

The Influence of Race Biases on Social Contagion

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Eyewitness memory often plays a crucial role in the criminal justice system, and therefore it is concerning when an account of an eyewitness is incorrect. Memory is malleable, and is susceptible to distortion through the exposure to misinformation. Even when the eyewitness is not aware, incorrect information can alter their memory. One possible source of misinformation can be social interactions following a witnessed event. Meade and Roediger (2002) studied this phenomenon of the effect of incorrect information supplied during a social interaction and coined the phrase social contagion paradigm. Further research has shown that the credibility of the source of the misinformation has an effect on how likely an individual is to internalize the false information (Horry et al., 2012; Davis & Meade, 2013). The less credible the source is perceived as, the less likely a participant will be to internalize incorrect information. The current study aims to expand upon Meade and Roediger's (2002) social contagion paradigm and add a manipulation of race, as society's implicit attitudes against black individuals suggest that participants may view a black confederate as a less credible source than a white confederate.

False eyewitness identifications are problematic and can lead to wrongful convictions. Since the early 1990s, the Innocence Project has used DNA evidence to exonerate over 300 innocent people that were wrongfully convicted of crimes. According to the Innocence Project Website, 75 percent of the individuals exonerated were convicted on false eyewitness testimony. This suggests that eyewitness testimony is not very reliable, and had a significant impact on the lives of at least these 300 people. There are many factors that limit an eyewitness's ability to give a complete and accurate account of the event. Among these factors are the significance of the event, the length of observation, the lack of ideal conditions, internal psychological characteristics of the witness, physical condition of the witness, and expectancy - when people

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perceive things in the way that they expect them to appear rather than in the way they actually appear (Swanson et al, 2003).

Of the factors that influence the accuracy of eyewitness memory, some unfortunately cannot be controlled by the criminal justice system. These factors are called estimator variables, and they have the ability to alter an individual's memory of an event. Some examples of these estimator variables are the characteristics of an event such as the lighting, the amount of time the culprit's face was in view, as well as the individual characteristics of the witness. Fortunately, there are some things that are able to be controlled by the criminal justice system. These are called system variables, which include the introduction of external information provided about the event (Wells & Olson, 2003). These system variables can be introduced in many contexts. For example, during an interview, the interviewer may ask questions in such a way that reveals their own biases. These biases could then be unconsciously internalized by the interviewee, and therefore have an effect on their eyewitness account of the event. Another possible scenario in which false information from an external source can be introduced is when the individual is interacting in a group setting. Estimator variables that had the potential to alter an individual's memory of an event could result in an individual sharing an incorrect account of an event to a group. Other group members could hear this incorrect information, and then later believe they remembered the incorrect details from the event.

In real life situations such as an eyewitness account of a crime, misinformation from a secondary source can have serious implications. Memory is malleable, and it can be altered after the exposure to false information (Loftus, 2005, for review). Individuals are even more susceptible to memory alteration after exposure to misinformation after a long time has passed after the original event (Loftus 2005). Surprisingly, even after given a warning of potential

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misinformation, individuals still report the incorrect information on later memory tests (Loftus, 2005).

Two different kinds of information are integrated into one's memory about an event (Loftus & Palmer, 1974). The first is the information during the original perception of the event, and the second is the external information that people are exposed to after the event has taken place (Loftus & Palmer, 1974). An example of this effect of external information is demonstrated in a study that shows that a verbal label influences the memory of visually presented stimuli. Participants were shown a video of a car accident and were later asked to estimate the speed the cars were travelling when they collided (Loftus & Palmer, 1974). The experimenters manipulated the verb used to describe the collision and found that when the verb "smashed" was used, the participants were more likely to estimate a higher speed of the cars at the collision than when verbs like "hit," or "collided," were used (Loftus & Palmer, 1974). The verbal label of "smashed" actually altered the participant's memory of the event, causing participants to think the cars were going at a faster speed (Loftus & Palmer, 1974).

As demonstrated in the Loftus and Palmer study, an external source of misinformation can be information people receive through social interactions. Another example of this is in a study performed by Wells and Bradfield (1998), where participants were given feedback on false identifications they made from a photo lineup. Participants viewed security footage of a gunman and were given a lineup in which they were instructed to identify the gunman (Wells & Bradfield, 1998). Although the gunman was not present in the photo lineup, the participants were given feedback either confirming or disconfirming their choice, or given no feedback at all (Wells & Bradfield, 1998). The feedback they were given altered their memory of the experience of the lineup presentation; people who were given confirming feedback were more certain about

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their choice, how clear they thought their memory was, and the quality of the view they had (Wells & Bradfield, 1998). What is concerning is that social interaction had an influence on the memory of the participants even if they did not realize it. The magnitude of the effect of the feedback was just as strong for people who denied the influence of the feedback as it was for those who admitted its influence (Wells & Bradfield, 1998).

This effect can be explained through the social contagion paradigm, a phenomenon in which social interaction affects memory. Meade and Roediger (2002) performed a study in which a participant and a confederate viewed household scenes and later performed a collaborative recall task in which they took turns recalling items from the scenes. During the collaborative recall phase, the confederate recalled some items that were not present in the scenes (contagion items). The participant later falsely reported the presence of these contagion items in the scenes on a later memory test (Meade & Roediger, 2002). The social contagion effect was measured in two ways, one in which responses to a free recall task were analyzed, and one that examined the ability of the participants to correctly attribute the contagion items to a source (Meade & Roediger, 2002). Both of these methods resulted in a social contagion effect, further showing the influence of social interaction on the memory of the participant (Meade & Roediger, 2002).

However, not all forms of social interaction have an equal influence on memory. The credibility of the source that one hears the incorrect information from also has an effect on how much the source has the potential to change their memory. Davis and Meade (2013) examined the difference in the recollection of false information when the source is either an older adult or a younger adult confederate. The memory of older adults was viewed as less credible with both

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young and older adult participants, as the participants recalled less incorrect information on a later memory test when paired with an older adult (Davis & Meade, 2013).

Another source of credibility can also be in-group and out-group race differences. People interact differently with members of their own race than they do with members of a different race. Social influence on memory was explored in a study by Horry and colleagues (2012), using in-group and out-group differences and memory for in-group and out-group faces. When recognizing out-group faces, out-group confederates were viewed as a more credible source than in-group confederates (Horry et al., 2012). Therefore, when the source was viewed as highly credible, there was a stronger effect of social influence on memory (Horry et al., 2012). This is due to the fact that individuals are better at recognizing in-group faces than they are at recognizing out-group faces, and therefore they trust members of the out-group to be better at recognizing out-group faces (Malpass & Kravitz, 1969).

Further, society's explicit and implicit race biases suggest that white participants would not view black individuals as a credible source of misinformation compared to white individuals. People perceive members of different races as less trustworthy in social situations, which was also correlated with implicit attitudes about race, specifically with information about black individuals (Stanley, Sokol-Hessner, Banaji, & Phelps, 2011). Therefore, when the source of the incorrect information is a black individual, people may be less likely to trust the information than when the information is coming from a white individual. This would be especially true when the participant is white, as people view members of their own in-group as more trustworthy (Stanley et al., 2011).

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Interestingly, interracial interactions also have the potential to cause shifts in attention, which could have an effect on memory accuracy due to the depletion of cognitive resources. In a study by Kleider and Goldinger (2001), they examined the effect of the presence of a black or white confederate on memory accuracy. In this study, participants were exposed to a staged accident. A white female confederate accompanied by another female confederate (either black or white) entered the testing room to retrieve a projector and slides (Kleider & Goldinger, 2001). The white confederate dropped projector slides in front of the participant (Kleider & Goldinger, 2001). When the confederates left the room, the experimenter asked the students if the confederate who dropped the slides had been tripped (Kleider & Goldinger, 2001). The participants were later given a lineup and were asked to identify the woman who dropped the slides (Kleider & Goldinger, 2001). The accuracy of identification decreased when a black confederate was present relative to when a white confederate was present (Kleider & Goldinger, 2001). Therefore, when the participants' attention was focused on the black confederate, memory performance was reduced (Kleider & Goldinger, 2001).

Craik and colleagues (1996) also demonstrated that memory performance decreased when attention was divided at encoding. With the assumption that an interracial interaction requires more attention, in the current study, the attention divide was present during encoding (the viewing of the household scenes and the first exposure to contagion items in the collaborative recall). In the current study, we expected to see white participants paired with a black confederate perform worse on retrieval of contagion items during the individual recall task due to the attention the interracial interaction requires during encoding. This depletion of cognitive resources may make it more difficult for participants paired with a black confederate to

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differentiate the source of the incorrect information, leading to a diminished effect of social contagion on a recognition/source-monitoring task as well.

Another possible aspect that could contribute to the depletion of cognitive resources during an interracial interaction is the stress caused by the interaction. Trawalter and colleagues (2012) found that interracial interactions resulted in higher cortisol levels and anxious behavior for white participants. High cortisol has been shown to impair memory retrieval overall but it also reduced susceptibility to false memories (Diekelmann, Wilhelm, Wagner, & Born, 2011). Using the Deese-Roediger-McDermott (DRM) paradigm, Diekelmann, and colleagues (2011) found that the administration of cortisol reduced the susceptibility to retrieve false memories. Rather than using words as stimuli for the DRM paradigm, Diekelmann and colleagues (2011) used abstract pictures. Cortisol administration impaired retrieval as a whole in addition to decreasing the retrieval of false memories. This supports the prediction that participants paired with black confederates will recall less contagion items in a later memory test than participants paired with a white confederate due to the higher stress and therefore higher cortisol level caused by the interracial interaction.

Building on the previous research conducted by Meade and Roediger (2002), the current study used Meade and Roediger's methodology with a novel manipulation of confederate race. Female participants viewed six household scenes with either a black or a white female confederate. The participant and the confederate completed a collaborative recall task, in which they took turns recalling items from the scenes, where the confederate recalled some incorrect items that were not present in the scenes (contagion items). It was expected that a social contagion effect will be present, which means that participants would report incorrect items suggested by the confederate on a later memory test. Of the false items incorrectly recalled, it

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was expected that participants would recall more high expectancy items (items likely to be in the scene) than low expectancy items (items not likely to be in the scene). Further, white participants paired with black confederates were expected to be less likely to recall contagion items presented by the confederate than white participants paired with a white confederate.

Society's implicit race biases against black individuals suggest that the memory of black confederates may be perceived as less credible and less trustworthy than white confederates (Stanley et al., 2011). Credibility of the source of the false information affects whether or not that incorrect information is internalized (Horry et al., 2012; Davis & Meade, 2013). Therefore, since black confederates would probably be viewed as less credible, participants paired with black confederates were expected to recall less contagion items during the individual recall test and also be worse at discriminating the source of the item during the recognition task compared to participants paired with white confederates. Previous studies examining cognitive depletion of interracial interactions due to the increased amount of stress and divided attention also support the hypothesis that participants paired with black confederates will see less of an effect of social contagion than participants paired with white confederates.

Methods

Participants

The participants in the current study consisted of 84 undergraduate students at Tufts University (aged 17 - 22). 72.62% of the participants were female and 27.38% of the participants were male. 72.62% of participants were white, 11.9% were Asian, 3.57% were Hispanic, 2.38% were black, and 9.52% of participants did not fit these demographic categories. Participants were recruited through the Psychology department using the participant pool, which included students

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enrolled in lower level Psychology courses at Tufts. All individuals received course credit for their participation.

Design

The study design replicated the methodology used in Meade and Roediger (2002) but with an additional manipulation of confederate race and measurement of implicit bias. The study was a 2 x 2 x 2 mixed subjects design. The variables manipulated within-subjects were the exposure to social contagion items (contagion/no contagion) and the expectancy of the presence of the contagion items in the household scene (high expectancy/low expectancy), while race of the confederate was a variable manipulated between subjects (black confederate/white confederate). The dependent variable is memory performance measured by free recall and recognition.

Materials

Materials included the six household scenes used in Meade and Roediger (2002) (toolbox, bathroom, kitchen, bedroom, closet, and desk) (See appendix for scenes). A Sudoku puzzle was used as a filler task. Additional materials used were sheets for the collaborative as well as individual recall tests. A 36 item recognition task was also presented to the participants. The items on the test included the 12 contagion items (both high and low expectancy), 6 items that were not in the scenes, as well as 18 previously studied items that were present in the scenes.

A modified version of the evaluative priming task used in Fazio et al. (1995) and Smith et al. (2008) was administered. The stimuli included 12 words of positive valence (appealing, favorable, pleasant, fascinating, magnificent, enjoyable, delightful, likable, wonderful, attractive, satisfying and beautiful) and 12 words of negative valence (awful, offensive, frightful, terrible,

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disgusting, miserable, horrible, repulsive, sickening, hideous, painful, and annoying). Forty-eight face primes were also used (12 white male, 12 white female, 12 black male, and 12 black female). The faces were normalized for attractiveness (Smith et al., 2008).

Procedure

Before the study began, the participant was randomly assigned to partner with either a black or a white confederate due to the examination of in-group/out-group interactions in regards to memory. Half of the participants were paired with a white confederate and half were paired with a black confederate. The confederates were thoroughly trained beforehand and throughout the study, followed a scripted procedure. The participant and confederate were each given a consent form, which stated that their responses would be kept confidential and anonymous. They were then provided with an opportunity to ask questions about the study, and were ensured that they would be able to stop participation at any time without penalty.

While in the same room, the participant and confederate watched a PowerPoint presentation of six household scenes. Following the procedure of Meade and Roediger (2002), the six scenes were presented for 15 seconds each, and labeled as they appeared. The participant and confederate were instructed to pay attention to each scene because they would be asked to remember items in the scenes on a later memory test. After they viewed the scenes, the participant and confederate were given a Sudoku puzzle as a filler task for 4 minutes.

The participant and confederate then participated in a collaborative recall phase, in which they were instructed to take turns recalling items from each scene until each had recalled six items from each scene. The confederates were instructed to do their best to recall at the same pace and level of confidence as the participant in order to prevent potential suspicion that they

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knew too much or too little. The experimenter recorded their answers. During this phase, the confederate recalled some items that were actually present in the scenes as well as some incorrect items that were not present in the scenes. For three of the six scenes, the confederate recalled two incorrect (contagion) items and four correct items that were actually present in the scenes. The confederate always recalled the high expectancy contagion item as the fourth item in the scene and the low expectancy contagion item as the sixth item in the scene. The confederate also memorized some alternate contagion items in the event that the participant incorrectly recalled one of the contagion items.

The confederate was then led out of the room so the participant could complete an individual recall task. The participant was told that the confederate would be doing the remainder of the study in a separate room. For each scene, the participant was provided two minutes to report all of the items that they remembered in the scene. They were also asked to give a confidence rating to indicate how confident they were that each item was in the scene. The experimenter entered the room every two minutes to give the illusion that the confederate was also participating in the individual recall task in another room.

After the participants finished the individual recall test, they were given a 36 item recognition test on the computer, which instructed them to report where they had remembered each item on the test from. The items on the test included the 12 contagion items (both high and low expectancy), 6 items that were not in the scenes, as well as 18 previously studied items that were present in the scenes. Possible responses were that the participant remembered the item from the scene only, from the other participant only, from both the scene and the other participant, or that they did not remember the item at all. Participants were given as much time as they needed to complete this task.

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Finally, the participant was presented with a modified version of the Evaluative Priming Task, adapted from Fazio et al. (1995) and Smith et al. (2008) in order to measure implicit racism. In the first phase, participants were presented with words with a positive or negative valence that appeared on the computer screen, and they were asked to classify words as positive or negative by pressing the appropriate key on the keyboard “A” or “L.” Participants were instructed to make a response as quickly and as accurately as possible. The key that corresponded to positive and negative words was counterbalanced across participants. For each trial, a small cross appeared on the screen for 500ms followed by the stimulus word until a response was made (or for 1750ms). Between the response and the next trial, a blank screen appeared for 2500ms. Each stimulus word appeared twice, totaling 48 trials. During this phase, reaction time was measured in order to measure a baseline response time.

In the second phase of this task, pictures of black and white, male and female faces were briefly presented to participants following the presentation of positive or negative words. The face was presented for 315ms, followed by a blank screen for 135ms. Following the face, a word with either positive or negative valence was presented until participants responded (or for 1750ms). Between the response and the next trial, a blank screen appeared for 2500ms. The participants were told to pay attention to the faces because they would be asked to remember them on a later memory test (although they were not given a later memory task). Again, they were instructed to classify the word as positive or negative as quickly and as accurately as possible. Each word appeared eight times, twice primed with a white man’s face, white woman’s face, black man’s face, and black woman’s face for a total of 192 trials. After the completion of this task, the participant was then debriefed and given an opportunity to ask questions.

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Results*Individual Recall Data*

The individual recall task gave participants an opportunity to recall all of the items they remember from the scenes. Possible answers given could have been correct, incorrect, or contagion items suggested by the confederate. A 2 (confederate race: black/white) x 2 (exposure to contagion items in a scene: yes/no) ANOVA was performed looking at correctly recalled items on the individual recall task. There were no main effects of exposure or of confederate race, $p > .05$. This means that when participants were exposed to contagion items, it did not affect their proportion of correct answers on the individual recall task. Further, there was no difference between the percentages of correct responses when participants were paired with a white confederate compared to when participants were paired with a black confederate (Table 1).

	Black confederate	White confederate
Exposed to contagion items	29.86%	29.22%
Not exposed to contagion items	30.07%	28.41%

Table 1. Percentage of correct responses for scenes where participants are exposed to contagion items compared to scenes in which participants are not exposed to contagion items as a function of race.

In the individual recall task, participants often falsely recalled contagion items previously suggested by the confederate. Contagion items could either be high expectancy items (items that are likely to be found in a scene) or low expectancy items (items that are not likely to be in a scene). A 2(confederate race: black/white) x 2 (expectancy: high/low) ANOVA examining contagion items as the dependent variable displays a main effect of expectancy $F(1, 78) = 37.22$, $p < .001$, $\eta_p^2 = .32$. Participants recalled high expectancy contagion items significantly more

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than low expectancy contagion items (Table 2). Consistent with the hypothesis, there was also a main effect of race $F(1, 78) = 5.38, p = .02, \eta_p^2 = .07$. Participants paired with white confederates recalled contagion items on the individual recall task more frequently than participants paired with black confederates (Table 2). The interaction between expectancy and race of the confederate was not significant, $p > .05$ (Table 2).

	Black confederate	White confederate
Low Expectancy	M = .12, SD = .03	M = .20, SD = .04
High Expectancy	M = .32, SD = .05	M = .44, SD = .05

Table 2. Percentage of contagion items recalled during the individual recall test as a function of item expectancy and race of the confederate.

Recognition Data

During the recognition task, participants were asked to attribute items to a source. They were asked if they remembered an item from the scene only, the confederate only, both the scene and the confederate, or they did not remember the item at all. For contagion items, a correct answer would be that the participant remembers the item from the confederate only. If the participant reported that they remembered the item from the scene only or both the confederate and the scene, it would result in the contagion effect. Using the data from this test, there were two possible ways to look at the contagion effect. The first was to analyze the effects of confederate race and item expectancy when the response on the recognition test was “scene only,” and the second was to analyze the effects of confederate race and item expectancy when the response was “both the scene and the confederate.”

To examine the contagion effect when participants attributed the contagion item to both the scene and to the confederate, a 2(confederate race: black/white) x 2(expectancy: high/low)

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ANOVA was performed. The analysis demonstrated a main effect of item expectancy $F(1, 78) = 13.97, p < .001, \eta_p^2 = .15$. Participants attributed high expectancy items to both the scene and the confederate significantly more than low expectancy items (Table 3). There was no effect of confederate race when attribution to two sources was made, $p > .05$ (Table 3). The second analysis performed to explore the contagion effect was a 2(confederate race) x 2 (item expectancy) ANOVA when participants attributed contagion items to the scene only. There were no significant effects for item expectancy or for confederate race, $p > .05$ (Table 3).

	Black confederate	White confederate
High expectancy – both	M = .29, SD = .27	M = .33, SD = .25
Low expectancy – both	M = .14, SD = .24	M = .21, SD = .30
High expectancy – scene only	M = .15, SD = .24	M = .16, SD = .24
Low expectancy – scene only	M = .20, SD = .28	M = .10, SD = .18

Table 3. Attribution of responses to the scene only or to both the scene and the confederate in the recognition task, examining item expectancy and race of the confederate.

Overall accuracy for the recognition task was also analyzed. There were four different types of items presented on the recognition task: high expectancy contagion items, low expectancy contagion items, new items (items that did not appear in the scene and were not suggested by the confederate), and studied items (items that did appear in the scene but were not suggested by the confederate). A correct answer for both high and low expectancy contagion items would be when the participant attributes the item to the confederate only. A correct response for new items would be that the participant did not remember the item at all, and a

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correct response for studied items would be that the participant remembered the item from the scene only.

To explore accuracy on the recognition task, a 4(item type: scene only/confederate only/both the scene and the confederate/neither the scene or the confederate) x 2 (item expectancy: high/low) x 2 (confederate race: black/white) ANOVA was run. A main effect of item type was found, demonstrating that participants are more accurate with some types of items compared with others $F(3, 78) = 19.14, p < .001, \eta_p^2 = .20$. There was no significant main effect of confederate race, $p > .05$

To determine which types of items differed from each other, a series of paired samples t-tests were performed to compare accuracy on high expectancy items, low expectancy items, studied items, and new items. Bonferroni corrections for multiple comparisons were used, so any alpha level lower than .008 was determined to be significant. Participants were less accurate with high expectancy items than low expectancy items, $t(82) = 3.45, p < .001$, and were also less accurate with high expectancy items compared to studied items $t(82) = 8.62, p < .001$ (Table 4). Low expectancy items resulted in poorer accuracy compared to studied items $t(82) = 4.39, p < .001$ (Table 4). Further, participants were less accurate with new items compared to studied items Studied vs new $t(82) = 5.92, p < .001$ (Table 4). There were two pairs in which there was no significant difference in accuracy. These were the pair of high expectancy items and new items, and the pair of low expectancy items and new items.

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	Black confederate	White confederate
High expectancy contagion items	M = .43, SD = .32	M = .40, SD = .31
Low expectancy contagion items	M = .53, SD = .37	M = .57, SD = .35
Studied items	M = .71, SD = .18	M = .71, SD = .21
New items	M = .50, SD = .18	M = .55, SD = .19

Table 4. Accuracy on the recognition task examining item type, item expectancy, and confederate race.

Collaborative Recall Data

During the collaborative recall task, the participant and confederate were asked to take turns recalling items until they had each recalled six items in each scene. The participants were encouraged to recall six items in each scene but sometimes they were not able to. Data was briefly examined for this task, and demonstrated that participants on average recalled 25.68 out of a possible 36 items (71.33%). There was also no difference between the number of items recalled when a participant was paired with a white confederate (70.44%) compared to when a participant was paired with a black confederate (72.22%).

Discussion

As in the Meade and Roediger (2002) study, the results of the current study demonstrate a general effect of social contagion. Analyses in both the individual recall task and the source recognition task suggest that people will incorporate incorrect information suggested by another individual. The novel contribution of this study was the finding that the race of the confederate impacted the magnitude of the social contagion effect. Specifically, participants were less susceptible to the social contagion effect when incorrect information was suggested by a black as

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compared to a white confederate. This finding suggests that black confederates were seen as a less credible source of the incorrect information suggested in the collaborative recall phase of the experiment. This is also consistent with the previous literature that demonstrated that the credibility of the source of the incorrect information made a difference in the internalization of the information (Horry et al., 2011; Davis & Meade, 2013). Further, the findings that participants recalled less contagion items when paired with a black confederate was also consistent with societal stereotypes that black individuals are viewed as less trustworthy in social situations (Stanley et al., 2011).

Further, as highlighted by Meade and Roediger (2002), previous studies have shown a reduced effect of misinformation (without social interaction) on recognition tasks in which the participant is asked to determine the source of the item (Lindsay & Johnson, 1989). Just as in the Meade and Roediger (2002) studies, the social contagion effect in the current experiment was strong enough to still appear in the analysis of the recognition tasks. However, the effects of race that were seen in the individual recall task were not significant in the recognition task. Social contagion race effects may not be present in the recognition task because it is a memory task that is influenced by familiarity processes in responding (Bulevich & Thomas, 2011). Therefore, the recognition task required less conscious evaluation to retrieve previously encoded information, so all participants, regardless of the race of the confederate, may have been more susceptible to social contagion compared to free recall. The conscious evaluation present in the individual recall task may have been why there was an effect of confederate race, as participants may have consciously discounted incorrect information suggested by a black confederate due to the societal stereotypes against black individuals.

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Social Contagion

In the individual recall task, participants were given two minutes for each scene to remember all of the items they could from the scene only (not including any items suggested by the confederate from the collaborative recall task). Correct responses were analyzed for each scene to make sure that the exposure to contagion items in a particular scene did not affect the rate of correct responses. These findings demonstrate that the baseline accuracy did not differ across race or across exposure to contagion items, and therefore the effects that display social contagion were not part of an overall difference in performance. Therefore, the second collaborative recall phase did not disrupt the memory of the original event. Participants were still able to access the items of the original event, but they also incorrectly recalled the contagion items that were suggested.

A basic effect of social contagion was supported by the results of the individual recall task. Participants incorrectly recalled contagion items that were suggested by the confederates in the collaborative recall phase. As predicted, participants recalled high expectancy contagion items significantly more frequently than they recalled low expectancy contagion items. This could be explained by previous research on semantically similar objects. An example would be the DRM paradigm (Roediger & McDermott, 1995) in which participants incorrectly report that they remember items if they are semantically related to a list of words that they had actually seen. Therefore, it would make sense that participants would falsely remember seeing high expectancy contagion items more frequently due to the fact that they are more semantically related to the items that were actually present in the scenes. This is also supported by research done by Pezdek, Finger, and Hodge (1997), who found that the more plausible an event was, the more likely a participant was to falsely remember that event. Since it would be more plausible to

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see high expectancy contagion items in the scene, the participant falsely remembered high expectancy contagion items at a higher rate than low expectancy contagion items.

A standard social contagion effect was present in the recognition test as well. That is, participants misattributed the incorrect suggested items to the scene. The first way to examine social contagion during the recognition task was to look at when participants attributed the contagion items to both the scene and the confederate. Both expectancy and race were examined when participants incorrectly remembered contagion items as being in the scene and also said by the confederate. Participants chose this option more often for high expectancy items than low expectancy items. The second way to look at social contagion in the recognition task was when participants attributed the contagion items to the scene only. Looking at the data this way also demonstrated a difference in expectancy of the contagion items. Participants also attributed high expectancy items to the scene only more often than they attributed low expectancy items to the scene only. This is also consistent with the individual recall task, and similarly could be due to the semantic similarity between the high expectancy items and the items that were actually present in the scenes, as well as the plausibility that the items would actually appear in the scenes (Pezdek, Finger, & Hodge, 1997).

Overall accuracy was also examined during the recognition task to see if there was a difference in frequency of correct responses between the four types of items on the task, and also to determine whether there was an effect of social contagion. The four types of items were studied items (items that appeared in the scene but were not suggested by the confederate), new items (items not in the scenes or reported by the confederate), high expectancy contagion items, and low expectancy contagion items. Correct responses for each of the item types were as follows: high and low expectancy items should be attributed to the confederate only, new items

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should be attributed to neither the confederate nor the scene, and studied items should be attributed to the scene only. Participants were more accurate with studied items compared to all other item types. These were the items that were actually present in the scenes, so it is not surprising that they were the most accurate on these trials. The poorest accuracy occurred for high expectancy contagion items compared to all other item types except for new items. This demonstrates a basic social contagion effect, because participants were frequently misattributing contagion items to the wrong source.

Race and Social Contagion

The results of the individual recall task also showed a difference in the social contagion effect based on the race of the confederate. Consistent with the hypothesis, participants who were paired with a white confederate were more likely to recall contagion items on the individual recall task than participants paired with a black confederate. Based on findings of previous research there are a few different explanations of why there was a difference in race. Consistent with Stanley, Sokol-Hessner, Banaji, & Phelps (2011) participants could have perceived black confederates as a less credible source due to the stereotype that they are less trustworthy in social situations. This implicit attitude may be the reason that participants were less likely to trust false information supplied by a black confederate.

Depleted cognitive resources could also contribute to the difference in race seen in the individual recall task. Due to the interracial interaction, divided attention of the participant during the encoding of the contagion items (which in this case is the collaborative recall phase) may also play a role in the race difference in the social contagion effect. The interracial interaction may have caused attention to be divided more when there was a black confederate compared to when there was a white confederate. When attention is divided at encoding,

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memory performance is diminished (Craik et al.,1996). Therefore, it is possible that participants less efficiently encoded the contagion items from the confederate due to the attention required during the interracial interaction.

The stress of the interaction also could have been a factor in the diminished social contagion effect seen when participants were paired with black confederates. This explanation is supported by previous research done by Diekelmann and colleagues (2011), who found that higher cortisol levels resulted in a reduced susceptibility to false memories. Since an interracial interaction has been found to cause heightened stress, it is very possible that the stress from the interaction was part of the reason for the race difference in social contagion (Trawalter et al., 2012).

Differences between Recall and Recognition

There was no effect of confederate race on the results of the recognition task in both options that would display a social contagion effect: when the participant attributed the contagion item to the scene only and to both the scene and the confederate. Therefore, there was no difference between the frequency with which participants attributed contagion items to both the scene and the confederate or to the scene only when paired with a white confederate compared to when they were paired with a black confederate.

It was interesting that there was no effect of confederate race during the recognition task but the race of the confederate did significantly affect social contagion on the individual recall task. This could be due to the difference in nature between the individual recall task and the recognition task in that the individual recall task involves more conscious decision making. This is supported by a misinformation study performed by Bulevich and Thomas (2011) that explored the difference in nature of a free recall task and a controlled recognition task. Bulevich and

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Thomas (2011) found that participants were less susceptible to misinformation when given a cued recall (similar to the recognition task in the current study) as compared to a free recall (similar to the individual recall task). They argued that the conscious controlled retrieval process of a free recall task caused participants to be more likely to report incorrect items on the final memory test (Bulevich & Thomas, 2011). These findings are consistent with the results of the current study, and potentially explain why there was no difference of social contagion based on confederate race in the recognition task but there was a race difference in the individual recall task. Due to the more controlled decision making process in the individual recall task, participants may have been likely to consciously discount information suggested by a black confederate that they viewed as a less credible source.

Collaborative Recall

The collaborative recall phase of the experiment consisted of the participant and confederate alternately recalling items from each scene until they had both recalled six items from each scene. Sometimes the participant was not able to recall six items in each scene, and the data for the collaborative recall task was examined to determine whether the performance on this task differed when the participant was paired with a white confederate compared to when the participant was paired with a black confederate. Results demonstrated that the performance on the collaborative recall task did not differ based on the race of the confederate. This was important to look at to ensure that the difference in performance on the individual recall task or recognition task was not due to a difference in overall inability to encode and remember items from the scenes.

Future Directions

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At the beginning of the study, it was determined that we use female confederates due to the convenience, and also to the fact that the subject pool would largely be made up of female participants. It would be interesting to see if there would be a larger difference of confederate race if black males were used in the study since societal stereotypes against black males are different than stereotypes against black females.

Further confederate-participant pairings could also be explored. The majority of the participant pool available consisted of white individuals. Therefore, the pairing between participants and black confederates in this study was generally viewed as an out-group interaction. Firstly, it would be interesting to look at the data from the current study and exclude any non-white participants from the analysis to see if the effects of race differences in social contagion are any stronger. A larger race difference in social contagion would be expected due to the fact that there are both out-group differences and negative stereotypes against black individuals at play, so it would not be surprising if the effects seen in the current study would be enhanced.

For future studies, it would be interesting to examine social contagion with black participants and black confederates. The current participant population available did not have enough black participants to do so for this experiment. However, there are two possible options that could occur in a black confederate-black participant pairing. The first would be that black participants would act in a similar manner as white participants and view black confederates as less trustworthy due to societal stereotypes. However, the increased stress and attention divide resulting from an interracial interaction would not be present in this pairing, so although the stereotype may contribute to a lesser effect of social contagion, it may not be as strong as the one seen with a black confederate and a white participant. An interaction between a black participant

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and a white confederate may induce these feelings of stress and require more attention, so there may be a diminished contagion effect there as well.

The second possibility that could occur with a black confederate and black participant pairing would be that the participant trusts the black confederate more due to the fact that they are in the same in-group. People interact differently with members of their own in-group than members of the out-group. In-group difference in trust in memory can be present with age as demonstrated by Davis and Meade (2013) as well as with race, as studied by Horry and colleagues (2012). People are generally more likely to internalize false information when it comes from a credible source, and in this case a member of the in-group race may be seen as more credible than a member of the out-group race. The trust between individuals in a black in-group pairing may even be stronger than the trust in a white in-group pairing due to perceived group victimhood (Rotella et al., 2013). This phenomenon may cause black individuals to trust another black individual even more due to the fact that they may perceive that their in-group has been victimized in the past by society (Rotella et al., 2013).

Conclusions

The results of this study demonstrate an effect of race biases on the social contagion paradigm. With future studies using black confederate and black participant pairings, it could help shed light on the social influence on eyewitness memory, and how race biases and differences between out-group and in-group pairings come into play. These findings can have implications for the criminal justice system, and help provide a better understanding of eyewitness memory and the influence of social interactions. Further, it can help officials in the criminal justice system understand how there is a difference in how the introduction of false information influences memory if the source is a black or a white individual.

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Appendix

Household scene stimuli

The Toolbox Scene



The Bathroom Scene



The Kitchen Scene

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The Bedroom Scene



The Closet Scene



The Desk Scene