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ABSTRACT—When two people witness an event, they often discuss it. Because memory is not perfect, sometimes this discussion includes errors. One person's errors can become part of another person's account, and this proliferation of error can lead to miscarriages of justice. In this article, we describe the social and cognitive processes involved. Research shows how people combine information about their own memory with other people's memories based on factors such as confidence, perceived expertise, and the social cost of disagreeing with other people. We describe the implications of this research for eyewitness testimony.

KEYWORDS—memory conformity; eyewitness testimony; suggestibility

When a police officer interviews an eyewitness, the hope is to tap into some pristine memory of the event. But memories are not complete descriptions of the past, nor are they always accurate. People forget information, confuse aspects of different events, and are influenced by what other people say. In this article, we focus on how eyewitnesses are affected by what other people say. This phenomenon—called memory conformity or social contagion of memory—builds upon classic work on social-influence processes and the malleability of memory. Three related processes contribute to memory conformity. Asch's (1955) work shows how normative influences guide behavior. In social situations, people will report something they do not believe in order to comply with group norms and to gain social acceptance. Sherif (1936) showed that informational influences can lead people to report what somebody else said because they are dependent on the other person for information in order to resolve uncertainty. In such cases, people may continue to report what somebody else said even after they are removed from the social situation, because they believe the other person. Loftus (2005) showed that people will report information suggested after an event because they have developed a false memory for it. We review recent research illustrating how these three processes can lead to eyewitnesses inaccurately reporting information that they heard from co-witnesses.

Eyewitnesses often talk with each other. A survey of eyewitnesses taking part in line-ups revealed that most saw the crime with other people present and over half of these people talked with the co-witnesses (Skagerberg & Wright, 2008). Because people may attend to different parts of an event and misremember parts, the discussion can include differences in memories and inaccuracies. These inaccuracies may spread among

eyewitnesses. A well-known case in which this occurred was the Oklahoma City bombing. Three employees were present when Timothy McVeigh rented the truck used in the bombing. Initially two of them thought McVeigh had been alone, but after discussing this with a third witness who believed there had been an accomplice, these witnesses also came to believe McVeigh had not been alone. The FBI now thinks this "accomplice" was an innocent person who rented a different truck the next day (Memon & Wright, 1999).

A more recent example involves investigation of the murder of UK TV presenter Jill Dando. The police constructed a line-up with their suspect, Barry George. Only one of the 16 witnesses taking part in the initial line-up identified him. However, this witness took a taxi home with other witnesses and they discussed the identification. What she said appears to have influenced these other witnesses. One, for example, had not felt confident enough to make an identification during the original line-up but after the taxi ride felt "95% sure" that George was the man she had seen. Barry George was convicted at the original trial, but this conviction was overturned in August, 2008.

Three methods tend to be used in most memory-conformity research. In the first, pairs of participants are shown a large number of stimuli and then tested on these together. The first person responds, followed by the second person. What the first person says often affects what the second person says, thus showing similarities to the social-psychology findings on conformity. Each participant contributes many data points, which means that fewer participants are needed when using this design than when using the other methods. The second method is more like the typical eyewitness situation and has a similar design to many postevent information studies. Participants see a crime sequence

and then discuss the event with other participants or confederates. Usually only a couple of misleading items are used, so that participants do not get suspicious. This means that more participants are needed with this method than with the first method. The final method provides participants with information about what other co-witnesses have said. A participant might be told either that 90% of the other people questioned thought the culprit was tall or that 30% thought the culprit was tall. Examples of each of these methods are provided in the remainder of this paper (see Schneider & Watkins, 1996; Gabbert, Memon, & Wright, 2007; and Skagerberg & Wright, in press).

THREE REASONS WHY AN EYEWITNESS MAY REPORT THE WRONG INFORMATION

An eyewitness could respond according to what another eyewitness said for three reasons: not wanting to disagree with the other person, thinking the other person is right, and having constructed a memory based on what the other person said. We describe research relevant to each of these reasons and relate it to eyewitness situations (Table 1).

The Cost of Disagreeing: Normative Influence

Imagine that you are with friends reminiscing about the past and someone recounts an amusing incident but misreports some of the details. The details are not important (the cost of this memory error propagating is low) and it would be rude to correct the person (the cost of disagreeing is high). The storyteller turns to you to verify the story and you nod in agreement. This is an example of normative influence.

In a forensic context, the interviewer can increase the cost of disagreeing and thereby encourage memory conformity. The interviewer may praise the interviewee for providing exculpatory information and may verbally punish the interviewee for providing

exonerating information. This can be a powerful suggestive technique, particularly when the interviewer is an authority figure and the interviewee a child. Consider the McMartin preschool case, in which positive statements included "Oh, you're so smart. I knew you'd remember," while negative statements included "Well, what good are you? You must be dumb." This was coupled with providing information about what other children allegedly said. For example (Schreiber et al., 2006, p. 29):

Interviewer: How about Naked Movie Star? You guys remember that game?

Child: No.

Interview: Everybody remembered that game. Let's see if we can figure it out.

This established a situation in which the cost of disagreeing with the alleged statements of the other children was large. Under such situations, normative influences come into play, and a person may comply with others for instrumental reasons: to gain acceptance and affiliation, and to avoid censure or disapproval. In the McMartin case, many children reported they had been abused under this aggressive questioning. All charges were eventually dropped.

Baron, Vandello, and Brunzman (1996) conducted an eyewitness-identification study that illustrates normative influences. They used either an easy task or a difficult task. Results from the difficult task are described in the next section. The results from the easy task, in which most of the participants would have been aware which person in the line-up was the true culprit, illustrate how changing the cost of an error affects normative influences. People knowingly gave an errant response so as not to disagree with a confederate when they were told the results were of little importance (that they were pilot

data), but were less likely to conform when they were told the results were important (that they would be used by police and courts).

Deciding Which Response Is Right: Informational Influence

After eyewitnesses discuss an event with co-witnesses, they are typically interviewed individually. Several studies have shown that many people continue to report suggested details in private. For example, Reysen (2005) tested participants individually after the group recognition task and found that the conformity effects persisted. This could be because they wanted to appear consistent with their public account. To address this, Wright, Gabbert, Memon, and London (2008) compared responding in secret to responding in public and found that both methods produced large conformity effects.

The more we trust the other person's information and value that person's opinion, the more we are subject to their influence (Festinger, 1957). Several factors reliably predict when people will trust another person's memory more than their own. The most studied factor is relative confidence: People will trust somebody else's memory if the other person appears more confident (e.g., Schneider & Watkins, 1996). In the McVeigh case, the person who originally remembered an accomplice with McVeigh was more confident than the other two witnesses.

Participants will also trust another person if they believe that person was in a better situation to encode the event. Gabbert, Memon, and Wright (2007) showed pairs of participants several pictures. They told individual participants that they had either viewed a scene for half as long as the other person or for twice as long. The people who were told they viewed the scene for less time than the other person were more likely to believe the

other person than those who were told they had viewed the scene for longer than the other person.

People also have beliefs about which groups of co-witnesses are most reliable. Skagerberg and Wright (2009) showed university students a video clip of a phone being stolen; this was followed by a line-up that did not include the culprit. The participants all chose someone, so all were in error. They were told that the study had also been run either with school children, who students believe have poor memories, or with police officers, who students believe have good memories. Participants were told either that most (97%) of these other people made the same choice as them or that few (4%) of them made the same choice. Participants were asked several questions about their own memory, including how certain they were and how difficult the task was. Research (Wright & Skagerberg, 2007) with eyewitnesses shows that responses to these questions change if a witness is told that the suspect was chosen or that an innocent filler was chosen. Figure 1 shows the mean for these responses; high values correspond to people thinking their memories are good. Those told about children's responses were not affected by the proportion of children agreeing with them. These participants judged the children's memories to be of so little value that they did not affect how they judged their own memories. Those told about police officers' responses were highly affected by the proportion agreeing with them. If more police officers agreed, their certainty was greater.

The difficult identification task used by Baron et al. (1996) illustrates informational influence. The authors argued that if it is important to be correct, people would be likely to go along with a confederate because they would not trust their own memory. This is what they found. When it was important to be correct, having been told

that the data would be used by the police and courts, participants were more likely to go along with an errant confederate than when the data were less important, having been told that the data were just for a pilot study.

Are New Memories Created? Memory Distortion

Cognitive psychologists differentiate between semantic memory, or simply believing that something is true (e.g., Edinburgh is the capital of Scotland), and having a memory that allows the person to mentally relive the event. This latter type is called an episodic memory (Tulving, 1983). An important question for both theory and application is whether these memory-conformity techniques just make people believe false information or whether actual episodic memories are created.

False memories can arise for a variety of reasons. In some cases the false information may be subtle, perhaps embedded in a misleading question. Loftus (1993) describes a good metaphor for this: "The new information invades us, like a Trojan horse, precisely because we do not detect its influence" (p. 530). Later when presented with the errant information, it may seem familiar and people may believe this familiarity is due to encoding the information as part of the original event. In other cases, people may explicitly encode the information and be aware of the source, but as time passes they may forget the source of the information, but not the information itself. In both of these situations, people make source-monitoring errors in which they falsely attribute the information suggested to them by the other person to information that they encoded as part of the original event (Johnson, Hashtroudi, & Lindsay, 1993).

Gabbert et al. (2007) had participants discuss a witnessed event with a co-witness and then had each participant provide an individual account of the event. They had

participants circle any items in their account that they remembered hearing from the co-witness but did not remember from the original presentation. Participants said that about half of the errantly recalled items they remembered from the co-witness and about half they remembered from the original presentation. Similarly, Meade and Roediger (2002) ran a series of studies in which they showed participants a slide show of cluttered room scenes and then asked them to recall the room contents, along with a confederate who deliberately introduced false items. Later, on an individual recall test, many reported the false items suggested by the confederate. Meade and Roediger asked participants to say whether they remembered the information from the original slide show, the confederate, both, or neither. They found that, most of the time, when participants reported a suggested item, they either recalled it being in the slide show or being in the slide show as well as reported by the confederate.

Participants forced to choose the source of their responses may report that the information was from the original presentation even if they have no memory for it. Meade and Roediger (2002; Roediger, Meade & Bergman, 2001) asked participants whether their responses were based on recollecting the item within the scene (i.e., an episodic memory) or not. They found that many participants reported episodic memories from the original scene for a substantial number of the items which had only been suggested to them by the confederate.

Real cases of eyewitnesses also provide evidence for false memories based on what other people say. The case of the eyewitnesses who saw McVeigh rent the truck used in the Oklahoma City bombing and who only came to believe McVeigh had an

accomplice after speaking with the confident co-worker is a good example (Memon & Wright, 1999).

SUMMARY

What does memory-conformity research mean for theories of social memory, and what are its implications for the legal system? For theories, it is important that researchers distinguish the three different processes that contribute to memory conformity. When people knowingly report errant information with others present, they are weighing the costs of disagreeing with the other person against the costs of being wrong. People may come to believe the suggested information because they trust the other person's memory more than their own. Moreover, having a belief and thinking about an event can lead to a person constructing an episodic memory. In order to differentiate these mechanisms, it is important to compare responding in private with responding in public, and to ask participants about their responses. Future research should involve manipulations that affect these three mechanisms differently; individual-difference measures, which are hypothesized to associate with these mechanisms differently, should be used.

These findings have an important but simple implication for the legal system: Police officers should ask eyewitnesses whether they spoke with co-witnesses. Eyewitnesses will not always be able to remember if they spoke with co-witnesses, but it is worth asking. If they have talked with others, then their memories should not be thought of as independent evidence. The police can investigate whether any memories may be contaminated by these discussions. This is part of the British Psychological

Society's (2007) recommendations to the UK Home Office for conducting line-ups, and we encourage US jurisdictions to follow.

Recommended Readings

Barnier, A.J., & Sutton, J. (Eds.). (2008). *From individual to collective memory*. Hove, UK: Psychology Press. This collection, simultaneously published as a special issue of *Memory*, 16(3), contains 10 chapters examining social memory, many on memory conformity; in particular, the papers by Harris, Paterson, and Kemp, and by Hirst and Manier provide excellent overviews.

Gabbert, F., Memon, A., Allan, K., & Wright, D.B (2004). Say it to my face: Examining the effects of socially encountered misinformation. *Legal and Criminological Psychology*, 9, 215-227. A study finding the size of the misinformation effect can be larger when the misinformation is introduced by another person than when it is only attributed to somebody else.

Shaw, J.S., Garven, S., & Wood, J.M. (1997). Co-witness information can have immediate effects on eyewitness memory reports, *Law & Human Behavior*, 21, 503-523. One of the first and most compelling demonstrations of co-witness influence on memory.

Wright, D.B., Self, G., & Justice, C. (2000). Memory conformity: Exploring misinformation effects when presented by another person. *British Journal of Psychology*, 91, 189-202. Examples of using a group recognition procedure and of using dialogue within the postevent information are described and related to the Oklahoma City Bombing.

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TABLE 1***Three Processes That Contribute to Memory Conformity***

Process	Description
Normative influence	Comparing the cost of disagreeing with the cost of being wrong. If the social cost of disagreeing is high, one may knowingly report errant information, particularly if making an error is not important.
Informational influence	Weighing the relative likelihood of the other person being correct versus oneself being correct. If the other person had a better view, has better memory in general, or is more confident, one is likely to believe that the other person's memory is correct.
Memory distortion	Information suggested by another person becoming, over time, part of an episodic memory. People can remember seeing information which they only heard from another eyewitness.

Fig. 1. Participants' beliefs about the quality of their own memories as a function of percentage of co-witnesses agreeing with them and who the co-witnesses were. (Skagerberg & Wright, 2009, Experiment 1). Y-axis scale is from 1 to 10 with high scores corresponding to good memories. 97% agreed means participants were told 97%

of either children or police officers chose the same person in the line-up as the participant. Shown are means and standard errors.

