

The Roles of Psychology in International Arbitration

Edited by

Tony Cole



Wolters Kluwer

CHAPTER 9

Human Memory and Witness Evidence in International Arbitration

*Ula Cartwright-Finch**

‘An obvious difficulty which affects allegations and oral evidence based on recollection of events which occurred several years ago is the unreliability of human memory. While everyone knows that memory is fallible, I do not believe that the legal system has sufficiently absorbed the lessons of a century of psychological research into the nature of memory and the unreliability of eyewitness testimony’.

The Hon. Mr Justice Leggatt EWHC 3560 (2003).¹

‘The law generally is unaware of the findings from the scientific study of human memory’.

British Psychological Society (2008).²

§9.01 INTRODUCTION

There is insufficient awareness among the legal profession generally about how memory operates. The implications of psychological studies for the resolution of disputes are also relatively poorly understood. Considerable research has been conducted in this area and there is greater awareness of these developments in the sphere

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1. The Hon. Mr Justice Leggatt, *Gestmin SGPS SA v. Credit Suisse (UK) Ltd and Anor* [2003] EWHC 3560 (Comm), paras 15-21.

2. The British Psychological Society, Research Board, *Guidelines on Memory and the Law: Recommendations from the Scientific Study of Human Memory*, § 1, 4 (Leicester: The British Psychological Society 2008).

of criminal law. Significant leaps are yet to be made in the civil sphere, however, and within international arbitration in particular. On this much, judicial authorities and psychologists appear to agree, as the two quotes above attest: the first was written by a judge at the English High Court in a commercial dispute over investment advice³ and the second is taken from a set of guidelines published by the British Psychological Society (BPS) on memory and law.⁴

Witness evidence covers a broad range of matters within international arbitration. This chapter will consider key research from the field of psychology and its implications for the accuracy and reliability of witness testimony, with a particular focus on the preparation of written witness statements and of witnesses before hearings.⁵ The discussion will apply to witnesses of fact rather than of experts, since the recollection of events is a less significant feature in the evidence of the latter. Section §9.02 therefore provides a brief overview of witness evidence in international arbitration, including how it is used and how witness statements are typically prepared in practice. The processes and procedures described are typical of complex, high-value disputes, in both commercial and investment arbitration.

The study of human memory is a huge field within modern psychology. The subject has generated thousands of studies examining memory in the context of law across numerous disciplines within the field. By way of illustration, research has examined: people's ability to judge whether a reported memory is real or imagined;⁶ whether it is possible to distinguish between real memories and false memories based on patterns of neural activation in the brain;⁷ the factors that lead us to conclude that a witness is credible or not;⁸ and the relationship between confidence, feedback and accuracy in the context of eyewitness performance on identity parades.⁹ It is outside the scope of this chapter to cover all of the 'lessons of a century of psychological research'¹⁰ on human memory and their importance for evidence in international arbitration. Rather, this chapter will present a detailed examination of scientific studies demonstrating the influence of information received after a given event (hereinafter post-event information) on people's memory. In sometimes striking fashion, this research demonstrates the unreliability and fallibility of human memory.

3. Leggatt, *Gestmin* (*supra* n. 1) 15-21.

4. The British Psychological Society, *Guidelines on Memory and the Law* (*supra* n. 2) 4.

5. There are clear applications of the research studies to cross-examination, but a separate consideration of the reliability and credibility of oral witness testimony will be excluded for the purposes of this chapter.

6. A. Clark-Foos, G. Brewer and R. L. Marsh, *Judging the Reality of Others' Memories*, 23(3) *Memory*, 427-436 (2014).

7. M. K. Johnson et al., *True and False Recovered Memories: Toward a Reconciliation*, Vol. 58: *Nebraska Symposium on Motivation*, *The Cognitive Neuroscience of True and False Memories* 15-52 (Ed. R.F. Belli, New York: Springer 2011).

8. B. E. Bell and E. F. Loftus, *Trivial Persuasion in the Courtroom: The Power of (a Few) Minor Details*, 56(5) *Journal of Personality and Social Psychology*, 669-679 (1989).

9. G. L. Wells and D. S. Quinlivan, *The Eyewitness Post-Identification Feedback Effect: What Is the Function of Flexible Confidence Estimates for Autobiographical Events?*, 23 *Applied Cognitive Psychology*, 1153-1163 (2009).

10. Leggatt, *Gestmin* (*supra* n. 1) 15-21.

This area of memory research is particularly pertinent to witness evidence, because the process of preparing witness evidence necessarily exposes fact witnesses – whose primary purpose is to report to the arbitral tribunal on events after the fact – to post-event information. The goals of this chapter are threefold, namely: (1) to outline the circumstances under which post-event information influences and interferes with human memory; (2) to consider how these effects may arise in the context of witness testimony in international arbitration; and (3) to consider strategies to mitigate the potential impact of these effects on memory.

§9.02 WITNESS EVIDENCE IN INTERNATIONAL ARBITRATION

[A] What Is Witness Evidence and How Is It Used in International Arbitration?

There are no formal rules about who may or may not serve as a fact witness within international arbitration proceedings. In practice, parties tend to pick those who are able to speak most authoritatively on a specific issue, reflecting the ‘best evidence’ principle. In the context of commercial and investment arbitration, this will typically be the company employees, directors or government officials who were involved in the matters giving rise to the dispute, since they will have first-hand knowledge of the issues.

In international arbitration, witnesses of fact usually provide their evidence-in-chief¹¹ in the form of a written witness statement. This statement will cover all of the relevant facts within that witness’ knowledge that are required to support their party’s case. The arbitral tribunal will specify in a procedural direction when witness statements are to be filed and each witness may file multiple rounds of statements, with subsequent statements responding to the facts and matters presented by the other side. In contrast to court litigation, international arbitration proceedings often adopt a ‘memorial approach’ to procedure. This means that the witness statements are filed at the same time as the party’s statements of case (i.e., Statement of Claim, Statement of Defence, Reply, Rejoinder), supporting documentary evidence and any expert reports.¹²

After witness statements have been filed, and assuming the dispute does not settle, the parties will have the opportunity to cross-examine the witnesses of fact at the hearing in order to test their evidence. As noted in *The Secretariat’s Guide to*

11. ‘Evidence-in-chief’ refers to the facts as told by the witness in support of their party’s case. Historically, in court litigation, evidence-in-chief was provided by the witness in direct examination by their party’s counsel at the hearing. Now, it is more common for witness statements to stand as a witness’ evidence-in-chief. Evidence-in-chief is distinguishable from evidence obtained under cross-examination, that is, on questioning at the hearing by counsel for the other side.

12. By contrast, litigation proceedings usually adopt a sequential procedure, where witness statements are filed some time after the parties’ written pleadings (usually a number of months afterwards). Documentary and expert evidence are also filed in separate phases in normal court procedure.

International Chamber of Commerce (ICC) Arbitration,¹³ if a witness of fact has filed a written statement, they are not usually permitted to repeat that evidence orally at the hearing. The cross-examination therefore follows a short direct examination where the witness is given the opportunity to correct anything that they have noticed is wrong in the witness statement as filed, or to respond to new matters raised by the other side's evidence if they have not had the chance yet to do so.

This level of procedural detail is usually dealt with by the directions issued by the arbitral tribunal in the form of a procedural order. The tribunal has a large degree of discretion over matters relating to witness evidence since national arbitration legislation and institutional arbitral rules have little by way of specific provisions on the issue of the scope and extent of witness evidence.

National arbitration legislation, which is determined by the law of the 'seat' or 'place' of arbitration, provides the procedural law of the arbitration.¹⁴ Arbitration laws tend to govern matters relating to the powers and duties of the arbitral tribunal, the availability of interim measures of protection and the enforcement of arbitral awards, including the grounds for their challenge. In general, they do not dictate the terms of specific aspects of evidence but instead leave these details to be determined by the arbitral tribunal and/or agreed between the parties. Section 34 of the English Arbitration Act 1996, for example, states expressly that: 'all procedure and evidential matters, [including those relating to written and oral evidence of fact], shall be decided by the tribunal, subject to the right of the parties to agree any matter'.¹⁵

The arbitration rules of arbitral institutions similarly tend to empower the tribunal and the parties to deal with the specific details of witness evidence, rather than setting constraints in this area. For example, the ICC Rules of Arbitration 2012 (hereinafter ICC Rules) do not address witness statements at all specifically, leaving the issue of fact investigation in the hands of the tribunal.¹⁶ Moreover, they deal with oral testimony only insofar as providing that: 'The arbitral tribunal may decide to hear witnesses, experts appointed by the parties or any other person, in the presence of the parties, or in their absence provided they have been duly summoned'.¹⁷ There is some brief guidance on witness evidence in the ICC Case Management Techniques for controlling time and costs in arbitration,¹⁸ although this is restricted to the suggestion of 'limiting the length and scope of written submissions and written and oral witness evidence (both fact witnesses and experts) so as to avoid repetition and maintain a focus on key issues'.¹⁹ The ICC guide on Effective Management of Arbitration deals

13. J. Fry, S. Greenberg & F. Mazza, *The Secretariat's Guide to ICC Arbitration: A Practical Commentary on the 2012 ICC Rules of Arbitration*; ICC Publication 729, § 3–966 (International Chamber of Commerce, Paris 2012).

14. For example, an arbitration seated in London, England, will be governed by the English Arbitration Act 1996; on the other hand, an arbitration seated in Hong Kong will be governed by the Hong Kong Arbitration Ordinance 2011.

15. English Arbitration Act 1996, Chapter 23, s. 34.

16. Article 25(1) of the ICC Rules provides that: 'The arbitral tribunal shall proceed within as short a time as possible to establish the facts of the case by all appropriate means.'

17. ICC Rules, Art. 25(3).

18. ICC Rules, Appendix IV.

19. ICC Rules, Appendix IV, para. (e).

with procedural matters relating to fact witness statements in greater detail, including options for their form, scope, number and timing of submission.²⁰ Those guidelines do not extend, however, to substantive issues such as the reliability (or otherwise) of witness evidence resulting from potential biases in memory. The London Court of Arbitration (LCIA) Arbitration Rules 2014 (hereinafter LCIA Rules) contain a number of provisions on witness evidence in Article 20,²¹ and Article 15.6 gives the tribunal broad discretion to give ‘additional directions as to any part of the written stage of the arbitration ... including witness statements’. However, the LCIA Rules do not address the substance of witness evidence, or how that evidence may be used and assessed by the arbitral tribunal in its determination of the dispute.

Perhaps the greatest source of guidance on the use of witness evidence in international arbitration is the IBA Guidelines on the Taking of Evidence in International Arbitration 2010 (hereinafter IBA Rules). These are widely adopted by parties in international arbitration, and are designed to govern procedural aspects of the arbitration in conjunction with national arbitration legislation and arbitral rules.²² Among other things, the IBA Rules ‘provide mechanisms for the presentation of ... witnesses of fact ... as well as the conduct of evidentiary hearings’.²³ Article 4 of the IBA Rules addresses witnesses of fact and contains provisions dealing with, for example, who may serve as a fact witness²⁴ and the submission and content of written witness statements.²⁵ Of particular relevance to this chapter, Article 9(1) of the IBA Rules states that: ‘The arbitral tribunal shall determine the admissibility, relevance, materiality and weight of evidence’, and Article 9(2) goes on to list a number of grounds on which evidence may be excluded. However, none of these grounds, nor any other provision in the IBA Rules, deals with the reliability or otherwise of a witness’ memory.

[B] How Is Witness Evidence Typically Prepared in Practice?

The process of preparing fact witness statements usually involves the following stages:

- (a) *Initial Investigation (Stage One)*: The legal counsel team will interview the potential witness in depth in order to obtain as much information as possible about the events related to the dispute. Typically, the events in question

20. ICC, *Effective Management of Arbitration: A Guide for In-House Counsel and Other Party Representatives*, Topic 8 (International Chamber of Commerce, Paris 2015).

21. In particular, Art. 20.2 allows parties to present witness testimony in the form of a written statement (subject to any contrary orders of the tribunal); Art. 20.3 gives the arbitral tribunal free reign over deciding when and how written witness evidence will be filed, including the right to ‘allow, refuse or limit the written and oral testimony of witnesses’, and Art. 20.5 gives express permission for parties or their legal counsel to interview potential witnesses subject to any applicable rules of law or directions of the tribunal.

22. In general, the IBA Rules are adopted either as binding provisions (subject to any mandatory rules of law) or, more commonly, as ‘guidance’ to the arbitral tribunal.

23. IBA Rules, p. 2.

24. IBA Rules, Art. 4(2).

25. IBA Rules, Art. 4(4).

occurred some time ago, ranging from months to years earlier.²⁶ The questions posed in this initial interview may be relatively open, particularly for the claimant party. However, they will be guided, to an extent, by the party's case theory.²⁷ Even before proceedings have been formally commenced, for example, the claimant will have an idea of what their claim(s) in the arbitration may be (e.g., misrepresentation, breach of contract), and so any questions to the witness will be focused around obtaining the facts necessary to prove those claims. The focus of the questions may be narrower still for the respondent party, even at this initial stage, as they will be framed by the claims and facts pleaded in the claimant's request for arbitration. As such, the respondent should have a relatively clear idea of what it needs to prove in order to succeed in its defence.²⁸ Of relevance to the discussion in this chapter, in-house counsel and compliance teams may have interviewed the witness before the legal counsel reaches this initial stage. Also, this stage is often conducted in parallel with an initial review of documentary evidence.

- (b) *Focused Investigation (Stage Two)*: Follow-up interviews may be carried out in order to clarify specific points. This occurs as the focus of the investigation is narrowed to the critical issues in dispute in order to fill gaps in the narrative obtained during the initial investigation (Stage One). For the respondent party, the legal team's focus at this stage will be driven largely by the facts alleged in the Statement of Claim and in the claimant's fact witness statements. The investigation by the claimant party will be similarly narrow in this phase if they are preparing reply witness statements, where the focus will be the facts put forward in the respondent's witness statements. The results of any documentary review may also be fed in to the investigation during this phase. In particular, the witness is likely to be shown documents and other records in order to 'refresh' their memory of specific events (e.g., a meeting or call) and/or to challenge the accuracy of facts they initially reported, where those facts conflict with other evidence the counsel team has found.
- (c) *Preparing the Witness Statement (Stage Three)*: More often than not in complex disputes, the legal team will prepare a draft of the witness' written statement, covering the points necessary to prove the party's case (insofar as the witness is able to speak to those issues) and to give context to the dispute. This statement will be based heavily on the information provided by the witness in Stages One and Two, and augmented by the results of any separate investigation into other sources of evidence (documents, recordings, etc.). The witness will review and provide input into this draft witness statement,

26. Claims in investment treaty arbitrations in particular can feature events stretching back a number of years.

27. A 'case theory' is the logical and comprehensive 'story' a party constructs from the facts in order to justify their legal case.

28. Time pressures may also play a role in restricting the scope of witness interviews. For instance, the witness may have limited time available to devote to the arbitration process and the legal counsel's time may be constrained by costs considerations. These additional drivers necessitate a selective approach when it comes to questioning a witness.

with various iterations being passed between counsel and witness until it is finalized and signed. As mentioned above, if the arbitration adopts a memorial approach, fact witness statements will be prepared in parallel to the statements of case, expert evidence and supporting fact exhibits. The witness may therefore read drafts of those documents and amend their own statement in their light.

- (d) *Hearing Preparation (Stage Four)*: In advance of the hearing, many witnesses will undergo some process of preparation in order to ready them for their oral testimony. This can be led by the legal counsel team or by an independent professional firm of legal trainers. The precise extent and specificity of this process will depend on any constraints within the rules of professional conduct applicable to the general counsel and by the governing law. For example, legal authorities²⁹ and professional conduct rules³⁰ in England draw a distinction between witness familiarization (which is permitted) and witness coaching (which is not). This means that English-qualified barristers and solicitors are allowed to educate fact witnesses on the theory, practice and procedure of giving evidence (witness familiarization) but they may not suggest to a witness what he should say or otherwise attempt to persuade them to change their evidence (witness coaching).³¹ In the US, by contrast, there are no equivalent provisions restricting or controlling interactions between counsel and witnesses of fact. Therefore, lawyers qualified in the US may (and often do) conduct mock cross-examinations with a witness, to simulate what they will go through at the hearing.

It is worth noting that during many (if not all) stages of the process described above, the witness is likely to speak to their colleagues to discuss the case and their view of the facts.

After all of these preparatory stages, the witness will testify at a hearing before the arbitral tribunal. This usually takes place a number of months after the written witness statement has been filed in the proceedings. As noted above, arbitration hearings

29. *R v. Momodou* [2005] EWCA Crim 177 and *Ultraframe (UK) Ltd v. Fielding and others* [2005] EWHC 1638 (Ch).

30. See, for example, the Bar Standards Board Guidance on Witness Preparation (published by the Bar Council Professional Standards Committee, October 2005) for a summary of what is permitted; see also Rule C9.4 of the Bar Code of Conduct, which applies to barristers, and states: 'You must not rehearse, practise with or coach a witness in respect of their evidence'; see also Objective 5.1 (duty not to mislead the court) of the Solicitors' Regulation Authority Code of Conduct 2011, which applies to solicitors, and the Indicative Behaviours (IB) which indicate when a solicitor will have failed to comply with that objective: 'attempting to influence a witness when taking a statement from that witness with regard to the context of their statement' (IB 5.10) and 'tampering with evidence or seeking to persuade a witness to change their evidence' (IB 5.11).

31. English-qualified lawyers (both barristers and solicitors) are bound by their professional conduct rules regardless of the forum or jurisdiction within which they are practising; these limitations therefore apply to their representation in international arbitration proceedings as they do in court.

typically dispense with examination-in-chief.³² The testimony of a witness of fact will therefore begin in substance with cross-examination conducted by the advocate for opposing counsel.

Any memory expert will immediately realize in light of this summary, that the process of preparing witness evidence in international arbitration proceedings necessarily and unavoidably exposes a witness' memory to the risk of interference from various sources.

In fact, in an extrajudicial speech, The Hon. Mr Justice Mostyn commented on the process of witness familiarization that:

The effect of this process is to establish in the mind of the witness the matter recorded in his or her own statement and other written material, whether they be true or false, and to cause the witness' memory of events to be based increasingly on this material and later interpretation of it rather than on the original experience of the events.³³

This chapter will summarize the findings of numerous studies of memory and consider the implications of those findings for the modern use of witness evidence in international arbitration described above.

§9.03 RESEARCH ON HUMAN MEMORY

Experimental psychologists have studied human memory for over a century. Our understanding of when, how and why memory fails has advanced considerably as a result, with research gaining pace over recent decades. Contrary to popularly held opinion,³⁴ evidence consistently demonstrates that memory does not operate like a video-tape. It does not 'record' a complete and accurate image of reality to be 'played back' on demand in the way it was originally 'recorded'. Rather, research shows that the act of remembering is a constructive process. As such, it is incomplete, inaccurate and malleable. In particular, memory is prone to errors and distortions in the very act of remembering.³⁵

32. *Supra* s. §9.02[A] and n. 11.

33. The Hon. Mr Justice Mostyn, *The Craft of Judging and Legal Reasoning, Speech to Bristol University School of Law*, 8 December 2014, § 10, 4, <https://www.judiciary.gov.uk/announcements/speech-by-the-hon-mr-justice-mostyn-the-craft-of-judging-and-legal-reasoning/> (accessed 5 September 2016).

34. In a large-scale telephone survey of the US population, 63% of 1,500 respondents agreed with the statement that: 'Human memory works like a video camera, accurately recording the events we see and hear so that we can review and inspect them later'; D. J. Simons and C. F. Chabris, *What People Believe about How Memory Works: A Representative Survey of the U.S. Population*, PLoS ONE 6(8): e22757, <http://dx.doi.org/10.1371/journal.pone.0022757> (accessed 5 September 2016).

35. Another important insight from modern cognitive psychology is that memory only incorporates that which reaches our conscious perception and that this perception is itself inherently flawed. While an examination of the very many visual and other sensory illusions to which we are all susceptible is beyond the scope of this chapter, research shows that our view of the world at any one time is far less complete and accurate than we tend to believe.

As noted earlier, this chapter will address research relating to the effects of post-event information on memory. Specifically, the following section will address the two, related effects often referred to as: (1) the misinformation effect and (2) memory conformity.

The misinformation effect is where (usually misleading) information received after an event interferes with or impairs a witness' memory for that event. This effect is one of the most influential findings in modern psychology; it challenged prevailing views about the accuracy of memory and sparked thousands of studies. Memory conformity, also referred to as social contagion of memory, is a relatively recent finding where a witness' memory appears to change to match and corroborate later (potentially conflicting) information provided by another witness. These studies have evident application to witness evidence, and the way in which it is prepared and assessed in arbitral proceedings.

It is important to distinguish at the outset between the honestly held, albeit mistaken, memories featured in the studies reviewed in this chapter and a witness deliberately misleading a tribunal about their memory of an event. Detecting deceit and perceptions of witness credibility represent separate fields of study within psychology. Whilst they are equally important to any evaluation of witness evidence in international arbitration, they are outside the scope of the present discussion.

[A] The Misinformation Effect

[1] Background and Origins

Our memory of an event faces constant interference by things we have experienced beforehand (proactive interference) and things we experience afterwards (retroactive interference). The misinformation effect is a form of this latter category of retroactive interference.

The misinformation effect was originally identified in studies carried out in the 1970s which examined whether responses to a question are influenced by the way it is phrased. In a study (albeit of linguistics rather than memory per se) Harris (1973) demonstrated that asking the same question using slightly different wording can change the response dramatically.³⁶ Harris asked participants to make 'intelligent numerical guesses' in response to a list of questions; no other context or explanation was provided for the questions. For each question, a quantitative adjective or adverb was given in one of two forms. For example:

'How long was the movie?' versus 'How short was the movie?'

'How young was the Senator?' versus 'How old was the Senator?'

Participants' estimates in response to Harris' questions were skewed heavily by the qualifying descriptor. For example, participants gave an average of 130 minutes

36. R. J. Harris, *Answering Questions Containing Marked and Unmarked Adjectives and Adverbs*, 97 *Journal of Experimental Psychology*, 399–401 (1973).

versus 100 minutes for the estimated length of a film and an average of 49 years old versus 36 years old for a Senator's estimated age.

In an unpublished study,³⁷ Loftus observed this phenomenon in the context of people describing their past personal experiences. In interviews purportedly investigating people's experience of headaches, Loftus asked participants about the number of different headache-relieving products they had tried and about the frequency of their headaches, using slight variations of two specific questions as follows:

- Questions about the frequency of headaches:
 - 1A. Do you get headaches frequently, and, if so, how often? versus
 - 1B. Do you get headaches occasionally, and, if so, how often?
- Questions about headache products:
 - 2A. In terms of the total number of products, how many other products have you tried? One? Two? Three? versus
 - 2B. In terms of the total number of products, how many other products have you tried? One? Five? Ten?

The researchers found that the numbers and adverbs used in the questions biased the participants' responses. In response to questions 1A and 1B, participants claimed suffering on average 2.2 headaches per week versus 0.7 headaches per week, respectively. Similarly, participants reported having tested an average of 3.3 or 5.2 products depending on whether they were asked question 2A or question 2B, respectively.

Loftus and colleagues quickly extended these findings to the context of memory for events, and into the specific domain of eyewitness testimony in particular. In one of the first of these seminal studies, Loftus and Palmer (1974) examined whether questions posed in different ways could influence numerical judgments of speed.³⁸ They showed participants a video-clip of a traffic accident and then asked them a series of questions, including an estimate of the speed of a particular car at the time of the collision. However, the verb used to describe the accident was varied for different groups of participants: 'smashed', 'hit', 'bumped', 'contacted' and 'collided'.³⁹ Loftus and Palmer found that asking someone: 'About how fast were the cars going when they smashed into each other?' elicited higher estimates of speed than the same question using the other verbs. In fact, the results show a linear relationship between the 'strength' of the verb and the participants' average estimate of speed as follows: smashed = 40.5 mph, collided = 39.3 mph, bumped = 38.1 mph, hit = 34.0 mph,

37. Reported in E. F. Loftus, *Leading Questions and the Eyewitness Report*, 7 *Cognitive Psychology*, 550-572 (1975).

38. E. F. Loftus and J. C. Palmer, *Reconstruction of Automobile Destruction: An Example of the Interaction Between Language and Memory*, 13 *Journal of Verbal Learning and Verbal Behaviour*, 585-589 (1974); the researchers chose speed as the critical focus of the leading question because velocity is known to be notoriously difficult to estimate.

39. These words were chosen on the basis of findings from linguistic studies which show that they imply different rates of movement.

contacted = 31.8 mph. This study provided evidence that changing a single word in a question can significantly and systematically influence a person's reported memory of an event they had seen only minutes earlier.⁴⁰

Loftus and Palmer also examined the effect of these 'leading questions'⁴¹ on participants' memory for the event after a delay, by recalling the participants a week later and asking them a further series of questions about the accident they had seen before. The critical question in this subsequent list was: 'Did you see any broken glass?'. In fact, there was no broken glass in the video-clip. However, participants were significantly more likely to confirm that they *had* seen broken glass ('yes' response) when they had been asked to estimate speed using the 'smashed' rather than the 'hit' formulation of the question in the initial round.⁴² The researchers interpreted these results as demonstrating that post-event information is integrated into the original memory of the event. This result has particular relevance to the preparation of witness evidence in international arbitration, where there are multiple rounds of interviews and significant delay between them.

Describing a collision using a particular verb does not provide misinformation, in the sense of deliberately introducing factually incorrect information. However, this study set the stage for many decades of research into what became known as the misinformation effect. A typical experiment investigating this phenomenon involves three stages. First, the participant observes an event (e.g., shown in a video-clip or in a set of photographs depicting the evolution of a scene over time). Next, the participant receives new information about the event (e.g., within the context of a series of questions about it), some of which is misleading or wrong. Finally, the participant's memory for relevant aspects of the event is tested to reveal the influence (if any) of the misinformation. Where subsequent recall is changed as a result of the post-event information, this is referred to as the misinformation effect.⁴³

[2] *Demonstrations of the Misinformation Effect*

Studies have found that memory can be distorted in various different ways as a result of the exposure to post-event information, using the paradigm described above.

When recalling colour, for instance, the actual colour and an implied (misleading) colour appear to be blended in subsequent reports. Participants who had seen a road traffic accident involving a green car were given questions that presupposed that the car was blue. In a later memory test asking about the colour of the vehicle, participants modified their responses in the direction of the misinformation: colours

40. The difference in estimated speed between some of the groups represents the difference between breaking the legal speed limit on certain roads and driving within the law.

41. The term 'leading question' is used in this context to refer to a question that influences a specific aspect of the response, rather than the strict legal sense of a question that suggests the desired answer.

42. The experimenters also posited that the words might also carry different connotations for the likely consequences of the relevant event.

43. E. F. Loftus and H. G. Hoffman, *Misinformation and Memory: The Creation of New Memories*, 118(1) *Journal of Experimental Psychology: General*, 100–104 (1989).

with blue-green hues were chosen more often when participants had been exposed to misinformation than when they had not.⁴⁴

In another study using a very subtle manipulation, the critical (misleading) questions in the second phase differed only in the form of the grammatical article (definite or indefinite) used to describe a particular detail within the scene. For example:

‘Did you see a broken headlight?’ (indefinite article) versus
 ‘Did you see the broken headlight?’ (definite article).⁴⁵

The second of these two questions presupposes the existence of a particular item (i.e., that there was in fact a broken headlight in the scene), whereas the first question does not.⁴⁶ In each case, the relevant object was absent from the scene the participants had viewed (i.e., there had been no broken headlight). The assumption carried by the interviewer’s question influenced participants on later memory tests of the incident. Those who were asked about a particular object using the definite article (e.g., ‘the’ broken headlight) were significantly more likely to report having seen a broken headlight (and less likely to give uncertain ‘I don’t know’ answers) than those who had been asked about ‘a’ broken headlight.

Using the same type of manipulation, people have been led to report the existence of an entire (large) object in a scene, which was not actually there (e.g., a barn along a country road).⁴⁷ Interestingly, another experiment in the same study found that people were more susceptible to the misinformation (in this instance, the presence of a school bus where there was none) if it was presented incidentally. There, the misinformation appeared as a presupposition in the context of another question rather than as the focus of a question. For example:

‘Did you see the children getting on the school bus?’ versus
 ‘Did you see a school bus in the film?’

The accuracy of a response to a specific question can therefore be influenced by very subtle changes in the wording of the particular question. Moreover, questions about an event can change subsequent memory reports of that event.

The misinformation effect has also been found where the misinformation directly contradicts what the observer actually saw, rather than adding an item that was absent (e.g., a broken headlight) or changing a detail slightly (e.g., in colour). Loftus, Miller and Burns (1978) showed participants a series of slides depicting a road traffic accident near a stop sign, and then asked various questions about the incident including: ‘Did another car pass the red Datsun when it was stopped at *the yield sign*? (emphasis

44. E. F. Loftus, *Shifting Human Color Memory*, 5 *Memory and Cognition*, 696–699 (1977).

45. E. F. Loftus and G. Zanni, *Eyewitness Testimony: The Influence of the Wording of a Question*, 5(1) *Bulletin of the Psychonomic Society*, 86–88 (1975).

46. Broken down, the first formulation of the question comprises two questions: (1) Was there a broken headlight?; (2) Did you see it?. The second question by contrast represents a statement of fact and a question: (1) There was a broken headlight; (2) Did you see it?.

47. E. F. Loftus (1975), (*supra* n. 37) Experiment 3.

added).⁴⁸ Participants were later asked to identify which photograph within various pairs depicted an image they had seen, including one pair featuring a photograph of a car next to a stop sign (correct image) and a photograph of a car next to a yield sign (incorrect image). Seventy-five per cent of participants who had not been exposed to the misinformation (i.e., the question implying that there had been a yield sign) were able to identify the stop sign as the correct image in the pair. By contrast, only 41 % of those who had been given the misleading question chose the correct photograph. These results suggest that misinformation is capable not only of supplementing memory by adding new details, but also of transforming existing memories in their entirety.⁴⁹

The misinformation effect has been replicated across a variety of different studies and using many different visual stimuli – including broken glass, garden tools, facial hair, street signs and school buses. Recent studies have also observed the effect in contexts where the misinformation is conveyed through non-verbal means (e.g., gestures).⁵⁰

[3] *Factors Affecting the Misinformation Effect*

The magnitude of the misinformation effect on participants' reported memory depends on a number of different factors. These include:

- (a) *The time interval between the observed event and the exposure to the misinformation.* Participants are influenced more strongly by misinformation the longer the delay between originally witnessing the event and subsequent exposure to misinformation. Misleading questions had a greater impact on memory when they were asked immediately prior to the memory test as opposed to shortly after the original observation of the event.⁵¹ According to prevailing theories, this is because the memory of the original event weakens over time.
- (b) *Social factors, including notably, the credibility of the source of the misinformation.* It is easier to resist the influence of misinformation delivered from a source that is perceived to lack credibility compared to a credible source. For example, after viewing slides of a car accident, participants were less likely to adopt misinformation delivered by the driver causing the accident than misinformation delivered by a neutral bystander.⁵²

48. E. F. Loftus, D. G. Miller and H. J. Burns, *Semantic Integration of Verbal Information into a Visual Memory*, 4(1) *Journal of Experimental Psychology: Human Learning and Memory*, 19–31 (1978).

49. See s. §9.04[A] below for an alternative explanation of how the misinformation effect operates.

50. D. J. Gurney, K. J. Pine and R. Wiseman, *The Gestural Misinformation Effect: Skewing Eyewitness Testimony Through Gesture*, 126(3) *American Journal of Psychology*, 301–314 (2013 Fall).

51. Loftus et al. (1978) (*supra* n. 48) Experiment 3.

52. D. H. Dodd and J. M. Bradshaw, *Leading Questions and Memory: Pragmatic Constraints*, 19(6) *Journal of Verbal Learning and Verbal Behaviour*, 695–704 (1980).

- (c) *Repeated exposure.* If misinformation is repeated, participants are more likely to accept the false information and demonstrate greater memory distortion.⁵³ This is true whether the misinformation is repeated by the original source⁵⁴ or by the participant themselves, for example, by asking them to reproduce the misinformation incidentally during an interim test phase.⁵⁵
- (d) *Age of the witness.* In general, younger children are more susceptible to misinformation than older children and adults.⁵⁶ Other studies have also reported greater misinformation effects in older adults (over 65 years) compared to younger adults.⁵⁷
- (e) *Warnings about the potential exposure to misinformation.* The research on warnings has found mixed results.⁵⁸ However, some studies have found warnings to reduce the strength of the misinformation effect in certain circumstances, particularly where the warning is given prior to the misinformation as opposed to afterwards.⁵⁹

[4] ***False Memories: An Extreme Example of the Misinformation Effect***

As section §9.03[A][2] above attests, the misinformation effect demonstrates distortions and inaccuracies in remembering across a large variety of situations and includes memories of colour and other perceptual material within a visual scene. However, the remembered events used in the studies discussed so far do not pertain to the individual as a participant but as an observer only. This is potentially an important limitation in the context of witness evidence in international arbitration, since testimony more often reflects recall of meetings or discussions at which the individual was present and participating, rather than an incident or scene the individual passively observed. It may

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- 53. For summary, see M. S. Ayers and L. M. Reder, *A Theoretical Review of the Misinformation Effect: Predictions from an Activation-Based Memory Model*, 5(1) *Psychonomic Bulletin and Review*, 1–21 (1998).
 - 54. K. J. Mitchell and M. S. Zaragoza, *Repeated Exposure to Suggestion and False Memory: The Role of Contextual Variability*, 35 *Journal of Memory and Language*, 246–260 (1996); M. S. Zaragoza and K. J. Mitchell, *Repeated Suggestion and the Creation of False Memories*, 7 *Psychological Science*, 294–300 (1996).
 - 55. In one study, participants were given two recall tests, with the first test asking separately for information contained in: (1) the slides they had seen depicting an event and (2) the (misleading) narrative they had subsequently read about the event; H. L. Roediger III, D. Jacoby and K. B. McDermott, *Misinformation Effects in Recall: Creating False Memories Through Repeated Retrieval*, 35 *Journal of Memory and Language*, 300–318 (1996).
 - 56. S. J. Ceci, D. F. Ross and M. P. Togliani, *Suggestibility of Children's Memory: Psychological Implications*, 116 *Journal of Experimental Psychology: General*, 38–49 (1987).
 - 57. E. F. Loftus, B. Levidow and S. Duensing, *Who Remembers Best? Individual Differences in Memory for Events That Occurred in a Science Museum*, 6 *Applied Cognitive Psychology*, 93–107 (1992).
 - 58. In Experiment 2 of Loftus et al. (1978) (*supra* n. 48), most participants persisted in reporting the presence of a presupposed (but actually absent) object, despite the fact that they were told after the list of questions that they may have been exposed to misinformation. The warning therefore had no effect in reducing the misinformation effect in this instance.
 - 59. E. F. Loftus, *Planting Misinformation in the Human Mind: A 30-Year Investigation of the Malleability of Memory*, 12 *Learning and Memory*, 361–366 (2005).

be the case, for instance, that memory for self-referential events is less susceptible to the misinformation effect because of their relevance and importance to the individual. Researchers have therefore tested the limits of the misinformation effect in this regard. In a remarkable and dramatic extension of the misinformation effect, researchers used suggested misinformation in order to lead individuals to believe that entire events occurred to them in the past. Moreover, these detailed – but false – memories were adopted and embellished by the test subjects as their own and often could not be distinguished from reported memories of real events.⁶⁰

Memory researchers have devised different methodologies for effectively ‘implanting’ memories for entire episodes in someone’s mind. One of the original demonstrations used what later became known as the ‘lost-in-the-mall’ technique.⁶¹ In this procedure, participants were told that they were contributing to a study about ‘the kinds of things you may be able to remember from your childhood’.⁶² With the participant’s agreement, the researchers contacted older family members to obtain a number of stories about their childhood. Participants were given a brief description of each of these stories, together with one fabricated story the experimenters had concocted. The false story involved the participant getting lost in a shopping mall or department store for a period of time, being found by an older woman and then reunited with their family. Participants were asked to recall as much information about each story as possible and were interviewed about their memories a number of times at various points afterwards (e.g., one or two weeks). If the participants did not remember anything about a particular story, they were told to say so.⁶³ The researchers found that often participants initially reported that they did not remember anything about the false story. However, over the course of the interviews, some participants began to ‘remember’ the concocted story, first with relatively vague recollections and later in greater detail and with greater confidence.⁶⁴ In some instances, the participants even came up with their own idiosyncratic details about the alleged encounter (e.g., adding that the lady who helped reunite the participant with her family was ‘heavy-set and older’⁶⁵). Experiments have therefore reliably demonstrated that a significant proportion of people will develop false memories for entire events that they are told happened to them during their childhood. Collapsing the results of a number of studies

60. The label ‘false memory’ has provoked heated debate between memory researchers on the one hand and clinical therapists on the other, over the veracity of uncovered ‘repressed memories’, for example, of early childhood trauma.

61. E. F. Loftus and J. E. Pickrell, *The Formation of False Memories*, 25 *Psychiatric Annals*, 720–725 (1995). Also referred to as the ‘familial-informant false-narrative procedure’; D. S. Lindsay et al., *True Photographs and False Memories*, 15 *Psychological Science*, 149–154 (2004).

62. Loftus and Pickrell (1995), (*supra* n. 61) p. 721.

63. This instruction seeks to reduce response bias effects where participants provide answers in an attempt to be helpful, but which may not reflect their actual memory.

64. The fact that participants originally report remembering nothing about the false story argues against the notion that the false memory effect is due to response bias or social pressure.

65. Loftus and Pickrell (1995), (*supra* n. 61) p. 723.

using this method, around 30% of participants on average report full or partial memories for these false events.⁶⁶

One criticism of the ‘lost-in-the-mall’ technique is that the experience of getting lost is relatively common and that participants reporting false memories may be remembering similar incidents that did, in fact, happen to them.⁶⁷ In order to address this potential limitation, memory researchers used a modified technique to implant memories for impossible events. In one such study, Braun, Ellis and Loftus conducted pre-screening of the participants to identify individuals who had been to Disneyland when they were children. They showed the adult participants manufactured adverts for Disneyland which suggested that the participant had shaken hands with Bugs Bunny and which incorporated an image of the cartoon character.⁶⁸ The participants were asked to imagine experiencing the manufactured event and to evaluate the advert along a number of dimensions (e.g., favourable–unfavourable, unpleasant–pleasant). Finally, they were asked a number of questions about the trip, including whether or not they remember seeing Bugs Bunny and specifically shaking hands with him. As cartoon aficionados will be aware, Bugs Bunny is a Warner Brothers character and so would never appear at a Disneyland resort. The manufactured event in this experiment could therefore never have happened. Despite this, however, a number of participants said they remembered shaking hands with Bugs Bunny after seeing the manipulated adverts. Again, a smaller proportion of people were susceptible to this suggestion compared to the earlier studies of the misinformation effect, but the effect nevertheless pervaded in a significant number of participants, even with impossible false events.

The Bugs Bunny experiment utilized an interesting finding about the role of imagination in memory which is that, if a participant imagines something happening to them, the act of imagining increases their confidence that it took place, even if it did not. In an early demonstration of this effect, participants rated the probability that certain events happened to them when they were children, in response to a list of different experiences (including getting lost in a shopping centre). A couple of weeks later, half the participants were asked to imagine experiencing each of the events on the list, including those that they did not recall happening to them, on the original test. On a subsequent test, participants who had imagined experiencing the events reported greater confidence that both the real and the imagined events had happened, as compared with the control group of participants.⁶⁹

66. Lindsay et al. (2004), (*supra* n. 61); A large proportion of people therefore resisted the suggested misinformation using this method and maintained that they had no recollection of the false event.

67. This criticism may carry less weight with experiments that used relatively novel incidents, such as seeing a hot air balloon (K. A. Wade, M. Garry, J. D. Read and D. S. Lindsay, *A Picture Is Worth a Thousand Lies: Using False Photographs to Create False Childhood Memories*, 9 *Psychonomic Bulletin & Review*, 597–603 (2002); see this s. §9.03[A][4] and Asch (1956), (*infra* n. 71) or putting toy slime in a teacher’s desk (Lindsay et al (2004), (*supra* n. 61)).

68. K. A. Braun, R. Ellis and E. F. Loftus, *Make My Memory: How Advertising Can Change Our Memories of the Past*, 19(1) *Psychology and Marketing*, 1–23 (2002).

69. M. Garry et al., *Imagination Inflation: Imagining a Childhood Event Inflates Confidence That It Occurred*, 3 *Psychonomic Bulletin and Review*, 208–214 (1996).

Another novel variant of the false memory paradigm was devised which combined elements from each of the studies reviewed above. In this procedure, participants were given photographs of themselves as children and asked to imagine reliving the scene that was depicted. Most of the photographs were authentic but one had been created by digitally imposing the participant into the basket of a hot-air balloon. When participants were asked about their memories of the depicted events, half of them reported remembering the hot-air balloon ride.⁷⁰

Distortions caused by post-event information therefore extend beyond specific features about a scene, to memory for entire events, or so-called false memories. While there are many factors that modulate the strength of the misinformation effect (e.g., lapse of time, age, imagination), the effect has been replicated many hundreds of times across a wide variety of different situations. It is a prevalent and powerful effect mediated by cues which are sometimes very subtle. In some instances, the misinformation effect is also immune to explicit warning.

[B] Memory Conformity

[1] Background and Origins

In the studies reported in this chapter so far, the effects of post-event information tend to be tested on participants in isolation from others. Whilst this experimental design affords maximum control over key variables, it is very different from the way people naturally experience events. More commonly, we speak to our friends and family about things we have seen or done, particularly if they represent a shared experience, such as attending a party together. Where an event takes on particular significance, the likelihood and frequency of these subsequent interactions is greater still. Returning to the context of international arbitration, consider a misrepresentation claim where it is alleged that representatives of the respondent company understated projected manufacturing costs at a pitch meeting with the claimant in order to win a significant supply contract. In this dispute, what was said at the pitch meeting could be decisive for the outcome of the case. It is very likely that the individuals who delivered the pitch will discuss the content of their presentation not just with legal counsel for the respondent (both in-house and external), but with other colleagues as well (particularly those who also attended the meeting). The series of studies described in this sub-section examines whether and how memory is influenced by post-event information that is introduced by another person. In particular, the researchers were interested in whether a witness' reported memory would change to corroborate another witness' recollection. The design of these experiments reflects a hybrid between the misinformation paradigm (discussed above) and early studies on social conformity, where participants are seen to adapt their responses so that they agree with other people. In Asch's seminal paper on social conformity, people changed their publicly reported responses to a simple

70. Wade et al. (2002), (*supra* n. 67). Twenty per cent of the participants reported complete memories of the false episode and 30% reported partial recollections.

perception judgment (e.g., which of three lines is the longest?) to match the response given by the majority of people in a group – even if that answer was clearly and obviously wrong.⁷¹

[2] *Early Studies on Social Contagion of Memory*

One of the first studies in this area examined participants' confidence in their ability to remember a would-be criminal. Luus and Wells (1994)⁷² showed a staged crime scene to pairs of participants and then tested each of them separately on their memory for the event. Specifically, the experimenters asked the participants to identify the suspect out of a police line-up and to rate their confidence that they had picked the right person. A participant's confidence fell when the experimenter told them that the other participant had picked a different suspect (whether or not that had been the case). Conversely, reported confidence grew when a participant was given to understand that they had identified the same person as their colleague. A witness' confidence in their testimony may therefore be influenced, positively or negatively, by another witness' version of events.

In another early study of this effect, Betz, Skowronski and Ostrom (1996)⁷³ asked participants to read a short narrative and then answer questions about it. Next, the experimenters told the participants about answers that other (hypothetical) participants in the study had given. These 'answers' were either consistent or inconsistent with the original narrative passage. A significant proportion of the participants who had heard about others giving inconsistent (i.e., wrong) answers elected to change their own responses to conform with what they believed other people had said.

The 'social presence' in these two studies (i.e., another participant's response to the same question) was implied by the experimenter; that is, the experimenter told the participant about how other (fictional) participants had performed. In these experiments, therefore, participants had no live social interaction with the apparent source of the misinformation. Later studies introduced misinformation using actual social presence by planting confederates in the experiment. These actors would typically be asked for their response to a memory test just before the participant was tested, and both individuals would answer aloud, in front of each other. In line with early studies using an implied social presence, participants scored lower on the memory test if they had just heard the confederate giving a wrong answer.⁷⁴

71. In that study, the other apparent 'participants' in the group were in fact acting as confederates; S. E. Asch, *Studies of Independence and Conformity: I. A Minority of One Against a Unanimous Majority*, 70(9) *Psychological Monographs* (1956).

72. C. A. E. Luus and G. L. Wells, *The Malleability of Eyewitness Confidence: Co-witness and Perseverance Effects*, 79 *Journal of Applied Psychology*, 714–723 (1994).

73. A. L. Betz, J. J. Skowronski and T. M. Ostrom, *Shared Realities: Social Influence and Stimulus Memory*, 14 *Social Cognition*, 113–140 (1996).

74. D. M. Schneider and M. J. Watkins, *Response Conformity in Recognition Testing*, 3(4) *Psychonomic Bulletin and Review*, 481–485 (1996); D. B. Wright, G. Self and C. Justice, *Memory Conformity: Exploring Misinformation Effects When Presented by Another Person*, 91 *British Journal of Psychology*, 189–202 (2000).

There is a drawback with using a technique requiring participants to respond in public. In those situations, it is difficult to tell whether the misinformation introduced by the other person actually alters the participant's memory or whether the participant is simply matching what the other person said (or to what they are reported to have said) – that is, pure social conformity. To distinguish between these two possible alternatives, subsequent studies administered the memory test in private (after the participant had been exposed to misinformation presented by a confederate). Roediger and colleagues (2001) developed a method where two people (one participant and one confederate) viewed detailed images of different household scenes together. The pair were then given a collaborative memory test where they were asked to recall twelve items from each scene, with the participant and the confederate reporting (aloud) six items each. In order to introduce misinformation during this phase, the confederate would report a few items that had not been present in the scene. Later, the participants were tested again – this time in isolation – being asked to remember as many items from the scene as they could. Conformity effects were evident even in the context of private reporting: a number of items that had been falsely reported by the confederate had crept into the participants' privately reported memory. The researchers referred to this effect as 'social contagion' of memory.⁷⁵

These early studies show that misinformation presented by an actual or an implied social presence significantly influences participants' public and private reported memory. By incorporating real interactions between apparent co-witnesses into the experimental design, studies also demonstrate effects of social contagion with a greater level of ecological validity.

[3] *Studies on Memory Conformity*

A consistent feature of all of the studies reviewed above is that participants were deliberately fed misleading information. But what if the misinformation were to arise naturally – for example, because the other person genuinely believed in a different truth? According to a study by Paterson and Kemp (2006), over 85% of people who had witnessed a real-life crime said that they discussed what they remembered, and their experience, of that event with a co-witness.⁷⁶ Given this statistic, and the fact that people often remember the same event differently, it is likely that people will come into contact with information that disagrees with their own recollection as a natural consequence of social interactions.

Gabbert and colleagues developed an extension of social contagion within a more natural setting designed to replicate these everyday discussions with others.⁷⁷ In their 'co-witness paradigm', pairs of participants watched a video-clip of a staged crime,

75. H. L. Roediger III, M. L. Meade and E. T. Bergman, *The Social Contagion of Memory*, 8 *Psychonomic Bulletin and Review*, 365–371 (2001).

76. H. M. Paterson and R. I. Kemp, *Comparing Methods of Encountering Post-Event Information: The Power of Co-witness Suggestion*, 20 *Applied Cognitive Psychology*, 1083 (2006).

77. For review, see F. Gabbert et al., *Memory Conformity Between Eyewitnesses*, 48 *Court Review: The Journal of the American Judges Association*, Paper 382, 36–43 (2012).

with each member of the pair watching the clip separately. The participants were led to believe that they were watching the same video-clip, when in fact, two clips had been filmed from different vantage points such that certain events – including the criminal act – were visible in one clip but not the other (and vice versa). For example, one event involved a girl walking into an unoccupied university building to return a book. In the film shot from the first perspective, participants could read the title of the book and see the girl throw something into a rubbish bin on her way out of the building. From the second perspective, participants could see the girl checking the time on her watch and stealing a £10 note from an unattended wallet. Before they were given an individual (privately reported) recall test, participants in the experimental condition were encouraged to talk to each other about what they had seen, whereas participants in the control condition were not allowed to discuss the event with one another. The interaction between co-witnesses in this design (i.e., open discussion) therefore reflects more closely what happens in real life, since the formulaic style of joint questioning featured in the social contagion paradigm bears little resemblance to how witnesses behave and are interviewed in practice.

Replicating the effects within this relatively naturalistic eyewitness setting, Gabbert and colleagues found that a significant proportion (over 70%) of participants who had discussed the criminal event with their co-participant mistakenly reported recalling some of the items they had acquired from their discussion, but which they had not themselves witnessed in the clip. This effect included making wrong attributions of guilt: 60% of participants who had *not* seen the criminal act in the video-clip said they thought the suspect was guilty after discussing the video-clip with a co-witness who *had* seen the theft take place.⁷⁸ Gabbert and colleagues refer to this phenomenon as ‘memory conformity’.⁷⁹

[4] *Factors Affecting Memory Conformity*

A number of factors have been found to affect the strength of the memory conformity effect (or the social contagion of memory):

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78. A smaller proportion of young participants (18–30 years) who *had* witnessed the theft showed the opposite effect in relation to attributions of culpability; a third of this participant group came to believe that the girl was innocent, after discussing the video-clip with a co-witness who had *not* seen the crime take place. Interestingly, this trend of misattributing innocence was not seen in older participants (60–80 years). F. Gabbert, A. Memon and K. Allan, *Memory Conformity: Can Eyewitnesses Influence Each Other’s Memories for an Event?* 17 *Applied Cognitive Psychology*, 533–543 (2003).
79. Wright et al. (2000) devised a similar procedure using a series of photographs to depict a crime scene rather than a video-clip. The second experiment in their paper reports that the majority of co-witnesses came to agree with each other over whether or not there was an accomplice in the crime scene, following their joint report of the event. This effect occurred despite the fact that participants’ original memory for the accomplice was very accurate (19 out of 20 pairs of participants correctly reported the presence or absence of an accomplice from the storybooks they had seen). See Roediger III, Meade and Bergman (2001), (*supra* n. 75).

- (a) *The relationship between co-witnesses.* The social relationship between the co-witnesses impacts the extent to which they are likely to influence each other. Using the memory conformity method described above, researchers found that pairs of co-witnesses who already knew each other were more susceptible to contamination by discussion than pairs of strangers. Pairs of participants who were friends or romantic partners were more likely to report items they had not seen themselves in the clip and to misattribute guilt (or innocence) in relation to the suspect.⁸⁰ French, Garry and Mori (2008) also reported higher levels of false memory (i.e., participants reporting details not present in the original footage they had seen) following collaborative remembering between intimate couples compared to pairs of strangers.⁸¹ An existing relationship between individuals may therefore have a negative impact on the accuracy of their reported memory for an event, due to higher levels of memory conformity among those who are already acquainted.
- (b) *Reported confidence in memory.* A witness' confidence in their own memory versus their co-witness' memory also determines how much misinformation they are likely to incorporate into their later reported recollection. In the context of a simple recognition test using the confederate paradigm, Schneider and Watkins (1996) showed that a participant is more likely to be influenced by a confederate's report if the confederate reported greater confidence in their memory than the participant.⁸² This accords with the general finding that relative overt confidence is a reliable predictor of when someone is going to trust (and be influenced by) another person's memory more than they trust their own.
- (c) *Perceived expertise.* Varying a participant's perceived expertise relative to their co-witness' also impacts the strength of the memory conformity effect. Level of perceived expertise was manipulated in a memory conformity study by telling each pair of participants that one of them had viewed the test scenes for twice as long as the other.⁸³ In fact, each member of the pair had studied the pictures for the same length of time. The results showed that participants who believed they had less time to study the pictures were more susceptible to the memory conformity effect: they reported more items that had appeared only in images the other person had seen.
- (d) *Source credibility.* Related to both confidence and expertise, the perceived credibility of the source of the misinformation also influences the strength of the memory conformity effect. Kwong See, Hoffman and Wood (2001) found that witnesses were less influenced by a (fictional) elderly co-witness, than a

80. L. Hope et al., 'With a Little Help from My Friends...' *The Role of Co-witness Relationship in Susceptibility to Misinformation*, 127 *Acta Psychologica* 476 (2008).

81. L. French, M. Garry and K. Mori, *You Say Tomato? Collaborative Remembering Leads to More False Memories for Intimate Couples than for Strangers*, 16(3) *Memory* 262-273 (2008).

82. D. M. Schneider and M. J. Watkins (1996), *see supra* n. 74.

83. F. Gabbert, A. Memon and D. B. Wright, *I Saw it for Longer than You: The Relationship Between Encoding Duration and Memory Conformity*, 124 *Acta Psychologica* 319 (2007).

(fictional) young witness.⁸⁴ In their study, participants (young adults) viewed a set of still images showing a theft and then read a short narrative describing the event, which contained a handful of contradictory facts. Participants were told that the narrative had been written either by a young adult (28 years old) or by an older adult (82 years old). On subsequent memory test, participants showed more intrusion errors when they thought the prose description was written by a young adult than a narrative apparently written by an older adult. Similarly, participants have been found to disregard information about how a (fictional) child is reported to have responded in a suspect identification test, whereas they accepted information on suspect identification from (fictional) police officers.⁸⁵

- (e) *The effect of warnings.* As with research on the misinformation effect, results about the impact of warnings on memory conformity are mixed. However, there is evidence that warning participants about the possibility of misinformation can reduce – albeit not eliminate – the strength of the memory conformity effect, in certain circumstances. For example, Bodner, Musch and Azad (2009) found that warnings were effective in reducing the rates of false memory reports when they were given at the time participants viewed and discussed the relevant event.⁸⁶ In that experiment, participants were told expressly not to report details they had heard about during their discussions, unless they had specifically remembered seeing the item themselves. By contrast, warning participants about the possibility of misinformation did not significantly reduce the effect when the warning was given a week after the initial encoding and discussion (in the memory conformity paradigm);⁸⁷ or when the warning was given just before the final test (in the social contagion paradigm).⁸⁸ The timing of the warning relative to the misinformation is likely to determine its efficacy because participants are generally unable to remember where they learned something. If the warning is given some time after the misinformation has been presented, it will be difficult for a participant to discard it retrospectively.

In summary, there is now a raft of studies that demonstrate the effect of post-event misinformation introduced by another person on the (in)accuracy of memory. A number of factors have been shown to modulate the strength of this effect, but in general, a person's memory appears to conform to be consistent with another co-witness' story, even if the information they receive from that co-witness contradicts

84. S. T. Kwong See, H. G. Hoffman and T. Wood, *Perceptions of an Old Female Eyewitness: Is the Older Eyewitness Believable?* 16 *Psychology and Aging* 346–350 (2001).

85. E. M. Skagerberg and D. B. Wright, *Susceptibility to Post-identification Feedback is Affected by Source Credibility*, 23 *Applied Cognitive Psychology* 506 (2009).

86. G. E. Bodner, E. Musch and T. Azad, *Reevaluating the Potency of the Memory Conformity Effect*, Dec 37(8) *Memory and Cognition* 1069–1076 (2009).

87. H. M. Paterson, R. I. Kemp and J. P. Forgas, *Co-witnesses, Confederates and Conformity: Effects of Discussion and Delay on Eyewitness Memory*, 16 *Psychiatry, Psychology and Law* 112 (2009).

88. M. L. Meade and H. L. Roediger III, *Explorations in Social Contagion of Memory*, 30(7) *Memory and Cognition* 995–1009 (2002).

what they saw themselves. Three psychological processes appear to mediate this effect. These are: (i) social influence, where people knowingly report incorrect information in order to agree with their co-witness and gain social acceptance; (ii) informational influence, where people report what their co-witness said because they believe the other person has superior knowledge and is therefore likely to be right; and (iii) memory distortion, where people report wrong information because their memory has been altered by what their co-witness has said. The role played by each of these processes will depend on the specific circumstances. Moreover, even warning someone about this effect will not prevent it from happening completely.

§9.04 IMPLICATIONS OF POST-EVENT INFORMATION EFFECTS FOR WITNESS EVIDENCE IN INTERNATIONAL ARBITRATION

[A] Critical Evaluation of the Scientific Studies

In order to assess the potential relevance and applicability of these research findings in the context of international arbitration, it is necessary first to give critical consideration to the methodological design and the results of the studies themselves.

There are certain aspects of studies on the misinformation effect that may limit their generalizability to the present discussion. For instance, the majority of these studies investigate people's memory for a particular event viewed over a short video-clip or across a number of photographs.⁸⁹ In contrast, the matters on which witnesses are asked to testify in arbitration proceedings often occur over longer periods of time and involve information from many different modalities (e.g., remembering a conversation will require auditory as well as visual recollection). The events featured in these studies also typically differ in complexity from those that are the subject of arbitration proceedings. Whereas experimental studies use simple episodes such as a car crash or a petty theft, high-value disputes submitted to arbitration deal with complex matters such as the commercial negotiation of a complicated contractual term or the multifaceted reasoning behind a political decision. Moreover, the significance of the event may not be apparent to a witness in arbitration proceedings at the time it is occurring (in contrast to most criminal situations). The ecological validity of these studies when considered in relation to the resolution of commercial disputes is therefore limited relative to eyewitness testimony at criminal trials. In addition, notwithstanding the impact of the various mediating factors discussed in section §9.03[A][3] above, the size of the misinformation effect across the majority of studies is around 40%–50%. It is not the case that every piece of misleading information will influence the memory of every individual to the same extent.

There are separate critical considerations in relation to the research on false memory for entire events. First, in general, the incidence of false memories for entire events (e.g., meeting Bugs Bunny) is lower than discrete distortions introduced by the

89. The experiments were deliberately designed this way because they were intended to simulate the role of an eyewitness at a criminal trial (e.g., an eyewitness to a car accident or a robbery).

misinformation effect (e.g., the colour of an object). As mentioned above, looking at the results across a number of different studies, the proportion of people who are influenced by fabricated events is around 30%. This represents a significantly smaller effect size than the earlier studies of the misinformation effect. In addition, the confidence people attach to their memories differs significantly for true and false memories. Across studies on false memory that measure confidence as a factor, true memories are held with more confidence than false memories.⁹⁰ Memories for true events are also reported with much more coherence. Participants tend to rate false memories as being less clear and they use fewer words to describe the fabricated events.⁹¹ Close analysis of the interviews also shows that some participants who are classed as reporting partial false memories may in fact be speculating about the events rather than reporting a recollection, for example, ‘*Well, it probably would have been...*’; ‘*I probably would have felt...*’.⁹² Fact witnesses often make this kind of formulation if they are unable to remember the specific event.

The experimental design used to implant false memories is relatively unusual. It involved the researchers deliberately trying to mislead participants into thinking that an entire episode had happened when it in fact had not. Another distinctive feature of the design is that adult participants were ‘remembering’ events that were said to have happened to them when they were young children.⁹³ Memory for such events is likely to be particularly weak because the memory is very old. It may also have a different quality because it relates to childhood events. Finally, a number of studies used (sometimes doctored) photographs to enhance the effect of active imagining on the creation of false memories. It is questionable how often this sort of situation would arise in real life and in the context of commercial disputes in particular. While witnesses often testify on matters that occurred some time ago, it is unusual (though

90. In Loftus and Pickrell (1995), participants gave their real memories an average rating of 2.7 during the first interview and 2.2 during the second interview, on a five point scale where 1 is ‘not confident’ and 5 is ‘extremely confident’. By contrast, participants rated their false memories average confidence scores of 1.8 and 1.4 during the first and second interviews, respectively. See Loftus and Pickrell (1995) (*supra* n. 62).

91. In Loftus and Pickrell’s ‘lost-in-a-mall’ study, participants used on average 138 words to describe their memories of the real events compared to an average of fifty words to describe the false events. Real memories were also given a higher average clarity rating (6.3 during both the first and second interviews) compared to false memories (2.8 during the first interview rising to 3.6 during the second interview), on a ten-point scale where 1 is ‘not clear at all’ and 10 is ‘extremely clear’; An example of a false memory from one participant in Loftus and Pickrell’s study described the event in the following terms: ‘*I vaguely, vague, I mean this is very vague, remember the lady helping me and Tim and my mom doing something else, but I don’t remember crying. I mean I can remember a hundred times crying... I just remember bits and pieces of it. I remember being with the lady. I remember going shopping. I don’t think I, I don’t remember the sunglasses part.*’ Loftus and Pickrell (1995), see *supra* n. 61, p. 723.

92. In light of these marked differences in the nature of memories for true and false events, some researchers have questioned the validity and the appropriateness of collapsing results across partial false memories and complete false memories; Lindsay et al. (2004), see *supra* n. 61, p. 154. If whole and partial memories are instead treated separately, rates of false memory would be much lower than many studies suggest.

93. The assumption is that it would be very difficult to persuade someone about the occurrence of an event that is alleged to have happened relatively recently.

not unheard of⁹⁴) for testimony to stretch back further than a few years and certainly highly unlikely to address matters which took place during the witness' childhood. The risk of false memories for entire events may therefore be relatively low in the context of witness evidence in international arbitration. Notwithstanding these possible limitations, the research on false memory is important in illustrating the extremity of the effects of post-event misinformation.

In relation to memory conformity, it is worth noting that in many cases, sharing recollections with other people may have a positive effect on memory recall. Some of the studies discussed above were designed to present deliberately false information whereas, what another person remembers may well be entirely consistent with your own recollection. However, there will be other instances where another person's memory is inconsistent, because of an honest mistake or because they experienced the situation differently (e.g., a different viewpoint meant that they saw different things). This can have very serious consequences, as Gabbert and colleagues' study on attributions of guilt demonstrated (*see* section §9.03[B][3] above).

Finally, there is still some debate among memory researchers about how post-event misinformation occurs. One theory is that it represents a memory impairment, that is, an effect operating on the underlying memory. This theory postulates that exposure to post-event information either changes the memory itself or makes the signal memory trace harder to access. Another theory rejects the notion that the misinformation effect is a failure of memory and instead proposes that it merely reflects a response bias. In particular, this theory holds that misinformation is incorporated by those people who did not encode (and therefore have no memory of) the original event in the first place.⁹⁵ There is no dispute, however, that the effect exists and that it is pervasive and powerful. Its relevance in the context of international arbitration therefore remains important.

[B] Application to Witness Evidence in International Arbitration

There are various opportunities during the process of preparing witness evidence for the effects of post-event information to creep in.

Even before Stage One (Initial Investigation), potential witnesses are likely to be questioned by compliance teams and in-house legal teams within interview settings of varying formality. As Loftus' studies indicate, this preliminary round of questions may change the way a witness remembers relevant events later on. For instance, in-house teams will inevitably have their own agenda and a view of what, in an ideal world, they would like the facts to be. The questions they ask may therefore contain inadvertent assumptions or presuppositions about particular facts which could skew the potential witness' initial responses as well as their later reports.

94. As noted earlier, exceptions to this do occur, in investment treaty arbitration, in particular.

95. *See, for example, M. McCloskey and M. Zaragoza, Misleading Post-Event Information and Memory for Events: Arguments and Evidence Against Memory Impairment Hypotheses*, 114 *Journal of Experimental Psychology General*, 1-16 (1985).

The same risk of influence exists for the interviews conducted by legal counsel during Stages One and Two (Initial Investigation and Focused Investigation). As noted in section §9.02[B], the questions put to witnesses even in these early stages are likely to be shaped by the party's case theory and/or the facts presented in the submissions received from the other side. As such, they may not be neutral and may bias the witness' responses. If witnesses are struggling, or simply taking a pause, to remember, interviewers may also have a tendency to prompt them with suggested answers. For example, if a witness does not come up with an answer to the question: 'How many times on average would you speak to him?', it is easy for an interviewer to follow up with: 'Would it be three, five, ten times per week?' The motivation of the interviewer in these situations is invariably to be helpful. However, this sort of prompting may in fact serve to bias the subsequent response.

All of these potential effects on memory may be compounded by the fact that there are often multiple rounds of interviews in Stages One and Two of the process. To the extent that (mis)information is repeated over the course of these interviews, the likelihood of its contaminating witness' evidence is all the greater. At the same time, legal counsel (both in-house and external) are likely to be viewed by a witness as a credible source. The legal team will, for instance, be more familiar than the witness with the documentary evidence surrounding the relevant events (e.g., attendance notes of meetings and calls, emails and other correspondence, etc.). According to the research, this perceived credibility increases the risk that information inadvertently provided by counsel will affect a witness' memory.

Stage Three (Preparing the Witness Statement) could present different sources of memory influence. If a witness reads draft documents that are being prepared in parallel with their witness statement (e.g., statements of case, other fact witness statements), they may change their version of events in response to any discrepancy between facts. Since narratives written by hypothetical co-witnesses have been shown to mediate memory conformity, other witnesses' draft statements could serve as a similar form of social pressure for fact witnesses in international arbitration.

Witnesses may also come into contact with other sources of information during this phase of the process. To the extent that memory is influenced by information contained in contemporaneous documents, this part of the process may actually steer memory towards greater accuracy. The risk of distortion arises in this context if the documents were created some time after the event or by a potentially biased source, for example, an attendance note written a long time after the event or a news article containing allegations put forward by the opposing party. Fact witness statements filed by the opposing party represent another source of potentially contaminating information. Witnesses will be asked to respond to the facts stated by the other side's witnesses and will therefore be required to read those statements when preparing their own.

The potential for questions to influence memory arises again at Stage Four (Hearing Preparation). With varying degrees of specificity, witnesses will be asked to repeat what they recall of relevant events in preparation for giving oral testimony before the arbitral tribunal. By this point, the threat to memory is at its greatest, because of the lapse of time between the event and the memory recall. As the research on false memory demonstrates, interference effects are stronger when memories have

faded over time. Added to this, repeated exposure to the same post-event information is likely to have a compounding effect. By Stage Four, the witness will have been exposed to similar information in different formats during the process of preparing witness evidence. This leads to a greater chance that it will distort their original memory.

Throughout the process of preparing fact witness evidence, there is also a strong risk that memory will be influenced by memory conformity effects as a result of discussions with colleagues. It is only natural for individuals to discuss their experiences with others, particularly when those experiences come under scrutiny. Again, the passage of time between the relevant events and the arbitration hearing only serve to increase this risk.

As noted in section §9.01 above, the analysis in this chapter is restricted to the preparation of witness evidence. It does not address issues relating to the delivery a witness' oral testimony at the hearing (e.g., whether a fact witness is permitted to attend the hearing during oral testimony of other witnesses or whether they must be sequestered until they have given their own evidence). The deliberate reporting of false memory and other forms of intentional deception represent another area of concern when dealing with fact evidence in international arbitration. The studies reported in this chapter deal only with honestly reported memories. However, separate bodies of psychological research, such as those on lie detection and witness credibility, may have useful application in this area and certainly merit future study.

[C] Mitigating Post-Event Information Effects in Witness Evidence

It is clear from the above analysis that there are many occasions where the effects of post-event information may arise in practice given how witness statements are typically prepared. Practitioners and users of arbitration should be aware of these risks and do what they can to limit potential sources of interference. These steps may include the following.

First, users of arbitration (parties, counsel and tribunals) would benefit from education about the unreliability and fallibility of memory generally, and about the potential effects of post-event misinformation specifically. According to research studies, most people have a poor understanding of the realities of human memory. Developing an awareness of its inherent fragility and the moments at which distortion is most likely is the first step to prevention. For instance, legal counsel should be aware that they themselves may represent a source of interference and that this risk is increased as a result of their credibility. Witnesses will often look to counsel for guidance or to be corrected when providing responses. Even in more subtle contexts, information conveyed by the legal team in the process of questioning is likely to be trusted and incorporated.

Second, witnesses should be interviewed as soon as possible after the relevant event, ideally before any exposure to potential misinformation has taken place. Moreover, this first download of information should be as comprehensive as possible, since it will record the witness' memory in its cleanest form. Psychologists are devising

tools to assist with this initial information capture, such as detailed written questionnaires for the witness to complete themselves, during any interim period where they are awaiting formal interview by the legal team.⁹⁶ In the context of commercial disputes, there will inevitably be limitations to this principle of best practice. Often-times, claims crystallize in relation to historical events (e.g., in a misrepresentation claim, a claimant will only discover that a pre-contractual statement was false after the contract has been signed and after they have sustained losses under that contract). In those cases, legal counsel would not be instructed until months or even years after the relevant events occurred.⁹⁷

Third, the conduct of witness interviews can be improved in a number of ways that increase the amount of information elicited and heighten the validity and accuracy of that information.⁹⁸ For example, interviewers can:

- (a) Identify potentially contaminating sources of information. In particular, find out who else has interviewed the witness and what, if anything, the witness has read (e.g., news articles). In assessing the risk of contamination, consider the time interval between receipt of possible misinformation and the subsequent interview (participants are more likely to identify (wrongly) that misinformation was part of the event where there is a longer delay until the memory test).⁹⁹ Similarly, ask the witness if they have discussed the event with anyone else. This may not stop the effects of post-event information but it will help counsel understand the situation and appraise the relative independence of evidence accordingly.¹⁰⁰
- (b) Deliver appropriate instructions at the start of the interview. For example, opening the interview with a reminder that memory is rarely complete and that it is natural to forget details and events will reduce the risk of response bias. Telling witnesses they should feel comfortable answering with: 'I don't know' or: 'I don't remember' is also helpful. Also, ask witnesses only to report what they actually remember rather than what someone has told them. Alternatively, if the goal is to obtain as comprehensive an account as possible, ask a witness to indicate when they are making an assumption (e.g., 'I assume I went to this meeting because there is an entry in my calendar on that

96. F. Gabbert, L. Hope and R. P. Fisher, *Protecting Eyewitness Evidence: Examining the Efficacy of a Self-Administered Interview Tool*, 33(4) *Law and Human Behavior* 298–307 (2009).

97. This is one of the ways in which witness evidence in international arbitration differs significantly from evidence in criminal cases.

98. Researchers have devised a method of interviewing called the Cognitive Interview based on psychological studies of memory and social functioning, incorporating some of the steps indicated in this sub-section; R. E. Geiselman et al., *Enhancement of Eyewitness Memory: An Empirical Evaluation of the Cognitive Interview*, 12(1) *Journal of Police Science and Administration*, 74–80 (1984).

99. P. A. Higham, *Believing Details Known to Have Been Suggested*, 89 *British Journal of Psychology*, 265–283 (1998).

100. From the recommendations of the British Psychological Society to the UK Home Office (2008), see *supra* n. 2, Chapter 7: Identification Parades.

- day') or when the memory they are relaying is second-hand (e.g., 'I can't remember this myself, but my colleague, John, said that this happened').
- (c) Prepare interview questions carefully and conduct a cold review before the interview. Use neutral language and avoid any inadvertent assumptions. Even very subtle changes in the language can have significant and lasting impacts on what a witness will remember.
 - (d) Avoid giving a helping hand during the interview by prompting the witness with suggested answers, as this may skew a witness' response.
 - (e) Record the interview as accurately as possible.¹⁰¹ It may not be appropriate or desirable to make an audio recording, but certainly, someone other than the person asking the questions should take detailed notes of the witness' responses. A second note-taker can also verify the written record of the interview.

Fourth, draft the witness statement in isolation as far as possible. The witness should not be given copies of written submissions or other draft witness statements until theirs is near-final to avoid being improperly influenced.

Fifth, be guided by the documents where discrepancies arise. The misinformation effect presupposes that witnesses are exposed to incorrect information. However, if a witness' memory is changed as a result of reading emails and other contemporaneous records relating to an event, their testimony is likely to move in the direction of accuracy rather than inaccuracy. Memory is influenced by subsequent information, whether it be accurate or misleading.

Sixth, consider whether it is appropriate to submit expert evidence on memory, particularly if a critical part of the case rests on the arbitral tribunal choosing one witness' recollection over another's – and there are no documents to distinguish between the two accounts. This is important because, without specific education on the topic, the tribunal may have a misguided impression of how memory really works.¹⁰² The BPS Guidelines on Memory and the Law advocate the use of memory experts in appropriate cases,¹⁰³ and the BPS has published a guide on expert evidence covering best practice in this area.¹⁰⁴

Finally, arbitral tribunals should give appropriate weight to witness evidence bearing in mind the potential unreliability of memory. The other side of the coin is to accord appropriate relative weight to the documentary record. Deliberate tampering and forgery aside, documents are not subject to distortion in the same way as human memory. To the extent that documents exist, they therefore represent the best source

101. Relying on the interviewer's memory carries its own risks.

102. While some arbitrators have served as professional judges in the past, these represent the minority. The majority of arbitrators are therefore unlikely to have the benefit of judicial education and other formal training on memory biases; see s. §9.03 and *supra* n. 35.

103. The British Psychological Society, *Guidelines on Memory and the Law* (*supra* n. 2) 4.

104. The British Psychological Society, *Psychologists as Expert Witnesses: Guidelines and Procedure* (4th edn, Leicester: The British Psychological Society 2015). For discussion of how memory experts have been used in criminal cases, see for example, Martin A. Conway, *On Being a Memory Expert Witness: Three Cases*, 21 *Memory*, 566–575 (2013) <http://dx.doi.org/10.1080/09658211.2013.794241> (accessed 25 September 2016).

of independent corroborating evidence and should be the first port of call in any investigation and presentation of the facts. Several judges have articulated this approach to fact-finding in the past. The Hon. Mr Justice Leggatt in *Gestmin* stated:

In the light of these considerations, the best approach for a judge to adopt in the trial of a commercial case is, in my view, to place little if any reliance at all on witnesses' recollections of what was said in meetings and conversations, and to base factual findings on inferences drawn from the documentary evidence and known or probable facts ... Above all, it is important to avoid the fallacy of supposing that, because a witness has confidence in his or her recollection and is honest, evidence based on that recollection provides any reliable guide to the truth.¹⁰⁵

Lord Bingham articulated a similar view in his essay, '*The Judge as Juror: The Judicial Interpretation of Factual Issues.*' He argued that the best approach to fact-finding is to look at the contemporaneous documentary record and the undisputed facts, and to use those sources primarily to draw conclusions.¹⁰⁶

§9.05 GENERAL CONCLUSION

It is impossible to make sweeping generalizations about when witness evidence will or will not be tainted by the types of memory distortion discussed in this chapter. This is because the content of each statement, and the process of preparing witness evidence, is different in each case. However, it is undeniable that the process of preparing witness evidence in international arbitration necessarily exposes a witness to several sources of possible memory distortion. These include questions posed by legal counsel, discussions with colleagues and exposure to other secondary sources of information that refer to an event (e.g., newspaper articles, *emails*). Information presented by these sources can influence and distort a person's subsequent recollection.

The insidious nature of post-event information makes these effects difficult to prevent. As Loftus noted: '*New information invades us, like a Trojan horse, precisely because we do not detect its influence.*'¹⁰⁷ It is impossible to guard against the alteration of memory entirely, but there are a number of practical steps that can be taken to minimize these potential memory effects. To the extent that counsel and tribunals can equip themselves with a good understanding of these effects, this will be the first step to minimizing their impact.

Fortunately, there is growing awareness among the international arbitration community of the potential impact of these effects of memory. Their repercussions for the use of witness evidence generally is also being considered. Any discussion about memory and witness evidence in international arbitration is incomplete without

105. Leggatt, *Gestmin* (*supra* n. 1) 15-21.

106. In T. Bingham, *The Business of Judging: Selected Essays and Speeches* (Oxford University Press 2000).

107. E. F. Loftus, *The Reality of Repressed Memories*, 48(5) *American Psychologist* 518-537, 530 (1993); also Loftus and Pickrell (1995) (*supra* n. 61) p. 720.

reference to The Kaplan Lecture Toby Landau QC delivered on the topic in 2010.¹⁰⁸ This lecture scrutinizes the use of witness evidence in modern arbitral practice by reference to scientific research, concluding with some revolutionary proposals for its reform. The topic was hotly argued a few years later in an Oxford-style debate at Global Arbitration Review Live Stockholm, with a motion calling for the abolition of witness statements being roundly defeated.¹⁰⁹ At the time of writing, there is an interdisciplinary ICC Task Force comprising legal practitioners and memory experts to report on how to increase the probative value of witness evidence in international arbitration.

Research into the intersection of memory and the law also continues apace and there are dedicated research facilities at leading academic institutions examining important questions in the area.¹¹⁰ Science never sleeps and with advancements in our understanding of how human memory operates will come improvements in legal practice associated with the use of witness evidence in international arbitration.

108. T. Landau QC, *Tainted Memories: Exposing the Fallacy of Witness Evidence in International Arbitration*, 17 November 2010, <http://neil-kaplan.com/wp-content/uploads/2016/06/The-Kaplan-Lecture-2010-final.pdf> (accessed 26 September 2016).

109. The debate was reported in D. Thomson, *Should Witness Statements Be Abolished?*, *Global Arbitration Review*, 15 April 2106.

110. Such as the Centre for Memory and Law at City, University of London.