

DO PERCEPTUAL AND SUGGESTED ACCOUNTS ACTUALLY DIFFER?

Antonio L. Manzanero
Complutense University of Madrid

Over the last few years a number of studies have attempted to develop techniques that permit us to discriminate the credibility of accounts, in an effort to distinguish those based on real events from those based on imagined or suggested events. Thus, numerous techniques have emerged based on analysis of the characteristics of accounts through which such discrimination is possible. On the other hand, research based on monitoring of memory sources has shown that there are not always differences between real and suggested accounts. The present study deals with true accounts and accounts contaminated by suggested false information. The results show that there are only differences in a few dimensions, and that they fade as time goes by. It is also shown that the acceptance of false information (without the deliberate intention to lie or mislead) may actually be due to the similarity between the two types of account, which would lead to confusion in subjects about its source.

Key words: *Memory, misleading information, eyewitness testimony, source monitoring.*

Durante los últimos años diferentes trabajos han tratado de encontrar técnicas que permitan discriminar la credibilidad de los relatos en un intento de diferenciar entre relatos basados en hechos reales y aquellos que lo hacen en sucesos imaginados o sugeridos. Así, han surgido de la práctica múltiples técnicas basadas en el análisis de las características de los relatos según las cuales la discriminación es posible. Por otro lado, se han realizado numerosas investigaciones basadas en los procesos de control del origen de los recuerdos que muestran que no siempre existen diferencias entre relatos reales y sugeridos. En el presente estudio se analizan diferentes relatos producto de la realidad y contaminados por la sugerencia de información falsa. Los resultados muestran que sólo existen diferencias en unas pocas dimensiones que se van perdiendo con el paso del tiempo, y que la aceptación de la información falsa (sin intención consciente por parte de los sujetos de mentir) se podría deber precisamente a la similitud entre los dos tipos de relatos que llevarían a confusión a los sujetos acerca de su verdadero origen.

Palabras clave: *Memoria, información sugerida, testigos, origen de los recuerdos.*

One of the areas most widely studied in forensic psychology in recent years concerns the possibility of discriminating between true accounts and false ones. An account may fail to describe the reality of a situation because people consciously lie, or because of faulty memory.

Popular belief about the functioning of memory attributes the majority of inaccuracies in a statement to the first explanation (Mira & Diges, 1991). Thus, if a person reports an event that never happened, or did not happen as they report it, this is inevitably due to the fact that they do not want to tell the truth.

However, research over several decades has shown that memory is far from perfect, and is limited not only in its capacity, but also due to the effect of innumerable fac-

tors that distort it, leading to errors (unintentional) of both omission and commission. That is, giving rise to false memories (the most comprehensive review in Spanish is Diges, 1997).

Thus, leaving aside the intentional provision of false data, the majority of accounts of events are riddled with errors beyond the person's control. The commonest sources of error are perceptual problems, the interpretation of events, the inference of non-processed information, the passage of time and/or the incorporation of false information after the event.

Every time witnesses recount an event, think about what happened, and above all answer questions for which they do not have a clear response based on their own recall, their memory undergoes transformations that accelerate its deterioration beyond that which would result from the passage of time alone.

Even our most vivid memories are sprinkled with details that never existed. And that includes those memories that we appear to be able to summon up as if they had just occurred, as though we were reliving them,

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Correspondence concerning this article should be addressed to Antonio L. Manzanero, Facultad de Psicología, Universidad Complutense de Madrid, Campus de Somosaguas. 28223 Madrid, Spain. E-mail: antonio.manzanero@psi.ucm.es

seemingly unaltered by time. This type of autobiographical memory, known as *vivid memories* or *flashbulb memories*, refers to events that made a strong impact on us for individual reasons or because of their social repercussions, and seem to have been “engraved in fire”. This type of memory would be found, for example, in victims of violent and/or traumatic events (road accidents, bombings, assaults, etc.). And although people with such memories may say that “I’ll remember it as long as I live”, *no memory is in fact immune to deterioration*. Various researchers (e.g., Brown & Kulik, 1977; Neisser & Harsch, 1992; Pillemer, 1984) in this field have shown that certain memories about what one was doing at the time of an event of this type are not real.

Do we really think we have seen things that never occurred?

A large number of studies have shown that witnesses to an event have great difficulty deciding whether a suggested detail was actually seen by them or comes from other sources, such as the recounting of the event or the questions asked by a researcher. Loftus, Donders, Hoffman and Schooler (1989) found that participants had the same level of confidence in the reality of their actual memories and in their suggested memories. Even so, this confidence is not sufficient to state that the witnesses actually believe in what they say.

In an attempt to demonstrate empirically that people believe in the reality of their imagined or suggested memories, Lindsay and Johnson (1987, 1989) carried out various studies in which they asked participants to identify the origin of their real and suggested memories. The results showed that people confused their origin.

However, it would seem that witnesses do not always have problems for distinguishing the origin of their memories. Zaragoza and Koshmider (1989) carried out an experiment in which they obliged participants to identify the origin of their memories of each detail. In this case, the results showed that subjects were capable of realizing the origin of their suggested memories.

Nevertheless, both Lindsay and Johnson and Zaragoza and Koshmider found that although in general people could correctly identify the origin of suggested or imagined memories, in some cases confusion occurred, so that they attributed a real origin to a suggested memory. In these cases subjects were sure of having *seen* the suggested details of the event.

In an effort to resolve this controversy, Lindsay (1990) used a new paradigm (Jacoby’s logic of opposition) for testing the hypothesis of subjects’ *certain belief* in their

suggested memories. After subjects had viewed a series of slides depicting an event, the event was described to them with the inclusion of some false information. They were then asked a series of questions. The new paradigm consisted in informing them that there would be no questions in which the correct answer was found only in the description and not in the real event. Answering affirmatively in the case of the suggested details would indicate that they were attributed to the original event, since they could not be explained by “task demands”. The results showed that in a condition of low discriminability (when the event and the suggestion were presented in the same session and the recall test two days later, and the voice accompanying the slide show and describing the event with the false information was the same), subjects confirmed the suggested details in 27% of cases, while the figure for the subjects who were not given false information was just 9%. Moreover, the data showed an overall decay of memories in those subjects who had been fed false information.

With a view to reinforcing this evidence of *certain belief*, Weingardt, Loftus and Lindsay (1995) carried out further research with a modified version of the paradigm used by Lindsay. While Lindsay informed subjects that there were no correct answers in the description that contained the suggestions, Weingardt’s group told their subjects that if they recalled having *seen* an item in the original event they should *not* indicate it. The results showed that the subjects to whom false items had been suggested included them in the list on original items. These results were obtained even obliging subjects to use strict criteria for distinguishing the origin of memories through a system of bets that indicated high involvement in the judgements. This evidence serves to reinforce the findings of Lindsay and strengthens the argument that subjects who are fed false information after the event sometimes believe firmly that such information is true.

Why do we confuse false data with what really happened?

One of the hypotheses proposed in response to this question states that it is because of a defect in the mechanisms that permit us to distinguish the origin of memories (Lindsay, 1990; Zaragoza & Lane, 1994), within the framework of Johnson and Raye’s (1981) Reality Monitoring model (see Figure 1).

Johnson and Raye distinguished between two types of memories according to their origin: perceptual and self-generated; in turn, they distinguished three different ori-

gins among the second type: a) *re-representations* of the perceptual experience or memories of something previously experienced, where the information that has disappeared from the consciousness or the active memory is reactivated later in the absence of the original external stimulus; b) *cotemporal thoughts*, processes of elaboration and association that augment, link up or enrich, as one goes along, perceptual experiences that do not necessarily form part of the true representation of the perceptual experience; and c) *fantasies*, which involve new combinations of information that produce imaginary events which occur only in our imagination.

The process through which we discriminate the source of memories depends on various factors. Johnson and Raye (1981) point out that the same process is not always followed, and that it will vary depending on the nature of the information recalled, on the conditions in which it occurs, and on the cost of errors. Decision-making about the origin of a given memory is based on two aspects: a) comparison of the attributes of the specific memory trace, with the typical discriminative attributes for the two types of memories; and b) a reasoning process that takes into account the qualitative character-

istics of memory traces –resulting from the previous comparison–, the additional information related to the trace and stored in the memory, and the person’s knowledge about the capacity and functioning of their own memory and that of others (knowledge of meta-memory). Thus, in a case in which we try to discern the source of a memory whose origin we are not sure about (for example, whether we already told a story or we only imagine we have told it), we would analyze the characteristics of the memory (details of the context in which we might have told the story, sensory information, whether or not cognitive processes are involved in the trace, etc.); if the balance of characteristics is in favour of the prototype of a memory deriving from the imagination, and if the reasoning about the information related to the trace (e.g., “it’s unlikely that I’ve told this story because I don’t usually talk about these things to these people”), and our metamemory knowledge (e.g., “I usually have a good memory of my own acts in circumstances like these”) suggest this, then we would conclude that in all likelihood this memory is the product of the imagination, and does not relate to reality.

According to the model, memories of external origin differ from those of internal origin in a series of specific dimensions (Johnson & Raye, 1981; Johnson, Hashtroudi & Lindsay, 1993). Memories of external origin have more contextual and sensory attributes, and more semantic detail; self-generated memories, on the other hand, contain more information on cognitive operations.

In this theoretical framework, numerous studies have been carried out with the aim of studying the differential characteristics of each type of memory, and how these are affected by different factors. These studies on discrimination between different sources of memories are interpreted in line with a distinction between different kinds of external-origin information, or between externally and internally generated information, or indeed between two kinds of information of internal origin. In the first case (external-external), the most common type of research looks at discrimination between different modes of origin of information, such as between verbal and non-verbal information (Hertel & Narvaez, 1986), or at post-event information (e.g., Alonso-Quecuty, 1993; Manzanero, 1993, 2001a; Lindsay & Johnson, 1989; Schooler, Gerhard & Loftus, 1986). Typical studies on the distinction between an external source and an internal one include those that attempt to throw light on the properties of each of these types of memory with respect to (external) reality and those that deal with self-

Figure 1

Reality Monitoring Model (Johnson & Raye, 1981 pp. 73)

1. Types of attributes potentially comprising memories
 - Contextual
 - Sensory
 - Semantic
 - Cognitive operations
2. Dimensions on which the classes of externally generated and internally generated memories typically differ
 - External have more contextual attributes
 - External have more sensory attributes
 - External have more semantic detail
 - Internal include more information about cognitive operations
3. Processing characteristics of reality monitoring
 - Decisions about the origin of a specific trace may be based on a weighted combination of the results of comparing the target trace attributes indicated above to criteria defining the general classes of external and internal representations
 - Decisions may be based on a reasoning process involving
 - Qualitative characteristics of the target trace
 - Characteristics of related traces
 - Metamemory assumptions
 - Which processes take place should depend on such factors as time, availability of different types of information, cost of mistakes, and so forth
4. Sources of errors in reality monitoring
 - Target trace not typical of its class
 - Characteristics of similar incorrect traces
 - Failure in a reasoning process (e.g., failure to retrieve additional information, incorrect metamemory assumptions)

generated memories from dreams (e.g., Johnson, Kahan & Raye, 1984), from the imagination (e.g., Johnson, 1988; Johnson, Foley, Suengas & Raye, 1988; Manzanero & Diges, 1994a; Suengas & Johnson, 1988) and from lies (e.g., Alonso-Quecuty, 1990; López & Zaldivar, 2002). Finally, the third important group of studies involves attempts to distinguish between two internal sources (e.g., Johnson, Kahan & Raye, 1984; Alonso-Quecuty, 1990). Furthermore, a research line has been developed that analyzes how memories of an event deteriorate from the point of view of the reality monitoring model, losing properties of the perceived traces under the influence of different variables, such as previous knowledge (Diges, 1995), perceptual mode (Henkel, Franklin & Johnson, 2000), preparation (Manzanero & Diges, 1995), questioning and multiple recall (Manzanero, 1994), or contextual factors (Manzanero, 2001b).

Are real memories truly different from false ones?

Schooler, Gerhard and Loftus (1986) applied a *reality monitoring model* in an attempt to distinguish real accounts from imagined ones through a series of questions biased with false information. In a first experiment, they showed one group of participants a series of slides of a road accident at a intersection with a yield sign, while another group were shown the same slides, but without the yield sign. Subsequently, they were asked about the event portrayed, and the presence of the sign (which they did not actually see) was suggested to the second group. In the third phase of the experiment, all participants were asked if they recalled seeing the sign, and if so, to describe it. On analyzing the descriptions of the sign produced by participants from the two groups who claimed to recall it, Schooler et al. (1986) found the descriptions based on fact to be qual-

itatively different from those based on suggested information, as indeed the model proposes. The descriptions by those to whom the information was suggested are longer, and contain more verbal hedges or clichés and more references to cognitive operations, and fewer sensory details, than the descriptions based on reality.

In a later study, Schooler, Clark and Loftus (1988) carried out an experiment similar to the previous one, but with different material (instead of a Give Way sign, they used three non-existent objects supposedly stolen in the film) and with different recall mode (in the first study participants responded in writing, and now they gave oral responses which were recorded on video). The results showed that the suggested memories included more allusions to cognitive processes, more self-references (more frequent appearance of the pronoun “I”) and more verbal hedges; while real memories included more allusions to perceptual processes and more sensory details. On the other hand, and in contrast to the findings of the first study (Schooler et al., 1986), the accounts based on internal sources were not significantly longer than those based on external ones.

On the basis of the findings from these two experiments, further research has attempted to analyze the qualitative differences between true accounts and those that involve material suggested in different conditions. Alonso-Quecuty (1993), using as material a real event, assessed the effect of post-event information on the quantity of contextual, sensory and idiosyncratic information and the length of accounts, finding significant differences only in relation to length (the real accounts were longer than the ones with suggested information).

Different results were found in two experiments (Manzanero, 2001a) in which participants were fed false information (a stop sign) immediately after having seen a video of a road accident. In the first experiment, par-

Figure 2
Mean and statistical scores for the significant differences (*) (Manzanero, 2001a, Experiment 1)

Suggestion	Not suggested	Suggested	t(58)	Falsehood	False	Real	t(43)
Accurate information	14,667	14,111		Accurate information*	11,875	14,595	1.837,p<.05
Distortions	2,333	2,622		Distortions	2,5	2,649	
Sensory information	5,133	4,067		Sensory information*	2,25	4,459	2.129,p<.01
Contextual information*	13,067	6,933	4.826, p<.0001	Contextual information	6,125	7,108	
Mental processes*	3,933	2,311	2.04, p<.05	Mental processes	2,265	2,243	
Judgements and comments	0,733	0,756		Judgements and comments	1,375	0,622	
Self-references*	2,867	1,489	1.777, p<.05	Self-references	2,25	1,324	
Expressions of doubt	0,933	0,644		Expressions of doubt	1,125	0,541	
Length	174,467	149,711		Length	148,75	149,919	

ticipants were asked to give their accounts half an hour after the suggestion of the false information, whilst in the second one they recounted the events one week later. In either case the experimenters measured the quantity of accurate information, distortions, sensory information, contextual information, allusions to cognitive processes, personal judgements and comments, expressions of doubt and self-references and the length of the accounts. The results showed in the first experiment (Figure 2) that the accounts by those who were fed false information contained less contextual information, fewer allusions to cognitive processes and fewer self-references, considering the accounts independently of whether the information had been accepted by the participants or not; when a distinction was made between false accounts, which mentioned the suggested information, and true accounts, which did not mention it, the former were found to provide smaller amounts of accurate information and of sensory information.

The results of the second experiment (Figure 3), with a delay of one week, showed that the suggestion of information, regardless of whether it was accepted, gave rise to accounts with less sensory information and fewer allusions to cognitive processes; and if we consider the accounts in which participants accepted (and mentioned) the suggested false information, they contained less accurate information, fewer distortions and less sensory information.

Thus, people's errors in discriminating false information from real information were associated with a lack of differences in contextual information, idiosyncratic information (judgements, personal comments and self-references) and related cognitive processes, or to a qualitative profile different from what would be expected according to reality monitoring processes. At the same time, true accounts were richer, with more sensory information.

None of the previous experiments found contextual differences among the two types of memories (or at least not in the expected direction) when participants accepted the suggested false information. In this regard, Diges (1997) proposes that the confusion between a real memory and a false one would arise because those who accept the false information would automatically create contextual links between the content of the memory and their personal past. Thus, Diges proposes three conditions for a false memory to be considered as true or real: a) it seems familiar, b) it seems plausible, and c) it has sufficient contextual links.

Moreover, it would appear that subjects' descriptions of memories, considered globally, do not differ substantially whether they are real or imagined, which makes it impossible to discriminate between them according to the features mentioned (Lindsay & Johnson, 1989). Also, the suggestion of false information post-event, despite not affecting the overall description in general terms, decays subjects' memory of the event, as various studies have shown. When subjects accept the false information, the quantity of accurate information decreases (Manzanero, 2001, Experiment 1), though curiously so does the number of distortions (Manzanero, 2001a, Experiment 2). For his part, Lindsay (1994) found that when participants were asked to recall an event after being provided with false information, the amount of accurate information in their account decreased, but the number of distortions and false alarms –even with regard to information unrelated to the suggested false details– increased. And it is this last finding that is most noteworthy. It appears that providing people with false information has a general effect on the quality of their accounts, even when this information is rejected by them.

Figure 3
Mean and statistical scores for the significant differences (*) (Manzanero, 2001a, Experiment 2)

Suggestion	Not suggested	Suggested	t(85)	Falsehood	False	Real	t(61)
Accurate information	15,125	14		Accurate information	12,364	14,346	1.564,p=.06
Distortions	2,208	2,921		Distortions*	1,909	3,135	1.746,p<.05
Sensory information	5,042	4,063		Sensory information*	2,182	4,462	2.687,p<.005
Contextual information*	13,042	8,413	3.924, p<.0001	Contextual information	7,091	8,692	
Mental processes*	4,083	2,683	1.988, p<.05	Mental processes	2,909	2,635	
Judgements and comments	0,625	0,667		Judgements and comments	1	0,596	
Self-references	2,708	1,746		Self-references	2,091	1,673	
Expressions of doubt	0,792	0,762		Expressions of doubt	1,091	0,692	
Length	173,417	159,73		Length	140,818	163,731	

Can we assess the truth of an account according to differential attributes?

It would seem that the process we use for distinguishing the origin of our own memories is similar to the one we use for assessing others' memories, as argued by several authors who propose similar models (e.g., Wells & Lindsay, 1983) and different studies that have analyzed the parallels between the two processes, finding numerous similarities (e.g., Schooler, Gerhard & Loftus, 1986).

It is a fact that we customarily employ this type of process of discrimination of the origin of memories, apparently with some success. However, we are often surprised to find that things we remember, or people tell us, never actually happened like that.

In this regard, Johnson and Raye indicate three possible sources of error in the discrimination process: a) the reasoning process is based on erroneous knowledge of metamemory or on related, but inaccurate, information; b) the memory traces on which we base our comparison do not belong to the memory category in which they are classified; and c) the specific trace may not have the features characteristic of the trace of its class.

Thus, taking into account the results mentioned above, it may be quite difficult to distinguish a real account from a false one based on the differential attributes described. In this direction, research has found that the percentage of errors in discrimination ranges from 48-40% in studies with adults and suggested accounts (Schooler, Gerhard & Loftus, 1986) to 37.5% with adults and imagined accounts (Manzanero & Diges, 1994b), and to 36% with children's testimonies (Santtila, Roppola & Niemi, 1998). In all the studies, slightly over one in three accounts was assessed incorrectly.

Nevertheless, Schooler et al. (1986) found that providing simulated judges with information about the differential attributes aids discrimination, given that the number of errors decreases, compared to assessments made with no such information, by 6-10% (Experiments 4 and 5).

From another perspective, throughout history humans have insistently sought objective procedures for assessing the truth of an account, and all cultures have developed techniques for detecting lies. However, all such techniques and procedures have been based on respondents' intentional (and therefore conscious) provision of false data, so that they are not applicable to the majority of false accounts produced by errors, which lack intentionality, since the subjects themselves believe they are telling the truth. Only intentional lying or distortion

would affect (and even then not always) psychophysiological and behavioural dimensions that can be measured through a range of techniques.

It is for this reason that there have recently emerged some procedures based on the content analysis of descriptions of memory. All start out from the assumption that statements proceeding from a real event differ from those based on a false (mistaken) event in various dimensions, such as type of expression, type of details described, doubts expressed, narrative structure, and so on (for a review, see Manzanero, 2001c). These differential attributes coincide largely with those proposed in the framework of the reality monitoring model, giving rise to a research line aimed at comparing the two procedures (see, e.g., Strömwell et al., 2004; Sporer, 1997; Vrij et al., 2004).

Some works (e.g., Escribano & Vallespín, 2000; Vázquez, 2004) based on forensic practice (in the context of sexual assault) have shown that accounts based on real events do indeed follow a characteristic pattern, considered both overall and in highly specific cases. Nevertheless, the applicability of these results in the framework of credibility analyses raises numerous problems, given that (among many other factors) every account is different "world", and these dimensions cannot be used as though they were diagnostic criteria (Offe, 2000; Undeutsch, 1989), such as those set out, for example, in the DSM-IV, or even as though they constituted a simple test (Tully, 1998); that is, we cannot consider after the fulfilment of a certain number of criteria that a statement is credible or not, as some authors propose (Juárez, 2004; Triandafilou, McCullough & Eslea, 1998). What is true from a statistical point of view is not always so from an applied perspective. As pointed out elsewhere (Manzanero, 1996, 2000, 2001c; Tully, 1998), and proposed by Undeutsch (1989), these techniques constitute a protocol of analyses that include something more than a list of *symptoms*. In fact, several studies have shown that not all criteria are applicable to just any type of assault and circumstances (the list of studies is extensive, as shown by Juárez, 2004, in his doctoral thesis, though among them we would highlight that of Bekerian & Dennett, 1992). Thus, the presence of certain criteria included in techniques such as Criteria-Based Content Analysis (CBCA) (Steller & Köhnken, 1989) may go against the credibility of a statement in some circumstances (Manzanero, 2001c). There are many factors that affect the content and quality of statements, and their effects are quite varied, as mentioned above, and as has been shown in a range of studies (e.g.,

Alonso-Quecuty, 1990, 1993; Diges, 1988, 1995, 1997; Henkel, Franklin & Johnson, 2000; Manzanero, 1993, 1994, 2001c; Manzanero & Diges, 1994a & b, 1995; Schooler et al., 1986, 1988; Suengas & Johnson, 1988). López and Zaldivar (2002), for example, found that only some content criteria appear to a greater extent in true statements compared to false ones (lies).

In assessing the credibility of a statement, are attributes based on the reality monitoring model less reliable than those of techniques based on practice, such as CBCA? It should be pointed out that higher percentages of success have been obtained using reality monitoring criteria than using the CBCA technique as a diagnostic criterion (Sporer, 1997). Even so, further research is required in this regard.

In any case, any light we can shed on how memory qualities are affected by different factors will contribute interesting information to increase our knowledge of memory functioning –knowledge which can be applied in the field of forensic psychology and the study of eyewitness testimony.

In order to look more deeply into the question of the differences between true and non-intentionally-false accounts, we carried out the following experiment, in which after manipulating the suggestion of information and the delay we analyzed participants' accounts in terms of their quality, based on the reality monitoring model (Johnson & Raye, 1981).

Hypothesizing on the results in this case is not easy, since according to some studies (Lindsay & Johnson, 1987, 1989; Alonso-Quecuty, 1993) there should be no significant differences between suggested and non-suggested memories, making it difficult to discriminate their origin; on the other hand, according to other studies on the content of memory descriptions (Schooler et al., 1986, 1988), suggested and non-suggested memories would indeed differ with regard to the features proposed by Johnson (Johnson & Raye, 1981; Johnson et al., 1993) for discriminating the origin of the information.

Perhaps the answer lies in the notion that memories of one origin and the other are actually different, but can sometimes become confused when some of the key attributes for assessing the source of the memory do not correspond to expectations.

METHOD

Participants

Sixty people participated in the experiment, all of them psychology students who volunteered to take part. Participants were of both sexes and all were of similar age.

Materials

a) As material to be recalled, participants were shown a complex event in a video lasting 27 seconds without sound. The event concerned was a road traffic accident in which two cars collide at the junction of two streets. The scene begins with an introduction in which we see one of the cars involved in the accident driving with other vehicles along a road that passes through a park. The crux of the scene is when this car reaches a junction, where it stops, immediately moves off again and collides at low speed with another vehicle coming from a road at right angles. The car that appears at the beginning of the scene is pushed along by the second car for some distance until they both stop, with considerable damage incurred, especially by the first car.

In all cases participants were informed previously about the nature of the event, the brevity of the video, and the fact that there was no sound. They watched the video on a colour television monitor in a lecture room at the university. The recall tasks were carried out in the same room.

b) Depending on their condition, participants were given one of two types of questionnaire. In the misleading condition the questionnaire described the event using the expression “smash” and suggested the existence of a stop sign, which did not actually appear in the video (“Did he see the stop sign at the junction where the accident occurred?”); in the real condition, the event was described using the word “hit”, and the question about the stop sign was omitted.

c) For measuring the accuracy of the accounts provided by the participants we used a protocol of analyses that describes the event by means of micro-propositions, whose usefulness in the assessment of the accounts, avoiding biases and aiding scoring, has been shown in several previous studies (e.g., Diges, 1988, 1995).

Design and Procedure

We used a factorial design with different subjects. The first independent variable was post-event information, with two levels (suggestion/no suggestion of information), and the second independent variable was delay between presentation of misleading information and free recall task, with two levels (immediate/delayed). Therefore, the design is factorial 2x2.

It was checked that none of the participants had seen

the material before, and to avoid interference they were urged not to speak to their colleagues about the experiment, and in particular about the content of the video.

All 60 participants watched the video, and one week later they were given one form of the questionnaire or the other, being divided at random into “control group” and “suggested group”, and into the immediate and delayed conditions. Once they had filled out the questionnaire they did a distractor task, which took at least 30 minutes and consisted in replying to a personality questionnaire. Half of each group were asked for free recall immediately after this distractor task, and the other half one week later. Subsequently, the accounts of participants who accepted the misleading information and those of participants who did not accept it were considered separately.

The dependent measures were the same as those of the previous experiment:

- *Total accurate information*: total quantity of correct information provided by participants in their accounts.
- *Distortions*: errors of commission, details that did not appear in the video, or appeared in a different form.
- *Sensory information*: information referring to sensory and geographical information that actually appeared: colours, sizes, positions, etc.
- *Contextual information*: information referring to spatial and temporal features of the scene of the accident.
- *Allusion to cognitive processes*: explicit mention of some cognitive process: imagining, seeing, hearing, remembering, “... caught my attention”, “... made me think”, etc.
- *Irrelevant information*: accurate information that does not form part of the pre-established script of the film, and is used for scoring the total information variable.
- *Length*: number of words in the account.
- *Expressions of doubt*: Phrases implying doubts over what is being described (could be, seem that, I think, it’s likely, etc.)
- *Explanations*: information that extends the description of events, providing a functional reference.
- *Spontaneous corrections*: corrections made to the description of the facts (except spelling mistakes), and which appear in the descriptions as crossed out or changed words.
- *Change of order*: alteration of the natural order of occurrence of the event: introduction, core and outcome.

- *Exaggerations*: descriptions which, due to excess or defect, distort the facts.
- *Information about source*: information about the origin of the event seen, in relation to both the experimental procedure and the filmed nature of the event, referring to the form of presentation and the type of information (position of cameras, video, television screen, etc.)
- *Self-references*: References participants make to themselves in describing the event.
- *Personal judgements and comments*: judgements of aspects of the event and respondents’ additional personal comments.

RESULTS

From the analysis of the free recall (see Figure 4) a series of analyses of variance (ANOVAs) were carried out, whose main effects and interactions are shown below.

Post-event information x delay

We found significant effects of the interaction of the two independent variables only in the case of quantity of expressions of doubt, $F(1,53)=4.443$, $p<.05$.

Post-event information

The post-event information variable significantly affected the quantity of irrelevant information that appeared in the accounts, $F(1,53)=3.496$, $p<.05$, and exaggerations, $F(1,53)=5.251$, $p<.05$. There were more

	Not suggested		Suggested	
	Immediate	Delayed	Immediate	Delayed
Accurate details*	15.06	11	14.53	11.8
Distortions	2	1.	2.4	2
Sensory information*	2.8	0.85	3.15	1.6
Contextual information	4.8	3.35	5.53	2.86
Doubts*	0.6	0.571	1.53	0.2
Exaggerations*	0.33	0.14	0.46	0.86
Irrelevant information*	0.4	0.42	0.92	0.73
Source information	2.33	1.71	2.38	2
Cognitive processes	2.66	1.35	2.07	1.8
Corrections	1.4	1	0.84	0.33
Change of order	0.26	0.14	0.15	0.2
Explanations	0.73	1.07	1.31	1.2
Self-references	2.66	1.57	2.61	1.53
Judgements and comments	1.2	1	1.23	1.26
Length*	147.6	110.64	157.30	128.06

irrelevant data and more exaggerations in the suggested accounts than in the non-suggested ones. No significant main effects of this variable were found in relation to the rest of the dependent measures. However, in the case of expressions of doubt the lack of an effect is misleading (see interaction data). In the immediate recall condition, the suggested accounts contained more expressions of doubt than the non-suggested accounts, $t(26)=1.619$, $p<.05$.

Delay

We found significant effects of delay on the quantity of accurate information, $F(1,53)=16.611$, $p<.0005$; sensory information, $F(1,53)=17.507$, $p<.0001$; contextual information, $F(1,53)=6.52$, $p<.01$; expressions of doubt, $F(1,53)=4.839$, $p<.05$; and length of the accounts, $F(1,53)=7.26$, $p<.01$. The immediate accounts contained more accurate information and more sensory and contextual information, and were longer than the delayed accounts. The effect on expressions of doubt, as it was seen, depended on the post-event information, since it only occurred in the conditions of suggested information, appearing more frequently in the case of immediate recovery than in that of delayed recovery, $t(26)=2.507$, $p<.01$. No main effects were found on the rest of the dependent measures.

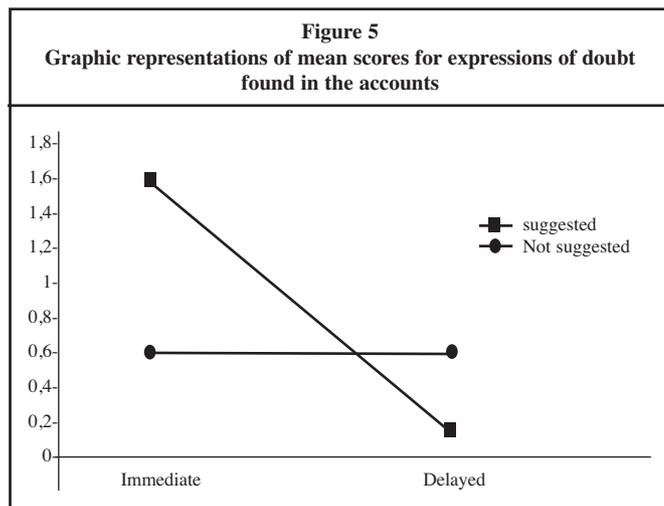


Figure 6
Number of accounts and percentages (%) that describe the stop sign in each of the experimental groups

	Suggested	Not suggested
Immediate	3 (23.08%)	3 (21.43%)
Delayed	7 (50%)	4 (26.67%)

Acceptance of suggested false information

Figure 6 shows the data on the description of the stop sign for each condition. As it can be seen, there is no difference in the number of errors committed by participants in describing the false information in the immediate recall condition, from which we can deduce that, at least with regard to accuracy, the suggestion of false information did not have an effect when recall was requested after just a few minutes. However, the same cannot be said when participants describe the event one week after the suggestion of the false information, when the number of errors doubles, reaching a figure of 50% of the participants to whom the information was fed, compared to 26% of participants who make errors spontaneously, $\chi^2(55)=73.5$; $p<.05$.

Does commission of this error, forced or spontaneously, affect the quality of the accounts and other measures of accuracy? In order to respond to this question we analyzed the differences between the different types of account according to whether they described the stop sign or not.

Differences in the accounts with suggested information

Considering the differences found (see Figure 7), we can observe different patterns for the accounts that describe the stop sign and for those that do not mention it according to the delay. In the case of the accounts provided immediately after the suggestion of the information it was found that participants who describe the false information provide accounts that are qualitatively more internal than the accounts of those who do not describe it, since they contain more allusions to cognitive processes, more explanations and more self-references. On the other hand, no differences are found with regard to sensory and contextual information, and the false accounts contain more information about source than the true accounts.

The pattern is inverted when participants describe the event one week after being fed the false information. The accounts that include the stop sign in the description of the event are qualitatively more external than those which do not mention it, since they provide more sensory information and more accurate details. As was seen in Figure 6, the percentage of accounts that describe the stop sign doubles with the delay, increasing from 23% in the immediate condition to 50% in the delayed condition.

Differences in the accounts with non-suggested information

In the immediate recall condition the participants who mention the stop sign provide more internal accounts, in

the same direction as those participants to whom the stop sign was suggested, since there appear more allusions to cognitive processes, more personal judgments and comments and more self-references in the accounts which mention the stop sign than in those which do not.

The pattern is similar when participants are asked to describe the event one week later, but in this case no significant differences are found. The only difference is found with regard to the quantity of accurate details, higher in the accounts of those who do not mention the stop sign. The percentage of accounts that describe the stop sign is similar for the two time conditions, though it tends to increase slightly with the delay. Also, quality decreases after the disappearance of the differences between the two types of account.

DISCUSSION

With the precautions necessary in these last analyses, due to the especially small samples in relation to the description of the false information, it can be said that only in the immediate recall conditions have the expectations generated by the reality monitoring model and previous experiments been fulfilled, with regard to the notion that false accounts on the basis of the suggested information would present a more internal profile than true accounts.

However, we did find confirmation of the hypotheses according to which those who provide false information probably do so due to faults in processes of reality monitoring caused by the attributes normally used for discriminating the origin of memories. We should bear in mind that this is one of the principal sources of error proposed by Johnson and Raye (1981).

Likewise, it is noteworthy, as is the case in other research, and as mentioned in the introduction, that we

did not find differences with regard to contextual information, given that it is one of the basic attributes for discriminating the source of information according to all proposals, both in the framework of reality monitoring processes and in that of content analysis (CBCA).

On the other hand, a global analysis of the data reveals that in the immediate conditions the differences in quality attributes are significant, whilst in the delayed conditions the differences in accuracy are significant. The loss of differences over time could be one of the decisive factors in the deterioration of memory traces that leads subjects to commit more errors of attribution.

Furthermore, from our findings we can state that there are differences in the patterns found between false accounts deriving from suggestion and those deriving from the errors committed on inferring information using previous knowledge congruent with the event witnessed. When the false information appears in accounts in the conditions in which its existence was suggested we can talk about the acceptance of a false suggestion; when it appears in accounts in which its existence was not suggested, we can talk about spontaneous errors deriving from participants' previous knowledge, in terms similar to those described by other researchers in the framework of everyday contexts (Brewer & Treyens, 1981), of chronically accessible categories (Diges, 1995) or of congruence with previous expectations (Bayen, Nakamura, Dupuis, & Yang, 2000). In this regard, the data that indicate an increase in internal characteristics concur with those obtained by Diges (1995), who explains them in terms of the automaticity of processing implied by an economy of resources for subjects that use chronically accessible categories for codifying and recovering information. The existence of a stop sign at a junction could be considered a construct that forms

Figure 7
Mean and statistical scores in the dependent measures that showed some significant effect for each of the experimental groups, taking into account the appearance in the accounts of the false information (stop sign) and the suggestion of information

	Not suggested						Suggested					
	Immediate			Delayed			Immediate			Delayed		
	Stop	No stop	t(11)	Stop	No stop	t(12)	Stop	No stop	t(12)	Stop	No stop	t(13)
Accurate details	12.3	15.2		13.4	10.3	2.486, p<.01	15.6	14.6		9	11.8	2.426, p<.01
Sensory information	2	3.5		2.4	0.8	1.905, p<.05	3	2.5	0.5	1		
Source information	4.6	1.7	3.28, p<.005	1.5	2.4		0.6	2.8		0.7	2.1	
Judgements	1.3	1.2		1	1.5		4	0.5	2.747, p<.01	1.2	0.9	
Cognitive processes	6	0.9	3.348, p<.005	0.7	2.7		5.6	2.0	2.551, p<.01	1.7	1.2	
Explanations	3	0.8	2.806, p<.01	0.8	1.4		1	0.9		1.2	1	
Self-references	7	1.3	3.292, p<.005	0.7	2.1		5.3	2.2	2.123, p<.05	1.5	1.7	

part of the everyday schemata of traffic systems, and of priority accessibility with respect to other related knowledge.

Finally, the data show that suggestion alone does not seem to affect the accounts, except in an increase of irrelevant information and expressions of doubt (in the immediate condition) that appear in the descriptions, which may be due to the fact that subjects could maintain active the two types of information (original and false), which would lead to a reduction of cognitive resources so that they were incapable of selecting the relevant information. We also found higher rates of exaggeration in these suggested accounts, and the explanation for this may reside in the type of post-event information manipulated. It should be borne in mind that in addition to the suggestion about the non-existent stop sign, the accident was described with two different degrees of impact, whose consequences would involve different levels of seriousness. The exaggerations are found basically in the description of these consequences.

Delay, as expected, strongly affects the descriptions of memories, resulting in a deterioration in their quality. When participants recall the event two weeks after witnessing it, the accounts contain less accurate, sensory and contextual information, while there is an increase in the number of details that characterize memory traces as being of internal origin, mainly related to the appearance of expressions of doubt.

Furthermore, the delay involved emerges as a key factor in the acceptance of false information, due to the deterioration caused by time in the quality of the memory traces.

When the suggested information was provided immediately prior to the free recall task, participants appeared to recall both the original and the suggested information. As shown by the data on information about source, which are important in defining the origin of memories, in the immediate condition participants spontaneously mentioned numerous aspects related to the filmed nature of the event when they were fed false information and it was accepted. These data suggest an important role of this type of information in the acceptance of the information. It should also be stressed that suggested and auto-suggested accounts, which in general terms have similar qualities, differ considerably when analyzed in terms of the time elapsed between the suggestion and the recall. When recall is immediate, accounts that mention the suggested data contain more information about source, more explanations and fewer personal judgments and comments than non-suggested accounts but

which also mention the false data (auto-suggested). These rates, however, do not resist the passage of time, and one week later the two types of account do not differ substantially, regardless of whether the information is suggested or auto-suggested. In general terms, with a one-week delay, the information would appear to have become so integrated in the memory trace that the subject is unable to differentiate inaccurate accounts from accurate ones, regardless of the source of the inaccuracy. When the accounts are accurate, nor are there significant differences with regard to whether or not the respondent has been fed false information, mainly if the suggestion (not accepted) took place one week earlier; the exception is the case of allusions to cognitive processes, which are more frequent in the accounts of those given false information (even though not accepted) –just the opposite of what occurs in the immediate recall condition.

In sum, it can be stated that the longer the time interval between the suggestion of false information and the recall, the greater the probability of acceptance of that information. In the short term no differences are found between forced and spontaneous errors, where errors are accompanied by lower quality of the accounts, in accordance with the perceptual/self-generated dimension proposed by Johnson and Raye (1981).

GENERAL CONCLUSIONS

By way of conclusion we shall reconsider some of the questions raised at the beginning of the paper:

a) Why do we confuse false data with what really happened?

Some explanations of the errors forced by the suggestion of false information claim that when this data is incorporated into memories it substitutes the original data (Loftus, 1975, 1982; Loftus & Palmer, 1974), whilst other authors argue that the two types of information would coexist (Bekerian & Bowers, 1983; Bowers & Bekerian, 1984; Tversky & Tuchin, 1989), and that subjects would tend to report one or the other due to diverse factors, the most important of which are task demands and faults in discrimination of the origin of the memories. The findings of the present study could support both explanations, which would be applicable to different time points of the memory processes involved.

The appearance of more irrelevant information in some accounts in the suggested information conditions may indicate that subjects maintain active both the original

information and the suggested data, which would result in a decrease in cognitive resources and a consequent inadequate selection of central from irrelevant information. This difference with regard to irrelevant information tends to be found more in the immediate recall conditions. These data may suggest two different phases in the effect of post-event information. A first phase, which would take place when the misleading information is provided immediately before the recall task, and in which this misleading data has not been integrated into the original memory trace, so that the two types of information (original and suggested) can coexist. The acceptance of one to the detriment of the other on describing the event would depend on variables such as task demands or faults in discriminating the origin of each type. In a second phase, the memory traces have decayed due to the passage of time and multiple recall, and have thus lost basic characteristics for determining the source of the trace and accessing contextual data on the origin of the event. In this phase it would be more difficult to discriminate the origin of the false data, which probably already forms an inseparable part of the trace. Further research is necessary to confirm this hypothesis.

The modification of memory traces, however, does not come solely from externally suggested information, but also from auto-suggestions deriving from previous knowledge (Bekerian & Conway, 1988; Brewer & Treyens, 1981; Diges, 1995). In the first phase, immediately after the external suggestion of information, when it does not yet form part of the trace and its origin could be inferred, the two types of suggestion (external and internal) are distinguished, but after time has elapsed and they have been integrated into the memory trace, this distinction is no longer possible.

b) Are real memories truly different from false ones?

The results of the present study only permit us to state that the two types of memory differ in a few secondary aspects, and not always, since this depends on the evolution of the qualitative characteristics of the accounts over time.

In this regard, the time elapsed between witnessing the event and being asked to recall it, and the point at which the false information is suggested, play an important role both in the acceptance of the information and in its effect on the quality of the memory traces. The less the delay, the less the possibility of the false information being accepted, and the less the effect on the quality of accounts.

c) Can we assess the truth of an account according to differential attributes?

It is a fact that memories decay over time in two directions. On the one hand they lose vividness, and some details of the events we experienced become inaccessible; on the other, our memories become transformed with the incorporation of false data. To such an extent that a large part of our memories represent events which, if indeed they occurred, never occurred in the way we remember them. Moreover, given the fact that all false accounts are produced from the modification of real events, it will be difficult for us to discriminate which data among all those provided by a person are real and which ones are not.

The fact that no differences are found in the majority of the characteristics of accounts, or that these are in the opposite direction to what would be expected according to the reality monitoring model, makes it difficult to discriminate the origin of the information, leading to source attribution errors.

If in the present experiment we tried to discriminate each type of account according to the attributes it presented, in the delayed suggested condition we would say that the accounts which provide false information are more perceptual (credible?) than those which do not provide it.

Therefore, we should like to stress the need for further research on the dimensions and procedures that permit us to discriminate between true and false accounts (not just the product of lying, but also of unconscious error), with a view to throwing more light on their practical applicability within the forensic framework.

REFERENCES

- Alonso-Quecuty, M.L. (1990): Recuerdo de la Realidad Percibida vs Imaginada. Buscando la Mentira. *Boletín de Psicología*, 29, 73-86.
- Alonso-Quecuty, M.L. (1993): Información post-evento y reality monitoring: Cuando el testigo "no puede" ser honesto. In M. Diges & M.L. Alonso-Quecuty: *Psicología Forense Experimental*. Valencia: Promolibro.
- Bayen, U.J.; Nakamura G.V.; Dupuis, S.E. & Yang, C.L. (2000): The use of schematic knowledge about sources in source monitoring. *Memory and Cognition*, 28, 3, 480-500.
- Bekerian, D.A. & Bowers, J.M.: (1983) Eyewitness testimony: were we misled? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 9, 1, 139-145.
- Bekerian, D.A. & Conway, M.A. (1988): Everyday context. In G.M. Davies & D.M. Thomson (Eds.):

- Memory in Context: Context in Memory*. New York: Wiley & Sons.
- Bekerian, D.A. & Dennett, J.L. (1992): The truth in content analyses of a child's testimony. In Lösel, F.; Bender, D. & Bliesener, T. (Eds.): *Psychology and Law. International Perspectives*. Berlin: W de Gruyter.
- Bowers, J.M. & Bekerian, D.A. (1984): When will postevent information distort eyewitness testimony? *Journal of Applied Psychology*, 69, 3, 466-472.
- Brewer, W. & Treyens, J. (1981): Role of schemata in memory for places. *Cognitive Psychology*, 13, 207-230.
- Brown, R. & Kulik, J. (1977): Flashbulb memories. *Cognition*, 5, 73-99.
- Diges, M. (1988): The accuracy/credibility relationship in free recall of a filmed traffic accident. Presented at the *NATO Advanced Institute on Credibility Assessment* (Maratea, Italy).
- Diges, M. (1995): Previous knowledge and delay in the recall of a filmed event. In G.Davies, S. Lloyd-Bostok, M. McMurrin & C. Wilson (Comp.): *Psychology, law and criminal justice*. Berlin: Walter de Gruyter.
- Diges, M. (1997): *Los falsos recuerdos. Sugestión y memoria*. Barcelona: Paidós.
- Escribano, E. & Vallespín, V. (2000): *Evaluación de los testimonios infantiles en caso de abuso sexual*. Jornades de Foment de la Investigació. Universitat Jaume I. (<http://www.uji.es/bin/publ/edicions/jfi5/abusosex.pdf>).
- Hart, J. (1967): Memory and the memory monitoring process. *Journal of Verbal Learning and Verbal Behavior*, 6, 685-691.
- Henkel, L.A.; Franklin, N. & Johnson, M.K. (2000): Cross-modal source monitoring confusions between perceived and imagined events. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 26, 2, 321-335.
- Hertel, P.T. & Narvaez, A. (1986): Confusing memories for verbal and nonverbal communication. *Journal of Personality and Social Psychology*, 50, 3, 474-481.
- Johnson, M.K. (1988): Reality Monitoring: An experimental phenomenological approach. *Journal of Experimental Psychology: General*, 117, 4, 390-394.
- Johnson, M.K.; Foley, M.A; Suengas, A.G. & Raye, C.L. (1988): Phenomenal Characteristics of Memories for Perceived and Imagined Autobiographical Events. *Journal of Experimental Psychology: General*, 117, 4, 371-376.
- Johnson, M.K.; Hashtrouidi, S. & Lindsay, D.S. (1993): Source monitoring. *Psychological Bulletin*, 114, 3-28.
- Johnson, M.K.; Kahan, T.L. & Raye, C.L. (1984): Dreams and reality monitoring. *Journal of Experimental Psychology: General*, 113, 3, 329-344.
- Johnson, M.K. & Raye, C. (1981): Reality Monitoring. *Psychological Review*, 88, 1, 67-85.
- Juárez, J.P. (2004): *La credibilidad del testimonio infantil ante supuestos de abuso sexual: Indicadores psicossociales*. Doctoral Thesis. University of Gerona. www.tdx.cesca.es/TESIS_UdG/AVAILABLE/TDX-0916104-162602/tjrjl.pdf
- Lindsay, D.S. (1990): Misleading suggestions can impair eyewitness's ability to remember event details. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 16, 1077-1083.
- Lindsay, D.S. (1994): Memory source monitoring and eyewitness testimony. In D.F. Ross, J.D. Read & M.P. Toglia (Eds.): *Adult eyewitness testimony. Current trends and developments*. Cambridge University Press.
- Lindsay, D.S. & Johnson, M.K. (1987): Reality Monitoring and Suggestibility: Children's ability to discriminate among memories from different sources. In S.J. Ceci, M.P. Toglia & D.F. Ross (Eds.): *Children's Eyewitness Memory*. New York: Springer-Verlag.
- Lindsay, D.S. & Johnson, M.K. (1989): The Eyewitness Suggestibility Effect and Memory Source. *Memory and Cognition*, 17, 3, 349-358.
- Loftus, E.F. (1975): Leading questions and the eyewitness report. *Cognitive Psychology*, 7, 560-572.
- Loftus, E.F. (1982): Remembering recent experiences. In L.S. Cermak (Ed.) *Human Memory and Amnesia*, LEA.
- Loftus, E.F. & Palmer, J.C. (1974): Reconstruction of automobile destruction: An example of the interaction between language and memory. *Journal of Verbal Learning and Verbal Behavior*, 13, 585-589.
- López, G. & Zaldívar, F. (2002): Diferencias en criterios de contenido en declaraciones verdaderas y falsas: El papel de la preparación, la parte de la historia considerada y la modalidad de presentación de los hechos. *Anuario de Psicología Jurídica*, 12, 87-114.
- Manzanero, A.L. (1993): ¿Puede la información post-suceso modificar la memoria de los testigos? In M. García Ramírez (Comp.): *Psicología social aplicada en los procesos jurídicos y políticos*. Sevilla: Eudema
- Manzanero, A.L. (1994): Recuerdo de sucesos complejos: Efectos de la recuperación múltiple y la tarea de recuerdo en la memoria. *Anuario de Psicología Jurídica*, 4, 9-23.
- Manzanero, A.L. (2001a): Recuerdos reales y recuerdos sugeridos: características diferenciales. *IV Congreso Iberoamericano de Psicología Jurídica*. Madrid. Noviembre. Actas del Congreso. pp. 491-503.
- Manzanero, A.L. (2001b): Interactive contexts and con-

- textual dependency on memory processes. *III International Conference on Memory*. Valencia, July.
- Manzanero, A.L. (2001c): Procedimientos de evaluación de la credibilidad de las declaraciones de menores víctimas de agresiones sexuales. *Revista de Psicopatología Clínica, Legal y Forense*, 1, 2, 51-71.
- Manzanero, A.L. & Diges, M. (1994a): El papel de la preparación sobre el recuerdo de sucesos imaginados y percibidos. *Cognitiva*, 6, 27-45.
- Manzanero, A.L. & Diges, M. (1994b): Análisis de la credibilidad de recuerdos percibidos e imaginados. *Apuntes de Psicología*, 41 & 42, 81-92.
- Manzanero, A.L. & Diges, M. (1995): Effects of Preparation on Internal and External Memories. In G. Davies, S.M.A. Lloyd-Bostock, M. McMurrin & C. Wilson (Eds.): *Psychology, law and criminal justice. International developments in research and practice*. Berlin: W. de Gruyter.
- Mira, J.J. & Diges, M. (1991): Teorías intuitivas sobre memorias de testigos: Un examen de metamemoria. *Revista de Psicología Social*, 6, 1, 47-60.
- Neisser, U. & Harsch, N. (1992): Phantom flashbulbs: False recollections of hearing the news about Challenger. In Winograd & Neisser, U. (Eds.): *Affect and accuracy in recall. Studies of "flashbulb" memories*. Cambridge University Press.
- Offe, H. (2000): El dictamen sobre la credibilidad de las declaraciones de testigos. *Anuario de Psicología Jurídica*, 10, 11-23
- Pillemer, D.B. (1984): Flashbulb memories of the assassination attempt on President Reagan. *Cognition*, 16, 63-80.
- Strömwell, L.; Bengtsson, L.; Leander, L & Granhag, P. (2004): Assessing children's statements: The impact of a repeated experienced on CBCA and RM ratings. *Applied Cognitive Psychology*, 18, 6, 653-668.
- Santtila, P.; Roppola, H. & Niemi, P. (1998): Assessing the truthfulness of witness statements made by children (aged 7–8, 10–11, and 13–14) employing scales derived from Johnson and Raye's model of reality monitoring. *Expert Evidence*, 6, 4, 273-289.
- Schooler, J.W.; Clark, L.A. & Loftus, E.F. (1988): Knowing when memory is real. In M.M. Gruneberg, P.E. Morris, & R.N. Sykes (Eds): *Practical Aspects of Memory: Current Research and Issues*. New York: Wiley.
- Schooler, J.W.; Gerhard, D. & Loftus, E.F. (1986): Qualities of the Unreal. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 12, 2, 171-181.
- Sporer, S. L. (1997): The less travelled road to truth. Verbal cues in deception detection in accounts of fabricated and self-experiences events. *Applied Cognitive Psychology*, 115, 373-397.
- Steller, M. & Köhnken, G. (1989): Criteria-based statement analysis. In D.C. Raskin (Ed.): *Psychological methods in criminal investigation and evidence*. New York: Springer.
- Suengas, A.G. & Johnson, M.K. (1988): Qualitative effects of rehearsal on memories for perceived and imagined complex events. *Journal of Experimental Psychology: General*, 117, 4, 377-389.
- Triandafilou, R., McCullough, M. & Eslea, M. (1998): *Using criteria based content analysis to identify true and false allegations of bullying*. Department of Psychology, University of Central Lancashire, Preston.
- Tully, B. (1998): Reliability of criteria-based content analysis of child witness statements. Cohen's kappa doesn't matter. *Legal and Criminological Psychology*, 3, 2, 183-188.
- Tversky, B. & Tuchin, M. (1989): A reconciliation of evidence on Eyewitness Testimony: Comments on McCloskey and Zaragoza. *Journal of Experimental Psychology: General*, 118, 1, 86-91.
- Undeutsch, U. (1989): The development of statement reality analysis. In J.C. Yuille: *Credibility assessment*. Netherland: Kluwer Academic Publishers.
- Vázquez, B. (2004): *Abuso sexual en la infancia: evaluación de la credibilidad del testimonio*. Centro Reina Sofía para el estudio de la violencia. Colección Documentos, 6.
- Vrij, A.; Akenhurst, L.; Soukara, S. & Bull, R. (2004): Let me inform you about how to tell a convincing story: CBCA and Reality Monitoring Scores as a Function of Age, Coaching, and Deception. *Canadian Journal of Behavioural Science*, 36, 2, 113-126.
- Weingardt, K.R.; Loftus, E.F. & Lindsay, D.S. (1995): Misinformation revisited: New evidence on the suggestibility of memory. *Memory and Cognition*, 23, 72-82.
- Wells, G.L. & Lindsay, R.C.L.. (1983): How do people infer the accuracy of eyewitness memory? Studies of performance and metamemory analysis. In S.M.A. Lloyd-Bostock & B.R. Clifford (Comp.): *Evaluating witness evidence*. New York: John Wiley & Sons.
- Zaragoza, M.S. & Koshmider III, J.W. (1989): Misdled Subjects May Know More Than Their Performance Implies. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 15, 2, 246-255.
- Zaragoza, M.S. & Lane, S.M. (1994): Source misattributions and the suggestibility of eyewitness memory. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 20, 934-945.