0.57$, $SD = 0.26$) than misleading claims from consistent reports ($M = 0.48$, $SD = 0.27$), $t(126) = 1.84$, $p = .07$, $d = 0.33$. There was no difference in the accuracy of control claims between the inconsistent ($M = 0.72$, $SD = 0.24$) and consistent ($M = 0.74$, $SD = 0.21$) conditions, $t(126) = 0.53$, $p = .60$, $d = 0.09$, and no tests of source were significant, all Fs < 1. Taken together, these results show a pattern consistent with the pattern of results found in Experiment 3.

Appendix C

Witness Reports

Transcript of Initial Interview

Critical items are underlined for demonstration purposes only and were not underlined in the reports given to subjects.

Police officer:
I'm now going to ask you some questions about the events you witnessed. First of all, could you please describe the person who arrived at the house?

Witness:
Umm, sure. Well, it was a man who drove a blue "AJ's Electricians" van, and it pulled up into the driveway. He had fairly… ummm, average features. Just brown hair is all really.

Police officer:
Okay, good. And what did the man do when he arrived at the house?

Witness:
He got his tool belt and a drill kit out of the van and went to the front door. Oh, and he got a key from under a flowerpot to unlock the door. Then, in the house, umm in the front hall area, he picked up a note that was next to a vase of flowers. He put that in his pocket and put his drill kit down.

Police officer:
Right. And what did the man do after he put down the drill kit?

Witness:
Um, he went into a bedroom on the right past the bed that was made. And there was a dresser past the bed, with a dark cloth over it. He lifted the cloth and opened the dresser and uhh, he just had a look inside the drawers.

Police officer:
He just looked inside?

Witness:
Yeah… But then he saw a wooden jewelry box on top of the dresser and he opened it and took out a pair of earrings, umm and he put them into his pocket…

Police officer:
Okay, and what did he do after that?

Witness:
He went back down the hallway into umm into the living room, and then into a lounge, where he opened some French doors. But then he went into the kitchen and he took a can of Pepsi from the fridge. He just had a look around everywhere.

Police officer:
Can you remember, was there anything in particular that he looked at?

Witness:
Ummm, yeah, he like rummaged through a pile of papers next to a mug on the kitchen bench. Then he went to the oven and bent down next to it. He used a screwdriver from his tool belt to fix the front panel.

Police officer:
Okay, what did he do after he fixed the oven?

Witness:
He went back down the hallway to another different bedroom. Uhh, then he kneeled down to check a power point. And then he had a look around that room too

Police officer:
What did he do in the room?

Witness:
Well, he tried on this blue cap and looked at himself in the mirror, but he put the cap back on the bed.

Police officer:
Go on.

Witness:
Ummm, he looked through the wardrobe, and then sat on the bed and started to flick through a news magazine, but then he just tossed it on the floor. Ohh, and then he went to the stereo and tried on a ring, and then he put the ring in his pocket. And he also looked through a pile of CDs, and took one to play on a stereo in the lounge.

Police officer:
So from there, he went back into the lounge?

Witness:
Yes. He went back into the lounge and put the CD on and did some more work in the lounge. He ummm, he opened a light fitting on the wall and did some things with the wiring, but it didn't work. Then after he did some more adjustments, the light came on.

Police officer:
And what did he do after that?

Witness:
Umm he sat down on the couch, turned off the stereo and turned on the TV instead. And he also picked up a red photo album and flicked through. Ummm,

then he looked at his watch, turned the TV off and he uh he got the CD out of the stereo and put it into his drill kit.

Police officer:
And then, did he do anything else?

Witness:
He shut the French doors again, and stopped to look at a picture on the wall. Ohh and then he went to the bathroom and took some prescription pills out of the cabinet - he also put those in his pocket. Then he hurried out the front door and closed it behind him.

Police officer:
And then he left?

Witness:
Yes, that was all.

Witness Report

I saw a man who drove up the driveway of the house in a blue "AJ's Electricians" van. He pulled up and got his tool belt and a drill kit out of the van. I could tell that he had brown hair, but I couldn't describe his other features

He took a key from under a flowerpot at the front door, unlocked the door, and went into the front hall area. He read a letter that was left for him on a small hallstand and put it in to his pocket.

He looked rather bored and started wondering around, going first to a bedroom on the right. He walked past a made bed with bright pink bedspread and over to a dresser that had a blue cloth on it, which he opened. He then closed the drawer and had a closer look at the things on top of the dresser. There was a jewelry box which he opened, and took out some earrings which he must have liked, because he looked closely at them and then put them into his pocket.

The electrician then headed back down the hallway and picked up his drill set that he had left there. He opened some big doors in the lounge and then went into the kitchen area. He must have been hungry and thirsty, because he then took a can of Pepsi from the fridge and an apple from a fruit bowl. He then had a look in the pantry, and flicked through some papers lying around a mug on the kitchen bench. After that, he went to the broken oven and fixed the front panel with a screwdriver.

He then headed back out of the kitchen and down the hallway to a second bedroom. There, he bent down and fixed a broken power point. Again, he snooped around the room, trying on a blue cap and looking at himself in the mirror, flicking through a news magazine, and even browsing through the wardrobe. He didn't find anything worth taking until he spotted a silver ring and pile of CDs next to the stereo. He put the ring in his pocket and also took a CD.

He then went back into the lounge and put the CD in the stereo while he did some work. After that, he worked on the wiring inside a light fitting on the wall

and finally got it to work again. He then decided to relax on the couch and picked up a black remote to turn on the TV. He also looked through a photo album he found on a wooden coffee table.

He then must have been in a hurry, because he looked at his watch, turned off the TV and got the CD back out of the stereo and took that with his drill kit. He closed the outside doors that he had opened earlier. Then he stopped to look at a picture on the wall, before having a quick look in the bathroom. He found some prescription pills in the cabinet and took those too. Then he rushed out of the house and back to his van.

Transcript of Followup Interview

Police Officer:

Could you please recount for me, in as much detail as possible, what you witnessed?

Witness:

Yes. Umm, the first thing I saw was a blue "AJ's Electrician's" van pull up into the driveway. The electrician who got out was a fairly young looking man with brown hair. He got out of the van and walked up to the front door of the house.

Police Officer:

Could you describe any other physical features of the man?

Witness:

Umm, not really… Just a normal looking man with brown hair.

Police Officer:

Okay, go on…

Witness:

Ummmm, so yeah, he went up to the front door and unlocked it using a key that he got from under a flowerpot. He then went into the hallway and found a note that had been left for him on a hallway table next to a vase. He left his drill kit in the hallway and then he went into a bedroom on his right.

Police Officer:

And what was it that he did in the bedroom?

Witness:

Well, he walked straight over past a made bed to a dresser that had a blue cloth over it, and he decided to have a look in the dresser drawers. He didn't take anything out of the drawer, but he did take a pair of nice earrings out of a jewelry box on top of the dresser.

Police Officer:
Could you just clarify for me, that he took them?

Witness:
Yeah, he took them and put them into his pocket. He then went back through the house and into a lounge area to open some doors. Then he went into the kitchen, right next to the lounge, and he took an apple from a fruit bowl and a can of Pepsi out of the fridge. He kind of just looked through everything, even the pantry and a pile of papers next to a mug on the kitchen counter.

Police Officer:
Did he take anything else from the kitchen?

Witness:
Umm, no. After that he did some work on the oven. He bent down and used one of his screwdrivers to fix the front panel of the oven, which must have been broken. Then he just left the kitchen and went back to the hallway and into another bedroom. First he did some work there – he checked a power point, but didn't take long. But then he looked through the wardrobe and tried on a blue cap, checking himself out in a mirror. He didn't take that either though, he just left it on the bed and had a look through a news magazine.

Police Officer:
So was there anything that he took from this second bedroom?

Witness:
Yes, there were some things. He must have spotted the silver ring on the stereo, because he tried that on too and put it into his pocket. He looked through a stack of CDs on the stereo and took that too. He must have wanted to listen to it while finishing his last job, because he went back into the lounge and played it on the stereo there. Then he did his final job, which was to fix a light fitting on the wall.

He had to open it and adjust the wires inside for quite a long time before he got it to work again.

Police Officer:
And then did he leave the house?

Witness:
No, he ummmm, yeah, after he finished that job, he just sat down on the couch and used a remote to turn on the TV. He just sat there and looked through a photo album that was sitting on a coffee table. Then he looked at his watch and turned the TV and stereo off, but he took the CD with him.

Police Officer:
He put that in his pocket too, to take away?

Witness:
Um, well he put it in with his drill set. Then he shut the French doors he had opened in the lounge, and he took some time to look at a picture on the wall. Then he went to the bathroom to have a look in the cabinet. He found some pills there, in one of those prescription bottles, and he put those into his pocket.

Police Officer:
And then did the man decide to leave?

Witness:
Yes, after that, he hurried out of the front door and closed it on his way.

Police Officer:
Thank you for your help.

Appendix D

Tests

Recognition Test

You will now be asked some questions about the video you saw. We are testing your memory for this video.

Each question has two parts:

1) the first part asks you about a particular item from the video;
2) the second part asks you how confident you are about your answer.

Here is a sample question.

Eric was working in _____

a. a house b. a shop

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

WHEN YOU HAVE READ AND UNDERSTOOD HOW TO ANSWER THESE QUESTIONS, TURN OVER THE PAGE AND BEGIN THE TEST.

1. Eric was wearing _____

a. overalls b. jeans

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

2. Eric ate _____

a. an apple b. a banana

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

3. The magazine that Eric read was _____

a. Time b. Newsweek

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

4. Eric read the note from the homeowner in the _____

a. kitchen b. hallway

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

5. The tool that Eric used in the kitchen was _____

a. pliers b. a screwdriver

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

6. In the lounge the picture Eric looked at was the _____Tower

a. Eiffel b. Leaning

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

7. The bed in the first bedroom was _____

a. made b. unmade

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

8. In the second bedroom, Eric tested a _____

a. power point b. light fitting

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

9. Eric played a _____

a. video b. CD

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

10. In the second bedroom, Eric tried on a _____ cap

a. blue b. black

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

11. The name of Eric's company was _____

a. AJ's Electricians b. RJ's Electricians

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

12. Eric checked the time _____

a. on his watchb. on the wall clock

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

13. The jewellery that Eric stole in the first bedroom was _____

a. earrings b. a necklace

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

14. In the lounge Eric looked through a _____

a. journal b. photo album

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

15. Eric's van was_____

a. blue b. red

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

16. Eric found the house key under a _____

a. door mat b. flower pot

How confident are you that your answer is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

17. Eric rummaged through papers that were next to a _____mug

a. yellow b. white

How confident are you that your answer is correct?

1	2	3	4	5

Not at all Confident — Very Confident

---

18. Eric drank a can of _____

a. coke b. pepsi

How confident are you that your answer is correct?

1 2 3 4 5
Not at all Confident — Very Confident

---

19. In the bathroom Eric stole _____

a. pills b. perfume

How confident are you that your answer is correct?

1 2 3 4 5
Not at all Confident — Very Confident

---

20. Eric stole _____ in the second bedroom

a. money b. a ring

How confident are you that your answer is correct?

1 2 3 4 5
Not at all Confident — Very Confident

Confidence Test

How confident are you that each of the following things happened during the electrician's visit?

Please circle a number to indicate your confidence, where 1 = not at all confident and 5 = very confident.

Here is a sample question.

Eric was working in a house.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

WHEN YOU HAVE READ AND UNDERSTOOD HOW TO ANSWER THESE QUESTIONS, TURN OVER THE PAGE AND BEGIN THE TEST.

1. Eric was wearing jeans.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

2. Eric ate an apple.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

3. The magazine that Eric read was Time.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

4. Eric read the note from the homeowner in the hallway.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

5. The tool that Eric used in the kitchen was a screwdriver.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

6. In the lounge the picture Eric looked at was the Leaning Tower.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

7. The bed in the first bedroom was unmade.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

8. In the second bedroom, Eric tested a power point.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

9. Eric played a video.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

10. In the second bedroom, Eric tried on a black cap.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

11. The name of Eric's company was RJ's Electricians.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

12. Eric checked the time on the clock.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

13. The jewelry that Eric stole in the first bedroom was a necklace.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

14. In the lounge Eric looked through a photo album.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

15. Eric's van was red.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

16. Eric found the house key under a flower pot.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

17. Eric rummaged through papers that were next to a white mug.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

18. Eric drank a can of Coca-Cola.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

---

19. In the bathroom Eric stole pills.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

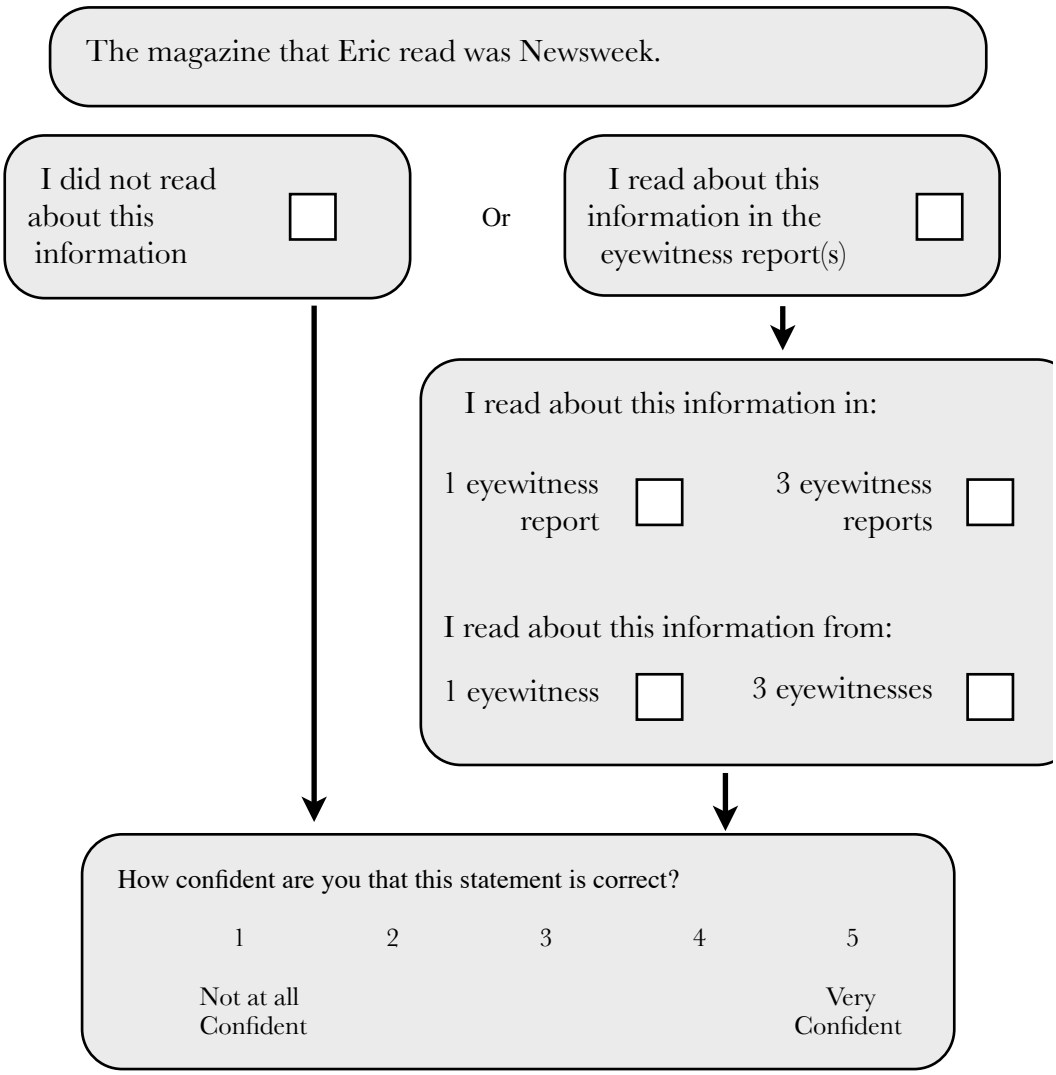
---

20. Eric stole money in the second bedroom.

How confident are you that this statement is correct?

1	2	3	4	5
Not at all Confident				Very Confident

Sample Item Taken From Confidence Test



Author Index

Keyword Index

List of Figures