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Claire Tyler
Western Washington University

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Crime Blindness: The Impact of Inattentional Blindness on Eyewitness Description Accuracy

Claire G. Tyler

Western Washington University
Abstract
Eyewitness misidentification is the leading cause of wrongful convictions in the United States. Inattentional blindness, the failure to become fully aware of an object or event despite its presence in the center of one’s visual field, may render some eyewitnesses unable to accurately describe the culprit of a crime that had occurred right in front of them. The members of Ira Hyman’s research lab explored the relationship between inattentional blindness and the ability to provide accurate eyewitness testimony. We asked participants to watch a video of a staged theft, instructing the experimental groups to either count the number of people wearing white T-shirts or to watch for the theft. Our control group simply watched the video. We assessed the participants’ ability to notice the theft, describe the culprit, and identify the culprit. I then quantified their descriptions of the culprit in order to explore whether inattentional blindness leads to a decreased ability to remember details about the event in question. I found that people who had been focused on counting T-shirts were less likely to notice the theft, and were less able to accurately describe the culprit—instances of inattentional blindness.

Keywords: inattentional blindness, eyewitness
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For some innocent people, the only thing standing between freedom and a prison sentence is a mistaken eyewitness identification. According to The Innocence Project, eyewitness misidentification is the leading cause of wrongful convictions in the US (National Research Council, 2014). Many factors can cause an eyewitness to misidentify a suspect, including poor viewing conditions, unfair police lineups, misleading post-event information, and faulty memory. Potential eyewitnesses may find it particularly difficult to describe and identify the culprit if they did not pay much attention to the crime. Potential eyewitnesses, just like the rest of us, do not go through their lives expecting to witness crimes. They are also frequently subject to internal distractions, such as their thoughts and worries, as well as to external distractions, such as their handheld electronic devices. Troublingly, most eyewitness research is based on the assumption that people will notice and be fully aware of the crimes they happen across.

Only a few researchers have investigated the set of circumstances that lead people to fail to notice crimes even when they are in plain view (Chabris, Weinberger, Fontaine, & Simons, 2011; Rivardo et al., 2011). This phenomenon can be more broadly defined as inattentional blindness, the failure in a complex environment to become aware of objects or events in one’s visual field due to lack of attention (Mack & Rock, 1998). To date, no one has explored this perceptual failure in relation to potential eyewitnesses’ memory for details of crimes. In this paper, I will examine the effects of inattentional blindness on eyewitness memory, specifically in terms of how accurately eyewitnesses can describe the perpetrator of a crime.

How can someone fail to become aware of a crime that unfolds directly in front of them? Whether or not we realize it, our perceptual systems are selective in choosing what information to process about our surroundings (Neisser, 1979). In complex environments, people tend to focus on only one aspect of their surroundings. When this occurs, we may experience inattentional blindness. According to the capacity theory of attention, this is because people have a limited amount of cognitive resources to devote to the perception of their surroundings (Kahneman, 1973; Simons & Chabris, 1999). That is, our capacity to fully perceive and remember objects and events in our visual field is limited by how much attention we give those objects and events.

The amount of attention we are able to pay to any given event is dependent upon our level of focus and control. We are able to safely spend an automatic and
low level of attention on many of our daily activities, but other tasks require us to control the amount of attention we spend on them. People have some control over the amount of attention they devote to any task, such as how carefully we monitor the road when driving (Hyman, 2016). If we are selectively focused on an event, we are able to expend much more attention than if we are engaged in multitasking. Multitasking does not eliminate our ability to pay attention, but it does usually result in degraded attention performance (Hyman, 2016). This is why we are much more likely to get into traffic accidents when we use cell phones.

When we have more control over the attention we spend on perceiving an object, we are better able to mentally bind the features of an object to the object itself (Treisman & Gelade, 1980). That is, when we consciously observe any given object, we are more likely to successfully attribute that object’s characteristics as belonging to that object. One striking demonstration of this principle took place outdoors on the Western Washington University (WWU) campus. Hyman and his colleagues hung realistic but fake three-dollar bills from tree branches that hung over a narrow pathway (Hyman, Sarb, & Wise-Swanson, 2014). Most people who walked down the path were able to navigate around the hanging money, but only a small percentage of people were observed to examine the money, and none of them took any of the bills. That is, because people were paying an automatic level of attention to their surroundings, they were able to avoid the money in their path without realizing what it was. Their attention tended not to be captured by the unusual circumstance, so most people were not able to make the switch from automatic to controlled attention (Simons, 2000). Because of this, they were not able to attribute the money’s features (i.e. green, hanging from a tree) to the money itself, instead merely taking the obstacle into account and navigating around it without becoming aware that it was money. Similarly, if people are engaged in an automatic level of attention when they come across a crime, their ability to notice the crime and to successfully bind the features of the event to itself is diminished. Clearly, inattentional blindness poses a threat to one’s ability to notice a crime, even if the crime occurs in the center of one’s visual field.

In order to study potential eyewitnesses’ ability to notice crimes, two sets of researchers staged crimes for participants who were engaged in attention-demanding tasks. Rivardo et al. (2011) asked participants to watch a video in which someone steals a shopping bag. The control group participants simply watched the video, while the experimental group participants counted either people wearing blue shirts or people with shopping bags. The participants who were focused on counting
things were twice as likely to fail to notice the theft as were those in the control group. In an outdoor experiment, researchers asked participants to follow after a running confederate and count the number of times he tapped his own head (Chabris, Weinberger, Fontaine, & Simons, 2011). Halfway through the outdoor running course, the confederate leads each participant past a staged fight. In this fight, two male confederates pretend to beat up a third male confederate. They are in plain sight, and they shout and grunt in an attempt to stage a convincing fight. The fight is visible to each participant for 15-30 seconds. Focused on the counting task, 44% of the participants failed to notice the staged fight during the daytime, and the number increased to 65% when the experiment took place at night. In contrast, only 28% of the participants failed to see the crime during the day if they were not instructed to count the runner’s head taps.

Both the shopping bag study and the runner study clearly linked inattentional blindness and the failure to become aware of a crime, but they did not address the effects of inattentional blindness on eyewitness memory for details of crimes. The current body of literature does not provide answers as to whether eyewitnesses affected by inattentional blindness will be able to accurately describe the culprit, or whether they will be able to identify the culprit in a lineup.

In our study, we asked participants to watch a video in which a confederate steals a backpack. We varied the attentional focus of different participants. The control group was asked to view the video carefully. The inattentional blindness group was asked to count the number of people in white T-shirts, and the eyewitness group was asked to watch for the theft. After the participants viewed the video, we asked if they noticed the theft, asked next for a description of the culprit, and then we instructed them to make an identification from a lineup. In alignment with previous findings in the field, we predicted that those in the inattentional blindness condition—the participants who counted the number of people in white T-shirts—would be least likely to notice the theft. We also predicted that those in the counting group who noticed the crime would recall fewer details about the culprit than those in the other groups who also noticed the crime. This is because we expected the participants affected by inattentional blindness to encode less information about the crime, even when they reported having noticed it. In order to explore this line of inquiry, I quantified and analyzed descriptive data we collected from the participants.
Methods

Participants

Eighty-seven college age students participated in our study. Seventy-five identified as female, and 12 as male. Sixty-nine identified as white, 10 as Asian, one as African American, one as Native American, and 12 as another ethnicity (participants were allowed to indicate more than one race/ethnicity, so these numbers exceed the total number of participants). The participants self-selected for the study through the WWU psychology department in return for class credit for their Introduction to Psychology classes. We eliminated the data gathered from participants if they knew the culprit or anyone else in the lineup, or if their phone made a noise during the study.

Procedure

We conducted experimental sessions individually, randomly placing the participants into one of three conditions based on the order in which they arrived. After signing an informed consent form, each participant watched the video of the backpack theft. In the video, which is 1 minute and 48 seconds long, 61 college students walk through a hallway in the psychology building. Of these students, 20 wear white T-shirts. The rest wear black T-shirts and other casual college attire. Near the beginning of the video, a group of three young women walk together across the screen and stand to the side, talking to each other. One of them sets her pink floral backpack on a chair behind her. On the other side of the hall, a young man reads a book at a table. After 1 minute and 3 seconds, another young man walks up to a poster next to the group of talking women. After looking at the poster for 5 seconds, he turns toward the video camera, walks past the group of women, slings the pink floral backpack over his shoulder, and walks off-screen past the camera. A still image of the theft can be seen in Figure 1 below. The young women do not appear to notice the theft. After 25 seconds, the young man who was reading gets up and walks away. The video ends after a few more students walk down the hallway.
In this study, the independent variable is attention. We gave each group different instructions in order to direct their attention to various aspects of the video, but we told the participants in every group that we would ask questions about the video afterwards. We instructed the control group to watch the video carefully. In an attempt to induce inattentional blindness, we told the second group to count the number of people in the video wearing white or mostly white T-shirts. This is the inattentional blindness condition. We instructed the third group to watch for a theft that occurs in the video. We called this the eyewitness condition.

After watching the video, the participants answered a series of questions that gauged whether they noticed the theft and whether they could describe the culprit. We first asked them whether they noticed anything unusual in the video. We then asked them if they noticed the theft that had occurred in the video. No matter whether they said yes or no, we asked them to describe the culprit. This is because during real criminal investigations, investigators often collect information from eyewitnesses who may have missed seeing crucial details about a crime, even those who claim not to have seen the crime.

After answering these questions, we asked the participants to look at a lineup of potential culprits and pick the one they thought was responsible for the theft. This
lineup contained six mug shots of WWU college students, all of whom fit the general
description of our culprit. The culprit was in the lineup, along with four distractors
who did not appear in the video, as well as the innocent bystander who sat reading at
the table for most of the video. We informed the participants that the culprit’s
physical appearance may have changed between the time of the theft and the time of
the photo, and that the culprit may or may not be in the lineup. Next, the
participants looked at a series of pictures of T-shirts. We asked them to note which
ones they had seen in the video and which ones were new to them.

Results
The primary focus of this research is the participants’ ability to describe the
culprit. First, I looked at the differences in the participants’ performance in noticing
the theft based on their attention conditions. Then, I divided the participants into
two grouping variables based on whether they noticed the theft, temporarily
disregarding which attention condition they were in. I then looked at what effect
noticing the theft had on the participants’ ability to accurately describe the culprit.
In order to assess description accuracy, I set boundaries of accuracy for each physical
characteristic or behavior that was true of the culprit. For example, ‘brown hair’ and
‘looked at a poster’ were both considered accurate descriptive details, while ‘short’
and ‘was reading a book’ were not. I then recorded which description details each
participant accurately reported.

Noticing the Theft by Condition
Before analyzing how the attention conditions affected the participants’
descriptions of the culprit, it is important to look at how their attentional focus
impacted their ability to notice the theft. Using a chi-square ($\chi^2$) test, we found that
the attention condition affected the percentages of people who noticed the theft, $\chi^2$
(2, $n = 87$) = 18.306, $p < .001$. We found that 70.9% of the participants in the
control (watch carefully) condition noticed the theft, along with 93.3% of the
eyewitness (watch for a theft) condition, while only 42.3% of the (count white T-
shirts) inattentional blindness condition noticed the theft (Figure 2). This is the effect
we predicted. When people are forced to divide their attention, they decrease their
capacity for paying attention to events outside the focus of their attention. For the
participants who counted T-shirts, this decreased attentional capacity resulted in
inattentional blindness for the theft of a bright pink backpack in the center of their
visual field.
Number of Accurate Descriptive Details by Condition

In order to investigate the degree to which inattentional blindness affects the ability to remember descriptive details, I investigated the participants’ ability to describe the culprit’s physical appearance and behavior. Using a one-way ANOVA, I found that the attention condition affected the number of accurate descriptive details provided, $F(2, 84) = 9.412$, $MSE = 7.560$, $p < .001$, $\text{eta}^2 = .18$. The participants in the control condition reported an average of 3.61 (2.70) descriptions, the eyewitness participants reported an average of 5.27 (2.85) descriptions, and the participants in the inattentional blindness condition reported an average of just 2.08 (2.68) descriptions (Figure 3). Though the average reported by the control condition participants is not statistically significantly different from the other two averages, the participants in the inattentional blindness condition reported statistically significantly fewer accurate details than those in the eyewitness condition. This finding helps to confirm our hypothesis that inattentional blindness negatively impacts our ability to remember descriptive details of an event that occurred in our visual field.
Interaction Between Noticing Theft and Attention Condition

In order to investigate a possible interaction between noticing the theft and the attention condition, we conducted a two-way ANOVA. I found no effect of attention condition on the number of accurate details $F(2, 81) = 0.131, MSE = 3.409, p = .877, \eta^2 = .003$. I found a main effect of noticing the theft on the number of accurate details, $F(1, 81) = 81.083, MSE = 3.409, p < .001, \eta^2 = .500$. That is, I found that the participants’ description accuracy was influenced more by whether they noticed the theft than by which attention condition they were in. As seen in Figure 4, I also found no interaction between the attention condition and noticing the theft $F = (2, 81) = 0.268, MSE = 3.409, p = .766, \eta^2 = .007$. 

Figure 3. Number of accurate descriptive details provided by the participants in each condition.

Figure 4. Description accuracy for attention conditions and for noticing the theft.
Discussion

Inattentional blindness negatively impacted our participants’ ability to describe the culprit of a crime that occurred in plain sight. False eyewitness statements are the leading cause of wrongful convictions in the U.S., and it may be that inattentional blindness contributes to these eyewitness misidentifications. If people are affected by inattentional blindness, they may be less able to provide accurate descriptions of what they saw. Because of this, in assessing the accuracy of an eyewitness statement, it is important to determine what secondary tasks, activities, or mental processes the eyewitness was engaged in at the time of the crime, and to understand that inattentional blindness may diminish potential eyewitnesses’ ability to accurately describe what they saw. This includes both descriptions of visual characteristics as well as the behavior of people involved in the crime.

Shortly after finishing this study, our lab conducted a replication of it. I plan to examine the new data and apply it in the context of this paper’s line of inquiry. With this new data set, I hope to further investigate whether inattentional blindness leads to the decreased ability to describe the culprit simply because those participants are less likely to notice the crime, or whether it is because their perception is altered such that they are less able to encode details even if they see the crime.

As with any lab experiment, there is a risk of ecological invalidity. That is, the very fact that this experiment was conducted in a lab setting may have influenced the data we collected, so it is difficult to claim that our findings generalize to the real world (Neisser, 1982). People in a lab setting may behave differently than they do in their daily lives. For instance, people asked to watch a video may already be expecting to see something interesting in it, and thus may pay more attention to it than they would to similar scenes they witness in their own lives. Additionally, in real life, eyewitnesses do not have the luxury of being warned about the crime they are about to witness. We attempted to mitigate this risk by choosing a setting and context that was familiar to most college students, rather than presenting the participants with a more abstract stimulus such as a computerized task (Mack & Rock, 1998). However, the fact remains that all lab studies carry the risk of ecological invalidity. To further minimize this risk, researchers could use cell phone tasks as a means of inducing inattentional blindness, as cell phones are a common distractor in our everyday lives, sometimes causing us to fail to perceive and prevent crimes that occur right in front of us (Hyman, 2016).
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