



## Mental control and visual illusions: Toward explaining race-biased weapon misidentifications<sup>☆</sup>

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### Abstract

People are biased to misidentify harmless objects as weapons when the objects are associated with African Americans (Payne, 2001). Two studies examined the processes underlying this bias. The illusory perception hypothesis argues that stereotypes alter the subjective construal of the object. In contrast, the executive failure hypothesis argues that even when perception of the item is intact, misidentifications can result from failures to control responses. Immediately after making an error, participants were able to accurately express that they had made a mistake via confidence ratings (Experiment 1) and by correcting their judgment (Experiment 2). Subjective confidence judgments were extremely well calibrated to accuracy, and participants virtually never believed their own mistakes. Conditions likely to create errors through both illusions and control failures are discussed.

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People tend to misidentify harmless objects as weapons when the objects are associated with African Americans. This bias was reported by Payne (2001) and subsequently found by two other laboratories (Correll, Park, Judd, & Wittenbrink, 2002; Greenwald, Oakes, & Hoffman, 2003). The weapon bias occurs regardless of whether the stimuli are complex scenes (Correll et al., 2002; Greenwald et al., 2003) or simple photographs of faces and objects (Payne, 2001). It occurs whether the judgment is framed as a perceptual gun/tool classification (Payne, 2001) or as a behavioral shoot/do not-shoot decision (Correll et al., 2002; Greenwald et al., 2003). Finally, the bias occurs among African American participants as well as among White Americans (Correll et al., 2002).

These findings are of theoretical and practical interest because they link recent advances in implicit prejudice research with significant socio-political events, such as the mistaken shooting deaths of Amadou Diallo and Timothy Thomas. In both of these well-publicized incidents, the victims were young Black men who were killed when police officers mistakenly responded as if they were armed. These two cases sparked peaceful protests and violent riots, civil suits and criminal trials, and new legislation aimed at reducing race biases in police practices. Because of the potential implications of research showing systematic race biases in weapon identification, it is important to develop a detailed theoretical understanding of the processes underlying this bias.

Two major classes of process explanations might account for the race bias. The first is that misidentifications result from distorted perceptions, and the second is that they result from failures to control one's responses. Both accounts are plausible, and have precedent in other literatures. The goal of the present research is to directly evaluate these two accounts.

The *illusory perception hypothesis* argues that participants misperceive the objects in what amounts to a

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perceptual illusion. This explanation assumes that perceivers use stereotypes as cues to resolve perceptual ambiguity, thus influencing their construal of the object. This hypothesis is consistent with the explanation behind scores of heavily studied perceptual illusions. The well-known Müller–Lyer illusion illustrated in Fig. 1 serves as an example. Here, the vertical line on the left appears longer than the one on the right. But in reality the line on the right is very slightly longer, as a ruler will confirm. Most viewers of this illusion find it compelling and will assert with high confidence that the left line looks longer.

One prominent explanation for this illusion holds that the visual system compensates for the fact that objects viewed in depth change apparent size depending on how far away they are. In most situations in daily life, lines flanked by concave angles like the left arrow recede away from us in depth (like the corner of a room or the far leg of a table). In contrast, lines flanked by convex angles like the right arrow jut out toward us (like the near corner of a table). The visual system compensates for these expected differences in size that co-occur with depth cues by interpreting the left line as longer than the right line.

By analogy, the illusory perception hypothesis holds that race cues provide a context which the mind uses to “adjust” or “fill in” aspects of the scene as it transforms raw sensation into the perception of a meaningful object. The visual assumption revealed by the race bias would be that items associated with African Americans are likely to be dangerous. The illusory perception hypothesis suggests that the mind incorporates these top-down assumptions by interpreting some objects as weapons when they are paired with Black racial cues.

The illusory perception hypothesis is consistent with social psychological perspectives that emphasize subjective construal as a major mechanism responsible for creating biases. Bruner’s (1957) seminal work on “perceptual readiness” argued that the cognitive accessibility

of potential categories determined how a stimulus was categorized, and thus how it was perceived. According to the constructivist approach fostered by the “New Look” movement, priming with African American faces should have the effect of making the weapon category more accessible. This heightened accessibility should cause harmless items to be misperceived as weapons some portion of the time, creating the race bias in question (see Payne, Jacoby, & Lambert, in press for a related discussion).

Research on race biases in weapon identification to date has used language that is generally consistent with this interpretation. For example, Payne (2001) referred to the bias as “misperceiving a weapon,” (p. 181). Similarly, Correll et al. (2002) described the stereotype bias as an effect that “can act as a schema to influence perceptions of an ambiguously threatening target” (p. 1325). Finally, Greenwald and colleagues (2003) emphasized the “perceptual ability to discriminate a weapon from a harmless object” (p. 405). This constructivist approach with its emphasis on subjective construal seems to be a common perspective from which researchers interpret this phenomenon. One way to think about the illusory perception hypothesis is by asking about the subjective reaction of a person who has just mistakenly “fired” at an unarmed suspect. Does the person immediately regret the snap decision that he or she knows to be a mistake? Or does the person firmly believe that they saw a gun? A false perception presumably would lead to the second reaction.

In contrast to the illusory perception account, the *executive failure hypothesis* argues that errors can occur even when perceptions of the objects are intact. The problem is that people fail to execute their actions as they intend. Executive control describes an ability to plan and carry out selective behaviors in a way that follows one’s goals. In many cases, this includes the need to override responses that are highly activated or well-learned but inappropriate. Because “selection” is an inherently relative concept, it is necessarily accompanied by the need to inhibit or suppress other potentially distracting information. Specifically, race stereotypes are expected to be activated by the race cues in the weapon identification task. Thus two different streams of information are available as bases for making responses: accessible stereotypes and the actual target item. Executive control performs a gating function, selectively allowing the appropriate information to control actions, while averting the influence of activated but inappropriate information. The executive failure hypothesis suggests that in a lack of coordination between eye, brain, and hand, participants’ *actions* are systematically biased even though they may be aware that they have made an error.

Extreme examples of executive failure can be seen among people with brain damage to areas in the pre-

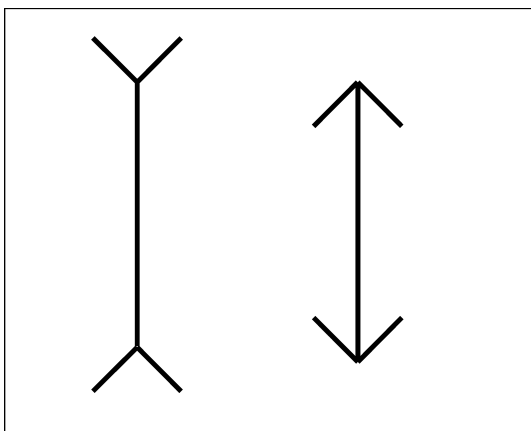


Fig. 1. The Müller–Lyer illusion.

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