

Eyewitness Testimony: Assessing the Knowledge and Beliefs of Students Studying Policing

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Abstract

Researchers in the area of the fallibility of memory have demonstrated that memories for an event are prone to confabulations and that these memory distortions can begin to occur immediately after a crime or accident has taken place. They have also demonstrated that the way in which a police officer interacts with a witness has the potential to cause some of these confabulations. It is therefore important for the officer to understand the variables that can impact a person's memory. The knowledge and beliefs of students studying policing concerning the variables that affect memory were ascertained through a short, anonymous survey, which was distributed to students in various police programs across Canada. The survey was interested in determining whether or not these students have a firm understanding of the research pertaining to the fallibility of eyewitness testimony. Results demonstrate that students studying policing are not well-versed in the science of eyewitness testimony as the average survey score was 55.3%.

Keywords: estimator variables, system variables, eyewitness testimony, students studying policing.

Eyewitness Testimony: Assessing the Knowledge and Beliefs of Students Studying Policing.

The fallibility of eyewitness testimony and its impact on the justice system has become a hot topic in psychological research. This is underscored by the number of universities currently offering courses and degrees in the area, as well as the number of journals dedicated to the subject (Fraser, Bond-Fraser, Houlihan, Fenwick, Korotkov & Morrison 2011). However, work in this subfield has been undertaken since the inception of the discipline of psychology. Among the early researchers was Hugo Munsterberg. In his controversial book, *On the Witness Stand*, (1908), Munsterberg wrote about inaccuracies in eyewitnesses' accounts and the malleability of memory (Munsterberg 1908; Memon, Mastroberardino, & Fraser 2008). These themes, explored by Munsterberg in the early 1900s, continue to be explored today (Memon et al. 2008; Loftus 1979). However, some members of the justice system are as reluctant to embrace this research today as others were back in 1908 (Wise, Safer, & Maro 2011). One reason for this reluctance stems from the fact that there are those within the judiciary who argue that the psychological research is not directly applicable to the justice system, and certainly not to members of the judicial process such as police officers (Magnussen, Melinder, Stridbeck, & Raja 2010).

Gary Wells, a prominent researcher in the area concerning the fallibility of eyewitness memory, has tried to bridge the information gap by dividing the variables that can influence an eyewitness's memory for an event into two distinct categories, which he termed "system" and "estimator" variables (Lieberman, & Krauss 2009). This paper will discuss the impact of both system and estimator variables on a witness's memory for an event and attempt to demonstrate how important it is for police officers to be aware of the impact these factors can have on the investigative process.

Eyewitness memory is merely a "trace" upon the mind of an individual who perceived an event, and not, as some believe, a direct memory stamp which is forever immutably engraved (Wells, & Loftus 1985). Faulty eyewitness memories account for more convictions of innocent people than all other judicial factors combined and, as such, cannot be ignored by individuals employed in the judicial process (The Justice Project n.d.). Police officers are often the first responders to an event and, therefore, are the first people to have the potential to influence a witness's memory for the event. This, in turn, can have an impact on the entire judicial process (Memon et al. 2008; Wells & Loftus 1985). Their understanding of these variables is therefore crucial to the successful conclusion of a case.

Estimator Variables

Estimator variables are those variables which cannot be controlled by the judicial system and thus their effects can only be estimated. Estimator variables fall under three broad categories: the characteristics

of the person, which may include the age and abilities of the individual witnessing a crime; the characteristics of the event, such as time of day, lighting, or other variables applicable to the event; and the characteristics of the testimony, which may include how confident a witness seems in front of a jury (Lieberman, & Krauss 2009). Despite the fact that these variables fall outside the direct control of the system, it is important that estimator variables be understood by police officers as they can have a profound effect on a witness's recollection of events. Estimator variables have played a role in many highly publicized cases, such as that of Troy Davis.

Troy Davis was executed in his home state of Georgia in 2011 having served twenty-seven years in prison for killing an off-duty police officer. Much of the evidence against Davis came in the form of eyewitness testimony. Seven of nine key eyewitnesses who testified against Davis later changed their testimonies, although this had little bearing on the appeals process throughout the case (Wilkinson 2011). One of the witnesses, who later changed her testimony, was Dorothy Ferrell. At the time of the murder, which occurred at approximately 1:00am, Ferrell was either 160 or 200 feet away, on the other side of a tree-lined, four-lane street. To elucidate, there were two palm trees in the vicinity, one was 160 and the other 200 feet away from the crime scene (Troy Anthony Davis v State of Georgia, 2008; NAACP n.d.). It was reported that Ferrell was under a palm tree when the incident took place. In either case, however, it has been demonstrated that correct face perception under ideal lighting conditions is hampered beyond 25 feet, and is essentially impossible at 110 feet (Loftus & Harley 2005; Troy Anthony Davis v State of Georgia 2008; Wells & Quinlivan 2009). Her testimony was partly responsible for Davis' execution, which occurred without retrial or consideration of possible error in eyewitness testimony (Wilkinson 2011).

Another case in which the estimator variables of distance and lighting may have factored is that of Derrick Williams. In August of 1992, a young Caucasian woman returned to her Florida home to find an African-American man standing on her porch. After watching him leave, the woman attempted to open her car door to exit her vehicle. However, the man re-appeared, forced his way into her car and drove her to a secluded orange grove. He then pushed her into the back seat, covered her with his grey t-shirt and sexually assaulted her. After the attacker left the vehicle, the victim was able to free herself, return to the driver's seat and flee from the scene of the crime. The perpetrator's t-shirt was still on the back seat. The victim chose Williams, first from a mug shot book and then a police lineup. It was later determined that the best view she had had of the perpetrator was when he was on the porch and she was sitting in her car 20 feet away. The evening was overcast and it was raining (Innocence Project n.d.a). It should also be noted that there was a potential for cross-racial bias, which may have hampered her ability to choose correctly during the mug shot procedures as it has been consistently demonstrated that a person is far better at identifying a person of their own race (Bothwell, Brigham & Malpass 1989). In 1993, Williams was charged and convicted of sexual assault, but thanks to DNA evidence from the shirt left in the car, was exonerated in 2011 (Innocence Project n.d.a).

Unfortunately, Williams' and Davis' experiences are not unique. Another example in which estimator variables may have had a confounding effect is in a case that occurred in Fairbanks, Alaska in October, 1997. On that day, in separate attacks, Franklin Dayton was assaulted and a fifteen-year-old John Hartman was murdered. Four young men, thereafter known as the "Fairbanks Four", were arrested and convicted of both crimes. Though the prosecution presented a number of pieces of evidence, none of the evidence was particularly incriminating. However, the prosecution largely relied on the testimony of Arlo Olson, which placed the four men together and demonstrated their violent tendencies. Olson witnessed the assault on Dayton and positively identified the four men involved (Loftus & Harley 2005; Free the Fairbanks Four 2012). However, it was determined that Olson was approximately 450 feet away at the time of the assault (Loftus & Harley 2005; Walker, 2013; Cole 2015). The distance from which Mr. Olson

allegedly saw the assault taking place calls into question the accuracy of his statements (Loftus & Harley 2005). The four men spent nearly twenty years behind bars despite several attempts by innocence projects and First Nations groups to exonerate them (Walker 2013; Cole 2015). They were released in 2015, but not exonerated (D'Oro, 2015).

System Variables

Unlike estimator variables, system variables are those variables that are part of the judicial system or procedure. These variables can be measured and controlled (Hope & Wright 2007; Hupbach & Dorskind 2014; Lieberman, & Krauss 2009). Such variables include interviewing techniques, the use of mug shots, line-up procedures and interrogation techniques, all which have been demonstrated to influence a person's memory for an event, and all of which are within the control of the police officers involved in the investigation (Lieberman, & Krauss 2009). During the initial interview of a witness, a simple leading question from a police officer can forever alter a witness's memory for an event. It has been demonstrated, for example, that an officer can unwittingly change a memory for an event with a single misspoken word. In their famous study on eyewitness memory confabulation involving what is known as the "misinformation effect", Elizabeth Loftus and John Palmer had participants view footage of a motor vehicle collision. Each participant saw the same film and was then asked the same follow-up question with one notable difference, the word used to describe the impact. Participants were asked "About how fast the cars were going when they *bumped, collided, contacted, smashed or hit.*" This simple substitution led to vastly differing estimates of speed (Wells & Loftus 1985).

It has also been demonstrated that a person can have a false memory implanted, either purposely or accidentally, by the addition of a simple suggestion. In the familial informant false narrative procedure, which is also known more familiarly as the "lost in mall" study, the researcher will relate to the participant a series of four or five incidents that they say happened to the participant in their childhood. The researcher claims that all these incidents were provided by a relative of the participant. The incidents are indeed genuine, with the exception of one, which is randomly substituted by the researcher for one taken from a list of their own specious fabrications. The substituted incidents may include fabrications such as having been lost in a mall, hence the alternative title, having been taken to the doctor with a bad earache, or having being attacked by a dog. The participant is then asked to recall, in as much detail as possible, all the incidents purportedly listed by their relative, which they have been led to believe occurred during their childhood. The results suggest that 25% of the participants will recall the implanted incident either completely or in part. The power of suggestion is so great that "recalling" such spurious incidents can change a participant's perspective and therefore may also alter their future behaviour. For example, if a participant has been asked to remember the occasion during their childhood on which they were attacked by a vicious dog, they will often feel a reluctance to idea of owning a dog thereafter (Bernstein, Laney, Morris & Loftus 2005).

Interviews

If a witness's memory for an event can easily be altered by a single word or phrase, then the police interview technique becomes very important in the investigative process. Unfortunately, however, the standard police interview technique, though often starting with an open-ended question, soon changes as the police officer, sometimes within seconds, begins to interrupt the witness by asking direct closed-ended questions. These force the witness into monosyllabic type responses such as "yes" or "no" (Greiselman & Fisher 2014). Researchers in the area of police interviewing techniques have demonstrated that better recall can be obtained from the witness if the officer uses open-ended questions and does not interrupt during the recollection phase (Dando, Wilcock & Milne 2008).

Mugshots and Line-ups

The power of suggestion can also factor in eyewitness testimony during a mugshot or line-up procedure. It has been demonstrated, for example, that a simple validation such as, “You’ve selected the suspect”, made by a police officer during a line-up procedure can also alter a witness’s memory for an event (Wilford & Wells 2013). This indeed occurred in the case involving Ronald Cotton. Cotton is an African American male who was found guilty of the rape of a Caucasian woman by the name of Jennifer Thompson. Thompson awoke one night to find a black man leaning over her bed. He threatened her and then proceeded to rape her over a period of several hours. Thompson was determined to survive and was also determined to commit his face to memory. Towards the end of her ordeal, Thompson asked her assailant if she could fetch a glass of water. She then proceeded to the kitchen, where she escaped through the back door and thence to her neighbour’s for help. The rapist fled the scene. Later, when Thompson was shown a photo-lineup at the police station, she chose Cotton’s photo together with another photo. It should be noted here that since Thompson is white and Cotton black, there was the possibility of the estimator variable of cross-racial bias. Thompson scrutinized both photos for a period of time then chose Cotton’s. At the end of the procedure, she asked the investigating officer if she had done well, at which time the officer gave her a positive response saying that she had. The investigating officer later conducted a live-lineup. Unfortunately, Cotton was the only person in the live-lineup whose image had also appeared in the photo-lineup. Thompson again chose Cotton. As she was leaving, she overheard the investigating officer saying that she had again chosen the same person she had chosen during the photo-lineup procedure. At the time of the trial, Jennifer was 100% sure that Cotton was the rapist. She even stated later that she despised him, his family and the public defender who supported him. Cotton was later exonerated by DNA evidence. Surprisingly he bore no malice to Thompson; they are now friends and together give public talks on the problems of eyewitness fallibility (Garrett 2011; Hansen 2001).

In the case of Ronald Cotton, it is obvious there was a problem in the way in which the lineup procedure was conducted. In order that suggestion should not contaminate a witness’s memory, researchers in the area of system variables suggest that all lineups be conducted as a “double blind” procedure. In such a procedure, both the officer conducting the lineup and the witness are unaware or “blind” as to whether or not the suspect is present in the lineup. Furthermore, in order to ensure the witness is unbiased, the officer indicates to the witness that they do not know whether or not suspect is present. This allows the witness to reject the lineup more readily if they are uncertain (Wells, Small, Penrod, Malpass, Fulero and Brimacombe 1998).

Unfortunately, there are many examples of how the misinformation effect, which can occur because of the incorrect use of the lineup procedure, can take place at any point during the investigation, be it hours, days, weeks or even years after the incident. In the case of Derrick Williams, the victim selected Williams from a police lineup in which his photo was placed twice. She cited her confidence at around 80% after seeing the two photos of Williams, but her confidence grew to 100% after selecting him from a lineup. Her testimony seemed to change as her confidence increased. Initially she said she had not seen the perpetrator’s back, but once a visible scar on Williams’ back became known to her, she “remembered” having seen a scar on the back of her attacker (Innocence Project n.d.a). The cards were stacked against Williams from the beginning as he appeared twice in the mug shot book and then again in the subsequent live line-up. Not surprisingly, this can have a compounding effect and, indeed, Gary Wells has warned about procedural problems that may funnel the witness into making a particular choice (Wells, & Quinlivan 2009; Wells, & Loftus 1985). Williams was incarcerated for eighteen years until finally exonerated by DNA evidence.

The possible impact of a faulty line-up can also be seen in the Canadian cases of Thomas Sophonow and Ivan Henry. Thomas Sophonow was charged with the murder of a doughnut shop employee by the

name of Barbara Stoppel. Sophonow, who lived on the west coast, was in Manitoba to visit his daughter and to deliver a Christmas gift. The witnesses to the murder saw a tall man in a cowboy hat enter the doughnut shop. Thomas was tall and also had a cowboy hat similar to the one worn by the murderer. A police sketch was made of the assailant and posted all over town. The police became aware of Sophonow and flew out to BC to interview him. Thomas was very cooperative and at the end of the interview the officers took a picture of him standing outside in a coat and the cowboy hat. The officers used this picture in a photo-lineup that they showed to the witnesses. Thomas' picture stood out in that it was obvious his picture was taken by a different camera and his was the only picture that was taken outdoors. There were many appeals, but despite the obvious flaws in the way the line-up procedure was conducted, one of the appellate court judges did not agree that the way the lineup was conducted would have impacted the witnesses' memory for the event. This is in sharp contrast to the opinion of Elizabeth Loftus, who was asked by Justice Peter Cory to comment on the Thomas Sophonow case. She said that his picture stood out and would attract the attention of the witnesses. She also said once the damage has been done to the witnesses' memory, it cannot be reversed. Sophonow was incarcerated for nearly four years during the entire trial and appeals process. He was released from prison after the third appellate court decided not to retry the case and exonerated after the release of the commissioned report by Justice Peter Cory (Fraser et al. 2011).

Yet another case in which procedural mistakes were made was that involving Ivan Henry. Henry was wrongfully convicted of sexual assault and was serving an indeterminate sentence. During the investigation, he had been placed in a lineup in front of a number of witnesses. However, the lineup went badly. Henry resisted during the procedure and had to be restrained by three police officers. Henry was thus pictured in the lineup in a headlock with three police officers surrounding him, while other members of the lineup were seen to be laughing (Woodward & Derrick 2014). Though the lineup was later discounted, the damage to the witnesses' memory for the perpetrator had been done (Fraser et al. 2011). The lineup in which Henry found himself is a glaring example of faulty lineup procedures. Ivan Henry was acquitted in 2010 having served twenty-seven years in prison (Woodward & Derrick 2014; Proctor 2015).

Interrogation

Another major concern for researchers who study the impact of system variables is the way in which police investigators interrogate possible suspects. A number of police forces in both the United States and Canada use an accusatory technique. This technique begins with a behavioural assessment. During this stage, the police officer engages the suspect in conversation, while looking for signs of deception in the suspect's body language and speech patterns. If the officer detects any deception, they will then proceed to the nine-step interrogation procedure. In this procedure, coercion is considered acceptable as the purpose of the nine steps is to extract a confession (Fraser et al. 2011). Researchers who study the impact of system variables point out that the entire process hinges on the police investigator's ability to detect deception. Numerous studies on the ability to detect deception have been conducted. The results demonstrate that police officers are no better than a person off the street in being able to detect deception, and that experience does not improve reliability (Aamodt & Custer, 2006; Vrij & Winkel, 1993 and Kassin & Gudjonsson, 2004). This is particularly concerning considering the results of a recent survey which tested Canadian police officers on their knowledge and beliefs concerning the fallibility of memory. One of the survey statements to which they were asked to respond, was: "A person's visible reaction to questions during an interview is a strong indicator of deception." The officers were given three possible responses: "Agree," "Disagree," or "Don't Know." Only 36% of the officers correctly disagreed with the statement. Officers were also asked to respond to the statement: "Innocent suspects cannot be coerced into confessing to a crime they did not commit." In this case 77% correctly disagreed with the statement. However, though the

majority believed a person could be coerced into confessing to a crime they did not commit, the accusatory technique suggests it does not matter, since officers using the technique already believe they have successfully eliminated the innocent during the behavioural assessment stage of the process (Fraser, Waite & Bond-Fraser 2013; Fraser, Bond-Fraser & Waite, 2014).

Obviously there are flaws with the accusatory technique. However, there is an alternative interrogation technique, PEACE (Preparation and planning, Engage and explain, Account, Closure and Evaluate), which has its origins in Britain. This technique is non-accusatory and is based on the most up-to-date psychological literature. It is more ethical than the accusatory technique as it neither condones the use of coercion nor relies on a behavioural assessment. In employing this ethical technique, the English police have found that the number of confessions has not decreased. Brent Snook from the University of Newfoundland has been championing the use of the PEACE technique in Canada, but has met with some resistance. This is understandable as many police officers are under the misapprehension that they have the ability to detect deception. Consequently, they believe that the accusatory technique, which most departments adopted back in the late 50s, works.

Where are we now?

The advent of DNA evidence in the courtroom in the early 1980s has brought research into the fallibility of eyewitness testimony to the fore. This is perhaps due to the fact that the majority of cases in which people were incorrectly convicted of a crime and later exonerated were due, at least in part, to faulty eyewitness testimony (Lieberman, & Krauss 2009, Innocence Project n.d.b). For jurors, confident testimonies can be the most memorable part of a trial, despite the fact that they may provide the least accurate evidence presented (Wells & Quinlivan 2009). As a result of such exonerations, many commissions have been set up to study the problem of eyewitness fallibility and have suggested remedies. Among these, a report published by the U.S. Department of Justice under Janet Reno entitled, *Eyewitness Evidence: A Guide for Law Enforcement*, has been particularly notable. Reno argued that a string of DNA exonerations in which innocent people had been convicted due in large part to faulty eyewitness testimony must be addressed by the legal system (Reno, Fisher, Robinson, Brennan, & Travis 1999).

The question remains, however, as to whether or not commissioned reports and research information concerning the fallibility of memory are having an impact on the up-and-coming players in the justice system. Is this information being accessed by and actively being taught to students studying policing and law school students? Fraser, Bond-Fraser, Ready & Houlihan (2012), using a survey instrument designed by Wise and Safer (2003), tested law students across Canada to assess their general understanding of the scientific research concerning the fallibility of memory. The law students scored an average of 73.7% on the knowledge portion of the survey, which demonstrated that there was room for improvement. What was more important, however, was the fact that 36.8% claimed to have had no exposure to empirical material pertaining to fallacious eyewitness memory.

Police officers are often the first responders at a scene and how they deal with witnesses in the initial stages of an investigation can have a profound effect on the ultimate outcome of a case. It is therefore important to assess the knowledge and beliefs that students studying policing have concerning the effects of system and estimator variables on a witness's memory for an event.

Method

Participants

As is pointed out on the mypolice website, "Police training in Canada varies from province to province. There are no mandatory national training standards per se. There is, however, a method of

equivalency between most federal, provincial and police agency training institutions (mypolice, n.d., para. 1). Students responding to our survey could have come from police foundation programs, practical training establishments and/or university programs; thus, to describe the students cohesively, we used the term “students studying policing.”

124 students studying policing from across Canada completed the survey. Participants were recruited from various police training schools across Canada with several provinces represented. The following demographic data was collected: 50 participants identified as female, 70 identified as male and four did not specify a gender. The length of police training programs from which participants were pooled varied greatly, ranging from 35 weeks to four years, therefore the following divisions were made: 0-1 years (86 participants), 2-3 years (29 participants), and 4+ years (9 participants). Participants were also asked how advanced they were in their respective programs, with the options being “beginning” (35 participants), “middle” (61 participants), or “end” (23 participants). Five participants did not disclose their time in the program. Finally, participants were asked to disclose their highest level of education with the following choices: high school degree (32), some college (24), college degree (23), some university (22), and university or graduate degree (17). Six participants did not disclose their education level.

Material and Procedure

This study employed a short survey to ascertain the knowledge of students regarding system and estimator variables and their effects on a witness’s memory for an event. The survey was based on that used by Fraser, Waite and Bond-Fraser (2013) to test Canadian police officers. The present authors modified the police survey to fit the target demographic. The main changes to the survey were to the demographic section, where information concerning length of program, time in program and highest form of education achieved, were sought.

The research proposal was approved by the university’s research ethics board after which a letter of introduction was sent to deans, human resource boards, and department heads of various policing programs across Canada. This letter explained the study and asked their permission to allow the students in their program to participate. Attached was a separate letter to be sent to students if permission were granted. This letter explained the study and contained an URL which linked them to the survey.

The first section of the survey concerned demographic information to determine the respondent’s educational background, gender, program in which they were enrolled, year-of-study, and whether or not the participant was currently a serving police officer. This last point was to control for any officers seeking further training. The second section, which was the knowledge section, contained fourteen questions pertaining to system and estimator variables, (see table 1), as well as three questions that asked participants if they believed judges, lawyers and police officers, respectively, could benefit from further training on the subject of eyewitness testimony.

Results

Participants scored an average of 7.75/14, or 55.3% on the fourteen-point knowledge-based section. The results for each question may be seen in table 1. A one-way analysis of variance was conducted to ascertain whether there was a difference in scores for people at the beginning, middle and end of their program. There was a main effect of time in the program, $F(2, 118) = 5.56$ $p < .001$. A Bonferroni post-hoc comparison showed there was no difference between the beginning (53%) and middle (51.2%) but there was between both the beginning and middle when compared to the end of the program (65.2%).

Table 1*Chi-Square analysis of the fourteen-point knowledge based section.*

Question	Statement	Results %
1. Whether or not a perpetrator is wearing a hat has no impact on the witness' ability to recognize the perpetrator.	A hat/disguise can impede eyewitness recognition. A disguise makes facial recognition more difficult and eyewitness identification less accurate (Cutler, Penrod, & Martens, 1987).	67.7%***
2. A witness' ability to recall minor details about a crime is a bad indicator of the accuracy of the witness' identification of the perpetrator of the crime.	Recalling minor details about a crime does not correlate with eyewitness accuracy, even though witnesses who recalled minor details are sometimes seen as being more accurate (Bell & Loftus, 1989).	24.2%***
3. An eyewitness' perception and memory for an event will not be affected by his or her attitudes and expectations.	Eyewitness' attitude can affect perception and memory. If a witness expects an individual to be guilty of a crime, either from prior exposure to the culprit or an external factor, their perceptions will change. (O'Sullivan, 2007; Bell & Loftus, 1989).	84.7%***
4. A police officer who knows which member of the lineup or photo array is the suspect should not conduct the lineup or photo array.	Police officers, who know which member of a lineup or photo array is the suspect, can influence, either intentionally or inadvertently, a witness to select a particular member of the lineup or photo array. All lineups and photo arrays should be double-blind (Austin, Zimmerman, Rhead, & Kovera, 2013).	61.3%**
5. Eyewitness testimony about an event often reflects not only what the witness actually saw but information obtained later on.	Eyewitness memory is not fixed. Information obtained after a crime can affect memory. Essentially, memory is malleable and not a snapshot of an event (Loftus, 1979).	71%***
6. At trial, an eyewitness' confidence is a good predictor of the accuracy of his or her statement.	Eyewitness confidence does not correlate with accuracy. The variance between eyewitness confidence and statement accuracy is striking, even though a confident eyewitness can be a deciding factor in criminal cases (Cutler, Penrod, & Martens, 1987).	36.3%*
7. An eyewitness' confidence cannot be influenced by factors that are unrelated to identification accuracy.	Eyewitness confidence can be influenced by factors that are of not related to the case. Individual attitudes, perceptions, and information obtained later can affect eyewitness memory. (O'Sullivan, 2007).	55.6%NS
8. The presence of a weapon can impair an eyewitness' ability to accurately identify the perpetrator's face.	The presence of a weapon impairs a witness' ability to recognise a perpetrators face as the witness' focus is on the weapon, not the face of the perpetrator. This phenomenon is called 'weapons focus' (Erickson, Lampinen, & Leding, 2014).	76.6%***

9. Exposure to mug shots of a suspect increases the likelihood that the witness will later choose the suspect from a lineup. Increased exposure to a mug shot creates a commitment effect whereby a witness is more likely to select a suspect if they have an increased exposure to them (Goodsell, Gronlund, & Neuschatz, 2015). 75.8%***
10. Witnesses are more likely to misidentify someone in a culprit-absent lineup when it is presented in a simultaneous (i.e. all members of a lineup are presented at the same time) as opposed to a sequential procedure (i.e. all members of a lineup are presented one at a time). Witnesses are more likely to misidentify someone in a culprit-absent lineup when it is presented simultaneously than sequentially because they feel they need to commit to someone in the lineup. In a simultaneous lineup, witnesses are comparing members of the lineup to one another *and* to their memory of the event. This can distort eyewitness memory and lead to an incorrect selection from the lineup (Glaze, 2007). 46.8%NS
11. The rate of memory loss for an event is greatest right after an event and then levels off over time. In her book, *Eyewitness Testimony Memory*, psychologist, Elizabeth Loftus, uses the term “forgetting curve” when addressing memory loss for an event. Loss is steepest shortly after an event and then begins to level off as time passes (Loftus, 1979). 53.2%NS
12. A person’s visible reaction to questions during an interview is a strong indicator of deception. In popular film, police officers can always tell when an individual is lying simply by observing visible reactions or ‘body language.’ It has been demonstrated, however, that reading body language is not an exact science and a person’s visible reactions to questions during an interview or interrogation are *not* strong indicators of deception, despite police culture to the contrary (Wise, Safer, & Marco, 2011). 21%***
13. Innocent suspects cannot be coerced into confessing to a crime they did not commit. There is a long history of suspects confessing to crimes they did not commit. The phenomenon is not new, as abundant examples arise from historical inquisitions and witch hunts. False confessions still occur today. Innocent suspects can be forced into confessing to crimes they did not commit. This is as true in the twenty-first century as it was in Salem, M.A. centuries ago (Kassin, 2016). 57.3%NS
14. Only in exceptional circumstances should a defendant be convicted solely on the basis of eyewitness testimony. Hundreds of DNA exoneration cases upon which conviction hinged only on eyewitness testimony should make such convictions the exception, not the rule. Only in rare circumstances, and with the knowledge of system and estimator variables, should eyewitness testimony be the sole basis of a conviction (Innocence Project, n.d.a.). 43.5%NS

Note Each percent is the total score for each question out of 100%, while each score beside each percent corresponds to a score which is significantly different than chance. These are:

*** = $p. < .001$, ** = $p. < .01$, * = $p. < .05$, NS = no significance.

Program length was analyzed using a one-way ANOVA. Program length was divided into zero to one year, two to three years, and four years or longer. There was a significant main effect of program length, $F(2, 122) = 7.70$, $p < .001$. A Bonferroni post-hoc comparison test revealed that there was no difference between 0-1 (51.5%), 2-3 (60.4%) or 2-3 years and 4+ (72.1%), but that there was a difference between 0-1 and 4+ years on the knowledge-based section of the survey.

The highest level of education participants had achieved was also analyzed using a one-way analysis of variance. Participants were divided into the following groups: high school graduates, some college, college degree, some university and university degree or graduate degree. There was a main effect of education attained $F(4, 123) = 6.44$, $P = .000$. A Bonferroni post-hoc comparison revealed that the high school students (44%) scored significantly lower than participants who had some college (59.3%), a college degree (62.5%), a university or post-graduate degree (63.4%). Interestingly, there was no significant difference between high school graduates and people who had taken some university courses (51.2%).

Discussion

This study follows the work by Fraser and his colleagues, who have conducted several studies across Canada to examine the knowledge and beliefs of various agents in the judicial processes concerning eyewitness memory. Each of the studies has employed a similar survey, which was originally adapted from that used Wise and Safer (2013) to test US judges. The groups were all asked the same knowledge-based questions concerning eyewitness memory variables; however, police officers and police officers in training were asked two additional questions. In order to compare the students studying policing directly to the other groups, as was the case in the Fraser, Waite and Bond-Fraser (2013) study of police officers, the current investigators removed these two extra questions. This allowed the adjusted score for police officers in training at 58.1% and police officers at 61.9% to be compared directly to the University professors 78.9%, undergraduate students 65.8%, law students 73.7%, civil litigation lawyers 64.8%, and criminal lawyers 75.7% (Fraser, Houlihan, Bond-Fraser & Ellis 2013; Fraser, Bond-Fraser, Morrison & Ready 2014; Fraser, Waite & Bond-Fraser 2013; Fraser, Bond-Fraser & Waite 2014; Fraser, Bond-Fraser, Ready & Houlihan 2012; Fraser, Ready, Bond-Fraser & Morrison 2014; Fraser, Bond-Fraser, Waite, Ready & Morrison 2014).

Despite the fact that students who were approaching the end of their training scored significantly better than those at the beginning or in middle of their program, their score of 65.2% on the fourteen knowledge-based questions demonstrated that they had not received adequate training concerning the variables of eyewitness memory. It would naturally be expected that police officers, those studying policing, and criminal lawyers would do much better than civil litigation lawyers, law students in general, psychology professors and undergraduate students, as the former groups are, or will be expected, to deal with this type of information on a daily basis. However, the evidence suggests that this is not the case and the results of this survey show that students studying policing and police officers on duty do not demonstrate a solid knowledge of this crucial information. This is concerning as the police officer, who is in the vanguard of the judicial process, can have a profound impact on the outcome of a case.

It is important to note that students did think that police officers would benefit from more training in the science behind eyewitness fallibility. Of 124 respondents, 89 said police officers should receive more training in eyewitness memory (71.7%). This result supports previous research in which 89.9% of serving police officers thought more training was needed (Fraser, Waite & Bond-Fraser 2013). Furthermore, 42% of the police officers in training thought lawyers should know more about eyewitness memory, while 41% thought judges should receive more information concerning eyewitness memory. There is a clear gap in the knowledge concerning system and estimator variables and, to their credit, students in policing programs seem to be aware they are missing salient information on the topic.

Limitations

This study relied on police training facilities across Canada allowing their students to participate in an online survey conducted on Lime Survey. If permission was received, the students were recruited on a voluntary basis. This means that the survey was not truly random. It should be noted here that one of the institutions who denied us access to their students did so because they believed their students would not score any better on the knowledge section of the survey than members of the general public. This concern appears to be justified as the overall score for police officers in training was 55.3%.

It is also possible that not all police training programs are created equal. This paper has analyzed students from across Canada enrolled in significantly different programs. While all students were studying policing, different programs may yield different results. It might be that university programs provide more information on eyewitness testimony than foundation or more practically-based programs. Further research could elucidate any distinction.

Further Research

This study is part of ongoing research concerning eyewitness memory. To-date, researchers have examined undergraduate students, university professors, civil litigation lawyers, criminal lawyers, police officers, and now students studying policing (Fraser, Houlihan, Bond-Fraser & Ellis 2013; Fraser, Bond-Fraser, Morrison & Ready 2014; Fraser, Waite & Bond-Fraser 2013; Fraser, Bond-Fraser & Waite 2014; Fraser, Bond-Fraser, Ready & Houlihan 2012; Fraser, Ready, Bond-Fraser & Morrison 2014; Fraser, Bond-Fraser, Waite, Ready & Morrison 2014).

Future research might test Canadian judges. As judges are obviously key players in the judicial process who make decisions concerning witness reliability on a regular basis, it is important to test their knowledge and beliefs concerning the variables of eyewitness memory. On the twelve-point, knowledge-based survey, civil litigation lawyers scored 64.8%, criminal lawyers scored 75.7%, while law students scored 73.7%. It would be interesting to see if judges' scores are similar to those of lawyers or law students. Research conducted in the United States has shown that judges scored only 55% on the same knowledge-based section used in this research (Wise & Safer, 2003). Exploring the knowledge and beliefs of Canadian judges would give us a better understanding of the current conditions within the judicial system.

Conclusion

The results of this study indicate that police officers are not receiving enough information concerning eyewitness memory in their education. In total, 18.5% of participants indicated they had not been exposed to any educational material on eyewitness testimony within their current program. However, having taken into consideration the fact that people at the end of the program scored significantly better than those at the beginning and the middle, it is important to note that, within this group, one person only (4%), indicated that they had not received any exposure. Having said this, those who were at the end of their program scored an average of 65.2%, which suggests that there is still significant room for improvement. The authors recommend that police training schools across Canada adopt a standardized curriculum to instruct their officers in training about the variables involved in eyewitness memory as, and has already been mentioned, there may be variance in scores between programs. According to our survey, this would be welcomed by the students, as the majority believe that police officers need more training in this subject area.

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