

# *Individual Differences in the Accuracy of Autobiographical Memory*

Robert Horselenberg,\* Harald Merckelbach, Gerard van Breukelen and Ineke Wessel

*Department of Experimental Psychology, Faculty of Psychology, Maastricht University, Maastricht, The Netherlands*

In recent literature on 'false memories', autobiographical memory distortions are often linked to manipulations such as hypnosis or imagination. However, Barclay and Wellman (1986) demonstrated that such distortions might also occur more or less spontaneously. The current study sought to replicate this phenomenon. In addition, it examined whether certain personality traits, (i.e. fantasy proneness, dissociation, absorption, suggestibility and depression) might contribute to such spontaneous pseudo-memories. Volunteers ( $N = 38$ ) kept a diary of self-selected, outstanding events for a 2-week period. Six months later, they were unexpectedly given a recognition test consisting of original memories and several types of foils. Participants performed relatively well on the recognition task, although they had some difficulties differentiating original items from foil items. Curiously enough, fantasy proneness was related to superior recognition performance. Copyright © 2004 John Wiley & Sons, Ltd.

## INTRODUCTION

It has long been recognized that autobiographical memory bears strong relevance to psychotherapy (e.g. Bonanno, 1990). One straightforward example of this is the use of autobiographical writing exercises during psychotherapeutic treatment (e.g. Pennebaker & Memon, 1996). Historically, the psychotherapeutic probing of clients' recollections have been portrayed as a form of mental archeology in which the therapist uncovers step by step the autobiographical truth of a client (Bonanno, 1990). We now know that this 'archeological metaphor' is misleading and that clients' recollections are coloured by therapist's questions and

interpretations. But what about spontaneous memory illusions? Schoutrop, Lange, Hanewald, Duurland and Bermond (1997) found that a majority of their participants recovered new memories when they wrote about their childhood traumas. How accurate are such spontaneous recoveries? And what does it mean that people may benefit from writing about other people's trauma (see for examples, Lepore & Smyth, 2002)? Does it imply that these people spontaneously come to accept other people's trauma as their own narrative truth?

There are only a handful of studies that address these issues. One of the most compelling studies is that by Barclay and Wellman (1986) in which participants were asked to record everyday autobiographical events over a 4-month period. After this recording phase, participants were invited to perform a recognition task that consisted of original items and foil items. Original records corresponded to participants' own records, while foils were distracters (i.e. altered records or records

\*Correspondence to: Robert Horselenberg, Department of Experimental Psychology, Maastricht University, P.O. Box 616, 6200 MD, Maastricht, The Netherlands.  
Tel: +31-43-3881924. Fax: +31-43-3884196.  
E-mail: r.horselenberg@psychology.unimaas.nl

from other participants). Barclay and Wellman (1986) found that autobiographical recollections become surprisingly inaccurate over time. After some weeks, many of the participants failed to identify original items as their own memories, a failure which involves an omission error (i.e. forgetting). Moreover, participants made, albeit on a smaller scale, commission errors in that they accepted foils as their own autobiographical memories. From a methodological point of view, the Barclay and Wellman paradigm was rather innovative. Unlike the classic diary experiments (e.g. Linton, 1975; Wagenaar, 1986) where experimenter and subject are one and the same, the Barclay and Wellman procedure is suitable for testing normal and clinical samples. Also, its reliance on foils to assess memory accuracy in a systematic manner might provide important information.

The results of Barclay and Wellman (1986) inform what has been dubbed the 'recovered memory debate'. In this debate, some authors have emphasized the effects of external factors (e.g. psychotherapy) on the development of pseudo-memories (see for an overview, Destun & Kuiper, 1996). A number of experimental studies do, indeed, show that treatment techniques such as imagery, journaling, dream interpretation, and hypnosis may lead to pseudo-memories (e.g. Garry & Polaschek, 2000; Horselenberg et al., 2000; Mazzoni & Loftus, 1996, 1998; Spanos, Burgess, Burgess, Samuels, & Bois, 1999). The Barclay and Wellman (1986) findings indicate that even in the absence of such treatment techniques, pseudo-memories may occur. Thus, it seems that at least in some participants, pseudo-memories might develop more or less spontaneously (see also Rassin, Merckelbach, & Spaan, 2001).

Merckelbach, Wessel and Horselenberg (1997) tried to replicate the study of Barclay and Wellman (1986). They also found that autobiographical memory is far from accurate in that participants made omission and commission errors. In addition, they explored individual differences in memory accuracy. This issue could only be addressed in a preliminary fashion because of their small sample size ( $N = 10$ ). Nevertheless, they found some evidence that depressive symptoms are associated with higher frequencies of pseudo-memories (i.e. accepting foils). To some extent, this link between depressive symptoms and pseudo-memories is in accordance with studies showing autobiographical deficits in depression (Williams, 1992). In short, Williams and colleagues (Williams, Stiles, & Shapiro, 1999) argue that depressed

people's avoidance of painful thoughts leads to a generic retrieval style that produces overgeneral (i.e. non-specific) memories. This lack of specificity may make depressive people susceptible to memory distortions. Meanwhile, most research on individual differences in susceptibility to pseudo-memories has focused on traits such as dissociation (e.g. Hyman & Billings, 1998; Winograd, Peluso, & Glover, 1998), absorption (e.g. Drivdahl & Zaragoza, 2001; McNally, Clancy, Schacter, & Pitman, 2000), fantasy proneness (e.g. Merckelbach, Muris, & Rassin, 1999), and suggestibility (e.g. Gudjonsson, 1992; Kassin, 1997) rather than depression.

The concept of reality monitoring proposed by Johnson, Hastroudi and Lindsay (1993) provides a framework for understanding how certain personality traits might contribute to the development of pseudo-memories (see also, Loftus, 1997). In short, reality monitoring refers to the ability of people to discriminate between memories of external events and memories of internal events (e.g. dreams, fantasies, imaginations). Pseudo-memories occur whenever an individual misinterprets memories of internal events as memories of external events. Basically, there are two pathways along which such pseudo-memories might arise. To begin with, pseudo-memories might occur because internal events have characteristics that are typical for real memories. Thus, to the extent that memories of internal events are very detailed, have a strong sensory loading, and are reconstructed without much cognitive effort, people might easily come to misinterpret them as real memories. A second pathway has more to do with criterion setting. Clearly, people have to rely on criteria to determine whether a given memory has the characteristics of a real (i.e. external) or an internal event. As a result, pseudo-memories might be the consequence of endorsing a liberal criterion for discriminating between memories of real and memories of imagined events.

Turning now to how personality traits may relate to reality monitoring, one could speculate that certain traits endow internal events with features that are usually typical for memories of external events. Fantasy proneness, dissociation, and absorption might be examples of such traits. Note, in passing, that there is a substantial overlap between these traits (Kihlstrom, Glisky, & Angiulo, 1994; Merckelbach, Horselenberg, & Muris, 2001). Thus, it may well be the case that people high on fantasy proneness, dissociation, and/or absorption are susceptible to pseudo-memories because they

misinterpret their detailed imagery as real memories. On the other hand, some individuals might be susceptible to pseudo-memories because they adopt liberal criteria and, perhaps, suggestibility and depression might be key features that characterize such individuals. After all, reality monitoring decisions consume cognitive resources and assume a certain amount of self confidence, yet, cognitive resources of depressed people are relatively limited, while their self-confidence is low. Suggestible people also suffer from a lack of self-confidence (e.g. memory distrust; Gudjonsson, 1992). Under these circumstances, it is conceivable that participants show a positive response bias in that they easily come to accept correct, but also incorrect, items as their memories.

Over the past few years, several studies have looked at how personality characteristics such as fantasy proneness and dissociation interact with certain manipulations (e.g. imagination) to produce pseudo-memories (e.g. Heaps & Nash, 1999; Paddock et al., 1999). However, with a few exceptions (Candel, Merckelbach, & Kuijpers, 2003; Rassin et al., 2001), little work has been done on spontaneous pseudo-memories and the personality characteristics that might be involved in such memories. The current study relied on the Barclay and Wellman (1986) paradigm to evaluate the contribution of fantasy proneness, dissociation, absorption, suggestibility, and depression to the occurrence of spontaneous pseudo-memories. A signal detection approach was used to determine whether fantasy proneness, dissociation, and absorption are linked to signal sensitivity (i.e. differentiation between targets and foils), while suggestibility and depression are linked to response bias.

## METHOD

### *Participants*

Participants were 38 undergraduate psychology and health sciences students (30 women) who volunteered to participate in the current study. Their mean age was 21.1 years (range 19–27 years). They were paid for their participation.

### *Materials*

Participants completed the Creative Experiences Questionnaire (CEQ; Merckelbach et al., 2001), the Dissociative Experiences Scale (DES; Bernstein &

Putnam, 1986), the Tellegen Absorption Scale (Tellegen & Atkinson, 1974), the Gudjonsson Suggestibility Scale (GSS; Gudjonsson, 1997), and the Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979).

### *Creative Experiences Questionnaire*

The CEQ ( $\alpha = 0.74$ ) is a 25-item yes/no index of fantasy proneness. CEQ items were derived from the extensive case descriptions of fantasy proneness provided by Wilson and Barber (1982). Typical CEQ-items are: 'In general, I spend at least half of the day fantasizing or daydreaming' and 'My fantasies are so vivid that they are like a good movie'. 'Yes' answers are summed to yield a total CEQ score with higher scores indicating higher levels of fantasy proneness.

### *Dissociative Experiences Scale*

The DES ( $\alpha = 0.89$ ) consists of 28 items that pertain to dissociative phenomena (e.g. feelings of derealization, depersonalization, disturbances in memory). Respondents indicate on 100-mm Visual Analogue Scales (VASs: 0 = *not at all*; 100 = *very much*) the frequency with which they experience these symptoms. Sample items are: 'Some people have the experience of feeling that their body does not seem to belong to them. Mark the line to show what percentage of the time this happens to you' or 'Some people have the experience of finding themselves in a place and having no idea how they got there. Mark the line to show what percentage of the time this happens to you'. VAS scores are averaged to obtain a total DES score with higher total DES scores indicating stronger dissociative tendencies.

### *Tellegen Absorption Scale*

The TAS ( $\alpha = 0.81$ ) is a widely used measure of mental absorption (Kihlstrom et al., 1994), which is defined as a disposition to experience 'episodes of total attention that fully engage one's representational (i.e. perceptual, enactive, imaginative, and ideational) resources' (Tellegen & Atkinson, 1974, p. 268). It consists of 34 yes/no items that address the tendency to become deeply involved (absorbed) in everyday activities. Sample items are: 'The sound of a voice can be so fascinating, that I can listen to it endlessly' and 'I like to watch the changing of cloud shapes'. Items are summed to obtain a total TAS score with higher scores reflecting a stronger disposition to become absorbed.

### *Gudjonsson Suggestibility Scale*

The GSS (version 1;  $\alpha = 0.62$ ) consists of a short story that is read out to the participants together with 20 specific questions about the story. Fifteen of these questions convey misleading information about the story. The extent to which an individual gives in to the leading questions constitutes that individual's Yield score (maximum score = 15). Having answered the 20 questions, participants are told in an authoritative manner that they made a number of mistakes and that all questions have to be answered for a second time. The number of times that participants change their answers constitutes their Shift score (maximum score = 20). Yield and Shift scores are summed to obtain a total GSS score (maximum score = 35). A number of other parameters can be derived from the GSS, but for practical reasons (i.e. extensive test sessions), the present study only focused on total GSS scores.

### *Beck Depression Inventory*

The BDI ( $\alpha = 0.88$ ) is a self-rating questionnaire consisting of 21 items that address behavioural manifestations of depression. Sample items are: 'I am so sad and unhappy that I can't bear it anymore' and 'I totally lost interest in other people'. Items are scored on a 4-point scale (range: 0–3) and scores are summed to obtain a total score, with higher scores reflecting higher levels of depressive symptoms.

### *Procedure*

Participants were asked to provide brief, but complete descriptions of three self-selected outstanding events each day, for 14 consecutive days. This resulted in 42 records for each participant. They were instructed to describe the events in a fixed format. All records had to specify 'context' (i.e. place), 'event' (i.e. what happened), and 'affective evaluation' (i.e. emotional reaction to the event).

After 6 months, participants were invited to participate in a study involving a computer task. They were not informed about the real purpose of the experiment and underwent a surprise recognition test. This test consisted of 40 items: 10 items were literal transcriptions of records written by participants, whereas the other 30 items were foils. There were three types of foils. Ten foil items consisted of original records of the participant in which the context was radically changed by the experimenter (context foils), 10 items involved original records of the participant in which the evaluation was

radically changed by the experimenter (evaluation foils), and 10 items were original records of other participants (other foils). Foils containing distortions deliberately made by the experimenter deviated strongly from the original records, but remained plausible. Thus, implausible modifications as well as vague, but possibly correct paraphrases of the original context or evaluation descriptions were avoided (for a detailed description of the procedure see, Barclay & Wellman, 1986; Merckelbach et al., 1997). Participants were informed that the recognition test consisted of original and foil records. For each item of the recognition test, participants indicated what type of item they thought was presented, resulting in four possible responses: original, context foil, evaluation foil, or other foil. In addition, they rated on a 100-mm Visual Analogue Scale (VAS: 0 = *not confident at all*; 100 = *absolutely confident*) how confident they were about their answers. Following this, they completed the earlier mentioned questionnaires.

## RESULTS

### *Hits and False Alarms*

Table 1 shows mean proportions of hits (i.e. original items identified as authentic memories) and false alarms (i.e. foil items accepted as authentic memories). The proportion of hits (0.78) was comparable to that reported by Merckelbach et al. (1997), whereas overall, the mean proportion of false alarms was higher than that found by Merckelbach et al. (1997): 0.35 (SD = 0.28) versus 0.19 (SD = 0.15), respectively. A one-way analysis of variance (ANOVA) made it clear that proportions of false alarms significantly differed between the three foil categories ( $F(2,111) = 73.29, p < 0.001$ ). A *post-hoc* analysis (Bonferroni) revealed that context foils elicited more false alarms than evaluation foils, which, in turn, induced more false alarms than other foils (all  $ps < 0.01$ ).

Table 1 also shows confidence ratings of participants for hits and false alarms. A one-way analysis of variance (ANOVA) was carried out showing that confidence ratings differed over the four response categories (original, context, evaluation, and other foil;  $F(3,148) = 43.02, p < 0.001$ ). A *post-hoc* analysis (Bonferroni) indicated that hits and false alarms on context and evaluation foils had similar confidence ratings, whereas confidence for false alarms on other foils was lower than that for the other three response categories ( $p < 0.001$ ).



Table 1. Proportions of hits (on original items) and false alarms (on context, evaluation, and other foils) of participants ( $N = 38$ ) during recognition testing. Confidence ratings are also shown

	Original items	Context foils	Evaluation foils	Other foils
Proportion (0–1)	0.78 (0.17)	0.64 (0.24)	0.32 (0.22)	0.09 (0.11)
Confidence (0–100)	89.8 (8.1)	77.1 (17.3)	78.9 (13.4)	69.8 (24.8)

Standard deviations are in parentheses.

Table 2. Mean scores (and SDs) on fantasy proneness (CEQ), dissociation (DES), absorption (TAS), suggestibility (GSS) and depression (BDI). Pearson correlation between these measures and kappa and  $\chi^2$  as well as their intercorrelations are also shown

	M	SD	Kappa	$\chi^2$	DES	TAS	GSS	BDI
CEQ	6.7	3.8	0.38*	-0.44**	0.41*	0.61*	0.19	0.39*
DES	18.0	10.7	0.19	-0.11		0.25	0.08	0.06
TAS	14.6	5.7	0.29	0.21			0.03	0.25
GSS	7.7	3.2	-0.01	-0.17				0.08
BDI	6.7	6.9	0.19	0.26				

\* $p < 0.05$ ; \*\* $p < 0.01$ .

### Discrimination and Response Bias<sup>1</sup>

Because participants were given four types of recognition items to which they could react with four types of responses (i.e. the item is an original, a context foil, an evaluation foil, or an other foil), our data consist of a four (item) by four (response) contingency table with 40 observations for each person. Usually, signal detection analysis relies on two-choice response tasks for deriving common discrimination (Pr) and response bias (Br) indexes. However, calculating these indexes for the present type of data matrix would lead to a considerable loss of power. Therefore, we calculated alternative measures for discrimination and response bias for each participant.

Cohen's kappa was used as a measure of discrimination. That is, we calculated the amount of

agreement between type of response and type of recognition item (i.e. correctly classifying recognition items). Similarly to Pr, kappa corrects the observed hit rate (proportion agreement) for its expected value under guessing. As an index of response bias (similar to Br), we used a chi-square to evaluate deviations of the observed response distribution from the expected response distribution for accurate responders. Since all four types of recognition items were presented 10 times, an accurate responder is expected to give each response-type 10 times. Under the null hypothesis of no bias, the measure has a chi-square distribution with  $df = 3$ .

Average kappa was 0.58 ( $SD = 0.14$ ), a value that indicates average performance. Thus, participants were able to discriminate between the four types of records at a modest level. A significant chi-square indicated response bias, that is, a preference for some responses above others. Setting alpha at 0.01 with a mean chi-square of 8.39 ( $SD = 5.67$ ), almost one-quarter of the participants showed a significant response bias. Two outliers (extremely high chi-squares) even classified more than half of their original and context foil items as other items.

### Individual Differences

Mean scores on CEQ, DES, TAS, GSS, and BDI are given in Table 2. To explore the contribution of individual difference measures to memory accu-

<sup>1</sup>For the sake of completeness we also calculated two high-threshold discrimination parameters: Pr and Br (Snodgrass & Corwin, 1988). Pr is an index of the capacity to discriminate between signal (authentic items) and noise (foils), while Br is a measure of response bias, i.e. the tendency to accept or reject items irrespective of their status (i.e. authentic or foil). Because of the unequal numbers of targets ( $n = 10$ ) and distracters ( $n = 30$ ; proportions of false alarms on all three foil items were summed), the formulas of Corwin (1994) were used to calculate these parameters. Pr and Br were 0.40 ( $SD = 0.20$ ) and 0.61 ( $SD = 0.17$ ), respectively, indicating that participants performed poorly on discriminating original items from foil items and that they had quite liberal response settings.

racy, Pearson correlations between these measures and discrimination and response bias indexes were calculated (see Table 2). It appeared that only fantasy proneness (CEQ) was related to both indexes. That is, individuals scoring high on fantasy proneness performed better on this recognition task. There were no relations between individual difference measures and confidence ratings.<sup>2</sup>

## DISCUSSION

The present study examined two issues. First, we sought to replicate earlier findings on spontaneous distortions in autobiographical memory (Barclay & Wellman, 1986; Merckelbach et al., 1997) in a larger sample. Second, the contribution of individual difference variables to memory was explored. As for the first issue, our results indicate that memory accuracy over a 6-month time interval was found to be far from perfect. As in the Barclay and Wellman study (see also Merckelbach et al., 1997), participants recognized on the average about 80 % of their original diary records, but also made commission errors by accepting foil records as their own. Commission errors or false alarms were not evenly distributed over different types of foil items. That is, participants seemed to have more difficulties rejecting context foils than rejecting evaluation or other foils.

The fuzzy-trace theory (FTT; Brainerd, Reyna, & Poole, 2000) offers a theoretical framework for interpreting the spontaneous memory distortions found in this study. According to this theory, target events are simultaneously stored in verbatim (episodic or item specific) and gist (semantic) traces. Both traces elicit different types of subjective impressions. Whereas verbatim traces go together with feelings of specific recollection, gist traces go hand in hand with a global impression of familiarity. These feelings, in turn, support all-or-none or graded similarity judgments. However, verbatim traces rapidly decay over time (i.e. within days; e.g. Koriat, Goldsmith, & Pansky, 2000), whereas gist traces are resistant to decay. When time passes, people will increasingly use global gist traces to reconstruct their memories. Thus, the high false-alarm rates on context and evaluation

foils can be explained by the 6-month interval, in which verbatim traces decayed, but vague feelings of familiarity based on gist traces still existed. In this light, the low false-alarm rates on other foils may be interpreted as the result of inconsistencies between these foils and gist traces.

As was the case in the Barclay and Wellman study (1986; see also Merckelbach et al., 1997), confidence ratings for hits and false alarms on context and evaluation foils did not differ, although participants were less confident about their false alarms on other foil items. This indicates that, in general, false alarms go hand in hand with high confidence scores. In Barclay and Wellman's (1986, p.101) words: 'People are more confident about the exact nature of events occurring in their life than they should be'. The type of task affects this overconfidence. It is a well-established fact that recognition tasks produce strong confidence-accuracy discrepancies (Robinson & Johnson, 1996). Overconfidence is also a function of ease of retrieval (see for example Kelley & Lindsay, 1993). The lower confidence ratings on other-foil items might be an indication that participants had relatively more difficulties retrieving this type of item.

The second issue that was explored in the present study pertained to the association between autobiographical memory distortions and the individual difference measures of fantasy proneness, dissociation, absorption, suggestibility, and depression. Note that the mean scores on these measures come close to those reported in earlier studies (e.g. Merckelbach et al., 1999; Horselenberg, Merckelbach, & Josephs, 2003; Gudjonsson, 1997). Intercorrelations between these individual difference measures also replicated patterns found in previous studies. For example, as was the case in Horselenberg et al.'s (2003) study, dissociation and fantasy proneness were found to correlate significantly. Likewise, as in the Lynn and Rhue (1986; see also Platt, Lacey, Iobst, & Finkelman, 1998) study, fantasy proneness and absorption were associated with each other. On the other hand, suggestibility was not related to any of the other measures, while depression only correlated with fantasy proneness.

A counter-intuitive relationship between fantasy proneness and memory performance was found. That is, participants scoring high on fantasy proneness were superior in discriminating between targets and foils, and they also exhibited reduced response bias. One possible explanation for this finding is that autobiographical records of highly fantasy-prone people are somehow different in their linguistic or narrative construction

<sup>2</sup>No significant relations were found between individual difference measures or confidence ratings and both bias indexes when the two high-threshold discrimination parameters (Pr and Br) were used.

compared to records of people who are less fantasy prone. Indirect evidence for this comes from a recent study (H. Merckelbach, in press) in which high and low fantasy prone people were asked to write down a fabricated story. The stories of highly fantasy prones were judged by blind psychologists as being more convincing than those of low fantasy prones, a finding that must have something to do with the way in which high fantasy prones construct their narratives. Thus, it might well be the case that in the current study, highly fantasy-prone participants could rely on a broad variety of stylistic features to identify their original records. Clearly, this issue warrants further study.

We anticipated that individual differences would modulate source monitoring. Yet, with the exception of fantasy proneness (cf. supra), none of the individual differences tapped in the current study, was related to memory distortions. This null finding can be interpreted in the light of the task employed in the current study. Recognition does not require individuals to elaborate on certain memory traces, and so involvement of source monitoring decisions might be minimal. In contrast, recall tasks require intensive use of source monitoring processes. Interestingly, Candel et al. (2003) found that individuals high on DES displayed more commission errors (i.e. false alarms) in a free recall task. On a related note, one could argue that individual differences in memory distortions occur primarily when individuals are exposed to post-event misinformation during an experiment (e.g. Platt et al., 1998).

The present findings, along with those of Barclay and Wellman (1986) and Merckelbach et al. (1997), converge on the notion that spontaneous autobiographical distortions are a common phenomenon. Yet, the present study found no evidence for individual difference variables contributing to this phenomenon. It may well be that such variables only matter with implausible (e.g. UFO-abductions; Bartholomew, Basterfield, & Howard, 1991; R. Horselenberg & H. Merckelbach, unpublished data) rather than plausible memory commissions. A case in point is the study by Spanos, Cross, Dickson and DuBreuil (1993) who showed that fantasy proneness is not related to UFO experiences *per se*, but to the unusual physical sensations of such experiences, with high fantasy prones reporting more bizarre experiences. Such an effect is also found in people reporting previous-life memories. Thus, in their study on people undergoing regression therapy and hypnosis, Horselenberg and Merckelbach (unpublished data)

found that high fantasy-prone subjects reported more eccentric previous-life memories than did low fantasy-prone people. Clearly, a more detailed understanding of who is likely to make commission errors and under what conditions awaits clarification.

Trierweiler and Donovan (1994, p.301) rightly remarked that 'memories of interpersonal events in a client's life are the grist for the psychotherapeutic mill'. Our results show that people's memories of their diary descriptions of such events are far from perfect. They not only forget a surprising proportion of their diary notes (omissions), but they also sometimes come to accept notes that are not their own (commissions). This, then, is another demonstration that narrative truth is quite different from historical truth (Bonanno, 1990). Psychotherapists are well advised to take this point into account, even when they make use of such relatively passive tools as writing exercises.

## REFERENCES

- Barclay, C.R., & Wellman, H.M. (1986). Accuracies and inaccuracies in autobiographical memories. *Journal of Memory and Language*, 25, 93–103.
- Bartholomew, R.E., Basterfield, K., & Howard, G.S. (1991). UFO abductees and contactees: psychopathology or fantasy proneness? *Professional Psychology: Research and Practice*, 22, 215–222.
- Beck, A.T., Rush, A.J., Shaw, B.F., & Emery, G. (1979). *Cognitive therapy of depression*. New York: Wiley.
- Bernstein, E.M., & Putnam, F.W. (1986). Development, reliability and validity of a dissociation scale. *Journal of Nervous and Mental Disease*, 174, 727–735.
- Bonanno, G.A. (1990). Remembering and psychotherapy. *Psychotherapy*, 27, 175–186.
- Brainerd, C.J., Reyna, V.F., & Poole, D.A. (2000). Fuzzy-trace theory and false memory. Memory theory in the courtroom. In D.F. Bjorklund (Ed.), *False-memory creation in children and adults. Theory, research, and implications* (pp.93–127). Mahwah: Lawrence Erlbaum Associates.
- Candel, I., Merckelbach, H., & Kuijpers, M. (2003). Dissociative experiences are related to commissions in emotional memory. *Behaviour Research and Therapy*, 41, 719–725.
- Corwin, J. (1994). On measuring discrimination and response bias: unequal numbers of targets and distracters and two classes of distracters. *Neuropsychology*, 8, 110–117.
- Destun, L.M., & Kuiper, N.A. (1996). Autobiographical memory and recovered memory therapy: Integrating cognitive, clinical, and individual difference perspective. *Clinical Psychology Review*, 16, 421–450.

- Drivdahl, S.B., & Zaragoza, M.S. (2001). The role of perceptual elaboration and individual differences in the creation of false memories for suggested events. *Applied Cognitive Psychology, 15*, 265–281.
- Garry, M., & Polaschek, D.L.L. (2000). Imagination and memory. *Current Directions in Psychological Science, 9*, 6–10.
- Gudjonsson, G.H. (1992). *The psychology of interrogations, confessions, and testimony*. Chichester: John Wiley & Sons.
- Gudjonsson, G.H. (1997). *The Gudjonsson Suggestibility Scales*. Hove: Psychology Press.
- Heaps, C., & Nash, M.R. (1999). Individual differences in imagination inflation. *Psychonomic Bulletin & Review, 6*, 313–318.
- Horselenberg, R., Merckelbach, H., & Josephs, S. (2003). Individual differences and false confessions: a conceptual replication of Kassir and Kiechel (1996). *Psychology, Crime & Law, 9*, 1–8.
- Horselenberg, R., Merckelbach, H., Muris, P., Rassin, E., Sijenaar, M., & Spaan, V. (2000). Imagining fictitious childhood events: the role of individual differences in imagination inflation. *Clinical Psychology and Psychotherapy, 7*, 128–137.
- Hyman, I.E., & Billings, F.J. (1998). Individual differences and the creation of false memories. *Memory, 6*, 1–20.
- Johnson, M.K., Hastroudi, S., & Lindsay, D.S. (1993). Source monitoring. *Psychological Bulletin, 114*, 3–28.
- Kassin, S.M. (1997). The psychology of confession evidence. *American Psychologist, 52*, 221–233.
- Kelley, C.M., & Lindsay, S.D. (1993). Remembering mistaken for knowing: ease of retrieval as a basis for confidence in answers to general knowledge. *Journal of Memory and Language, 32*, 1–24.
- Kihlstrom, J.F., Glisky, M.L., & Angiulo, M.J. (1994). Dissociative tendencies and dissociate disorders. *Journal of Abnormal Psychology, 103*, 117–124.
- Koriat, A., Goldsmith, M., & Pansky, A. (2000). Toward a psychology of memory accuracy. *Annual Reviews of Psychology, 51*, 481–537.
- Lepore, S.J., & Smyth, J.M. (2002). *The writing cure: How expressive writing promotes health and emotional well-being*. Washington, DC: American Psychological Association.
- Linton, M. (1975). Memory for real-world events. In D.A. Norman, & D.E. Rumelhart (Eds), *Exploration in cognition*. San Francisco: Freeman.
- Loftus, E.F. (1997). Researchers are showing how suggestion and imagination can create 'memories' of events that did not actually occur. *Scientific American, 262*, 71–75.
- Lynn, S.J., & Rhue, J.W. (1986). The fantasy prone person: hypnosis, imagination, and creativity. *Journal of Personality and Social Psychology, 51*, 404–408.
- Mazzoni, G.A., & Loftus, E.F. (1996). When dreams become reality. *Conscious Cognition, 5*, 442–462.
- Mazzoni, G.A., & Loftus, E.F. (1998). Dream interpretation can change beliefs about the past. *Psychotherapy, 35*, 177–187.
- McNally, R.J., Clancy, S.A., Schacter, D.L., & Pitman, R.K. (2000). Personality profiles, dissociation, and absorption in women reporting repressed, recovered, or continuous memories of childhood sexual abuse. *Journal of Consulting and Clinical Psychology, 68*, 1033–1037.
- Merckelbach, H. Telling a good story: Fantasy processes and the quality of fabricated memories. *Personality and Individual Differences*, (in press).
- Merckelbach, H., Horselenberg, R., & Muris, P. (2001). The Creative Experiences Questionnaire (CEQ): a brief self-report measure of fantasy proneness. *Personality and Individual Differences, 31*, 987–995.
- Merckelbach, H., Muris, P., & Rassin, E. (1999). Fantasy proneness and cognitive failures as correlates of dissociative experiences. *Personality and Individual Differences, 26*, 961–967.
- Merckelbach, H., Wessel, I., & Horselenberg, R. (1997). The accuracy of autobiographical memory: a replication of Barclay & Wellman (1986). *Behavioural and Cognitive Psychotherapy, 25*, 103–111.
- Paddock, J.R., Noel, M., Terranova, S. Eber, H.W., Manning, C., & Loftus, E.F. (1999). Imagination inflation and the perils of guided visualization. *Journal of Psychology, 133*, 581–595.
- Platt, R.D., Lacey, S.C., Iobst, A.D., & Finkelman, D. (1998). Absorption, dissociation, and fantasy-proneness as predictors of memory distortion in autobiographical and laboratory-generated memories. *Applied Cognitive Psychology, 12*, S77–S89.
- Pennebaker, J.W., & Memon, A. (1996). Recovered memories in context: thoughts and elaborations on Bowers and Farvolden (1996). *Psychological Bulletin, 119*, 381–385.
- Rassin, E., Merckelbach, H., & Spaan, V. (2001). When dreams become a royal road to confusion: realistic dreams, dissociation, and fantasy proneness. *Journal of Nervous and Mental Disease, 189*, 478–481.
- Robinson, M.P., & Johnson, J.T. (1996). Recall memory, recognition memory, and the eyewitness confidence-accuracy correlation. *Journal of Applied Psychology, 81*, 587–594.
- Schoutrop, M., Lange, A., Hanewald, G., Duurland, C., & Bermond, B. (1997). The effects of structured writing assignments on overcoming major stressful events: an uncontrolled study. *Clinical Psychology and Psychotherapy, 4*, 179–185.
- Snodgrass, J.G., & Corwin, J. (1988). Pragmatics of measuring recognition memory: applications to dementia and amnesia. *Journal of Experimental Psychology: General, 117*, 34–50.
- Spanos, N.P., Burgess, C.A., Burgess, M.F., Samuels, C., & Blois, W.O. (1999). Creating false memories of infancy with hypnotic and non-hypnotic procedures. *Applied Cognitive Psychology, 13*, 201–218.
- Spanos, N.P., Cross, P.A., Dickson, K., & DuBreuil, S.C. (1993). Close encounters: an examination of UFO experiences. *Journal of Abnormal Psychology, 102*, 624–632.
- Tellegen, A., & Atkinson, G. (1974). Openness to absorbing and self-altering experiences ('absorption'), a trait related to hypnotic susceptibility. *Journal of Abnormal Psychology, 83*, 268–277.
- Trierweiler, S.J., & Donovan, C.M. (1994). Exploring the ecological foundations of memory in psychotherapy: interpersonal affordance, perception, and recollection in real time. *Clinical Psychology Review, 14*, 301–326.



- Wagenaar, W.A. (1986). My memory: a case study of autobiographical memories over six years. *Cognitive Psychology*, 18, 225–252.
- Williams, J.M.G. (1992). Autobiographical memory and emotional disorders. In S.A. Christianson (Ed.), *Handbook of emotion and memory: Research and theory* (pp.452–477). Hillsdale, NJ: Erlbaum.
- Williams, J.M.G., Stiles, W.B., & Shapiro, D.A. (1999). Cognitive mechanisms in the avoidance of painful and dangerous thoughts: elaborating the assimilation model. *Cognitive Therapy and Research*, 23, 285–306.
- Wilson, S.C., & Barber, T.X. (1982). Fantasy-prone personality: implications for understanding imagery, hypnosis, and parapsychological phenomena. *PSI-Research*, 1, 94–116.
- Winograd, E., Peluso, J.P., & Glover, T.A. (1998). Individual differences in susceptibility to memory illusions. *Applied Cognitive Psychology*, 12, S5–S27.