How choice blindness can help us understand face recognition

Chapter

HOW CHOICE BLINDNESS CAN HELP US UNDERSTAND FACE RECOGNITION

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ABSTRACT

How people recognise unfamiliar faces has puzzled cognitive psychologists for decades. Ample evidence suggests that effective face recognition requires good perceptual and memory skills. One needs to be capable of extracting information about facial identity and recall this information when required to recognize a face. However, choice blindness, the phenomenon that describes the inability to detect surreptitious changes in the outcome of one's decisions, calls the view that perception and memory alone are sufficient for successful recognition of unfamiliar faces into question. As this chapter will demonstrate, eyewitnesses often fail to notice changes in the outcome of their face recognition and identification decisions, albeit having sufficient memory resources. Drawing from the choice blindness literature, we conclude that metacognition is a contributing factor in unfamiliar face recognition.

Keywords: choice blindness, face recognition, eyewitnesses, metacognition

Authors note

This version of the article may not completely replicate the final authoritative version published in Sagana, A**.** & Sauerland, M. (2017). How choice blindness can help us understand face recognition. In M. Bindemann & A. Megreya (Ed.), F*ace processing: systems, disorders and cultural differences*. Nova Science Publications

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INTRODUCTION

Face recognition appears effortless, yet it is arguably one of the most complex tasks people are able to perform. Naturally, many models have been proposed to explain the processes that are involved in the perception and the recognition of faces (Bruce & Young, 1986; Burton, Jenkins, Hancock, & White, 2005; Clutterbuck & Johnston, 2002, 2005). Currently, much of the accumulated evidence suggests that face recognition is primarily a bottom-up process. First, visual-sensory input is used to produce an internal representation of the face. Then, during recognition, this representation is compared with various candidate representations of faces to signal a match. A successful match is signalled to the cognitive system when sufficient correspondence has been achieved (for a review see De Haan, 2001; Palermo & Rhodes, 2007). Few, if any, of the existing models consider metacognition as a factor that may shape face perception and affect subsequent face recognition attempts.

In this chapter, we assert that the face recognition literature should consider the role of metacognition in face perception. We demonstrate that eyewitnesses often fail to notice changes in the outcome of their face recognition and identification decisions, albeit having sufficient memory resources. This effect is known as *choice blindness*. We provide evidence suggesting that the acceptance of this type of facial identity change can affect subsequent recognition attempts, not because of lacking memory resources but because participants come to believe that the non-chosen face had been their original choice.

The first part of this chapter provides a brief overview of findings on choice blindness for preferential choices with a focus on judgements of facial attractiveness. This is followed by a discussion of the application of the choice blindness paradigm in the field of eyewitness face recognition and identification decisions. We demonstrate that face recognition decisions are malleable and easily shaped by simple choice blindness manipulations. Consequently, we discuss potential mechanisms of choice blindness concentrating on those that originate from or are relevant for the face recognition literature. Through this discussion, we aspire to show that metacognition is a contributing factor that deserves consideration in contemporary models of face recognition. In the final part of this chapter we consider the relevance of the choice blindness paradigm for the legal setting.

CHOICE BLINDNESS

Choice blindness refers to the difficulty people have in detecting covert changes in the outcome of a choice they previously made and their tendency to justify choices they never made. In a first demonstration of the phenomenon, Johansson, Hall, Sikström, and Olsson (2005) presented participants with pairs of images of female faces and asked them to choose which face in each pair they found more attractive. Then the experimenter put the images face-down and slid the selected image face to the participant. The participant picked the slid image up and

described the reasons for having chosen that face. However, in some of the trials, the experimenter used a sleight of hand magic card trick and passed the rejected face on to the participant. Hence, participants actually ended up with the non-chosen face. In the overwhelming majority of trials (75%) participants were willing to endorse the originally rejected face; thus appearing blind to the manipulation. When asked to explain the reasons behind their choice, participants often referred to unique features of the manipulated face which, strikingly, had not been present in the chosen person, such as blond hair when the actually chosen person had dark hair (Johansson, Hall, Sikström, Tärning, & Lind, 2006). Interestingly, when participants were given a description of the procedure (prior to the debriefing) and were asked whether they would have noticed such choice manipulations, the vast majority of them were confident that they would have done so. This effect is dubbed choice blindness blindness.

Following the original demonstration choice blindness has been replicated with male and female faces in live (Johansson et al., 2006) and on screen interactions (Johansson, Hall, & Sikström, 2008). In later years, choice blindness has been demonstrated in all different modalities. Hall, Johansson, Tärning, Sikström, and Deutgen (2010) showed the effect for olfactory and gustatory stimuli in live interaction with supermarket customers. Steenfeldt-Kristensen and Thornton (2013) established choice blindness for tactile stimuli and haptic object recognition. Sauerland, Sagana, and Otgaar (2013) demonstrated that choice blindness extends to auditory stimuli; findings which have been extended further in the linguistic domain with spoken decisions (Lind, Hall, Breidegard, Balkenius, & Johansson, 2014). Furthermore, recent studies have broadened the application of the choice blindness paradigm in the context of attitude formation and moral sentiment (Johansson, Hall, & Chater, 2012), political preferences (Hall et al., 2013), norm violating behaviours (Sauerland, Schell-Leugers, & Sagana, 2015; Sauerland, Schell, et al., 2013) and suspects' alibis (Sauerland, Mehlkopf, Krix, & Sagana, 2016) with striking results. For instance, Hall et al. (2013) who changed participants voting intentions for the opposite of a previously stated voting intention, reported that about 80% of the manipulations remained undetected. Likewise, Sauerland and colleagues (2013, 2015) manipulated the frequency with which participants reported to have committed certain transgressions. Participants were blind to up to 40% of these alterations. Additionally, Sauerland et al. (2016) found that participants were largely blind (range 64-99%) to alterations in the content of their alibis when interviewed a few days following their original alibi statements. Together, these studies suggest that choice blindness can occur for a wide variety of stimuli and decisions, including those that are important and highly self-relevant.

Apart from the immediate impact of choice blindness, accumulating evidence indicates that the effect may continue to influence perception and decision making beyond the time of the initial manipulation. For example, Johansson, Hall, Tärning, Sikström, and Chater (2014) observed that when participants had to indicate their preference concerning the attractiveness of two faces again in a second round directly following the first, the initially rejected faces were chosen more frequently

and the perceived attractiveness of these faces increased in the second selection round (for a replication see Taya, Gupta, Farber, & Mullette-Gillman, 2014). Similarly, Merckelbach, Jelicic, and Pieters (2011) found that participants not only failed to detect mismatches in the intensity of their psychological symptoms but were also more likely to report increased symptom ratings at a re-test one week later. Likewise, Sauerland, Schell, et al. (2013) described that participants who failed to notice manipulations on how often they had committed certain norm-violating behaviours tended to modify their ratings in a way that was mostly consistent with the manipulation four weeks after an initial interview.

The realization that decisions are sensitive to simple manipulations may surprise researchers because it is accompanied with questions about the limits of people's perceptual and decision making abilities. Above all, choice blindness is a dramatic manifestation of human fallibility across a wide range of cognitive domains. This makes the choice blindness paradigm an effective tool in understanding human perception in general.

CHOICE BLINDNESS FOR FACE RECOGNITION

In parallel with the expansion of the choice blindness paradigm to various evaluative decisions, we were interested in its application to the field of face recognition and identification decisions. We aimed to examine whether choice blindness is relevant for decisions about the identity of a suspect following a crime. That is, whether eyewitnesses would realize that an originally recognized face had been swapped. Although this line of work was not aimed at investigating face recognition per se, we believe that it can shed light on factors that are related to face recognition. More specifically, the inability to detect a manipulation might reflect the conditions under which face perception and recognition fail. Here, we aspire to demonstrate that the choice blindness paradigm is a useful tool for studying (the limits of) face recognition.

The first systematic study of choice blindness manipulations for recognition decisions tested whether and under which conditions blindness phenomena occur in the eyewitness setting (Sagana, Sauerland, & Merckelbach, 2014b). At first, we approached the possibility that blindness phenomena would transfer to recognition tasks with scepticism. This was because in choice blindness for recognition decisions, the change in the outcome goes beyond the abstract character of preferential choices. The change takes place at the observable, visible level and more specifically with regard to the features of a previously studied face. In other words, recognition decisions are absolute in nature (i.e., correct or incorrect) while preferential choices are evaluative and might change depending on mood or context (Loewenstein & Small, 2007). For these reasons, preferential choices may be more susceptible to choice-blindness manipulations than face recognition decisions. This hypothesis was tested in a series of experiments where participants first watched a number of mock crime videos and then identified the targets from simultaneous target-present photo-arrays. Following each forced-choice

recognition decision, participants were confronted with the identified face and were asked to provide reasons for their decision. On some of the trials, however, participants were confronted with an originally non-chosen face from the photo-array. When the confrontation with the manipulated outcome occurred shortly after the identification, participants failed to immediately detect (i.e., concurrent blindness) the manipulations at a rate of 32-35% (Experiments 2a-c). After participants had been informed about the possibility of a manipulation (i.e., in retrospect) blindness rates were virtually non-existent. When a 48hr interval was inserted between the identification and the confrontation with the manipulated outcome, blindness rates rose to 68% concurrently and to 39% in retrospect (Experiment 3). In this line of research, we established that blindness phenomena are pertinent to face recognition decisions.

To confirm the occurrence of the effect under naturalistic encoding conditions, two additional experiments employing a field study methodology were conducted. Using staged neutral (Sagana, Sauerland, & Merckelbach, 2013) and crime-related events (Sagana, Sauerland, & Merckelbach, 2015a), we replicated the laboratory findings demonstrating that blindness for identification decisions can occur at an alarmingly high level in real life settings (41-69%), even when the manipulation occurred minutes following the identification. Recently, Cochran, Greenspan, Bogart, and Loftus (2016) replicated these findings with similar blindness rates. Furthermore, they demonstrated that, compared to detectors, participants who were blind to the manipulation were more likely to change their identification decision in the direction of the manipulation when asked to perform the identification task a second time. Considering all this evidence our concerns regarding the extension of choice blindness for recognition decisions dissipated rapidly. Importantly, these results show that recognition decisions are susceptible to simple manipulations and therefore imply that our representations of unfamiliar faces may be even more fragile than originally thought.

Apart from establishing blindness phenomena in a naturalistic setting, our field study findings (Sagana et al., 2013) showed that high similarity between the originally chosen and the manipulated face increases blindness rates (but see Johansson et al., 2005). This may be because the early mental representations of unfamiliar faces are too crude to capture small differences between faces. In line with this view are also the findings emerging from the application of the choice blindness paradigm to cross-race identification decisions (Sagana, Sauerland, & Merckelbach, 2015b). Specifically, participants who made other-race identifications were more likely to be blind to the change in the identity of the originally chosen face than participants who made own-race identifications. Because the ability to distinguish the facial features that are diagnostic for recognition is inherently difficult for other-race faces (Michel, Corneille, & Rossion, 2007; Rhodes et al., 2009; Valentine, 2001), it can be reasoned that the early mental representations of other-race faces would be less specific than those of own-race faces. This may in turn hinder the detection of a manipulation. Taken together, these discoveries speak to the limited ability of people to account for

between-face variability among unfamiliar faces and put forward the idea that choice blindness could be a useful paradigm for the study of face recognition.

Recently, we extended the application of the choice blindness paradigm to an area of cognition research that does not require explicit face recognition, namely unfamiliar face matching. More specifically, we examined the pliability of face identity judgements by combining a face sorting task with blindness manipulations (Sauerland et al., 2014). Participants first had to sort facial images by identity, such that images of the same person were grouped together. Then the experimenter extracted image pairs that were grouped either together or apart and asked the participants to justify their grouping decisions. On manipulated trials, however, the presented pairings were different from those the participants had actually produced. Blindness rates for these identity manipulations were strikingly high (up to 77%). Interestingly, the justifications for identity decisions that participants had not made typically referred to specific facial features (for similar findings see Johansson et al., 2006). This latter finding underscores the fragile insight in our own judgements about other people's faces. Furthermore, we found that high confidence in one's matching decision was associated with low prevalence of choice blindness. Similar findings have been reported for recognition decisions (Sagana et al., 2013). This suggests that the trust one puts in the ability to match the faces might determine how flexible one's criterion is when accepting within-face variation (Sauerland et al., 2014). Hence, the low confidence in one's own face matching ability might result in a greater willingness to accept variations in the facial characteristics, without doubting the identity of the depicted person.

Apart from demonstrating that blindness phenomena are relevant for recognition and identification decisions, this line of work also raises questions about the role of memory strength for blindness to occur. Memory strength in this setting can be approximated by recognition accuracy. Our laboratory studies, where recognition accuracy was the highest, revealed no meaningful effect of recognition accuracy on concurrent and retrospective blindness rates (Sagana et al., 2014b; Sagana et al., 2015b). However, in our first field study accurate recognition decisions were associated with lower retrospective, but not concurrent blindness rates, compared to inaccurate ones (Sagana et al., 2013). A different picture emerged from our second field study. Although accuracy rates were comparable to the earlier field study, participants who made accurate positive identification decisions displayed higher concurrent, but not retrospective, blindness than participants who made an inaccurate positive identification (Sagana et al., 2015a). Together with the finding that participants are capable of remembering their choices with precision when requested to do so, even when they had failed to notice the manipulation (Sagana, Sauerland, & Merckelbach, 2014a), these results led us to believe that memory strength is insufficient for explaining blindness phenomena. Further support for this position comes from work investigating recognition and source memory for preferential choices. Pärnamets, Hall, and Johansson (2015) found that participants' face recognition accuracy, tested following a choice blindness manipulation, did not differ between detected and non-detected trials.

When participants were asked to make a recognition decision between a previously presented and a new face (i.e., a morph between one of the previously presented faces and a non-presented face), the accuracy did not differ between detected (96.3%) and not-detected trials (95.9%). Nevertheless, participants' ability to classify a correctly recognised face as the one they had or had not chosen was decreased for non-detected compared to detected trials. That is, participants blind to the manipulation misattributed the non-chosen face as chosen when asked to indicate if the recognised face was also the chosen one. The authors interpreted these findings as evidence for a differential distortion between face recognition and the ability to correctly attribute the source of a memory as a result of choice blindness manipulations. In other words, the inability to detect a swap between identities might reflect errors in determining the source of a memory rather than problems with the representation and preservation of facial features.

CHOICE BLINDNESS IN VIEW OF FACE PROCESSING

The notion of a differential effect of choice blindness on face recognition and source memory (Pärnamets et al., 2015) is important because it alludes to the mechanism(s) underlying choice blindness. To be clear, the exact mechanisms underlying the effect are not yet known. So far, only a few studies have focused on the forces driving choice blindness. Consequently, many of the explanations offered here are primarily conjectural and have not yet been tested empirically. We will concentrate on mechanisms that originate from or are relevant for the face recognition literature.

From a perceptual point of view, successful face recognition requires a face to be coded in abstract face representations that are freed from surface appearance and qualities such as pose, expression or context (Bruce & Young, 1986; Burton, Bruce, & Hancock, 1999; Johnston & Edmonds, 2009). The aptitude to process a face in some abstract manner that eliminates information irrelevant to its identity increases with exposure to different instances of the same face (Burton et al., 2005; Burton, Jenkins, & Schweinberger, 2011; Jenkins & Burton, 2008). Accordingly, the robustness of familiar face recognition is theorized to be the result of abstract facial representations that develop over time and through exposure from different angles and contexts (Burton et al., 2005; Burton et al., 2011). Likewise, the struggle to recognise unfamiliar faces is considered by many to originate from the fact that these faces are processed in more image-specific, rather than identity-specific ways (a literature review on this issue is beyond the scope of this chapter, for an extensive review see Burton et al., 2011). Relatedly, a large body of research has demonstrated that within-face variability poses a problem for unfamiliar face recognition, as showcased in people classifying two pictures of the same face as different persons (Burton et al., 2011; Jenkins, White, Van Montfort, & Burton, 2011; Johnston & Bindemann, 2013; Megreya, Sandford, & Burton, 2013). The latter implies that in order to be able to recognize a face successfully, one needs to learn how facial appearance varies. Drawing on this evidence, we suggest that

choice blindness for faces might derive from participants' limited representation of the presented faces, because they are provided with only one or few photographs or short videos of unfamiliar faces. Consequently, the confrontation with the non-chosen face may be interpreted as another variant of the originally chosen face. Findings showing higher blindness rates for highly similar faces (Sagana et al., 2013) and for other-race identifications (Sagana et al., 2015b) support this view. The situation may be aggravated further by the fact that people have limited insight into their ability to recognise unfamiliar faces (Bindemann, Attard, & Johnston, 2014) as they lack the markers that could signal the discrepancy between the chosen and the non-chosen face.

Apart from the perceptual aspects (i.e., visual sensory input), cognitive aspects are also important for successful recognition (Burton et al., 1999; Hancock, Bruce, & Burton, 2000). These aspects focus on how we store and retrieve information of an individual's facial appearance. Specifically, to make an identification a decision-making mechanism needs to be activated. The activation signals the degree of resemblance between the seen face and the stored representation in order to deem a person as familiar or unfamiliar (Bruce & Young, 1986; Burton et al., 1999; Hay, Young, & Ellis, 1991)[1]. Hay et al. (1991) argued that this decision mechanism needs to be flexible and tolerate some degree of mismatch to accommodate for poor view of a face or natural changes in appearance. Participants in choice blindness experiments are often accurate in their identification decisions (though accuracy depends on the difficulty of the task) and are able to discriminate between old and new stimuli (Pärnamets et al., 2015). These findings suggest that participants possess those perceptual elements that are necessary for the identification. Accordingly, we can infer that blindness may be the result of a failure at the cognitive level when determining whether the degree of resemblance is sufficient to signal a match.

Within this context, it is sensible to consider the role of metacognition. Low confidence in the accuracy of a recognition decision or a face matching task have been associated with high prevalence of choice blindness (Sagana et al., 2013;

[1] This interpretation comes close to the monitoring and control framework of Koriat and Goldsmith (1996), which posits that people invoke monitoring and control processes to obstruct potentially wrong information. The model includes a monitoring process that assesses the correctness and informativeness of the potential response and a control mechanism that determines whether to volunteer the best candidate answer through the regulation of precision and coarseness of the information (Goldsmith, Koriat, & Weinberg-Eliezer, 2002; Koriat & Goldsmith, 1996). That is, witnesses first retrieve a very informative and detailed candidate answer from memory. Then, the individual's feeling of rightness (i.e., confidence in the likely accuracy) of the candidate answer is assessed and is finally tested against a criterion value. If confidence exceeds the criterion, the detailed answer is volunteered; otherwise, a less detailed and relatively coarse answer is retrieved from memory, and the monitoring and control processes are repeated.

Sauerland et al., 2014). Hence, choice blindness may be caused by some participants feeling under-confident in their identification or recognition decision and distrusting their memory; despite good facial representations. This, in turn, renders them more susceptible to accept information suggested by external sources (Gudjonsson, Kopelman, & MacKeith, 1999), such as a manipulated decision outcome. This interpretation is in line with the finding that people have poor insight into their ability to recognise unfamiliar faces (Bindemann et al., 2014). More generally, the lack of insight into our recognition judgements, which is essentially a metacognitive skill, might facilitate perceptual errors. Additionally, as discussed above, participants blind to a manipulation have been shown to adapt their face choices in accordance with the manipulated outcome later on (Cochran et al., 2016; Johansson et al., 2013). This supports the view that the belief that a non-chosen face had in fact been chosen can shape subsequent face recognition attempts. This is a powerful illustration of how confidence and the act of reflecting on our previous decisions can shape the way we regard and understand faces. These preference reversals resemble the *choice induced preference change* effect, which refers to the observation that choices are able to alter one's preferences (Chammat et al., 2017), thus suggesting a common mechanism of choice blindness and choice induced preference change. Accordingly, choice blindness may simply disclose the role of metacognition in ensuring a conscious coherence between our past actions and current beliefs (Chammat et al., 2017). For face recognition decisions, this means that the outcome of a choice and metacognitive influences can modify the representation of the facial features generated from the original exposure to the face.

Apart from the perceptual and cognitive aspects of recognition, we should also consider the possibility that the failure to detect changes in facial identity reflect a source monitoring error. Disruptions either in memory (e.g., forgetting) or in decision making (e.g., due to heuristics, social influences) might cause participants to mistake the non-chosen face as chosen. This was illustrated by Pärnamets et al. (2015) and is supported by recent findings in our lab concerning blindness for changes in one's own written eyewitness reports (Sagana, Sauerland, & Merckelbach, 2017). Here participants written reports following a witnessed mock crime were manipulated such that four critical details were discordant with the original report. Blindness rates for these manipulations increased disproportionately when the retention interval between the production of the original report and the presentation of the manipulated version was longer (a month) rather than shorter (minutes and 48hr). The finding is in line with the idea that due to fading memory cues, participants may not be able to trace whether the (manipulated) detail comes from their original version of the report or whether it was externally suggested. Hence, source monitoring errors may be the reason for the elevated choice blindness rates.

CONTRIBUTIONS OF CHOICE BLINDNESS TO THE FACE RECOGNITION LITERATURE

In our view the greatest contribution of choice blindness to the field of face recognition is the insight that metacognition may shape face perception. Choice blindness exemplifies in the most dramatic way that our beliefs and views of our own abilities can affect the way we recognise faces. We have seen that the degree of confidence we ascribe to identification or face matching decisions is associated with the prevalence of blindness, with low confidence leading to higher blindness rates (Sagana et al., 2013; Sauerland et al., 2014). Relatedly, when participants believe, erroneously, that they had chosen the manipulated face and are asked to perform the task a second time, they tend to modify their decisions to match the manipulated outcome (Cochran et al., 2016; Pärnamets et al., 2015). Additionally, when participants who fail to notice the changed identity provide justifications for a choice they never made, they often refer to facial features that are not evident in the original choice or that belong to the original but not the manipulated face (Johansson et al., 2006; Sauerland, Schell, et al., 2013).

These findings not only illustrate the fragility of peoples' representations of unfamiliar faces but also demonstrate the potential power of metacognition in face perception. In conclusion, we hold that the face recognition literature would profit from considering the role of metacognitive thoughts on face perception and recognition. Furthermore, we argue that the choice blindness paradigm could serve as a means of studying face recognition and more specifically the differences between familiar and unfamiliar face recognition. It is a common, though untested, belief that the choice blindness effect would not hold for familiar faces. It should be hard, to say the least, to trick participants regarding the identity of their best friend or the person they are about to marry. Though this assumption remains to be tested, the results of such experimentation would be meaningful for face recognition research. If supported, the choice blindness paradigm could be used to study how unfamiliar faces become familiar and the prerequisites of this process. If, on the other hand, choice blindness is evident for familiar as well as unfamiliar faces, then that could point to the common denominator between these two.

PRACTICAL IMPLICATIONS FOR THE FIELD OF LEGAL PSYCHOLOGY

Choice blindness for face recognition and identification decisions has important implications for the legal setting. Many of the findings presented here indicate that a large proportion of eyewitnesses would fail to detect changes in the outcome of their identification decisions. Consider, for example, the case of Bernard Maughan who was brought to the police station under the suspicion of a hit and run near his neighbourhood. Maughan, already known to the police because of previous violations, was a reasonably good suspect for the incident and was therefore put in a live lineup for an eyewitness to make an identification. Maughan

was placed at position number seven. The eyewitness proceeded and made an identification by saying "I think it's number six". The administrator of the lineup mistakenly noted down "I think it's number seven". Following the protocol the administrator read the (erroneous) sentence back to the witness. Anyone would have expected the witness to object to this blunt change in her identification decision. Furthermore, one would have expected that the Maughan's lawyer, who was present during the identification, would have protested and requested for the mistake to be corrected. Yet neither the witness nor the lawyer demurred. As a result, the official record did not mention the actually identified lineup member. The defendant was charged. It was only during the appeal, two years later, that the defendant's new lawyer spotted the miscommunication while reviewing the identification tapes (Wolchover, n.d.). The behaviour of the witness and the lawyer is incomprehensible. There seems to be no reason why they would both accept the change in the identification decision. Their strange behaviour may be a real-life instance of choice blindness.

Mistaken or deliberate manipulations of that sort can lead to the incrimination of innocents and impede the investigation and conviction of the real perpetrator. Even if these mistakes were corrected, given the long-term effects that choice blindness might have on eyewitness memory and decision making, witnesses who have been exposed to a blindness manipulation can no longer provide reliable information. These issues are of high relevance particularly in light of the report on prosecutorial misconduct cases compiled by the Northern California Innocence Project (Ridolfi & Possley, 2010). The report sides with the notion of altered identification decisions and tampered testimony in real investigations. Specifically, the report revealed 4,000 cases of alleged misconduct, in 707 of which the courts explicitly established that the prosecutors deliberately mishandled, mistreated or destroyed evidence. Therefore, the issues emerging from this line of work directly appeal to and emphasize the importance of blind lineup administration procedures that leave little room for surreptitious manipulations. Furthermore, studies indicating the relevance of blindness phenomena in the field of interrogations and false confessions, and eyewitness interviews (Sagana et al., 2017; Sauerland et al., 2015; Sauerland, Schell, et al., 2013) underscore the importance of camera recordings during the interviewing process. Additionally, our findings regarding matching identities apply to situations where police or eyewitnesses have to match CCTV images of the perpetrator with a suspect (Sauerland et al., 2014). The results suggest that witnesses or police may be blind to their own identity matches. If matching decisions are poorly documented, due to procedural errors, misunderstandings or even deliberate manipulations (Findley & Scott, 2006), a switch of identities could easily go undetected and the images can be presented in court as identification evidence (Valentine, 2006). Considering how often other errors slip into forensic testing procedures, and the flexibility with which some types of evidence are treated (see Ask, Rebelius, & Granhag, 2008; Kassin, Dror, & Kukucka, 2013; Ridolfi & Possley, 2010; Saks & Koehler, 2005), it would be

interesting to estimate the frequency of identity switches. The clear implication of our current findings is that such switches could easily go undetected.

To sum up, the application of the choice blindness paradigm in the field of face recognition and identification decision has important implications for theory and practice. We believe that choice blindness, as an effect as well as a paradigm, offers many interesting avenues for future research and can provide useful insights in the field of face recognition.

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