

The False Recognition Effect in Criminal Profiling

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Abstract A study was conducted to examine the false recognition effect in criminal profiling. Participants ($N=83$) were presented with a crime scene description and a criminal profile made up of semantically related statements. After a one week delay, the task for each participant was to recognize statements from a suspect description that were included in the profile, either with or without the profile in front of them. The suspect description consisted of descriptors that were: (1) included in the profile, (2) related to, but not included in the profile, and (3) unrelated to the profile. Participants in the memory-based condition also had to indicate, for each recognized item, whether they actually remembered reading the statement or simply knew that they had read it. Results indicate that participants who had to rely on their memory were more likely to recognize descriptors that were related to the profile, but not included in it, and these participants frequently indicated that they remembered, rather than simply knew, that they had experienced these statements. Potential explanations for these findings, implications for profiling practices, and directions for future research are discussed.

Keywords Criminal profiling · False memory · False recognition · Phantom recollection

Introduction

Research has convincingly demonstrated that people often have memories for things that they have never actually experienced (Brainerd and Reyna 2002; Roediger and McDermott 2000). For example, when people hear the sentences “The rock rolled down the mountain” and “The rock crushed the tiny hut”, they are more likely to recognize the new, composite sentence “The rock which rolled down the mountain crushed the tiny hut” as a previously experienced sentence than either of the original sentences (e.g., Bransford and Franks 1971; Cabrera et al. 2001). Likewise, when people are presented with sentences that encourage pragmatic inferences (i.e., conclusions that go beyond the available information), people often recognize the inferences in recognition tasks rather than the sentences that were actually presented. For example, after being exposed to sentences like, “The karate champion *hit* the cinder block” and “The infant *stayed awake* all night”, people often remember that the karate champion *broke* the cinder block and that the infant *cried* all night (e.g., Brewer 1977; Chan and McDermott 2006).

What is perhaps most interesting about these types of false memories is that they often seem very real to participants (for a review of this issue, see Lampinen et al. 1998). For example, when participants in false memory (FM) studies are asked to indicate for each of the recognized items whether they can actually *remember* being exposed to the item, or whether they simply *know* that the item was presented based on a feeling of familiarity, participants frequently report remembering the incorrectly

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recognized items (e.g., Lampinen 1996; Lampinen et al. 2005; Tuckey and Brewer 2003). In other words, participants in these studies often indicate that they are able to mentally relive, or consciously recollect, experiences that never actually occurred. In some studies, participants are in fact just as likely to report remembering items that were never experienced as they are to remember experienced items (e.g., Chan and McDermott 2006).

Fuzzy Trace Theory (FTT) is often used to explain these findings. The theory suggests that when individuals in FM studies are presented with stimuli during the acquisition phase, two representations of the stimuli are stored: a verbatim representation that captures item-specific information (e.g., surface features) and a gist representation that captures more general information (e.g., semantic meaning) (Brainerd and Reyna 2002). According to FTT, verbatim and gist traces are stored independently, and at the time of retrieval, participants can consult either. Both representations can account for accurate instances of memory, but gist representations account for instances of FM, such as when a nonexperienced item that fits with the gist of the presented stimuli is incorrectly recognized (Brainerd and Reyna 2002). With respect to the phenomenological experience associated with these memories, conscious recollection (i.e., remembering) is usually thought to correspond to verbatim retrieval and familiarity-based judgments (i.e., knowing) to gist retrieval. However, when gist representations are especially strong, memories for nonexperienced items that cue the gist trace can also seem very real (i.e., result in remembering) (e.g., Brainerd et al. 2003).

The purpose of the present study is to extend the examination of FM into an area where the existence of such a phenomena could be particularly harmful. Specifically, we will examine the false recognition effect (and the accompanying phenomenological experiences) in the field of criminal profiling, where attempts are made to predict the demographic, behavioral, and personality features of unknown offenders based on the way they have committed their crimes (Douglas et al. 1986). The paper is divided into four sections. First, we explain the relevance of false recognition to criminal profiling and describe the conditions under which false recognition is likely to occur in this field. Second, we present a study demonstrating the existence of the false recognition effect in the profiling context. Third, we discuss the implications of these results. Finally, we conclude by proposing several lines of future research.

The Relevance of False Recognition to Criminal Profiling

One of the purposes of a criminal profile is to prioritize suspects in criminal investigations (Douglas and Burgess 1986). This is accomplished by developing a portrait of the

unknown offender through an analysis of his or her crimes. A document outlining the predictions is then delivered to the police so that they can compare the profile to potential suspects. This allows police to focus their energies on individuals that represent good matches. General problems with profiling have been discussed elsewhere (e.g., Alison et al. 2002; Canter 2000; Hicks and Sales 2006). Here, we are interested solely in whether the profiling process can result in a false recognition effect when the person asked to evaluate the degree of profile-suspect match is forced to rely on his or her memory of the profile. In other words, when an individual is presented with a profile of an unknown offender, and later asked to recognize profile predictions in a suspect's background, are items that were not included in the original profile ever incorrectly recognized?

We believe that conditions can and do currently exist in the profiling field that makes this form of false recognition likely. Specifically, we argue that: (1) people are occasionally required to rely on their memory of a profile when determining whether that profile matches a particular suspect's background and (2) many profiles are constructed in such a way that strong gist representations are likely to be encoded when the profile is first presented, and a range of suspect descriptor's are likely to cue gist traces, which will sometimes cause false recognition.

Having to Remember Offender Profiles

Despite the fact that profiling is now commonly used in criminal investigations, there are still no accepted principles to guide profiling practices (Canter & Alison 1999; Hicks and Sales 2006; Kocsis et al. 2002; however, see Rainbow 2008). As a case in point, in most countries there are no established procedures for how profiles should be delivered to the police, nor are there any accepted guidelines for how to evaluate profiling advice (Alison et al. 2003a). One consequence of this state of affairs is that profiles are not always formally documented (i.e., written down) and, on occasion, it appears that they are not documented at all (Alison and Canter 2005; Alison and Canter 1999; Rainbow 2008; Snook et al. 2007). For example, consider a well-known case from the UK, where the profile consisted of a list of suspect descriptors written on a whiteboard that was subsequently wiped clean (Alison and Canter 2005).

Even in countries where significant steps have been taken towards professionalizing the profiling field, there is evidence that profiles are not always properly documented. For example, in a recent survey of police officers in Canada, where some degree of standardization does exist, approximately 20% of officers who had used profiling in previous investigations indicated that they had received their profiles over the phone (it was not clear from the survey whether these officers wrote the profile down on paper)

(Snook et al. 2007). Given this finding, one can only imagine the situation in countries with less stringent standards. Beyond the obvious ethical problems associated with improperly documented profiles, memory errors can occur (Alison and Canter 1999). Given the manner in which many profiles are constructed, relying as they often do on an offender typology, we believe that one particular type of memory error — false recognition — is a particular concern.

Getting the Gist of Offender Profiles

While there is no single method for constructing profiles (for a review, see Hicks and Sales 2006), a relatively common procedure is to draw on some sort of classification system. These systems are relied upon in an attempt to link a particular type of crime to a particular type of offender (e.g., Canter and Fritzon 1998; Kocsis et al. 2002; Ressler et al. 1985). For example, consider the popular organized-disorganized typology developed by the FBI to assist with the task of profiling serial murderers (Ressler et al. 1985). The typology assumes that the majority of serial murders, and serial murderers, can be categorized as either organized or disorganized, and further, that organized crimes will be committed by organized offenders and disorganized crimes, by disorganized offenders.

Based on interviews with incarcerated offenders, the FBI has produced lists of semantically related behaviours and characteristics that are expected to correspond with each of the crime and offender types. For example, according to Ressler et al. (1985), the behaviours one would expect at an organized crime scene reflect a semblance of order and a high degree of planning (e.g., victim's body is hidden, restraints are used to control victim, no evidence is left at the scene, etc.). In terms of offender characteristics, organized offenders are expected to be relatively high functioning (e.g., reasonably intelligent, socially competent, skilled worker, etc.). In contrast, disorganized crime scenes are sloppy and reflect little effort on the offender's part to avoid detection (Ressler et al. 1985). The observable behaviours are the exact opposite of those expected at an organized scene. Likewise, the background characteristics of disorganized offenders contrast those of the organized offender, and characterize an individual that generally does not function well.

As an example of what might emerge when relying on this typology, consider the following profile of a disorganized offender that was developed by the FBI (Ressler et al. 1985):

White male, aged 25–27; thin, undernourished appearance; single, living alone in a location within 1 mile of the abandoned station wagon owned by one of the victims. Residence will be extremely slovenly and unkempt, and evidence of the crimes will be found at the residence. Suspect will have a history of mental

illness and use of drugs. Suspect will be an unemployed loner who does not associate with either males or females and will probably spend a great deal of time in his own residence. If he resides with anyone, it will be with his parents. However, this is unlikely. Subject will have no prior military history; will be a high school or college dropout; probably suffers from one or more forms of paranoid psychosis. (pp. 24–25)

Not only are these predictions semantically related in the sense that they all depict a “low functioning individual”, but built into this profile are many statements that encourage pragmatic inferences. For example, the fact that the suspect is profiled to be an unemployed loner may lead one to conclude (correctly or incorrectly) that the suspect has been fired from multiple jobs. Along the same lines, the fact that the suspect is profiled to have a history of mental illness and drug use may lead one to conclude that the suspect will have had previous encounters with police.

According to FTT, being presented with this profile should result in a verbatim representation of the profile items. In addition, a gist representation will be formed that captures the general meaning, or gist, of the items — that of a generally disorganized, low functioning individual. Given that the profile consists of semantically related statements, many of which imply the existence of further disorganized characteristics, the gist representation is likely to be especially strong. If exposed to suspect descriptors at retrieval that fit with the gist of the profile, and the profile is not available for direct comparison, false recognition of profile items in the suspect description is highly likely. Under such conditions, it might also be expected that some degree of forgetting will occur, whereby experienced profile items are not always recognized in the suspect description. This is because verbatim traces are known to deteriorate relatively rapidly (Brainerd and Reyna 2002).

An Empirical Examination of the False Recognition Effect

The current study examines the false recognition effect in the profiling context. This can be accomplished by exploring the types of memory errors that occur when people are required to recognize the contents of a criminal profile (from a suspect description) based on their memory of the profile. Specifically, when compared to participants that do not have to rely on their memory, we hypothesize that participants who are asked to recognize previously presented profile items from a suspect description will exhibit (1) a lower rate of recognition for experienced items and (2) a higher rate of recognition for nonexperienced items that cue gist traces. Furthermore, for participants who

are asked to recognize items from a previously presented profile, we hypothesize (3) that they will frequently indicate being able to remember (i.e., consciously recollect) non-experienced items that relate to the gist of the profile.

Method

The study consisted of two stages. The first stage involved the development of a semantically related criminal profile and suspect description for use in the second stage of the study. The second stage consisted of participants evaluating the contents of the profile in terms of how well it matched the suspect description, either from memory or with the profile in front of them.

Stage 1: Construction of the Offender Profile and Suspect Description

Participants Participants in this stage of the study consisted of 59 undergraduate students from Carleton University. The average age of these participants was 20.44 years ($SD=4.95$), there were 19 men and 40 women, and none had any experience investigating crimes of an interpersonal nature.

Materials Each participant was provided with a survey consisting of 92 offender characteristics. The participants were asked to rate each characteristic in terms of how representative it was of an organized or disorganized offender on a 10-point scale. A score of one indicated that the characteristic was viewed as highly representative of a disorganized offender and a score of 10 indicated that the characteristic was viewed as highly representative of an organized offender.

In accordance with the definitions proposed by Douglas et al. (1992), an organized offender was defined for the participants as: *One who is in control of his life and the situations that he finds himself in. He is aware of the implications of his actions. He is intelligent and demonstrates competence in social interactions and in dealing with anything he encounters. There is a lack of impulsivity, and an element of planning in all that he does.* A disorganized offender was defined as: *Someone who lacks control in his life. He is unaware of the implications of his actions, which can often indicate mental illness. He is not overly intelligent and does not handle social situations with competence. Finally, he seems impulsive in nature, not thinking things through before acting.*

Procedure Participants were instructed to read these definitions before rating each offender characteristic and to base their ratings solely on the definitions provided. After collecting the surveys, the median rating for each offender characteristic was calculated. The characteristics were then categorized as an organized characteristic if the median

Table 1 Organized offender characteristics included in the offender profile

Offender Characteristic	Median Score
The offender will follow the story in the media in order to avoid detection.	9
The offender will have a career.	8
The offender will be of above average intelligence.	8
The offender will be known to have good social skills.	8
The offender will be highly mobile.	7
The offender will be married or in a committed relationship.	7
The offender will not have a previous criminal record.	7
The offender will not have any psychiatric problems.	7
The offender will be described by those who know him as creative.	7

score was ≥ 7 , a disorganized characteristic if the median score was ≤ 3 , or a neutral characteristic if the median score was between 4 and 6. Only those offender characteristics that were categorized as organized or disorganized were used in the remainder of the study.

Overall, 16 statements were classified as organized and 7 statements were classified as disorganized. Since a higher number of characteristics could be classified as organized, these were used to construct the offender profile. Table 1 contains the organized characteristics that were used to construct the profile along with the participants' median scores for those characteristics. It was expected that when this profile was presented to participants in Stage 2 of the study, it would generate a strong, enduring gist representation of an organized, high functioning individual.

The suspect description was constructed using offender characteristics from both the organized and disorganized categories (see Table 2). Specifically, the suspect description was made up of 4 different types of statements for a total of 12 suspect descriptors (i.e., 3 statements of each type).

Same (S) statements consist of organized offender characteristics (as determined by our participants) taken directly from the profile in Table 1. Highly related (HR) statements consist of organized offender characteristics (as determined by our participants) that were not included in the original profile, but are pragmatically implied by a characteristic in that profile (e.g., "The offender will be of above average intelligence" does not necessarily mean that "The suspect has a university degree", but it is implied).¹ Moderately related (MR) statements consist of organized offender characteristics (as determined by our participants)

¹ The other two pragmatic inferences are: "The offender will be highly mobile"- "The suspect has a decent car in working condition" and "The offender is known to have good social skills"- "The suspect is known as a ladies man."

Table 2 Offender characteristics presented in the suspect description

Type of Statement	Statement
Same (S)	(1) The suspect has followed the investigation in the media.
	(2) The suspect has been described as creative.
	(3) The suspect has a career.
Highly related (HR)	(1) The suspect has a decent car in working condition.
	(2) The suspect is known as a ladies man.
	(3) The suspect has a university degree.
Moderately related (MR)	(1) The suspect is a police enthusiast.
	(2) The suspect has a military history.
	(3) The suspect is proficient in martial arts.
Unrelated (UR)	(1) The suspect has poor living conditions.
	(2) The suspect has previously attempted suicide.
	(3) The suspect is known as an exhibitionist.

that were not included in the original profile and are not pragmatically implied by statements in the profile (e.g., “The suspect has a military history” is an organized characteristic, but it is in no way implied by any of the statements in the original profile). Finally, Unrelated (UR) statements consist of offender characteristics rated by our independent sample of judges as being disorganized (e.g., “The suspect has previously attempted suicide”, which is totally unrelated to the statements included in the original profile).

For participants who have to rely on their memory of the profile, it was expected that S and UR statements would cue verbatim traces of the profile (resulting in accurate memories for these items) and HR and MR statements would cue gist traces of the profile to varying degrees (resulting in inaccurate memories for these items).

Stage 2: Recognizing Items from the Profile

Participants Participants in this stage of the study consisted of 83 undergraduate students from Carleton University. Participants were tested in groups of one to four individuals in a research laboratory. Each participant was assigned randomly to one of three groups: With-documentation ($n=27$), Without-documentation ($n=29$), and Control ($n=27$) (the differences between these groups are explained in more detail below). There were no significant differences in age between participants in these groups (With-documentation: $M=20.12$, $SD=4.32$; Without-documentation: $M=20.09$, $SD=3.33$; Control: $M=21.34$, $SD=5.09$). There were also no significant gender differences between the groups (With-documentation: $M=7$, $F=20$; Without-documentation: $M=7$, $F=22$; Control: $M=8$, $F=19$). Only one person in the study had previous experience in investigating crimes of an

interpersonal nature and this person was in the Without-documentation group.

Procedure In Week 1, the participants in the With-documentation group were presented with a crime scene description involving the murder of a young woman (taken from Ressler et al. 1988) and the criminal profile described above. Participants were given 10 minutes to examine the material. Once they had completed this task, participants were asked to answer a short questionnaire about their views of criminal profiling (this questionnaire was used solely for the purpose of concealing the true purpose of the study). Participants in the With-documentation group returned one week later under the guise that they would be given follow-up questionnaires about their views of criminal profiling. In reality, they were provided with the same crime scene description and criminal profile from Week 1, as well as a suspect description (provided above). Next to each descriptor in the suspect description was the question “Was this statement included in the original profile? (Yes/No)”. All materials used in Week 2 remained with the participants as they answered these questions. In Week 1, participants in the Without-documentation group were given 10 minutes to view the crime scene description and the criminal profile. These participants also completed the Week 1 questionnaire. In Week 2, the Without-documentation group received the crime scene description and the suspect description, but not the criminal profile. Next to each descriptor in the suspect description was the question “Was this statement included in the original profile? (Yes/No)”. Finally, this group was asked to indicate, for every statement that they indicated *had* been in the original profile, whether they could actually remember reading the statement, or whether they simply knew that it had been included in the profile.

For the Without-documentation group, Remember and Know judgments were defined in a similar manner to how Roediger and McDermott (1995) defined these terms (see Tulving 1985 for a discussion of these terms). Specifically, the following information was provided to participants: *A Remember experience is defined as one in which you can mentally relive the experience of reading an item (perhaps by recalling what you were doing when you read the item). A Know judgment should be made when you are confident that the item was presented, but you are unable to re-experience (i.e., remember) its occurrence.*

In Week 1, participants in the Control group were presented with the crime scene description and the Week 1 questionnaire, but not the criminal profile. In Week 2, the Control group received the crime scene description, the suspect description, and the criminal profile. Next to each descriptor in the suspect description was the question “Was this statement included in the original profile? (Yes/No)”.

This group was used to control for potential exposure effects.²

Results

Hypotheses 1 and 2: Yes/No Responses

Figure 1 illustrates the proportion of Yes responses for each of the three groups for each statement type. This data was analyzed using a 3 (Condition: With-documentation group x Without-documentation group x Control group) by 4 (Statement type: Same (S) statement x Highly related (HR) statement x Moderately related (MR) statement x Unrelated (UR) statement) mixed design ANOVA.

The analysis revealed a significant main effect of condition, $F(1,80) = 3.35, p < .05, \eta^2 = .08$, indicating that the proportion of Yes responses varied significantly with regard to the participants' group. A Tukey's post-hoc test indicated that the Without-documentation group gave a significantly higher proportion of Yes responses compared to the With-documentation group ($p < .05$). The results also revealed a significant main effect of statement type, $F(3,240) = 304.74, p < .001, \eta^2 = .79$, indicating that the proportion of Yes responses was significantly higher for some statement types than others. A series of paired samples t-tests indicated that a significantly higher proportion of Yes responses were given for S statements than for HR, $t(82) = 16.04, p < .001$, MR, $t(82) = 29.48, p < .001$, and UR statements, $t(82) = 36.12, p < .001$. In addition, the proportion of Yes responses given for HR statements was significantly higher than both MR, $t(82) = 6.17, p < .001$, and UR statements, $t(82) = 6.94, p < .001$.

Finally, and most importantly, there was a significant interaction between condition and statement type, $F(6,240) = 2.82, p < .001, \eta^2 = .07$. In contrast to what was expected in Hypothesis 1, however, further analyses revealed that the proportion of Yes responses for S statements was not significantly lower for participants in the Without-documentation group ($M = .92, SD = .15$) compared to participants in the With-documentation group ($M = .98, SD = .09$) or Control group ($M = .98, SD = .09$). Thus, forgetting portions of the profile did not seem to be a particular problem for participants in the Without-documentation group, as their hit rate was essentially equivalent to participants in the other groups.

In partial support of Hypothesis 2, a significant difference was found between the groups with respect to

the proportion of times that some of the other types of suspect descriptors were incorrectly recognized. Furthermore, the extent of these memory errors depended, to some degree, on the relation between the original and new statements. Unexpectedly, no significant differences in the proportion of Yes responses were observed for HR statements between the Without-documentation ($M = .37, SD = .34$), With-documentation ($M = .37, SD = .31$), and Control groups ($M = .35, SD = .34$). However, significant differences were found for the MR statements, $F(2,82) = 11.44, p < .001$, with the Without-documentation group ($M = .24, SD = .27$) giving a significantly higher proportion of Yes responses to these statements compared to the With-documentation ($M = .02, SD = .09$) and Control groups ($M = .05, SD = .15$). A significant difference was also found for the UR statements, $F(2,82) = 4.05, p < .05$, with the Without-documentation group ($M = .15, SD = .21$) giving a significantly higher proportion of Yes responses to these statements compared to the With-documentation ($M = .02, SD = .09$) and Control groups ($M = .07, SD = .17$).

Hypothesis 3: Remember-Know Judgments

Only the Without-documentation group was asked to give a Remember-Know judgment for their Yes responses in the recognition task. Table 3 contains the overall proportion of Yes responses given for each statement type, as well as the percentage of Yes responses for each statement type that were Remember versus Know judgments. In line with Hypothesis 3, participants in the Without-documentation group frequently indicated that they could actually remember reading suspect descriptors that were never in the

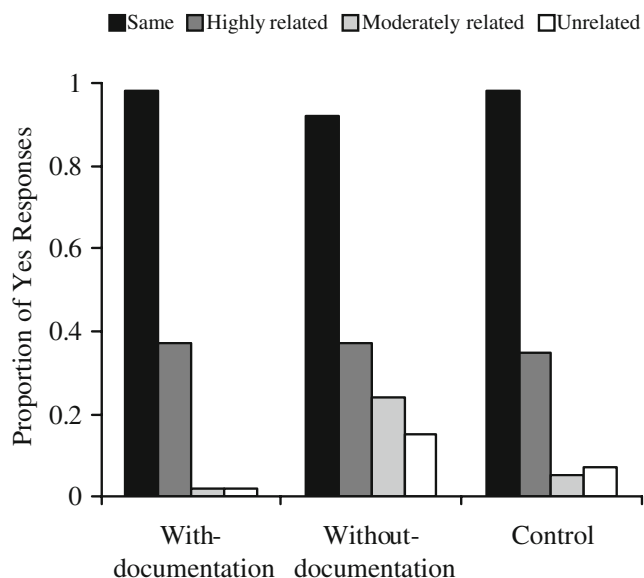


Fig. 1 Proportion of yes response for each condition and statement type

² As was the case for the Without-documentation group, participants in the Control group were only exposed to the profile once, but like the participants in the With-documentation group, this exposure allowed the Control participants to directly compare the contents of the profile to the suspect description.

Table 3 Proportion of yes responses given by participants in the without-documentation group for each statement type and the percentage of remember and know judgments

Statement Type	Proportion of Yes Responses	Remember (%)	Know (%)
Same (S)	.92	56.5	43.5
Highly related (HR)	.37	54.1	45.9
Moderately related (MR)	.24	33.3	66.7
Unrelated (UR)	.15	33.3	66.7

original profile and the degree of remembering corresponded with the descriptors' relation to the original profile. Specifically, Remember judgments were made more than half the time for S (56.5%) and HR statements (54.1%), and a third of the time for MR (33%) and UR statements (33%).

Discussion

The present study examined the false recognition effect in the context of criminal profiling. Compared to participants in non-memory-based conditions, it was hypothesized that participants in the Without-documentation group would fail to recognize portions of the profile, indicating that S statements were not included in the profile when in fact they were. It was further hypothesized that participants in the Without-documentation group would incorrectly recognize suspect descriptors that were not in the original profile and that the rate of these errors would correspond to the degree to which the suspect descriptor was related to the contents of the profile. Lastly, it was hypothesized that, in cases where false recognition occurred, participants in the Without-documentation group would often indicate that they actually remembered reading the statement in the profile. The results pertaining to each hypothesis will now be discussed.

Failing to Recognize Portions of the Profile

Hypothesis 1 was only partially supported. Although a small amount of forgetting did occur between when the profile was presented to the Without-documentation group and when these participants were required to recognize profile statements, the hit rate for S statements was remarkably high ($M=.92$). In fact, the proportion of Yes responses given by the Without-documentation group for S statements was similar to the proportion of such responses given by the With-documentation ($M=.98$) and Control groups ($M=.96$). This is an impressive result, especially given the one week retention interval used in the current study, which is in contrast to the immediate recognition tests that are typical of most FM studies.

Why did participants in the Without-documentation group exhibit such a low rate of forgetting? We based our

first hypothesis (that forgetting would occur) on the fact that verbatim traces are known to deteriorate more rapidly than gist traces (e.g., Gernsbacher 1985; Murphy and Shapiro 1994). Without being able to access verbatim traces of the profile, how could a participant correctly recognize experienced items? It is, of course, possible that our participants retained their verbatim representation of the profile after the week delay and this could explain the finding (Reyna and Kiernan 1994, 1995). However, even if this were not the case, there is, in hindsight, another possible explanation. Research on FTT has shown that, as time passes and verbatim traces become inaccessible, the representational basis of accurate memories shift from a reliance on unstable verbatim traces to more stable gist traces (Brainerd et al. 1995b; Reyna and Kiernan 1994). In our study, we anticipated that the profile would result in a strong gist trace of an organized offender. When this enduring gist fits with suspect descriptors, as it does in the case of S statements, high rates of accurate memories should be expected.

This finding should not undermine the need to properly document (i.e., carefully write down) profiling advice. Indeed, the low rate of forgetting exhibited by our memory-based group may be specific to the conditions tested in this study; forgetting may be more likely under other conditions. For example, if a profile does not result in a strong gist trace, as would be the case if it consists of both organized and disorganized characteristics, it seems likely that more forgetting would occur (Tuckey and Brewer 2003). This would be especially true if the retention interval were longer, as is the case in naturalistic settings where the interval can be months, or even years.³

³ As an interesting aside, consider the Green River Murders in Washington State. The crimes began in the early 1980s and were only recently solved when Gary Ridgway was captured in 2001. Interestingly, a recent newspaper article (Wilson 2003) highlighted the fact that, without proper documentation, it may not only be police officers who experience memory problems when evaluating, but the profiler himself. For example, when asked recently, the FBI agent who provided the Green River profile could not remember why he had decided that a letter written to the police during the early crimes was not written by the actual offender. The police now know that the author of the letter was indeed Ridgway.

Recognizing Profile Statements That Were Never There

Hypothesis 2 was also partially supported. Participants in the Without-documentation group showed clear signs of falsely recognizing nonexperienced profile items. Furthermore, the rate of false recognition related to how well the suspect descriptors matched the gist of the profile. Specifically, participants in the Without-documentation group were most likely to incorrectly recognize HR statements ($M=.32$), followed by MR ($M=.24$), and UR statements ($M=.15$). However, contrary to expectations, between-group differences in false recognition rates were only found for MR and UR statements. Surprisingly, for HR statements, groups that had the profile in front of them when assessing suspect match showed the same rate of false recognition as participants in the Without-documentation group.

The reasonably high rate of false recognition for participants in the memory-based group is clearly explained by FTT. As indicated above, when verbatim memories are inaccessible to participants, they will be forced to rely on gist memories of the profile that capture its general meaning, but not its specific content (Brainerd and Reyna 2002). While a reliance on gist memories may serve participants well when considering descriptors that were included in the original profile (see above), these same memories can lead one to falsely recognize descriptors that were not experienced by participants, but match the gist of the profile. What is also predicted from FTT is that the likelihood of false recognition will vary across descriptor types (Reyna and Kiernan 1994, 1995). Consistent with FTT, false recognition was clearly more pronounced for semantically consistent pragmatic inferences (HR), than it was for semantically consistent (MR) and inconsistent (UR) descriptors (although it is important to note the unexpected high rate of false recognition for UR statements by participants in the Without-documentation group, potentially indicating that these participants used a more lenient criteria for recognition decisions than participants in the other groups).

What is more difficult to explain is why no significant between-group differences were found in the recognition rates associated with HR statements? There is clearly more going on here than memory errors. Unfortunately, at this point no definitive answers can be provided to this question. However, one potential explanation does exist. Alison et al. (2003b) demonstrated that when different groups of police officers were provided with a profile and substantially different suspect descriptions, the two groups could reinterpret the profile to make it fit their respective suspects. Thus, if a similar process of reinterpretation were operating in this study, it is possible that participants in the non-memory-based groups could find profile-suspect

matches (with respect to the pragmatic inferences) that are simply not there (i.e., “The offender will be known to have good social skills” is *reinterpreted* as “The suspect is known as a ladies man”).

Collectively, and regardless of the explanation, the rate of false alarms found in this study is cause for concern. The finding indicates that people are prone to match suspect descriptors to a profile, even if the descriptors are not included in the profile. This tendency appears to be particularly likely when people have to rely on their memory of the profile, especially for profiling predictions that encourage pragmatic inferences. Alarming, however, it can also happen when memory is not even a factor. The existence of the false recognition errors highlights the need to carefully document profiling advice, but the other type of error indicates that it may be important to warn police officers about the dangers involved in reinterpreting such advice.

The Existence of Phantom Recollection

Hypothesis 3 was largely supported. Consistent with previous FM studies (e.g., Brainerd et al. 2001; Chan and McDermott 2006), participants in the Without-documentation group frequently indicated that they could remember reading statements in the original profile that were not actually experienced — a phenomenon commonly referred to as *phantom recollection* (Brainerd et al. 2001). In addition, the degree of remembering corresponded to how well the suspect descriptors matched the gist of the profile. That is, S statements were remembered most often (56.5%), followed closely by HR (54.5%), MR (33.3%) and UR (33.3%) statements.

According to FTT, feelings of item-specific recollection (i.e., remembering) are usually reserved for the retrieval of verbatim traces (Brainerd et al. 1995a). Yet, a significant portion of memories for HR and MR statements resulted in Remember judgments when verbatim retrieval was clearly not being used (because the items were never actually experienced). This finding can be explained by research showing that, when gist memories are particularly strong, they too can support feelings of vivid recollection (e.g., Brainerd et al. 2003). It would seem then that the stimuli used in this study (a criminal profile) can establish a strong, enduring, overriding gist, namely of someone who either leads an organized or disorganized life.

The dangers associated with phantom recollection in the applied context are obvious — the more convincing an episode of false recognition is, the more likely the police will be to act on these recognition errors. Thus, given the profile statement, “The offender will be highly mobile”, the police may recognize, and vividly remember, the pragmatic inference, “The offender has a decent car in working condition”. They will then presumably begin using this

potentially incorrect inference to search for, or prioritize, suspects that own decent cars, when they should just as actively be searching for truck drivers, traveling businessmen, backpackers, or anyone else considered “highly mobile”. Not only will phantom recollection waste valuable time and money, it could have devastating effects for people who are wrongly considered suspects by the police.

Limitations and Future Directions

The current research is limited in a number of potentially important ways and attempts to address these limitations provide the foundation for some interesting future research. Three issues in particular warrant further investigation. First, students were used as participants, when clearly it is police officers who evaluate profiling advice. In the future, it would be important to attempt a replication study using officers as participants. Not only would this enhance the ecological validity of the study, it may also influence the results (e.g., an increase in false recognition rates due to pre-existing schemas of organized and disorganized offenders that students do not possess). Second, the results of this study are based on a single profile that may not be typical of profiles in the field. For example, while profiles based solely on organized or disorganized characteristics may be used in naturalistic settings, they are probably less common than profiles containing a mixture of items (Douglas et al. 1992). The use of mixed profiles will likely affect the results of false recognition studies because they will influence the strength of gist traces. Third, in a further attempt to generalize the findings to more naturalistic settings, it would be important to vary the way in which the profile is presented to participants. For example, interesting findings have emerged with respect to the retention interval, whereby false memories seem to be particularly stable over long delays (e.g., Brainerd et al. 1995a). This finding may have particular relevance to the profiling context where retention intervals can be very long.

Conclusion

The use of offender profiling in crime investigations has increased dramatically over time. Unfortunately, a corresponding increase in professionalism surrounding the field has not occurred at the same rate (Rainbow 2008). The result is that inappropriate practices emerge, such as providing (and relying on) inadequate documentation of profiling advice (Alison and Canter 1999). The current study demonstrated that problems might occur when profiles are not properly documented, including a small amount of forgetting and a significant amount of false recognition. If

these results were to generalize to more naturalistic settings, the consequences could be potentially serious. Even without such attempts to generalize the results, we feel the current study (in addition to the ethical arguments presented by others; Alison and Canter 1999) provides sufficient reasons for why profiles should be documented. In those jurisdictions where sensible standards have been put in place to ensure proper documentation, the results from this study provide empirical support for that decision.

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