Crime Type, Perceived Stereotypicality, and Memory Biases: A Contextual Model of Eyewitness Identification

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Summary: The fallibility of eyewitness identifications is well documented. Nevertheless, research has yet to assess the possibility that the type of crime committed systematically influences who eyewitnesses mistakenly identify. We address this oversight by presenting a contextual model of eyewitness identification (CMEI). The CMEI asserts that discrete crimes automatically activate distinct stereotypes about a perpetrator’s appearance. Depending on the congruence between these stereotypes and the perpetrator’s actual appearance, eyewitnesses will remember the perpetrator as appearing more (or less) representative of his or her group (i.e., higher or lower on perceived stereotypicality). Estimator and system variables are posited to affect identifications at different stages of the identification process. The literatures on stereotype activation, perceived stereotypicality, and stereotype-consistent memory biases are reviewed to support the CMEI. Our conceptual integration provides a model of eyewitness identification that explains when mistaken identifications are likely to occur and who they are likely to affect. Copyright © 2014 John Wiley & Sons, Ltd.

Decades of research demonstrate the frailty of eyewitness memory (see Clark & Godfrey, 2009; Wells & Olson, 2003). Although this literature has done an excellent job of documenting when errors in eyewitness identification are likely to occur, little is known about whether the type of crime committed (i.e., the crime type) systematically affects who eyewitnesses mistakenly identify. In the current paper, we argue that focusing on the crime type can help explain why eyewitnesses choose one innocent suspect over another from a police line-up. To advance this thesis, we provide an integration of the literatures on (i) the automaticity of stereotype activation, (ii) perceived stereotypicality, and (iii) stereotype-consistent memory biases. In doing so, we develop a contextual model of eyewitness identification (CMEI). After showing how these respective literatures support the CMEI, we review recent studies that directly test our model. We conclude by discussing the generalizability of the CMEI and examining the implications our synthesis has for the identification process.

THE ACCURACY OF EYEWITNESS IDENTIFICATION

A healthy literature has demonstrated that many variables can affect the accuracy of eyewitness identifications. In doing so, this research makes a critical distinction between estimator and system variables (Wells, 1978). Estimator variables include aspects of the crime (e.g., the eyewitness, the perpetrator, and the duration of the crime), whereas system variables refer to factors that are controllable by those in the criminal justice system (e.g., the line-up construction, instructions, and implementation). Because excellent reviews of this literature already exist (see Clark & Godfrey, 2009; Deffenbacher, Bornstein, Penrod, & McGorty, 2004; Meissner & Brigham, 2001; Steblyay, 1997; Wells & Olson, 2003), we will only briefly discuss the major findings to emerge from these studies. Together, this research indicates when errors in eyewitness identification are likely to occur.

Estimator variables

Many aspects of the crime can affect the accuracy of eyewitness identifications. Unsurprisingly, the amount of time eyewitnesses are able to see a perpetrator positively correlates with identification accuracy (MacLin, MacLin, & Malpass, 2001; Meissner & Brigham, 2001; Memon, Hope, & Bull, 2003; Pezdek & Blandon-Gitlin, 2005). Likewise, eyewitnesses who are cognitively busy while witnessing a crime—or while performing an identification task—are less accurate in their identifications than their counterparts who are not cognitively busy (Garcia-Marques, Hamilton, & Maddox, 2002). Field studies replicate this finding by showing that busy environments produce more identification errors than environments that are not busy (Brigham, Maass, Snyder, & Spaulding, 1982; Fahsing, Ask, & Granhag, 2004).

Because witnessing a crime is inherently stressful, the impact of arousal on the accuracy of memory has also received attention. Intuitively, arousal should produce a decrement to memory performance. The results from past work, however, have provided inconsistent support for this thesis. Specifically, some studies show that arousal decreases the accuracy of eyewitness identifications (Deffenbacher et al., 2004; MacLin et al., 2001; Stanny & Johnson, 2000), whereas others suggest that arousal may enhance memory performance (Bornstein, Liebel, & Scarberry, 1998). These conflicting findings have led some to differentiate between the types of attentional control elicited by arousal-inducing situations (Deffenbacher, 1994; Deffenbacher et al., 2004). Deffenbacher (1994) argued that situations that elicit an arousal mode of attentional control facilitate memory for information that attracts attention. In contrast, situations that elicit an activation mode of attentional control can either improve or impair memory, depending on one’s level of arousal. Specifically, arousal will improve memory up to a point. After reaching a critical threshold, however, increases in arousal will produce a rapid decrement to
memory. Thus, arousal has a multifaceted relationship with memory.

Whether a weapon is present during the commission of a crime can also affect identification accuracy. Studies on the weapon focus effect demonstrate that the presence of a weapon decreases the accuracy of eyewitness identifications (Kramer, Buckhout, & Eugenio, 1990; Pickel, 1998; Pickel, Ross, & Truelove, 2006). A critical finding from this literature is that the reduction in identification accuracy does not occur because of heightened arousal but rather because the novelty associated with the presence of a weapon temporarily draws eyewitnesses’ attention away from the suspect (Kramer et al., 1990; Pickel, 1998; Pickel et al., 2006). That said, recent research suggests that the unusualness of seeing a weapon only partially explains the weapon focus effect (see Hope & Wright, 2007).

Finally, identifications can be impaired when the race of the perpetrator differs from the race of the eyewitness (Behrman & Davey, 2001; Meissner & Brigham, 2001; Pezdek, Blandon-Gitlin, & Moore, 2003). This phenomenon, referred to as the cross-race effect, has received a considerable amount of attention over the last 40 years. Notably, the cross-race effect is robust across both laboratory and field studies (Brigham et al., 1982; Wright, Boyd, & Tredoux, 2001). That said, studies show that the cross-race effect can be reduced (or even eliminated) by recategorizing other-race faces as part of one’s ingroup (Cassidy, Quinn, & Humphreys, 2011; Hehman, Mania, & Gaertner, 2010). Such a finding implies that eyewitnesses’ failure to individuate other-race faces contributes to the cross-race effect (see Hugenberg & Sacco, 2008; Hugenberg, Young, Bernstein, & Sacco, 2010).

System variables

Variables that are controllable by the criminal justice system also affect the accuracy of eyewitness identifications. One such variable is the line-up construction. Indeed, the degree to which known innocent people included in a line-up (i.e., foils) match the description of the perpetrator can affect the accuracy—and, therefore, the diagnostic value—of eyewitness identifications (Cutler, Penrod, & Martens, 1987; Wells, Rydell, & Seelau, 1993). Namely, including foils who match eyewitnesses’ description of the perpetrator yield line-ups that are more diagnostic than line-ups containing foils who do not match eyewitnesses’ description of the perpetrator (Lindsay & Wells, 1980). Foils should not, however, be so similar to the alleged perpetrator that it is impossible to perform the identification task (Luus & Wells, 1991; Wells et al., 1998).

The instructions given to eyewitnesses before the administration of a line-up can also influence the accuracy of their identifications. Eyewitnesses who are told that the perpetrator may not be included in the line-up (i.e., unbiased instructions) are less likely than eyewitnesses who are not given this warning (i.e., biased instructions) to produce false alarms (Brewer & Wells, 2006; Steblay, 1997). This has led the American Psychology-Law Society to recommend that, prior to performing an identification task, all eyewitnesses should be informed that the line-up may not include the actual perpetrator (Wells et al., 1998).

Other studies show that the number of times a line-up is presented to an eyewitness can affect identification accuracy. Specifically, showing a line-up to an eyewitness on multiple occasions can increase the probability of a false alarm (i.e., selecting an innocent suspect from a line-up; Deffenbacher, Bornstein, & Penrod, 2006; Hinz & Pezdek, 2001; Pezdek & Blandon-Gitlin, 2005). Moreover, the delay between seeing the perpetrator and subsequent exposure to the line-up is negatively correlated with the accuracy of eyewitness identifications (Behrman & Davey, 2001; Meissner & Brigham, 2001; Pezdek & Blandon-Gitlin, 2005).

Finally, the presentation of a line-up can influence the accuracy of eyewitness identifications. Specifically, law enforcement officials can present line-ups that show the suspect and foils (i) at the same time (i.e., a simultaneous presentation) or (ii) individually (i.e., a sequential presentation). Whereas simultaneous presentations facilitate the use of relative judgments in which eyewitnesses choose the suspect who most closely matches their memory of the perpetrator relative to the other suspects in the line-up (Wells, 1984), sequential presentations rely on eyewitnesses’ absolute judgments whereby they compare each suspect with their memory of the perpetrator (Lindsay & Wells, 1985). Critically, the latter format is better than the former format at reducing false alarms when the perpetrator is not in the line-up (Cutler & Penrod, 1988; Steblay, Dysart, Fulero, & Lindsay, 2001). Sequential presentations may, however, decrease eyewitnesses’ ‘hit rate’ (i.e., positive identifications) when the perpetrator is in the line-up (Clark & Godfrey, 2009; Steblay et al., 2001).

Summary

Because errors in eyewitness identification are the primary cause of wrongful convictions (Innocence Project, 2013; Wells et al., 1998), the amount of research devoted to uncovering the factors that affect eyewitness memory should come as no surprise. The importance of studying this issue is further motivated by the powerful influence eyewitness testimony has on key players in the criminal justice system (see Benton, Ross, Bradshaw, Thomas, & Bradshaw, 2006). Such efforts have been fruitful; research demonstrates that both estimator and system variables can affect the accuracy of eyewitness identifications. This provides important information about when errors in eyewitness identification are likely to occur. Nevertheless, studies have failed to consider the possibility that the type of crime committed may systematically influence who eyewitnesses mistakenly identify from a line-up. This is a topic to which we now turn.

WHO WILL BE MISTAKENLY IDENTIFIED?

Research on eyewitness identifications has made important advances by documenting when errors in eyewitness identification are likely to occur. Specifically, a number of aspects associated with the crime (i.e., estimator variables), as well as factors under the control of the criminal justice system (i.e., system variables), can affect the rates at which mistaken identifications occur. Although this research provides important insights into how to reduce errors in the identification process, the literature has yet to assess the possibility that
the type of crime committed affects who eyewitnesses mistakenly identify. It is likely, however, that crime types systematically influence eyewitnesses’ memory of a perpetrator’s appearance.

The remainder of the paper will advance the argument that there is a discernible pattern to mistaken identifications. We begin by introducing a CMEI. This model explains both (i) when errors in eyewitness identification will occur and, importantly, (ii) how the type of crime committed affects who eyewitnesses mistakenly identify. To support our model, we integrate the literatures on (i) stereotype activation, (ii) perceived stereotypicality, and (iii) stereotype-consistent memory biases. We then review recent research that directly tests the CMEI. In doing so, we provide the first theory of eyewitness identification that explains why the type of crime committed can systematically influence who eyewitnesses choose from a target-absent identification task.

The contextual model of eyewitness identification

Figure 1 presents the proposed CMEI. The model begins with the palpable, albeit novel, assertion that the type of crime committed affects the identification process. Specifically, crime types are hypothesized to automatically activate corresponding stereotypes about the perpetrator’s appearance (for evidence of the automaticity of stereotype activation, see Blair & Banaji, 1996; also see Devine, 1989). In the context of racial stereotypes about a perpetrator,1 stereotypically White crimes such as embezzlement, serial killing, and identity theft (see Osborne & Davies, 2013) are expected to make stereotypes about Whites salient. Conversely, stereotypically Black crimes such as drive-by shooting, carjacking, and pimping (see Osborne & Davies, 2013) should make stereotypes about Blacks salient.

Once activated, these stereotypes are hypothesized to influence eyewitnesses’ perception and memory of the perpetrator’s face. Continuing with our race-based example, stereotypically White crimes will cause eyewitnesses to preferentially encode—and subsequently retrieve from memory—facial features of the perpetrator that are prototypical of Whites. In contrast, stereotypically Black crimes will cause eyewitnesses to preferentially encode—and subsequently retrieve from memory—facial features of the perpetrator that are prototypical of Blacks. Thus, the CMEI posits that crime types alter eyewitnesses’ memory of the perpetrator’s perceived stereotypicality (i.e., the degree to which a person has physical features perceived as representative of his or her social group). Moreover, these memory alterations should be systematic, thereby providing insight into who eyewitnesses are likely to mistakenly identify.

The consequences of this process are depicted in Figure 2. Photograph B is a picture of a hypothetical perpetrator. Based on the type of crime observed, the CMEI asserts that eyewitnesses will commit distinct images of the perpetrator to memory. Stereotypically White crimes should shift eyewitnesses’ memory of the perpetrator away from the group prototype. This will cause eyewitnesses to encode the perpetrator as being lower on perceived Black stereotypicality (i.e., closer to Picture A) than had he been seen in a neutral context. Conversely, stereotypically Black crimes should shift eyewitnesses’ memory of the perpetrator toward the group prototype. This will cause eyewitnesses to encode the perpetrator as being higher on perceived Black stereotypicality (i.e., closer to Picture C) than had he been seen in a neutral context. Thus, crime types are predicted to indirectly affect eyewitness identifications by activating corresponding racial stereotypes. These stereotypes should, in turn, systematically alter the image of the perpetrator that eyewitnesses commit to memory.

It is important to emphasize that stereotype activation is posited to be a necessary, albeit insufficient, condition affecting eyewitness identifications. Specifically, the CMEI maintains that the application of relevant stereotypes is required to affect eyewitnesses’ memory of a perpetrator. Thus, we argue that stereotype activation—and the subsequent application of these stereotypes—shapes how eyewitnesses encode the appearance of a perpetrator.

Returning to Figure 1, the conditional application of stereotypes is modeled by the moderating influence estimator variables have on the identification process. It has already been noted that these variables affect the accuracy of eyewitness identifications (Behrman & Davey, 2001; Deffenbacher et al., 2004; MacLin et al., 2001; Meissner & Brigham, 2001; Memon et al., 2003; Pezdek et al., 2003; Pickel, 1998; Pickel et al., 2006). According to the CMEI, this decrement in identification accuracy occurs because estimator variables facilitate the application of recently activated stereotypes. That is, estimator variables are hypothesized to increase eyewitnesses’ cognitive load, thereby constraining the controlled processes associated with stereotype suppression (cf. Devine, 1989; Gilbert & Hixon, 1991; Macrae, Schloerscheidt, Bodenhausen, & Milne, 2002). This should ultimately facilitate the application of recently activated stereotypes and subsequently alter eyewitnesses’ memory of the perpetrator.

After encoding and storing an image of the perpetrator, eyewitnesses must retrieve this information during the identification task. The right half of Figure 1 illustrates this process. Because crime types should systematically distort how eyewitnesses’ encode the perpetrator’s appearance, eyewitnesses will perform the identification task with an imperfect image of the perpetrator in mind. That is, the CMEI proposes that eyewitnesses will reference a biased

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1 For conciseness, we focus on racial stereotypes about Blacks and Whites. It should be noted, however, that the process captured by the CMEI should underlie eyewitnesses’ memory for any social group where appearance-based expectations about a prototypical group member are associated with a particular crime. As such, crimes committed in cultures where there are no stereotypes about the physical appearance of a criminal are beyond the scope of the CMEI. We address this limitation in our discussion of the generalizability of our model.

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image of the perpetrator when performing an identification task. Given the facilitation of multiple moderating variables (which will be discussed later), the end result of this process will be a systematic error in eyewitness identification.

As noted earlier, a number of factors controllable by the criminal justice system can affect the accuracy of eyewitness identifications (Behrman & Davey, 2001; Brewer & Wells, 2006; Cutler et al., 1987; Deffenbacher et al., 2006; Hinz & Pezdek, 2001; Pezdek & Blandon-Gitlin, 2005; Steblay, 1997; Steblay et al., 2001). The CMEI argues that one of the ways in which system variables contribute to mistaken identifications is by increasing the likelihood that eyewitnesses’ distorted memory of the perpetrator is relied upon during the identification task. This increased reliance on distorted memory traces should, in turn, increase the likelihood of a mistaken identification when the actual perpetrator is absent from the line-up.

The CMEI provides insight into how the type of crime committed will affect who is mistakenly identified when certain facilitating factors (i.e., system variables) are present. Specifically, when members of a line-up are presented simultaneously, eyewitnesses to a stereotypically Black (White) crime are expected to select a suspect from a line-up who is higher (lower) on perceived Black stereotypicality relative to other suspects in the line-up (cf. Wells, 1984). Likewise, a suspect who is presented multiple times across line-up administrations will have an increased chance of being mistakenly identified when his or her level of perceived stereotypicality is congruent with the stereotypes associated with the specific crime type. Thus, the CMEI argues that victims of mistaken identification are not chosen at random. Rather, numerous factors including the (i) crime type, (ii) estimator variables, and (iii) system variables systematically influence who eyewitnesses choose from a target-absent line-up.

Summary

A CMEI is proposed in which errors in eyewitness identification occur as a function of crime types and corresponding stereotypes. The central thesis of this model is that crime types affect eyewitnesses’ memory of a perpetrator’s perceived stereotypicality. Moreover, both estimator and system variables moderate the accuracy of eyewitness identifications but at separate stages of the identification process. The CMEI increases our understanding of eyewitness identifications and has important implications for the criminal justice system. Before addressing these topics, we turn to the literatures on (i) stereotype activation, (ii) perceived stereotypicality, and (iii) stereotype-consistent memory biases. In doing so, we demonstrate that research in the respective literatures supports the predictions derived from our model.

SUPPORT FOR THE MODEL

Support for the CMEI can be found through an integration of the literatures on stereotype activation, perceived stereotypicality, and stereotype-consistent memory biases. Because each of these respective areas has independently accumulated an impressive body of research, it is beyond the scope of this paper to provide a comprehensive review of these separate literatures. Instead, we focus our attention on findings that are most pertinent to our model. We do, however, note relevant inconsistencies in the literature. Nevertheless, in order to balance the demands of thoroughness with the constraints necessarily imposed on a focused review, we restrict the current discussion to findings that are most applicable to the CMEI.

Stereotype activation

Automaticity of stereotype activation

An integral component of the CMEI is the thesis that contextual cues (i.e., crime types) automatically activate stereotypes. Research on stereotype activation provides consistent support for this claim (Blair & Banaji, 1996; Blair, Judd, & Fallman, 2004; Devine, 1989; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Eberhardt, Goff, Purdie, & Davies, 2004; Payne, 2001). Specifically, exposure to situational cues such as stereotypic traits, occupations, and/or objects (Blair & Banaji, 1996; Kawakami & Dovidio, 2001; Lemm, Dabady, & Banaji, 2005), as well as stereotypes communicated by the media (Davies, Spencer, Quinn, & Gerhardstein, 2002; Davies, Spencer, & Steele, 2005), automatically activate stereotypes about the given social group. Moreover, this activation occurs irrespective of people’s explicit attitudes (Dovidio et al., 1997; Fazio, Jackson, Dunton, & Williams,
Thus, exposure to situational cues stereotypical of a group automatically activates corresponding stereotypes regardless of one’s personal biases.

The CMEI also assumes that stereotype activation occurs across modalities. That is, semantically based stereotypes (i.e., the linguistic component of a stereotype) are posited to activate corresponding appearance-based stereotypes (i.e., the visual component of a stereotype). Research utilizing priming paradigms supports this assumption. Kawakami and Dovidio (2001) showed that participants primed with trait-based stereotypes of men and women subsequently categorized the gender of a target’s face faster when the given face was consistent (vs. inconsistent) with the primed stereotype. Lemm and colleagues (2005) found similar results using gender roles, demonstrating that behaviors strongly associated with a given target group activate corresponding stereotypes about the target’s appearance. Thus, crime types that activate stereotypes about the race of a perpetrator may cross modalities and activate stereotypes about the perpetrator’s appearance.

**Stereotype application**

The CMEI posits that stereotype activation is a necessary, but not sufficient, condition that affects the identification process. Specifically, the application of recently activated stereotypes is needed in order to affect how eyewitnesses’ encode the perpetrator’s appearance. To these ends, we hypothesize that estimator variables facilitate the application of recently activated stereotypes during the encoding process by depleting eyewitnesses’ cognitive resources. Such a sequence is consistent with numerous dual-process models of stereotyping that claim that the initial automatic activation of stereotypes is followed by a secondary controlled process capable of inhibiting stereotype application (cf. Devine, 1989; Fazio & Dunton, 1997; Fazio et al., 1995; Gilbert, 1989; Payne, 2001).

Consistent with the CMEI, variables that deplete people’s cognitive resources exacerbate stereotype application (Macrae et al., 2002). Specifically, performing either multiple tasks (Blair et al., 2004; Gilbert & Hixon, 1991) or a particularly complex task (Bodenhausen & Lichtenstein, 1987) increases the likelihood that previously activated stereotypes will affect evaluations of a stereotyped target. Likewise, decreasing the amount of time participants have to process information—a variable that is similar to the amount of time eyewitnesses are exposed to a perpetrator—increases the likelihood that stereotype application will occur (Dijksterhuis & van Knippenberg, 1995; Payne, 2001). These findings support the CMEI’s assertion that various estimator variables facilitate the application of recently activated stereotypes, thus altering eyewitnesses’ memory of the perpetrator.

**Perceived stereotypicality**

Another assumption made by the CMEI is that the type of crime committed will systematically alter eyewitnesses’ memory of a perpetrator’s appearance. Specifically, we argue that crime types shift eyewitnesses’ memory of the perpetrator’s appearance toward the relevant group stereotype. As described in an earlier section, stereotypically Black crimes should cause eyewitnesses to remember the perpetrator as appearing higher, whereas stereotypically White crimes should cause eyewitnesses to remember the perpetrator as appearing lower, in perceived Black stereotypicality than had the perpetrator been seen in a neutral context.

The assertion that crime types systematically affect eyewitnesses’ memory of the perpetrator assumes that stereotypes are differentially applied to targets based on their level of perceived stereotypicality. Continuing with our race-based example, research shows that people who are high on perceived Black stereotypicality are seen as more representative of their racial group than are people who are low on perceived Black stereotypicality (Blair et al., 2004; Blair, Judd, Sadler, & Jenkins, 2002; Livingston & Brewer, 2002; Maddox & Gray, 2002). Moreover, Livingston and Brewer (2002) demonstrated that people can determine the racial category of a target quicker when the target is high (vs. low) on perceived Black stereotypicality. Thus, stereotypes are differentially associated with targets based on their level of perceived stereotypicality.

The CMEI also argues that the salience of a given stereotype at the time of encoding will influence people’s memory of a perpetrator’s level of perceived stereotypicality. Eberhardt, Dasgupta, and Banaszynski (2003) conducted a pair of studies that test this thesis. Specifically, participants were classified as incremental or entity theorists and subsequently shown a photograph of a racially ambiguous person (i.e., the target) whom they were told was either Black or White. In actuality, the photograph was a morphed composite of two faces—one person who was Black and another person who was White. Participants were later presented with two photographs and asked to select the one that corresponded to their memory of the target. These photographs were altered such that they contained either (i) more of the original Black face (i.e., a face that was high in perceived Black stereotypicality) or (ii) more of the original White face (i.e., a face that was low in perceived Black stereotypicality) relative to the target. In Study 2, participants were also told to sketch the target’s face from memory. A set of judges then indicated whether the sketches were of a Black person or a White person.

Eberhardt and colleagues’ (2003) results support the CMEI’s assertion that memory of a perpetrator’s appearance can be systematically altered. Specifically, their data indicated that entity theorists who were told that a target was Black later remembered the target as appearing higher (vs. lower) in perceived Black stereotypicality. This pattern of results was reversed for participants who were told the target was White. Moreover, data from Study 2 indicated that these memory biases were reflected in participants’ sketches (as assessed by a third-party judge).

Eberhardt and colleagues’ (2003) findings complement other research on the impact that racial categorization has on the perception of faces. Specifically, providing a racial category for racially ambiguous faces affects people’s perceptions of race-based facial features in a stereotype-consistent manner (Levin & Banaji, 2006; MacLin & Malpass, 2001, 2003). Likewise, Corneille, Huart, Beccquart, and Bredart (2004) demonstrated that people accentuate the most
ethnically salient dimensions of a face when remembering ethnically ambiguous faces. Together, these studies support the CMEI’s assertion that stereotypes activated by environmental cues are capable of systematically altering people’s perception and subsequent memory of others’ faces.

**Stereotype-consistent memory biases**

An additional assertion of the CMEI is that, after encoding the perpetrator’s appearance, eyewitnesses will retrieve this information in a stereotype-consistent manner during an identification task. That is, eyewitnesses are posited to remember stereotype-consistent information better than stereotype-inconsistent information. Because people have stereotypes about the facial features of criminals (Bull & McAlpine, 2003; Dumas & Testé, 2006; Yarmey, 1993), this memory bias should systematically alter eyewitnesses’ memory of a perpetrator’s appearance as a function of the crime type. Specifically, the CMEI asserts that crime types will cause eyewitnesses to remember a perpetrator as appearing higher along the corresponding dimension of perceived stereotypicality (e.g., race, gender, and socio-economic status) than had the same person been seen in a neutral context.

Research on the impact that stereotypes have on memory supports this thesis. Specifically, people often recall stereotype-consistent information better than stereotype-inconsistent information (García-Marques et al., 2002; Marsh, Cook, & Hicks, 2006). Moreover, stereotypes can cause people to develop false memories that are consistent with the given stereotype (Lenton, Blair, & Hastie, 2001; Macrae et al., 2002; Payne, Jacoby, & Lambert, 2004). That is, people ‘recall’ information that is consistent with their stereotypes even in the absence of encountering it (e.g., Roediger & McDermott, 1995).

It should be noted that research sometimes reveals the opposite pattern. That is, people sometimes remember stereotype-inconsistent information better than stereotype-consistent information (Dijksterhuis & van Knippenberg, 1995; Macrae, Hewstone, & Griffiths, 1993; Sherman & Frost, 2000). Indeed, an early meta-analysis of the stereotyping and memory literature found a slight tendency for people to remember stereotype-inconsistent information better than stereotype-inconsistent information (Loftus & Loftus, 1982). A subsequent meta-analysis by Fyock and Stangor (1994), however, revealed that stereotype-consistent information is remembered better than stereotype-inconsistent information. Moreover, the authors noted that the bias favoring stereotype-consistent information is particularly prevalent when a strong relationship exists between the given stereotype and the subsequently recalled information—a condition that characterizes the relationship between race and crime types (see Skorinko & Spellman, 2013).

These contradictory findings imply that differences in the experimental setting may contribute to the inconsistencies found in past work. Critically, studies showing a memory preference for stereotype-consistent information are often conducted under conditions that are more analogous to the real world than studies showing the opposite effect (cf. Macrae et al., 1993; Stangor & Duan, 1991). For example, people who are simultaneously performing multiple tasks (Macrae et al., 1993; Marsh et al., 2006; Pendry & Macrae, 1999) or who are hurried (Dijksterhuis & van Knippenberg, 1995) recall more stereotype-consistent information than stereotype-inconsistent information. Likewise, stereotypes that are subtly activated yield preferential recall for stereotype-consistent information (Heider et al., 2007). The conditions that produce memory biases favoring stereotype-consistent information over stereotype-inconsistent information intuitively characterize the conditions under which eyewitnesses encounter a perpetrator and thus lend further support for the CMEI.

**Direct support for the contextual model of eyewitness identification**

Although the literature reviewed earlier provides indirect support for the CMEI, a few studies have directly tested the CMEI’s thesis that crime types will systematically influence people’s memory of others’ faces. Kleider, Cavrak, and Knyucy (2012) paired faces that were either high or low on perceived Black stereotypicality with category labels that were either consistent (i.e., drug dealer) or inconsistent (i.e., artist and teacher) with stereotypes about Blacks. After studying these face-label pairings, participants were shown each face individually and asked to indicate the category label with which the face had initially been paired.

Consistent with the CMEI, Kleider and colleagues (2012) found that faces that were high on perceived Black stereotypicality were more likely to be correctly remembered as being paired with the drug dealer label than with the artist or teacher labels. Conversely, faces that were low on perceived Black stereotypicality were less likely than faces that were high on perceived Black stereotypicality to be correctly remembered as being paired with the drug dealer label. In other words, aspects of the environment (i.e., the category labels) facilitated memory for faces in a stereotype-consistent manner. Other studies have found similar results using faces stereotypical of different occupations (e.g., see Hills, Lewis, & Honey, 2008; Klatzky, Martin, & Kane, 1982).

In the most direct test of the CMEI to date, Osborne and Davies (2013) had two groups of participants watch a slideshow of a male target who was of moderate perceived Black stereotypicality leave a building. Participants in one group were told that the target was a suspect in a stereotypically White crime (i.e., a serial killing), whereas participants in another group were told that the target was a suspect in a stereotypically Black crime (i.e., a drive-by shooting). All participants then watched identical slideshows and were later asked to identify the suspect from a video that morphed his appearance from low-to-high perceived Black stereotypicality. Consistent with the CMEI, participants who expected to see a suspect of a stereotypically Black crime later remembered the suspect as being higher on perceived Black stereotypicality than participants who expected to see the same suspect involved in a stereotypically White crime.

**Summary**

Support for the CMEI comes from a synthesis of the literatures on (i) stereotype activation, (ii) perceived stereotypicality, and (iii) stereotype-consistent memory biases. Specifically, research demonstrates that stereotype activation occurs...
automatically and outside the perceiver’s awareness (Devine, 1989). Additionally, group-based stereotypes are seen as more applicable to people who are high (vs. low) on perceived stereotypicality (Blair et al., 2004; Blair et al., 2002; Eberhardt et al., 2004). Moreover, basic memory processes favor stereotype-consistent information over stereotype-inconsistent information (Bodenhausen & Lichtenstein, 1987; Dijksterhuis & van Knippenberg, 1995; Marsh et al., 2006) particularly when the perceiver’s cognitive resources are depleted (Macrae et al., 2002; Pendry & Macrae, 1999). Finally, recent research directly supports the CMEI by showing that crime types systematically shift people’s memory of a suspect’s appearance in a stereotype-consistent manner (Osborne & Davies, 2013). Thus, the CMEI builds upon a strong empirical foundation.

MODEL GENERALIZABILITY

By incorporating basic psychological processes (i.e., stereotyping and memory biases) into our model of eyewitness identification, the CMEI is able to explain both (i) when errors in eyewitness identification occur and (ii) who they are likely to affect. This section addresses the generalizability of our model by arguing that crime types can activate more than just racial stereotypes. That is, crime types likely imbue different expectations about a perpetrator’s appearance. In turn, these expectations should systematically shift eyewitnesses’ memory of the perpetrator toward the given group prototype. In advancing this argument, we demonstrate the theoretical range of the CMEI. We also note limitations to the model and highlight areas for future research.

Appearance-based stereotypes of different social groups

A central component of the CMEI is the assertion that crime types automatically activate stereotypes about the perpetrator’s appearance. In turn, these stereotypes are expected to systematically alter eyewitnesses’ memory of the perpetrator. It should be noted, however, that people have stereotypes about the appearance of many different groups. As such, the same processes that are posited to influence eyewitnesses’ memory of a perpetrator’s racial stereotypicality should also affect how they remember the perpetrator along other dimensions of stereotypicality (e.g., gender and age). In the following section, we focus on three such dimensions (namely, gender, trustworthiness, and baby-facedness) and conclude with a discussion on the limitations of the CMEI.

Gender stereotypicality

Crime types elicit more than just stereotypes about a perpetrator’s race. Take the distinct crimes of prostitution and rape as a case in point. Whereas people expect prostitutes to look more feminine than rapists, rapists are expected to have more masculine facial features than prostitutes (Ward, Flowe, & Humphries, 2012). As outlined by the CMEI, these different expectations have important implications for the identification process. Namely, suspected prostitutes will have a greater likelihood of being mistakenly identified by an eyewitness if they are high (vs. low) on perceived gender stereotypicality (i.e., if they ‘look’ more feminine). The opposite pattern should occur for suspected rapists.

Although other pairs of crime types will fail to produce as polarized expectations about a suspect’s level of perceived gender stereotypicality as prostitution and rape (see Ward et al., 2012), crime types should activate gender stereotypes to varying degrees. This is particularly likely given that the actual delinquency and arrest rates for men and women vary as a function of crime type (LaGrange & Silverman, 1999)—some crime types are more likely to be committed by men than by women, whereas the reverse pattern (or at least an attenuated one) holds for other crime types. These differential rates of delinquency should, in turn, facilitate the development of stereotypes about the perceived gender stereotypicality of a perpetrator. As posited by the CMEI, these stereotypes will systematically influence how eyewitnesses remember a perpetrator. Thus, future research should address how crime types affect eyewitnesses’ memory of a perpetrator’s perceived gender stereotypicality.

Trustworthiness

An additional facial feature associated with criminality and the legal system is trustworthiness (i.e., the extent to which a person ‘looks’ trustworthy). Relevant to this discussion, beliefs about what a trustworthy person looks like are consensually held (Engell, Haxby, & Todorov, 2007; Rule, Krendl, Ivecic, & Ambady, 2012). Although often inaccurate (see Porter, England, Juodis, ten Brinke, & Wilson, 2008), intuition about a defendant’s trustworthiness can influence how people within the criminal justice system interpret evidence (Porter & ten Brinke, 2009). Thus, trustworthiness is similar to other dimensions of perceived stereotypicality in that people have expectations about the appearance of a trustworthy person, which affect how they process information about the given person.

According to the CMEI, these expectations will shape how eyewitnesses’ encode a person’s appearance. Specifically, eyewitnesses who believe they are watching a person engage in a charitable activity (i.e., an act positively associated with trustworthiness; see Fehrler & Przepiorka, 2013) should remember the person as appearing more trustworthy than had they thought they saw the same person engage in a neutral act. Conversely, eyewitnesses who believe they are watching a person engage in a criminal activity (i.e., an act negatively associated with trustworthiness; see Flowe, 2012) should remember the person as appearing less trustworthy than had they thought they saw the same person engage in a neutral act. In other words, the context in which eyewitnesses believe they are seeing a person should bias how they encode the given person’s appearance in a stereotype-consistent manner.

Baby-facedness

Another feature-based stereotype relevant to criminality is baby-facedness. Research indicates that the criteria used to assess baby-facedness—the extent to which a person has child-like facial features (e.g., eyes that are large and round, coupled with a small chin and high eyebrows)—are shared cross-culturally (McArthur & Berry, 1987). Moreover, perceived baby-facedness positively correlates with multiple trait-based impressions including honesty and warmth (Berry & McArthur, 1985; McArthur & Berry, 1987), whereas
it negatively correlates with perceptions of criminality (Flowe, 2012). Thus, facial features that convey baby-facedness are universally detected and create expectations about a target’s behavior.

The extent to which a person is baby-faced has a number of important implications for the criminal justice system. Jury simulation studies show that expectations about a perpetrator’s baby-facedness vary as a function of crime types and that these expectations affect conviction rates. Specifically, people accused of unintentional acts of criminality are more likely to be convicted if they are baby-faced than if they are not baby-faced (Berry & Zebrowitz-McArthur, 1988). These findings have been replicated within actual courtrooms (Zebrowitz & McDonald, 1991). Thus, eyewitnesses to an unintentional crime will expect the perpetrator to be more baby-faced than had the same perpetrator been seen committing an intentional crime.

According to the CMEI, these expectations should cause eyewitnesses to remember a perpetrator who unintentionally committed a crime as being more baby-faced than had the same perpetrator intentionally committed a crime. Therefore, suspects included in a line-up for an unintentionally committed crime would be more likely to be the victim of mistaken identification if they are baby-faced than if they have mature facial features. The impact crime types have on eyewitnesses’ memory of a perpetrator’s baby-facedness offers yet another interesting avenue for future research.

**Limitations to the model**

Although the CMEI can explain *when* errors in eyewitness identification are likely to occur and *who* they are likely to affect, it is important to note limitations to our model. Specifically, because the CMEI assumes that discrete crime types activate corresponding stereotypes about a perpetrator’s appearance, crimes that are unassociated with feature-based stereotypes are beyond the scope of our model. Likewise, the associations between specific crime types and facial features may vary across cultures. As such, testing must be carried out to examine the cross-cultural generalizability of the CMEI.

**Summary**

Because people have stereotypes about the appearance of many groups, crime types should alter more than just eyewitnesses’ memory of a perpetrator across numerous dimensions of perceived stereotypicality. That is, crime types likely affect eyewitnesses’ memory of a perpetrator’s physical appearance along other dimensions of perceived stereotypicality. In this section, we examined three dimensions: (i) perceived gender stereotypicality; (ii) trustworthiness; and (iii) baby-facedness. Although we limited our discussion to these three dimensions, the CMEI is able to incorporate many more dimensions of stereotypicality into its framework. Indeed, our model argues that *any* appearance-based stereotype activated by a crime type will *systematically* affect eyewitness identifications. Thus, the CMEI is a broad theory capable of explaining multiple types of mistaken identifications.

**IMPLICATIONS**

Given that mistaken identifications are the main cause of wrongful convictions (Innocence Project, 2013; Wells et al., 1998), the implications of the CMEI are profound. Specifically, we argue that crime types affect eyewitnesses’ ability to identify perpetrators. For example, eyewitnesses to a stereotypically Black crime should remember the perpetrator as appearing higher on perceived Black stereotypicality than had the *same* perpetrator been seen committing a stereotypically White crime. Crime types that elicit expectations about a perpetrator’s appearance along other dimensions of perceived stereotypicality are posited to affect eyewitness identifications in a similar manner. Thus, the current model offers an addition to the literature that is of both practical and theoretical importance by explaining both (i) *when* errors in eyewitness identification are likely to occur and (ii) how crime types affect *who* eyewitnesses mistakenly identify.

Examining the impact that crime types have on the identification process provides a critical advancement to the literature on perceived stereotypicality. Specifically, perceived stereotypicality has traditionally been conceived of as an *independent* variable in studies on criminal justice outcomes (e.g., Blair, Judd, & Chapleau, 2004; Eberhardt, Davies, Purdie-Vaughns, & Johnson, 2006). We argue, however, that perceived stereotypicality can also be used as a *dependent* variable. Specifically, information imbued by the situation (i.e., crime types) may cause people to remember a suspect as appearing more (or less) representative of his or her racial group. This insight advances the literature on perceived stereotypicality by showing that aspects of a target’s physical features can also be understood as the *effect* of a prior causal variable.

Finally, investigating the impact that crime types have on eyewitness memory provides a *social* psychological analysis of the identification process. Specifically, the approach advocated in this paper argues that crime types affect eyewitness identifications. If eyewitnesses see a person commit a stereotypically Black crime, their memory of the perpetrator’s appearance should shift toward features that are perceived to be Afro-centric. Conversely, if eyewitnesses see a person commit a stereotypically White crime, their memory of the perpetrator’s appearance should shift toward features that are perceived to be Euro-centric. Such an approach recognizes the importance of the situation and stresses that *different contexts* are likely to have *different effects* on the identification process. This is an invaluable contribution to the field that yields hypotheses that wait to be examined in future research.

**CONCLUSIONS**

Research has done an excellent job of documenting *when* errors in eyewitness identification are likely to occur. This has led to a number of important insights into how those within the criminal justice system can reduce mistaken identifications (e.g., see Wells et al., 1998). Although we do not wish to minimize these findings, the literature has yet to consider the possibility that the type of crime
committed may influence who will be the victim of a mistaken identification. We addressed this oversight by presenting a new model of eyewitness identification (namely, the CMEI). Our model begins with the assumption that crime types automatically activate stereotypes about a perpetrator’s appearance. In turn, these stereotypes should affect eyewitness identifications in a systematic manner. Estimator variables are hypothesized to increase the likelihood that these stereotypes are applied to the perpetrator and subsequently stored in memory, whereas system variables are posited to facilitate mistakes in the identification process by influencing what people retrieve from memory.

The tenets of the CMEI receive solid support from research on (i) stereotype activation, (ii) perceived stereotypicality, and (iii) stereotype-consistent memory biases. After integrating these literatures, we addressed the generalizability of the CMEI by arguing that the mistakes in eyewitness identification captured by our model can be produced for a variety of different social groups. In pursuing our thesis, we hope to turn scholars’ attention toward an overlooked—albeit nonetheless important—question: namely, who is likely to be mistakenly identified? Only after we understand both when errors in eyewitness identification occur and who they affect will we be able to rectify the grievous miscarriages of justice that result from mistaken identifications.

REFERENCES


