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Eyewitness confidence : the relation between accuracy and confidence in episodic memory

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General discussion

Introduction

Eyewitnesses are the most important source of information in reporting criminal events. They are also an important source of evidence in legal cases, either by identifying suspects or by reporting details about criminal events, thereby often determining the outcome of trials (van Koppen & Malsch, 2008). As noted by Loftus and Ketcham (1991, p.16) "aside from a smoking pistol, nothing carries as much weight with a jury as the testimony of an actual witness". It is therefore crucial to know how accurate eyewitnesses are. Since the early work of Stern (1902) and Münsterberg (1908) it is already known that eyewitness reports are not always reliable and accurate. During the last 40 years psychological research has greatly enhanced our knowledge about the fallibility and the malleability of eyewitness memory (Loftus, 1979; 2005).

The central focus of this dissertation is on the accuracy of eyewitness memory, and especially on the relationship between accuracy and confidence (i.e., the subjective judgment of accuracy). We studied these factors both in laboratory studies (chapters two to four) and in a field study (chapter five). To enhance the ecological validity of the laboratory studies, we used a method that allowed us to determine accuracy and confidence scores for the recall of details of complex naturalistic events. Moreover, we examined the effects of some variables that are characteristic of actual eyewitness interviews, such as long (versus short) retention intervals, and repeated (versus non-repeated) questioning. This final chapter starts with a summary of the major findings followed by methodological considerations as well as recommendations for the legal practice.

Accuracy

The results of the experiments discussed in this dissertation show that the overall level of memory accuracy for details of complex events is quite high. This is the result of the experimental design which is high in ecological validity by using open-ended questions and the option to respond with "I don't know". Accuracy rates range from 0.94 (after a brief interval for information recalled with high confidence) to 0.84 (after a long delay recalled with high confidence). Only a relative small proportion of all the information retrieved from memory appears to be incorrect, ranging from .12 (after a brief interval) to .29 (after a long interval). The finding that the participants in our studies appear to be quite accurate in their recall stands in contrast with the thought that eyewitness testimony is often unreliable. This idea has been created by the focus of most researchers on errors and false memories, resulting in a somewhat biased picture. In addition, the faith the legal system places in eyewitnesses has been shaken recently by the advent of forensic DNA testing (see, e.g., Innocence project,

2007; Wells, Memon, & Penrod, 2006). All together, it creates an image that suggests that the memory of witnesses constantly fails and produces errors.

The results of the experiments described in this dissertation show that indeed people do make mistakes and sometimes they are inaccurate in what they say they remember. However, the majority of information they recall is correct, especially the information that is provided with the maximum level of confidence.

Accuracy in suggestive questioning

Things change dramatically though, when the questions are suggestive in nature, as shown in chapter 3. Subjects appear to be very prone to accept suggested incorrect details, even if they are given the opportunity not to answer. Especially after longer retention intervals, chances that incorrect (i.e., fantasized) answers are provided in response to a suggestive question become high, and correct rejections of the suggestion decreases fast. The conclusion that our participants were prone to suggestion obviously is not a new finding, but it emphasizes again the importance of interviewing witnesses in a correct manner, i.e., refraining from suggestive questions at all times.

Confidence and the accuracy-confidence relationship

Given the importance of accuracy in eyewitness memory it is imperative to look for indicators that can be used to estimate accuracy. One such indicator is the subjective estimation of the accuracy of a memory expressed as a confidence judgment. It has been shown that both lay persons and legal professionals assume that confidence is a good indicator of accuracy (Cutler, Penrod, & Stuve, 1988; Leippe, 1980; Leippe, Manion, & Romanczyk, 1992; Lindsay, Wells, & O'Connor, 1989; Luus & Wells, 1994; Penrod & Cutler, 1995). Overall, the results of the experiments in this dissertation show that this intuition is correct to some extent. There is indeed a relation between confidence and accuracy in episodic memories. In all our studies we found that the distribution of correct and incorrect information as a function of confidence levels shows an increase in accuracy with increasing confidence. This relationship, however, is not perfect with within correlations ranging from 0.63 to 0.38, depending on the test conditions. Although these correlations are clearly higher than accuracy-confidence correlations found in person identification tasks (e.g., Bothwell, Deffenbacher, & Brigham, 1987; Sporer, Penrod, Read, & Cutler, 1995), they still indicate that inaccurate memories are sometimes given with a high level of confidence, and accurate memories with a low level of confidence. In calibration terms, the distributions of accurate and inaccurate recall as a

function of confidence level invariably indicate overconfidence at the high end of the confidence scale and under-confidence at the low end of the confidence scale.

Retention interval

As expected, the length of the retention interval (the delay between perceiving an event and first recall) has a large effect on the level of accuracy. Longer intervals not only cause more forgetting (i.e., more 'I do not know answers'), but also lead to more memory mistakes. These results emphasise the importance of questioning witnesses as soon as possible after an event. Any delay reduces the amount of information recalled and increases the chance of memory errors.

Confidence in recall is also negatively affected by longer retention intervals. On average, confidence decreases with longer retention intervals. However, because this decrease in confidence is almost proportional to the decrease in accuracy, the accuracy-confidence relationship remains almost the same.

Repeated retrieval

A few effects of repeated retrieval are found. Repeated retrieval did not result in memory enhancement (chapters 2-5). Only in the study described in chapter 4 did repeatedly retrieving the same information from memory seem to inflate the confidence expressed in the answers provided. These results are somewhat surprising because other studies have reported that repeated recall attempts may increase recall, a phenomenon known as hypermnesia, (Roediger, McDermott, & Goff, 1997; Scrivner & Safer, 1988; Turtle & Yuille, 1994), and may also cause confidence inflation (Shaw, 1996; Shaw & McClure, 1996; Shaw, McClure, & Dykstra, 2007). It should be noted, however, that in our experiments exactly the same open-ended questions were asked in the subsequent retrieval sessions. This form of repeated questioning seems to do no more than to consolidate the information that was retrieved in previous attempts. This is also suggested by the fact that recall performance remained at about the same level in subsequent recall sessions. It is possible that also previously given confidence judgments were remembered, which would explain why repeated recall did not affect the subjective confidence in the accuracy of what is recalled.

It can be concluded that asking the same questions repeatedly is not effective in remembering additional information. Of course, it cannot be ruled out that changes in subsequent retrieval attempts, for example, by asking different questions or by using a cognitive interview to follow-up on a free recall attempt, would produce additional information.

On the other hand, it is of importance to note that asking the same questions on subsequent occasions does not harm the witness report either, because no evidence is found of recall that is more incorrect or of inflated confidence. This is a forensically interesting finding, because repeatedly questioning witnesses about the same event is common practice in judicial investigations.

Consistency

Consistency of recall, i.e., the same information being recalled at two different moments in time, is another indicator of memory accuracy. This indicator is often used in conditions where it is impossible to check the accuracy of recall against a record of the original event. Consistency of recall is used as a proxy for accuracy for instance in studies investigating so called 'flashbulb memories' (Brown & Kulik, 1977; Wolters & Goudsmit, 2005), and memory of traumatic experiences (Giezen van, 2007).

Consistency, however, is a necessary but not a sufficient condition for accuracy. Both accurate and inaccurate information can be recalled consistently. Moreover, inconsistencies in the form of omissions (information recalled at time 1 but not at time 2) or commissions (information not recalled at time 1 but recalled at time 2) may either be correct or incorrect.

The repeated retrieval paradigm allowed us to examine the relationship between consistency and accuracy. As was shown in chapter 3, consistency is not a good indicator of accuracy. Although consistency is related to accuracy, this relationship is even less than the accuracy-confidence relationship. The weak relationship between consistency and accuracy is understandable considering the nature of memory and the process of memory retrieval. Memories are not static entities but they can change over time. Moreover, the success of memory retrieval strongly depends on the quality of available retrieval cues and the retrieval operations performed by the person who tries to remember something. Therefore, it is likely that details that can be remembered at one point in time may not be remembered another time. Consequently, some inconsistencies between testimonies of the same person at different points in time are normal and testimonies of eyewitnesses should not be dismissed just because of these inconsistencies.

Methodological issues

One of our aims was to study aspects of the accuracy of eyewitness memory in ecologically valid conditions that would allow generalization of the results to the real world. As a consequence we had to balance between experimental control and everyday variability. At one

end of this balancing act we conducted a field study using as much methodological rigour as possible (thereby losing some of the ecological validity), and at the other end we performed laboratory studies in which we tried to induce conditions resembling real life situations (striving for, but not completely attaining, ecological validity).

There are methodological shortcomings of the laboratory studies that prevent us from generalizing our results to the real world. First, to allow comparisons of accuracy between conditions we had to use the same questions in subsequent retrieval attempts. This is quite unlike more natural situations where different questions will be asked in subsequent interviews. Using exactly the same questionnaire clearly introduces the possibility that subjects remembered the questions and the previously given answers. So the repeated retrieval condition used in our studies does not allow a generalization to the much more variable retrieval conditions that occur in the real life situations.

Second, participants in laboratory studies lack the emotion and stress that is experienced by eyewitnesses of actual criminal events. Also, laboratory experiments typically use students, acting as 'witnesses'. College students appear to be less suggestible and more accurate as eyewitness overall than are either children or the elderly (Cutler & Penrod, 1995). Therefore, we cannot be sure that this selective and homogeneous group of participants generates results that are generalizable to the average population.

It is interesting to note, however, that we found comparable results regarding accuracy and confidence of memory for event details in laboratory studies (with students watching attentively a video of complex event video) and in a field study (with supermarket employees who witnessed an actual robbery). This finding suggests that our laboratory results can reasonably well be generalized to real life situations.

Is a confident witness a good witness?

Although the findings show a clear and consistent relationship between confidence judgments and the actual accuracy of memories, it has to be noted that the forensic usefulness of this finding is limited. Information remembered with high confidence are more often correct than details remembered with less confidence, but even a maximum level of confidence does not guarantee accuracy. This implies that in deciding about the accuracy of a particular memory on the basis of a confidence judgment there is always a margin of error. The proportion of inaccurate memory with the highest level of confidence varies between 0.06 with short intervals to 0.16 with longer intervals and depending on particular conditions. However, the diagnostic value (i.e., the ratio of the number of correct decisions and the number of false decisions) of the memories with the highest level of confidence after the shortest retention interval tested (1 week) is 16. This is above the criterion of 15 that is minimally required to be acceptable in judicial decisions (e.g., Wagenaar, van Koppen & Crombag,

1993). Therefore, with some caution, confidence may be used as a partial indicator of accuracy, especially during the early stages of an investigation. Unfortunately, however, there always remain incorrect items that are given the maximum confidence score. That is the reason why no single witness statement can be accepted as certainly correct, based on confidence alone. Although the proportion of highly confident but incorrect recall may be small, it is a significant factor because it is potentially dangerous during a police investigation and can be disastrous in a courtroom.

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