CHANGE BLINDNESS AND THE SEQUENTIAL LINEUP:

AGE-RELATED COMPARISONS

by

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A Thesis submitted to the

School of Graduate Studies

in partial fulfillment of the requirements for the degree of

Masters of Science

Psychology Department

Memorial University of Newfoundland

August 2014

St. John's, Newfoundland and Labrador

Abstract

Change blindness (CB) refers to a lack of awareness regarding changes that occur within our environment. Recently, CB has been discussed as a potential factor that increases false eyewitness identifications when one's view of the culprit is obstructed. CB has not been studied in a forensic setting with seniors. Furthermore, past CB research has failed to consider how an alternative procedure to the simultaneous lineup may affect false identifications due to CB. In this study, a sample of young adults (n = 90) and seniors (n = 90) viewed one of two mock-theft videos where the culprit changed (CB video) or did not change (control video) during the video. To address identification, culprit-present and culprit-absent sequential lineups were used. Results indicated that 28.9% of young adults and 37.8% of seniors displayed CB (p = .46), but surprisingly, it was not found that CB affected their identification accuracy. Findings are presented in terms of the potential benefits of the sequential lineup in reducing the effects of CB.

Keywords: change blindness, young adults, seniors, sequential lineup, eyewitness, identification

This thesis is dedicated to my late grandmother, Doreen Tucker.

Because two things helped get me through this degree: my stubbornness and my love for coffee.

Both I attribute to genetics.

Thanks Nan.

Acknowledgements

I would first like to thank my thesis supervisor, Dr. Jamie Drover for all of his help and guidance throughout this project and for taking a big chance on me. This research is really different than anything Dr. Drover has previously been involved with, and I would therefore like to thank him for this opportunity. It has been challenging but very rewarding.

I would also like to express a big thank you to the Social Sciences and Humanities Research Council (SSHRC) for funding this project with the Joseph-Armand Bombardier Canada Graduate Scholarship (Master's). It has really made all the difference.

Thank you to my wife, Heather Canning, for being the most outstanding volunteer for this project. Heather has helped me in every way imaginable: from the planning stages of this thesis, all the way through recruitment, data collection and more recently data analysis and writing. It has really helped working with her, especially considering that we share the same degree program as well as area of specialization (developmental). Although her thesis participants are on the opposite end of the age spectrum (children) from my own (seniors), her insights have been an invaluable addition to this research project.

Thank you to all the volunteers who have worked on this project. From running participants to transcribing interviews, this project would not have been possible without all of their hard work and dedication.

Thank you to the people who provided their photograph for the lineup and acted in the videos for this project.

I would also like to thank Malcolm Grant for his helpful input with the statistical analyses for this thesis and his patience with my back-and-forth e-mails as well as my scheduled and impromptu meetings.

Finally, I would like to extend my gratitude to the seniors' organizations in St. John's for their help with recruiting senior participants.

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Change Blindness and the Sequential Lineup: Age-related Comparisons

Since 1990, the use of DNA testing has played an important role in exoneration cases. Seventy-five percent of DNA exoneration cases investigated by the Innocence Project have involved individuals who were wrongfully convicted on the basis of faulty eyewitness identification (Magnussen, Melinder, Stridbeck, & Raja, 2010; Nelson, et al., 2011; Wells et al., 2000). Eyewitness identification is notoriously difficult, and developmental research suggests that these difficulties increase over the lifespan (Memon & Gabbert, 2003; Wells et al., 1998). However, the relationship between aging and errors made by eyewitnesses has not received much attention (Bornstein, 1995; Wells et al., 2000). This issue is very important because society is facing an aging population. In many countries, the number of people 65 and over is growing; more than ever before, seniors are likely to be witnesses to crimes (Havard & Memon, 2009).

Aging is related to a decline in the perceptual and cognitive systems, both of which are vital for the accurate perception and retention of information about the environment (Mueller-Johnson & Ceci, 2007). Aging is further related to a decrease in recognition memory for unfamiliar faces (Memon & Gabbert, 2003; Searcy, Bartlett, & Memon, 1999). In terms of lineup identification, seniors have been shown to be less accurate than younger adults and this difference is usually presented in the number of false identifications made by witnesses (i.e., choosing a filler in the lineup) (Memon & Gabbert, 2003; Memon, Hope, Bartlett, & Bull, 2002; Rose, Bull, & Vrij, 2005).

A concept known as change blindness has also been shown to affect rates of false identifications in the few studies linking the two together (Nelson et al., 2011; Ross, Ceci, Dunning, & Toglia, 1994). The term 'change blindness' (CB) refers to a lack of awareness about changes that occur in our environment (see below for a full description). CB was first suggested by Ross et al. (1994) as a possible explanation for the misidentification of innocent bystanders by eyewitnesses (Berberian, Chambaron-Ginhac, & Cleeremans, 2010; Nelson et al., 2011). Ross et al. (1994) reasoned that the misidentification of innocent bystanders is the result of eyewitnesses believing that the culprit and bystander are actually the same person (Ross et al., 1994). For instance, if a witness has his/her observation of a culprit disrupted, as may occur if a culprit runs through a crowd of people, he/she may confuse the culprit with a similar-looking bystander they observe emerging from the crowd (Davies & Hine, 2007). Thus, CB may potentially explain some eyewitness errors and therefore, it warrants further study to better understand and eventually reduce its impact (Davis, Loftus, Vanous, & Cucciare, 2008; Wells et al., 2000).

Change Blindness

In 1994, Ross and his colleagues conducted a study that would later be considered by many in the research community as one of the first examinations of CB. In their study, Ross et al. (1994) initially planned to investigate a separate phenomenon termed 'unconscious transference'. It is important to note the word 'unconscious' in the term unconscious transference, as it serves to distinguish the concept from CB. In detail, unconscious transference can be defined as the misidentification of an innocent person

from a lineup because he/she appears to be familiar (Ross et al., 1994). Therefore, the identity of the familiar bystander becomes confused with the identity of the culprit. According to unconscious transference, this causes the eyewitness to identify the wrong person in the lineup because the eyewitness believes that the bystander and the culprit are the actually the same individual (Ross et al., 1994). As alluded to by the term 'unconscious', this process is thought to occur without the witness' conscious recollection of the bystander (Ross et al., 1994).

In Ross et al.'s (1994) study, participants were shown one of two different videos of a mock-theft, a control video and a video designed to induce unconscious transference. Participants were informed that they would watch a video about what it is like to be a pre-school teacher. In both videos, a group of children were read a story by their teacher. In the control condition, the teacher who read the story was female (i.e., the victim), whereas in the transference condition, the teacher who read the story was male (i.e., the innocent bystander). Both videos featured the victim and the culprit; however, only transference participants ever saw the bystander. During both the control and transference videos, the victim left to go to the cafeteria, leaving the children with the other teachers. In each video, the female teacher entered the cafeteria and sat down next to the culprit, took money out of her wallet for the vending machine and then left her wallet on the table. While the victim had her back turned to the culprit, he stole the remaining bills from her wallet and then left the cafeteria.

A key finding of Ross et al.'s (1994) study was that 66% of transference participants reported viewing the culprit in another scene, despite the culprit only being

shown in the final scene of the video, in contrast to past unconscious transference research. This suggested that transference participants believed the bystander and the culprit were actually the same individual. As described earlier, a key tenet of unconscious transference is that a witness should have *no* conscious recollection of the bystander (Ross et al., 1994). Therefore, these results clearly do not fall within the parameters of unconscious transference. Researchers have since proposed that the findings of Ross et al.'s (1994) study may instead be an example of CB. This idea fits in well with the work that has been conducted on CB and eyewitness identification, where the underlying principle is that witnesses who demonstrate CB can consciously recall having seen both the bystander and the culprit but mistakenly believe they are the same person.

Simons and Levin (1998) examined CB in a study in which an experimenter approached participants on the street and asked them for directions. Mid-conversation, a confederate, and the second experimenter carried a door and walked between the participant and the first experimenter, providing an opportunity for the first experimenter to change places with a second experimenter. Half of the pedestrians failed to notice this change. In a separate study, Levin, Simons, Angelone, and Chabris (2002) sought to determine if CB would still occur in a real-world paradigm where the transition between experimenters was more natural. In their study, each participant approached an experimenter at a counter to sign-up for an experiment. When the participant had completed the consent form for the study, the experimenter then ducked behind the counter to retrieve additional forms for the participant to complete. Once the

experimenter was completely out of view from the participant, he was replaced by a second experimenter who then rose from behind the counter and handed the participant a package of questions to complete in another room. Levin et al. (2002) found the change in experimenters went unnoticed by 75% of participants in their study.

The studies conducted by Simons and Levin (1998) and Levin et al. (2002) consisted entirely of samples of young adults. In fact, with few exceptions (Rizzo et al., 2009; Veiel, Storandt, & Abrams, 2006), CB has been studied exclusively with university students or middle-aged adults (Nelson et al., 2011), whereas seniors have been underrepresented. Notwithstanding, in the few studies that have included seniors, it has been found that they are more susceptible to CB compared to younger adults (Rizzo et al., 2009; Veiel et al., 2006). Rizzo et al. (2009), for example, examined CB as a function of both increased age and early Alzheimer's disease. In their study, participants were shown a series of images on a computer screen that depicted changes to various driving scenes, which faded in and out unobtrusively. For example, in one CB trial, participants viewed an image of a multi-lane roadway where a vehicle appeared and disappeared in one of the lanes. They found that both aging and early Alzheimer's disease were associated with increased susceptibility to CB. Also, Veiel et al. (2006) reported that older adults were slower to detect changes in a visual scene, compared with younger adults.

Change blindness and why it occurs. There are many different hypotheses that attempt to shed light on CB (Levin et al., 2002; Simons, 2000). Simons (2000) discussed five possible explanations for CB, in his review of the literature [see Simons (2000) for a more in-depth discussion]. Imagine that you were presented an image of a fork followed

by an image of spoon and you failed to notice the change in objects occur. According to the Overwriting Hypothesis, CB is the result of one stimulus being overwritten by another stimulus. This hypothesis suggests that the image of the spoon overwrites the image of the fork, and therefore, you would only remember the image of the latter. This hypothesis is supported by empirical evidence that suggests that CB is the result of sparse or inaccessible representations of the initial stimulus (Simons, 2000; Levin et al., 2002).

Alternatively, the First Impressions Hypothesis suggests that CB occurs because only features of the original scene and not the changed scene are represented (Simons, 2000). Using the example that was described earlier, this hypothesis would state that when presented the sequence of fork followed by spoon, you only encoded or 'represented' the individual features of the fork, not the changed object (i.e., the spoon).

The Nothing is Stored Hypothesis is perhaps the most radical explanation for CB. Proponents of this hypothesis argue that we fail to store any information about our environment automatically. If details about a scene are not consciously processed and encoded, then change detection is thought to be impossible (Simons, 2000). For this hypothesis, if you were not directly attending to these images, you would fail to recall the images of the fork and the spoon because you failed to extract their individual details from the sequence.

Next, the Everything is Stored but Nothing is Compared Hypothesis states that CB is the result of a lack of comparison between the original stimulus and the changed stimulus (Simons, 2000). In this case, both images, the fork and the spoon, are

represented in your memory. However, unless your attention is oriented to the discrepancy, you will not be aware that change in images occurred.

The final hypothesis discussed by Simons (2000) in his review is the Feature Combination Hypothesis. As implied by the term, this hypothesis suggests that details of both the original and changed stimulus are retained after viewing and are combined to form a composite image (Simons, 2000). For example, features of the two images (the fork and the spoon) would merge in your memory and you would subsequently report being presented a "spork".

Presently, there is no consensus regarding which of the five hypotheses discussed above best accounts for CB. This is because, depending on the type of stimuli, one hypothesis may better account for CB compared to others (Simons, 2000). Nonetheless, each of the five hypotheses listed above provide compelling insight into our representations of events and sequences (Simons, 2000)

The application of change blindness to forensic psychology. Previous research in the field of CB has found that observers often fail to detect both small and large changes to scenes and people in both staged recordings and real-world interactions (Nelson et al., 2011; Simons & Levin, 1998; Veiel et al., 2006). CB has been further examined in a forensic paradigm wherein the identity of the culprit changes partway through a video stimulus (Davies & Hine, 2007; Nelson et al., 2011). To address identification, CB studies have unanimously opted for a simultaneous presentation of lineup photographs. In Ross et al. (1994; see above), after watching the video, participants were presented with one of three different lineups. The 5-person lineup

featured the bystander, or the culprit, or both the bystander and the culprit. The remaining photographs for each lineup were foils. In lineups that featured just the bystander and four foils (i.e., a culprit-absent lineup), participants in the transference condition were about three times more likely to identify the bystander in the lineup. Ross et al. (1994) also found that CB participants were less likely than control participants to reject the lineup (33.7% v. 64.4%).

Nelson et al. (2011) presented participants with a video, which involved the theft of a sum of money that the victim had used to bookmark a page in her textbook that she had left unattended. Upon leaving the building, the perpetrator turned a corner and was replaced by a different actor who was similar in appearance and clothing. In the CB condition, Nelson et al. (2011) reported that 95% of participants failed to notice the change in actors during the video, a figure that Nelson et al. (2011) themselves noted as being much higher than has been found in prior CB studies. In a similar study, Davies and Hine (2007) showed participants a video depicting a burglar (referred to as Burglar 1) breaking and entering into a student's house. In the video, the burglar entered the house hurriedly searching for valuables. He proceeded to go upstairs to continue his search in another bedroom. The door then opened, and a different burglar emerged (referred to as Burglar 2), continued looking around for valuables, and then left the house. Davies and Hine (2007) found that 61% of participants did not report the change in burglars. Collectively, these studies show that eyewitnesses to a crime can often fail to notice important details or changes.

Researchers have also studied the relationship between CB and accuracy in lineup identification (Davies & Hine, 2007). In general, procedures designed to induce CB have been found to increase the rates of false identifications (Levin et al., 2002; Nelson et al., 2011). Nelson et al. (2011) reported in the above study that participants who had seen the CB video were more likely to identify the CB actor than the culprit from a photo lineup. Levin et al. (2002) tested CB in two different real-word scenarios modelled after Simons' and Levin's (1998) study. In one scenario, an experimenter approached participants with a disposable camera and asked them if he/she could take the experimenter's photograph in front of a display. While he/she was occupied taking the photograph, a confederate and a second experimenter carried a large piece of cardboard and walked between the participant and the experimenter. During this interruption, the first experimenter changed places with a second experimenter who had been carrying the cardboard. In the other scenario, Levin et al. (2002) replicated Simons and Levin's (1998) door study. In both scenarios, the second experimenter probed participants' awareness of the change that had occurred by asking if they had noticed anything unusual during their interaction. If they had not spontaneously reported it, participants were asked if they had noticed the change in experimenters. Following this exchange, participants were presented with a four-person lineup and were asked if they could identify the first experimenter. Only 26% of participants in the CB condition who failed to notice the change correctly identified the first experimenter from the lineup. Conversely, 63% of participants in the CB condition who detected the change in experimenters correctly were able to identify the first experimenter from the lineup.

In their burglar study (see above), Davies and Hine (2007) presented participants with a six-person photo lineup that included both burglars from their video and then they asked participants to select who they recognized seeing from the video. They found a trend for participants who selected only one burglar from the lineup to choose Burglar 1, albeit this trend did not reach statistical significance ($p = .13$). Davies and Hine's (2007) observation is interesting because it is incongruent with the literature conducted on CB and eyewitness identification. Typically, it has been found that the second actor (Burglar 2) is more likely than the original culprit (Burglar 1) to be selected from a lineup by participants who did not observe the change in actors occur (Nelson et al., 2011; Ross et al., 1994).

Presentation Style

In the laboratory, lineup research is often studied under both 'culprit-present' (culprit is present in the lineup) and 'culprit absent' (culprit is absent from the lineup) conditions. In so doing, researchers are able to observe witnesses' performance under these two different scenarios, including the influence each scenario has on false identification rates (Wells et al., 2000). Culprit-present lineups are composed of a suspect and several foils or 'fillers' (known innocent persons) who are matched to a description of the culprit, whereas culprit-absent lineups are composed of only foils (Wells et al., 2000). In a review of the literature, Penrod and Bornstein (2007) reported that for culprit-present lineups, the unweighted averages for correct and false identifications were 42% and 32% respectively. In culprit-absent conditions, the rates of false identifications were about 35-40% (Penrod & Bornstein, 2007). Predominantly, in lineup research, participants are

presented with a video stimulus of a mock/staged crime (or real footage, e.g., crime stoppers footage) and then asked to identify the culprit in a lineup procedure.

Police can administer lineups to witnesses in a number of different ways, which differ in convenience and real-world practicality (Koehnken, Malpass, & Wolgater, 1996; Lipton, 1996). Live lineups, for example, are used by police and have been recognized by the law (and empirical research) to be more reliable than photo lineup displays (Lipton, 1996). Video lineups, an alternative to both live and photo lineups, have also been shown to be quite reliable, relative to live lineups, and associated with significantly fewer false identifications relative to photo lineups in culprit-absent conditions (Cutler & Fisher, 1990; Lipton, 1996). In culprit-present conditions, however, Cutler and Fisher (1990) found no differences between the live and photo lineup displays. Police often opt for photo lineups as their method of choice, by virtue of the practical difficulties associated with the composition of a live lineup (Lipton, 1996). In addition, photo lineups offer police a lot of control in terms of the presentation of the lineup, relative to live lineups (Koehnken et al., 1996).

In studies wherein CB and identification accuracy were examined together, researchers have unanimously opted for a simultaneous (or all-at-once) presentation of lineup photographs (Ross et al., 1994). It has been demonstrated that this method of identification may not always be beneficial, particularly in how eyewitnesses arrive at their decision (Wells et al., 1998). In a simultaneous lineup, witnesses are presented lineup photographs all-at-once or ‘simultaneously’, and usually only six photographs constitute the photo spread (Wells et al., 1998). In opting for an all-at-once presentation,

it is important to note that the simultaneous lineup facilitates the use of a relative judgment criterion (i.e., Who looks most like the culprit?) (Pozzulo et al., 2008). If the culprit is present in the lineup, this strategy is likely to be quite effective. However, if the culprit were absent, a relative judgment strategy would increase the likelihood of committing a false identification (Pozzulo et al., 2008; Wells et al., 1998).

In 1985, Lindsay and Wells developed the sequential lineup as an alternative to the simultaneous lineup procedure. In a sequential lineup, eyewitnesses are shown each of the lineup photographs only once. The photographs are presented one at a time and the eyewitness is instructed that they will not be able to go back and forth between the photographs or view any of the photographs again (Lindsay & Wells, 1985). In addition, the number of photos that comprise the lineup is not disclosed to eyewitnesses (Pozzulo et al., 2008). In so doing, it is speculated that the sequential lineup will reduce the pressure that the eyewitness may feel to make a decision regarding the culprit (Lindsay & Wells, 1985). Eyewitnesses are also cautioned that the culprit may or may not be present in the lineup (Lindsay & Wells, 1985; Malpass & Devine, 1981). This warning is encouraged for all lineup types as it has been found to have a profound impact on the rates of false identifications (Malpass & Devine, 1981). Relative to the simultaneous procedure, which operates under a relative judgement criterion (i.e., Who looks most like the culprit?), the sequential lineup promotes the use of a stricter decision-making criterion, referred to as an absolute judgement (i.e., Is this the culprit?) (Steblay, Dysart, & Wells, 2011).

Compared to the simultaneous lineup, some studies have found that the sequential lineup yields equivalent rates of culprit identifications while reducing the rates of false

identifications (Lindsay & Wells, 1985; Pozzulo et al., 2008). In 2011, Steblay, Dysart, and Wells conducted a meta-analysis of 27 studies comparing the efficacy of the simultaneous and sequential lineups with culprit-present and culprit-absent lineups using an adult sample. In these studies, the simultaneous lineup was found to result in significantly higher choosing rates than did the sequential lineup, irrespective of culprit-present or culprit-absent conditions (Steblay et al., 2011). Therefore, in culprit-present conditions, the simultaneous lineup leads to more correct identifications; however, in culprit-absent conditions, the simultaneous lineup produces significantly more false identifications (Steblay et al., 2011). Overall, the average discrepancy in correct identifications between the simultaneous and sequential lineups in culprit-present conditions was found to be 8% in favour of the simultaneous lineup. In culprit-absent conditions, however, the sequential lineup was found to reduce false identifications by 22% (Steblay et al., 2011).

Lineup identification and the elderly. Presently, there are few investigations into the effects of aging on identification accuracy (Rose et al., 2005). Notwithstanding, aging is related to a decrease in recognition memory for unfamiliar faces (Memon & Gabbert, 2003; Searcy et al., 1999). In terms of identification, seniors have been shown to be less accurate than younger adults. This difference is usually presented as the number of false identifications made by eyewitnesses (Memon & Gabbert, 2003; Memon et al., 2002; Rose et al., 2005). Memon and Gabbert (2003) and Rose et al. (2005) found that the elderly made more false identifications than younger adults in both the culprit-absent and culprit-present sequential lineups. In comparison to the simultaneous lineup, older

participants provided significantly fewer false identifications with culprit-absent sequential lineups; however, culprit-present sequential lineups produced greater false identifications with older adults. The sequential lineup promotes the adoption of a stricter decision criterion, which has been demonstrated by past research to reduce age differences in false positive identifications (Memon & Gabbert, 2003; Memon et al., 2002). This is further supported by data from Searcy, Bartlett, and Memon (2000), which demonstrated that for both young adults and seniors, the sequential lineup was effective in reducing choosing rates in a culprit-absent lineup with both young adults and seniors.

Present Study

Only a handful of studies have investigated whether CB influences identification accuracy (Nelson et al., 2011). These studies have found that participants who demonstrate CB are less accurate in their identifications because they believe that the culprit and CB actor (i.e., the bystander) are actually the same person (Ross et al., 1994). In other cases, the presence of the CB actor (who is similar in appearance to the culprit) could impair participants' memory for the culprit. This study will examine age as a function of change blindness and lineup type (culprit-present or culprit-absent) in a sequential lineup format.

Hypotheses for the primary questions of interest are:

Hypothesis 1: Seniors will demonstrate greater susceptibility to CB than younger adults, as demonstrated in past research on CB (Rizzo et al., 2009; Veiel et al., 2006).

Hypothesis 2: Seniors will be less accurate in their identifications compared to young adults.

Hypothesis 3: Control participants will have superior identification accuracy compared to CB participants.

Hypothesis 4: CB participants will have higher rates of false identifications in a culprit-absent lineup compared to control participants, congruent with past research stating that CB is associated with higher rates of false identifications.

Hypotheses for the secondary questions of interest are:

Hypothesis 5: This study will find lower rates of CB and more accurate identifications compared to past studies on CB, as participants will be informed they will view a mock-theft video and have their memories tested.

Hypothesis 6: In the CB condition, participants who spontaneously report noticing the change in actors will be more accurate with the lineup than participants who report noticing the change only when asked and participants who do not report noticing the change (Levin et al., 2002).

Method

Participants

Two age groups were recruited for this study. First, a sample of 102 young adults (69 women, 33 men, M_{age} = 20.76, SD_{age} = 2.78) aged 18 – 30 was recruited from the undergraduate student population at Memorial University of Newfoundland. Fifty-seven students received bonus credit for participating in this study as part of their course curriculum, which encourages the participation in research studies at Memorial University of Newfoundland. Forty-five students were recruited from introductory psychology courses, as well as through posters placed around the Memorial University of Newfoundland campus. These students were informed that by participating in this study they would be entered into a draw for a $100 gift certificate. Students receiving bonus credit for participating in this study were not included in the draw. Second, a sample of 94 seniors aged 55 – 82 (55 women, 39 men, M_{age} = 67.87, SD_{age} = 7.77) was recruited though a variety of recruitment methods. Seventeen were recruited from an existing participant pool gathered by Dr. Aimée Suprenant of the Psychology Department at Memorial University of Newfoundland. Fifty-one participants were recruited from a combination of seniors' clubs and organizations in St. John's, Newfoundland as well as convenience sampling in St. John's, Newfoundland. An additional 26 participants were recruited via convenience sampling in Corner Brook, Newfoundland (n = 17), and Ottawa, Ontario (n = 9). Sixty-one seniors completed the study at their location of residence. The remaining 33 seniors completed the study in one of three testing rooms at Memorial University of Newfoundland. Seniors were informed that by participating they

would be entered into a separate draw for a $100 gift certificate. Twelve students were excluded from the final sample because they recognized people from the lineup or the actors in the videos. This was anticipated as both the lineup members and video actors were recruited from the student population at Memorial University of Newfoundland. Four seniors were excluded from the final sample because they did not meet the visual acuity cut-off for the study (see below) (n = 3) or did not meet the age requirement for the sample (n = 1). The final sample for this study consisted of 90 young adults and 90 seniors (see Figure 1 for age distribution). All participants provided written consent (see Appendices A-D). Approval to conduct this research was granted by the Interdisciplinary Committee on Ethics in Human Research (ICEHR) at Memorial University of Newfoundland.

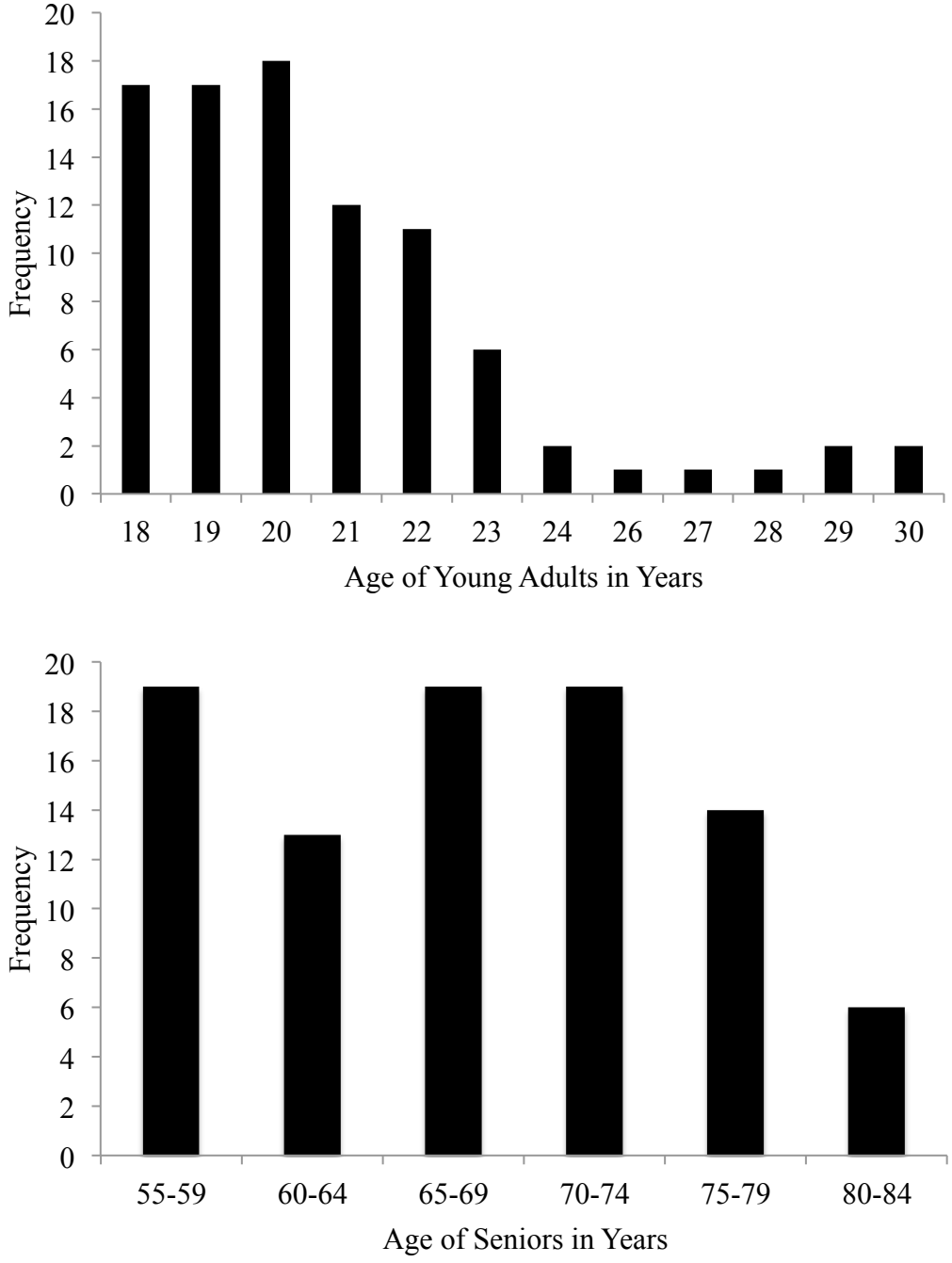

Figure 1. Age distribution of the final sample of young adults and seniors included in this study.

Materials

Video. Participants watched individually one of two videos (each about one minute in duration) on a 13-inch laptop display. The videos corresponded to a CB or control condition. Participants were seated approximately 16-inches from the screen. Each video showed an opportunistic theft of $100 in 20-dollar bills from a female student's unattended handbag. Each video began with a black screen and faded in to reveal a female student studying at a desk in a library. The student's cell phone began ringing and she quickly exited through a nearby door. As the student exited the frame, the culprit was depicted gathering his materials together to begin leaving the library. He turned around and noticed that the female student's purse was left unattended. He approached her desk and looked around (providing a clear image of his face [see Figure 2, photo 4]). He then reached into her purse and took the $100 dollars. The culprit then left the library through a different set of doors. In the control condition, the culprit turned around a corner and walked down two hallways, leaving the library through a nearby door. In the CB condition, the culprit is shown leaving the scene and as he took a turn around a corner, the CB actor, a different person, but similar in appearance and clothing to the culprit (see Appendix E for culprit description), subsequently replaced him and continued to walk through the library and later exited the library through a door at the end. The videos were filmed on the same occasion, so lighting and other details of the scene (e.g., placement of tables and chairs, etc.) remained constant. The videos filmed for this study were shorter in length compared to past research (1 minute v. 2 minutes) (Davies & Hine, 2007; Nelson et al., 2011). However, like Davies and Hine (2007),

participants in this study had equal exposure to both actors during the video (i.e., 30 seconds each). Screenshots of the two videos can be found in Figure 2. Photos 1-4 show the opening scene of the video. In photo 5, the culprit is seen exiting the library's reading room through a nearby set of doors. The proceeding scenes depict the culprit (6A) or the CB actor (6B) walking down a hallway to leave the library.

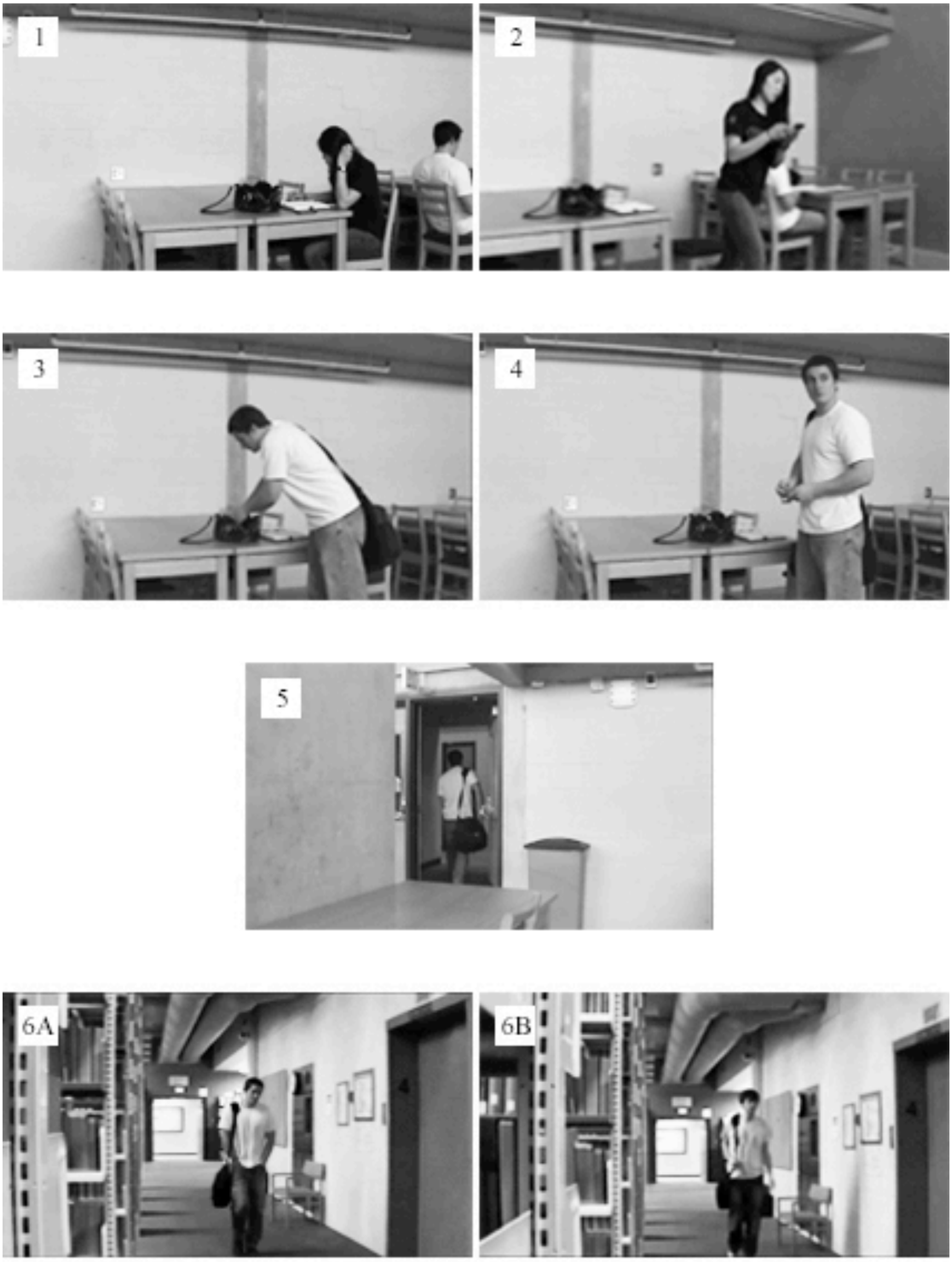

Figure 2. A scene-by-scene progression for each of the two videos used in this study.

Vision screening. To ensure that performance in this study was not affected by visual impairments, each participant had his/her visual acuity tested using the Early Treatment Diabetic Retinopathy Study (ETDRS) visual acuity test (see Figure 3). The test consists of a chart containing rows of letters in which the size of the letters within the rows decreases progressively as one reads from top to bottom. Each row contains five letters. Each participant was asked to identify the letters on each row. To progress to the next row, the participant had to name at least four out of the five letters correctly. The smallest letter row for which the participant could identify at least four letters correctly was taken as a measure of visual acuity. Each participant was tested using his/her corrective lenses, if applicable, and only those who scored 20/50 or better were included in the final sample.

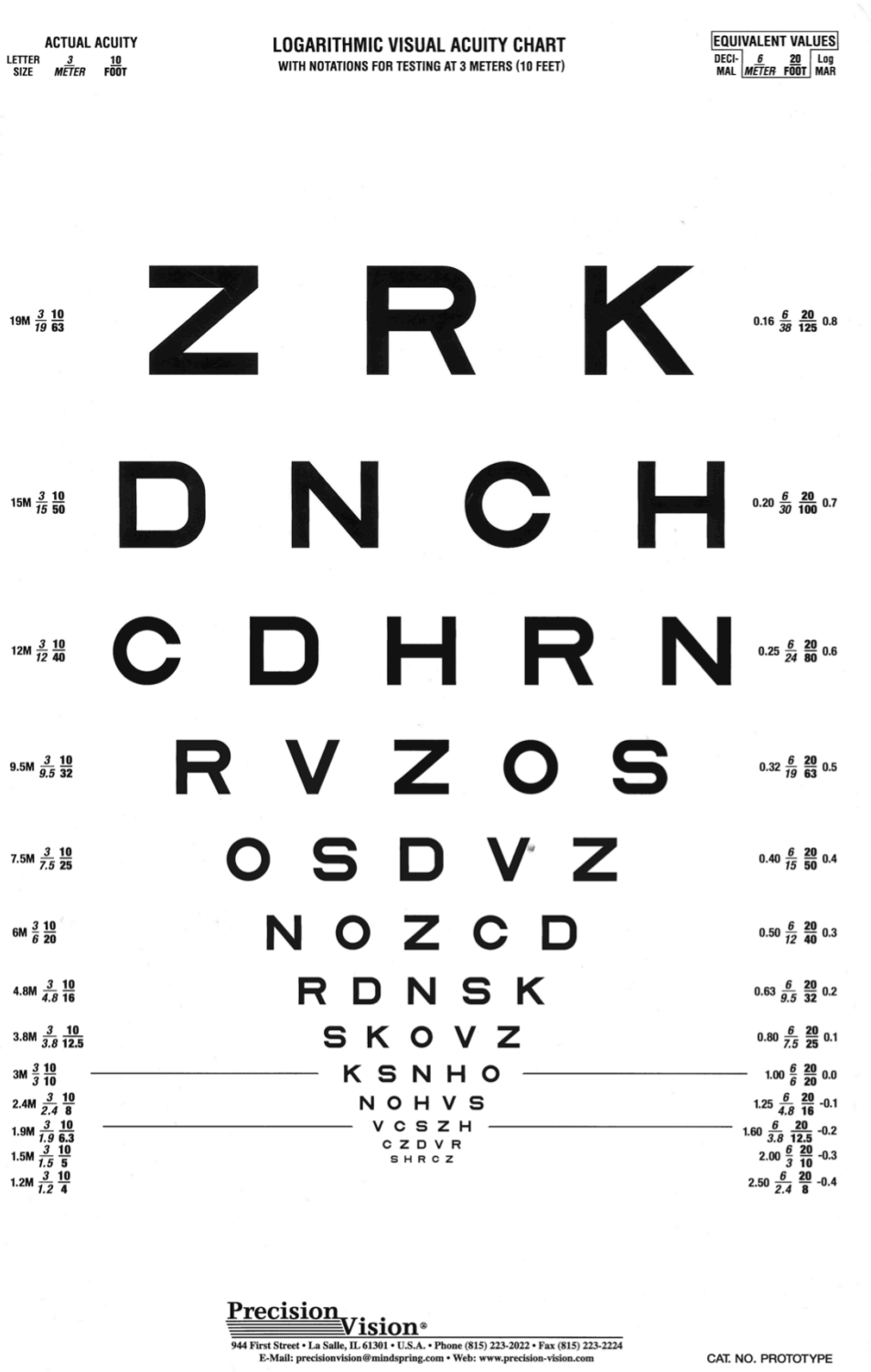

Figure 3. Early Treatment Diabetic Retinopathy Study (ETDRS) visual acuity chart

Lineup construction. Identification was addressed using the sequential lineup procedure. Participants were tested with the sequential lineup under culprit-present or culprit-absent conditions. The sequential lineup was constructed from six photographs (8.5 in. by 11 in.). All foils matched a description of the culprit that was obtained in a pilot study (see Appendix A). The culprit-absent lineup consisted of all six foils (see Figure 4). For the first culprit-present lineup, one of the two foil photographs with the lowest similarity ranking (foil 5), as determined in a pilot study (see Appendix A for a full description), was randomly selected and replaced by the photograph of the culprit, leaving the culprit and five foils. For the second culprit-present lineup, the photographs of the foils with the two lowest similarity rankings were replaced with the CB actor (foil 1) and the culprit leaving the culprit, CB actor, and four foils. All remaining photos were left unchanged. Colour photographs were used and the photographs were shot from a head-and-chest perspective. Photographs were taken against a plain white wall, at the same distance and under identical lighting and background conditions. The foils used in this study as well as the culprit and CB actor can be viewed in Figures 4 and 5 respectively.

Figure 4. The foils used in this study.

Figure 5. The culprit (left) and CB actor (right).

Sequential lineup. Six photos were presented during the sequential lineup procedure. When applicable, photos for the culprit and the CB actor were presented in random order (using a random number generator) but neither appeared as the first or last photo in the lineups. The photos were separated by a blank card to prevent participants from seeing the next photo in the lineup. A research assistant who was blind to the identity of the culprit individual presented all of the photographs. The following instructions were provided to participants in oral form:

> I am going to show you some photographs. The criminal's photograph may or may not be present in the lineup. You will see each photograph *only* once. When I present a photograph, please indicate if he is the criminal that you saw in the video. After you have made a decision, you will *not* be able to see the photograph you chose again or go back or forth between any of the photographs in the lineup. Take as much time as you need before moving on to the next photograph, a clear decision must be made before moving on. If you make a decision regarding the criminal, please indicate in a percentage how confident you are in your decision. Do you have any questions about this lineup procedure?
>
> Think back to the crime and compare your memory of how the criminal looked in the video to the following pictures I am going to show you.

Procedure

For seniors, testing was conducted either at the participant's home or at Memorial University. All students were tested at Memorial University. The author was present for all participants, accompanied by one of six female research assistants. Participants were

assigned to CB or control video conditions and one of three sequential lineups under culprit-absent and culprit-presents conditions with a Latin square (see Figure 6, for research design). A research assistant who was blind to the condition placement of each participant conducted the lineup procedure.

Each participant was informed that he/she was taking part in a memory study and was asked to view a brief video about a mock-theft by the author. After the participant viewed the video, he/she completed a brief demographic questionnaire (see Appendix F), followed by the visual acuity test. Finally, each participant was asked to recall what he/she could remember about the video in a structured interview (see Appendix G). The participant was then informed that the study was actually concerned with lineup identification and he/she was read the non-biased lineup instructions (see above). If the participant personally recognized any of the foils or the culprit, his/her data was discarded. Lastly, to control for any dishonest responses from participants regarding their change detection, a research assistant asked each participant, regardless of video condition, the following:

> There are two videos used in this study. You saw one of them.
> In one of the videos, the actor playing the criminal changed partway through and a different man walked down the hallway.
> In the other video, it was the same man the whole way through.
> Which video do you think you saw? Did you notice a change?

Participants were debriefed following their completion or withdrawal from the study.

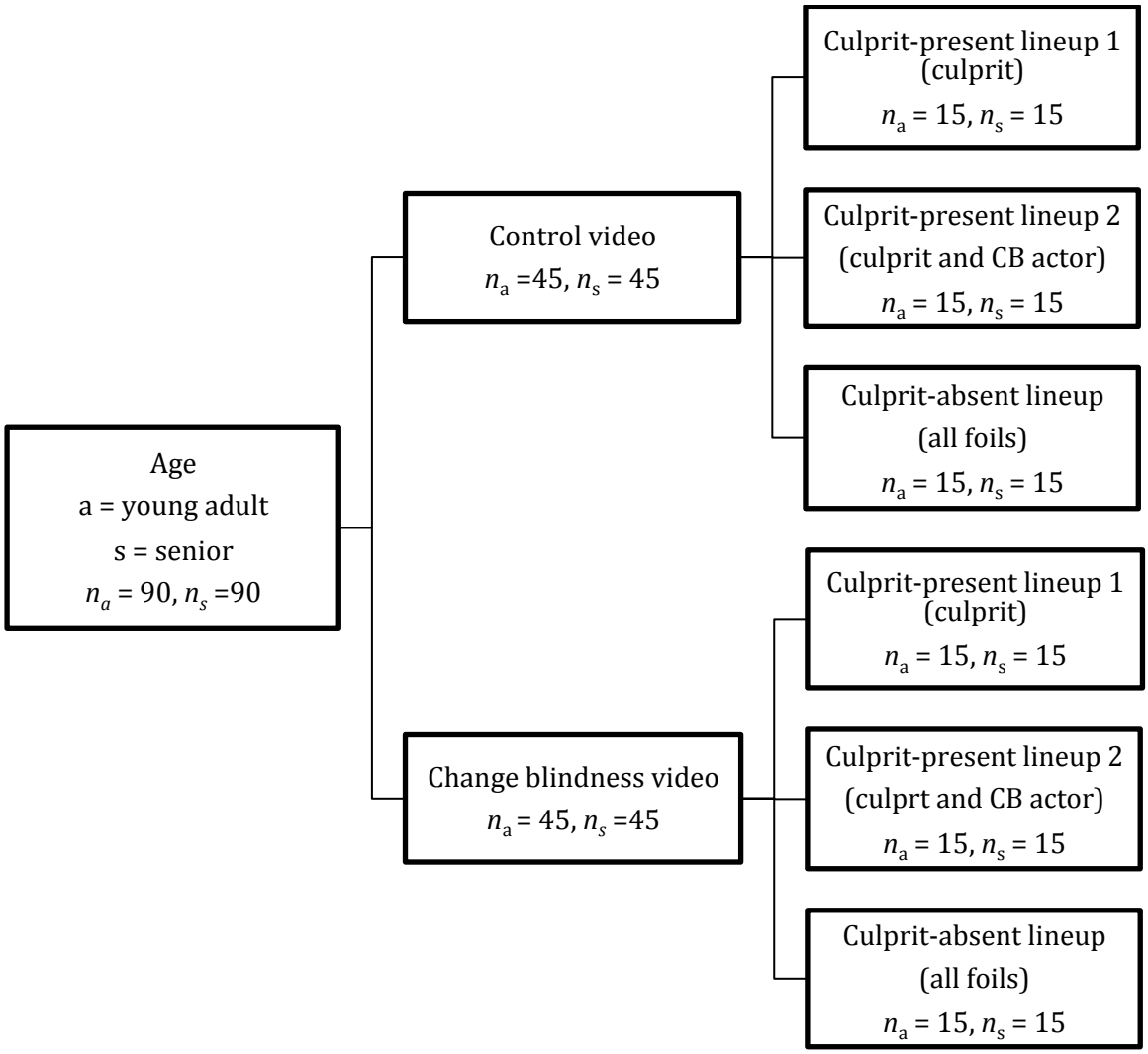

Figure 6. Research design.

Results

Chi-square analyses were conducted to examine age differences in change detection. Hierarchical log-linear analyses (henceforth referred to as hiloglinear) were conducted on the culprit-absent and culprit-present data separately. Second and third order terms that remained in the final hierarchical models were followed-up with chi-square tests of independence. No participant in the CB condition chose the CB actor and as a result, the two culprit-present conditions (one included only the culprit, and the other contained both the culprit and the CB actor) were combined to yield a single culprit-present variable for all subsequent analyses for both the control and CB video conditions.

Age Differences in Change Detection

Of the 90 participants in the CB condition, 28.9% of young adults and 37.8% of seniors failed to detect the change in video actors. This difference was not found to be statistically significant, χ^2 (1, N = 90) = 0.80, p = .371. To investigate whether prior knowledge about CB affected change detection, participants were asked if they have heard of the concept of CB. Prior knowledge of CB was not found to govern change detection in either young adults, χ^2 (1, N = 45) = .850, p = .356, or seniors, χ^2 (1, N = 14) = .009, p = .923.

Culprit-Absent Data

A three-way hiloglinear analysis was carried out on the frequency data formed by cross-classifying the 60 cases according to (1) age group (senior or student), (2) video condition (control video or CB video) and (3) culprit-absent decision (correct rejection or foil choice). Starting with the saturated model, backward elimination was used to find the

simplest model that satisfactorily accounted for the eight cell frequencies. This analysis revealed only one significant effect, a greater proportion of correct than incorrect decisions. A correct rejection was made by 70% of participants in the culprit-absent condition.

A second, 3-way hiloglinear was carried out on the frequency data formed by cross-classifying the 30 CB cases according to (1) age group, (2) change detection (spontaneously, prompted, or no detection) (3) culprit-absent decision (correct rejection or foil choice). Starting with the saturated model, backward elimination was used to find the simplest model that satisfactorily accounted for the 12 cell frequencies.

Deleting the three-way interaction made the model significantly worse; therefore the 3-way interaction, all two-way interactions, and first-order terms were included in the final model, $G^2(2) = 6.979$, $p = .031$. In examining the three-way interaction, it was found that seniors who reported the change spontaneously made more correct rejections than seniors who failed to report the change in actors, χ^2 (1, $N = 15$) = 6.563, $p = .010$. A chi-square test was conducted on the age group by culprit-absent decision interaction, which revealed a non-significant trend for seniors to make more false identifications compared to young adults, χ^2 (1, $N = 30$) = 3.59, $p = .058$ (see Table 1). A follow-up chi-square test was conducted on the age group by change detection interaction, which revealed that young adults were more likely than seniors to require prompting in order to report noticing the change in actors, χ^2 (2, $N = 90$) = 8.76, $p = .013$ (see Table 2). A chi-square test was carried out on the culprit-absent decision by change detection interaction. This analysis revealed no significant differences, χ^2 (2, $N = 30$) = 1.32, $p = .517$ (see Table

3). A follow-up chi-square goodness of fit test on the change detection first-order term revealed that CB participants were more likely to report noticing the change in actors during the interview than to require later prompting, χ^2 (2, N = 90) = 4.27, p = .038. Table 4 provides culprit-absent decision frequency by age group and video condition.

Finally, a chi-square test was conducted on the control data to investigate any age-related differences on participants' culprit-absent decision. No significant differences were observed between young adults and seniors in their culprit-absent decision, χ^2 (1, N = 30) = .19, p = .666. In other words, young adults and seniors were found to be equally likely to make a correct rejection or a foil choice.

Table 1

Age Group by Culprit-Absent (CA) Decision for CB Participants

CA Decision	Age Group		Total
	Young Adults # (% of age group)	Seniors # (% of age group)	
Correct Rejection	12 (80.0%)	7 (46.7%)	19 (63.3%)
Foil Choice	3 (20.0%)	8 (53.3%)	11 (36.6%)
Total	**15 (100.0%)**	**15 (100.0%)**	**30 (100.0%)**

Table 2

Age Group by Change Detection

Change Detection	Age Group		Total
	Young Adults # (% of age group)	Seniors # (% of age group)	
During interview	15 (33.3%)	23 (51.1%)	38 (42.2%)
Prompted	17[a] (37.8%)	5[a] (11.1%)	22 (24.4%)
No detection	13 (28.9%)	17 (37.8%)	30 (33.3%)
Total	**45 (100.0%)**	**45 (100.0%)**	**90 (100.0%)**

Note. Items with the same superscript are significant different from each other at the $p < .05$ level or lower.

Table 3

Culprit-Absent (CA) Decision by Change Detection

Change Decision	CA Decision		Total
	Correct rejection	Foil choice	
During interview	11 (57.9%)	4 (36.4%)	15 (50.0%)
Prompted	2 (10.5%)	2 (18.2%)	4 (13.3%)
No detection	6 (31.6%)	5 (45.5%)	11 (36.7%)
Total	**19 (100.0%)**	**11 (36.7%)**	**30 (100%)**

Table 4

Culprit-Absent (CA) Decision Frequency by Age Group and Video Condition

Video Condition	CA Decision	Age group		Total
		Young Adults	Seniors	
		# (% of Total)	*# (% of Total)*	
Change	Correct Rejection	12 (80.0%)	7 (46.7%)	63.3%
	Foil Choice	3 (20.0%)	8 (53.3%)	36.7%
	Total	**15 (100%)**	**15 (100%)**	**100%**
Control	Correct Rejection	12 (80.0%)	11 (73.3%)	76.7%
	Foil Choice	3 (20.0%)	4 (26.7%)	23.3%
	Total	**15 (100%)**	**15 (100%)**	**100%**

Culprit-Present Data

A three-way hierarchical log-linear analysis was carried out on the frequency data formed by cross-classifying the 120 cases according to (1) age group, (2) video condition and (3) culprit-present decision (incorrect rejection, foil choice, or culprit choice). Starting with the saturated model, backward elimination was used to find the simplest model that satisfactorily accounted for the 12 cell frequencies.

The final model included age group by culprit-present decision, $G^2(6) = 1.676$, $p = .947$. Follow-up chi-square analyses revealed that seniors made more foil choices compared to young adults, χ^2 (2, $N = 120$) = 8.832, $p = .012$ (see Table 5).

Table 5

Age Group by Culprit-Present (CP) Decision

CP Decision	Age Group		Total
	Young Adults # (% of Total)	Seniors # (% of Total)	
Incorrect Rejection	38 (63.3%)	27 (45.0%)	65 (54.2%)
Foil Choice	11[a] (18.3%)	26[a] (43.3%)	37 (30.8%)
Culprit Choice	11 (18.3%)	7 (11.7%)	18 (15.0%)
Total	**60 (100.0%)**	**60 (100.0%)**	**120 (100.0%)**

Note. Items with the same superscript are significant different from each other at the $p < .05$ level or lower.

A second three-way hierarchical log-linear analysis was conducted on the frequency data formed by cross-classifying the 60 cases in the CB condition according to (1) age group, (2) culprit-present decision (incorrect rejection, foil choice, or culprit choice) and (3) change detection (spontaneous, prompted or no detection). Starting with the saturated model, backward elimination was used to find the simplest model that satisfactorily accounted for the 18 cell frequencies.

The only variable that contributed to the final model was culprit-present decision, $G^2(15) = 12.826$, $p = .616$. Follow up chi square goodness of fit tests revealed that CB participants made significantly more incorrect rejections, χ^2 (1, $N = 39$) = 11.31, $p < .001$, and foil choices, χ^2 (1, $N = 30$) = 4.80, $p = .028$, compared to culprit decisions (see Table 6).

Table 6

Culprit-Present (CP) Decision Frequency by Age Group and Video Condition

Video Condition	CP Decision	Age group		Total
		Young Adults	Seniors	
		# (% of Total)	*# (% of Total)*	
Change	Incorrect Rejection	17 (56.7%)	13 (43.3%)	30[a] 50.0%)
	Foil Choice	7 (23.3%)	14 (46.7%)	21[b] (35.0%)
	Culprit Choice	6 (20.9%)	3 (10.0%)	9[ab] (15.0%)
	Total	**30 (100%)**	**30 (100%)**	**100.0%**
Control	Incorrect Rejection	21 (70.0%)	14 (46.7%)	35 (58.3%)
	Foil Choice	4 (13.3%)	12 (40.0%)	16 (26.7%)
	Culprit Choice	5 (16.7%)	4 (13.3%)	9 (15.0%)
	Total	**30 (100%)**	**30 (100%)**	**100%**

Note. Items with the same superscript are significant different from each other at the $p < .05$ level or lower.

Lastly, a chi-square test was conducted on the control data to investigate any age differences in participants' culprit-present decision. Results showed significant age differences between young adults and seniors on their rates of incorrect rejections and foil choices but not for participants' rates of culprit choices, χ^2 (2, $N = 60$) = 5.51, $p = .064$. Young adults made more incorrect rejections and fewer foil choices compared to seniors.

Young adults and seniors were equally likely to choose the culprit from the lineup (see Table 6, above).

Choosing Rates and Confidence/Accuracy

Choosing rates (where choosing refers to selecting a photo as opposed to rejecting the lineup) and the relationship between confidence and accuracy were also examined. Choosing rates were examined using a combination of hiloglinear analyses and chi-square tests of independence. The relationship between confidence and accuracy was analysed using a univariate ANOVA.

A four-way hierarchical log-linear analysis was conducted on the frequency data formed by cross-classifying the 180 cases according to (1) age group, (2) video condition and (3) photo selection (yes/no), (4) lineup condition (culprit present/absent). Starting with the saturated model, backward elimination was used to find the simplest model that satisfactorily accounted for the 16 cell frequencies.

The final model included age group by photo selection, and photo selection by culprit present/absent, G^2 (10) = 3.752, p = .958. Follow-up chi-square analysis carried out on the age group by photo selection interaction revealed that seniors were more likely to choose a photo from the lineup, regardless of accuracy, compared to young adults, χ^2 (1, N = 180) = 6.660, p = .010. Follow-up chi-square analysis carried out on the photo selection by culprit-present/absent condition interaction revealed that participants in the culprit-absent lineup were less likely to choose a photo than participants in the culprit-present lineup, χ^2 (1, N = 180) = 4.16, p = .041. Table 7 provides choosing frequencies for each of the lineup photos, collapsing across culprit-present and culprit-absent

conditions. Table 8 provides choosing frequencies for each the six lineup photo positions.

A 2 (age group) X 2 (video condition) X 2 (incorrect/correct decision) univariate ANOVA was carried out to investigate the effects of these three factors on participants' self-reported confidence following their identification decision (i.e., choosing a photo). The main effects of age group, $F(1, 64) = .649$, $p = .423$, video condition, $F(1, 64) = .1.319$, $p = .225$, and correct/incorrect lineup decision, $F(1, 64) = 2.641$, $p = .109$, were not found to be significant. There were no significant interactions.

Table 7

Choosing Frequencies for Each of the Lineup Photos

Lineup Decision	Age Group	Choosing Frequencies	
		# (% of Total) [1]	*# (% of Seen)* [2]
No Choice	Young	62 (68.9%)	N/A
	Senior	45 (50.0%)	N/A
Foil #1	Young	1 (1.1%)	60 (1.7%)
	Senior	1 (1.1%)	60 (1.7%)
Foil #2	Young	2 (2.2%)	87 (2.3%)
	Senior	12 (13.3%)	88 (13.6%)
Foil #3	Young	0 (0.0%)	82 (0.0%)
	Senior	4 (4.4%)	73 (5.5%)
Foil #4	Young	10 (11.1%)	79 (12.7%)
	Senior	11 (12.2%)	66 (16.7%)
Foil #5	Young	0 (0.0%)	26 (0.0%)
	Senior	4 (4.4)	24 (16.7%)
Foil #6	Young	4 (4.4)	66 (6.1%)
	Senior	5 (5.6%)	50 (10.0%)
Culprit	Young	11 (12.2%)	54 (20.4%)
	Senior	7 (7.8%)	46 (15.2%)
CB Actor	Young	0 (0.0%)	25 (0.0%)
	Senior	1 (1.1)	18 (5.6%)

[1] (Number of times chosen) / (number of participants in age group).
[2] (Number of times chosen) / (number of participants in age group who saw the photograph).

Table 8

Choosing Frequencies for the Six Lineup Photo Positions[1]

General Position	Age Group	Lineup Position	Frequencies *# (% of Total)*
Beginning	Young	1	3 (10.7%)
		2	2 (7.1%)
	Senior	1	9 (20.0%)
		2	4 (8.9%)
Middle	Young	3	5 (17.9%)
		4	9 (32.1%)
	Senior	3	9 (20.0%)
		4	9 (20.0%)
End	Young	5	5 (17.9%)
		6	4 (14.3%)
	Senior	5	9 (20.0%)
		6	5 (11.1%)

[1] Does not refer to specific lineup photos. It refers to the position of photographs in a lineup (e.g., the first photo in a lineup).

Discussion

Change Blindness and Identification Accuracy

In this study, it was found that 28.9% of young adults and 37.8% of seniors did not observe the change in actors. This difference was not significant. This finding is inconsistent with past research that has employed other methods of investigating CB (such as detecting changes within a scene [Rizzo et al., 2009; Veiel et al., 2006]). These studies have found that aging is associated with increased susceptibility to CB.

Collapsing across age groups, CB was observed in 33.3% (or 1/3) of the total CB sample. Prior research in the field has found evidence of CB occurring in 50-95% of participants (Davies & Hine, 2007; Levin et al., 2002; Nelson et al., 2011; Ross et al., 1994; Simons & Levin, 1998) with both real world staged events and mock-theft videos. This difference can be attributed to the fact that the present study was the first CB study to explicitly inform all participants that they would be shown a video that depicted a mock-theft. Furthermore, participants were also told to anticipate a memory test regarding the content of the video stimulus. Taken together, this study is a representation of the best-case scenario for both change detection as well as eyewitness identification; the video stimulus was viewed in a controlled laboratory setting by participants who were not only aware of the content of the video beforehand, but also that they would later have their memories tested for the content. In a real-world situation, this would not occur.

Davies and Hine (2007) employed a similar procedure by telling participants in one condition that, “This short video illustrates the ease and frequency of burglaries of

student accommodations and the importance of keeping houses secure" (p. 428). However, the description of the video was ambiguous and therefore did not highlight what participants could expect to see from the video. In another condition, to make the video stimulus appear more salient, Davies and Hine (2007) told participants, "You are about to watch a short video. Pay careful attention to the content, as there will be a memory test later" (p. 428). In the first condition, 61% of participants exhibited CB, whereas in the second condition, Davies and Hine (2007) reported that 35% of participants exhibited CB, a figure comparable to the present study (33%). Together, these results appear to suggest that participants' knowledge about being tested is a significant variable affecting CB.

Surprisingly, this study found that participants in the CB condition were no more likely to choose the CB actor from the lineup than were participants in the control condition. Perhaps even more surprising was that in the CB condition the CB actor was not chosen at all. This finding is incongruent with past research on the effects of CB on identification accuracy (Levin et al., 2002; Nelson et al., 2011; Ross et al., 1994). Generally, in past studies it has been found that the CB actor is more likely to be identified in a photo lineup by CB participants compared to control participants (Nelson et al., 2011).

While our finding is indeed in contrast to the majority of studies conducted on CB and lineup identification, it does, however, fit in with a study that was conducted by Davies and Hine (2007). In their study, participants saw a video wherein a burglar broke into a house and hurriedly began throwing their personal artifacts into his rucksack. He

went upstairs to continue his search and entered a room nearby. When the door opened again, a different burglar emerged and continued his search for valuables before finally leaving the house. When asked to identify everyone they saw in the video in a photo lineup, participants who picked only one individual tended to choose the culprit (Burglar 1) rather than the CB actor (Burglar 2); however this trend was not statistically significant (Davies and Hine, 2007). Taken together, the results of the present study, in conjunction with those of Davies and Hine (2007) highlight the need for more research to be done in this area.

Age Differences in Choosing and Identification Ability

Overall, across conditions, it was found that seniors were more likely to choose a photograph (regardless of accuracy) from the lineups compared to young adults. This finding is congruent with past research (Searcy et al., 1999). In the present study, analyzing only the control condition data for the culprit-absent lineup revealed no age differences in identification accuracy. Notwithstanding, in the culprit-present lineup, this study found that seniors made more false identifications than young adults in the control condition. In their study, Memon and Gabbert (2003) reported that in both culprit-present and culprit-absent sequential lineups, seniors made more false identifications than did young adults. Searcy et al. (1999) reported similar findings.

Comparing the control condition for the present study to past studies that have used the simultaneous lineup, the rates of incorrect rejections observed for young adults in the culprit-present lineup were much higher in this study (70%) compared to findings of past research (28%) (Pozzulo et al., 2008). Consequently, the present study found

fewer foil identifications as well as culprit identifications (Pozzulo et al., 2008). This finding also emerged for our culprit-absent lineup; 80% of young adults made a correct rejection compared to 47% adults in Pozzulo et al.'s (2008) research. In the present study, seniors in the culprit-present lineup made more incorrect rejections (46.7%) and foil choices (40.0%), but fewer culprit identifications compared to seniors in Memon and Gabbert's (2003) study that employed the simultaneous lineup (23% and 29% respectively). This finding is in agreement with some studies that have found that sequential lineup may increase foil identifications in culprit-present lineups (Memon & Gabbert, 2003, Steblay et al., 2011). In the culprit-absent lineup, this study found that seniors in the present study had much higher rates of correct rejections (73.3%) than seniors in past research using the simultaneous lineup (10%).

These results suggest that the sequential lineup, compared to the simultaneous lineup, reduces choosing by young adults and seniors in both culprit-absent and culprit-present conditions (Memon & Gabbert, 2003; Steblay et al., 2011). In culprit-present conditions, this lower choosing rate translates to fewer correct identifications of the culprit compared to the simultaneous lineup procedure (Memon & Gabbert, 2003).
In the CB culprit-absent condition, the present study found a non-significant trend (p = .058) for seniors (n = 8) to make more false identifications compared to young adults (n =3). In the culprit-present condition, a similar pattern emerged wherein seniors (n = 14) made twice as many false identifications compared to young adults (n =7), although this difference was not found to be statistically significant (p = .145). Overall, in conjunction with the age differences observed in the control condition above for culprit-absent and

culprit-present lineups, these patterns of results appear to reflect seniors' propensity toward false identifications compared to young adults.

In this study, collapsing across age groups, it was found that for the culprit-absent lineup the most common decision was a correct rejection and for the culprit-present lineup, the most common decision was an incorrect rejection, followed by a foil choice and a culprit choice. If choosing rates for the two lineup conditions are considered, in the culprit-absent lineup, participants were more likely to not make a photo selection. Conversely, in the culprit-present condition, no significant difference was observed in choosing rates. In other words, participants were found to be equally likely to select a photo in the lineup (regardless of accuracy), as they were to reject the lineup.

Before concluding our discussion regarding the age differences in identification accuracy observed in this study, it would be prudent, especially in the context of the high rates of incorrect rejections observed in this study, to discuss the differential impact of incorrect rejections and false identifications for the legal system (regardless of lineup procedure). If a witness makes a false identification, he/she has committed two different errors: (1) he/she has failed to identify the guilty party and (2) he/she has incriminated an innocent person (Steblay et al., 2011). However, if a witness fails to make an identification decision, he/she has only committed one type of error: that is, a failure to identify the guilty party (Steblay et al., 2011). Compared to the simultaneous lineup, the sequential lineup provides the advantage of reducing false identifications (Steblay et al., 2011). Because false identifications have the added problem of incriminating an innocent

individual, they should be regarded as the more problematic (and costly) decision for the legal system (Steblay et al., 2011).

Change Blindness and the Sequential Lineup

It was expected that, compared to past CB research, the present study would find lower rates of false identifications with the sequential lineup procedure. This study is the first to examine the effects of CB in a true culprit-absent lineup without the culprit or CB actor being present. Encouragingly, there was no effect of video condition on participants' identification decision. That is, participants in the CB condition were no more likely to identify a foil or the CB actor than participants in the control condition. In fact, the CB actor was not chosen at all by CB participants. This finding is in contrast to past research, which suggests that CB participants are more likely to identify the CB actor (Ross et al., 1994; Nelson et al., 2011) compared to control participants. Other research has found that CB participants are also more likely to identify a foil than control participants (Nelson et al., 2011; Ross et al., 1994).

It the present study, it is possible that the sequential lineup caused participants to adopt a stricter decision-making criterion (i.e., an absolute judgment), compared to past CB research that has used the simultaneous lineup. This interpretation is reasonable, especially considering the high rates of lineup rejections (i.e., not choosing a photo) for young adults and seniors in both culprit-absent and culprit-present lineups observed in this study for each of the video conditions. For young adults, the rates of lineup rejection in this study ranged from 56.7% – 80.0%; for seniors, the rates of lineup rejection ranged from 43.3% - 73.3% (see Table 4 and 5).

If the sequential lineup is indeed superior to the simultaneous lineup at reducing false identifications caused by CB, the sequential lineup would be beneficial for police in cases of suspected CB (for example, if the witness lost sight of the culprit). The reduction of false identifications caused by CB would also constitute an additional benefit of the sequential lineup overall. The sequential lineup is already gaining popularity among police in Canada. In 2006, Beaudry and Lindsay conducted a survey of Ontario and found that the sequential lineup comprised 55.8% of lineups administered by police officers. When they were asked about their identification practices in the past two years, 92.7% of those surveyed reported using the sequential lineup at least once and 42.7% reported using the sequential lineup exclusively (Beaudry & Lindsay, 2006). Further research can help promote the use of the sequential lineup as a stronger alternative to the simultaneous lineup, which can help reduce errors made by eyewitnesses.

Spontaneous v. Prompted Change Detection

Giving consideration to when participants noticed the change in actors, it was found that seniors who reported noticing the change spontaneously (i.e., naturally during the video presentation or the interview) made more correct rejections and consequently fewer foil choices than seniors who failed to report the change in culprit actors. Additionally, it was found that young adults were significantly more likely to require prompting in order to report the change in actors compared to seniors.

Confidence and Accuracy

In agreement with past research, this study did not find a relationship between confidence and accuracy with the sequential lineup (Nelson et al., 2011). This finding

held true even when participants' age and video condition (CB or control) were included as part of the analysis.

Limitations and Directions for Future Research

There are a few limitations to this research. First, in this study, comparisons could not be drawn between the simultaneous lineup and the sequential lineup, as the simultaneous procedure was not included in the materials that were prepared for this study. Nevertheless, this study was able to make valuable contributions to the literature by indirectly comparing the sequential lineup with past research on CB with the simultaneous lineup. Future research should use both lineup procedures to address identification in a CB mock-theft paradigm.

Second, the findings of this study could have been influenced by the effects of the own-age bias (OAB). In detail, the OAB is the observed phenomenon that own-age faces are better recognized than other-age faces (Hole & Bourne, 2010; Verdichevski & Steeves, 2013). The OAB is a robust finding in both the facial processing and memory literatures and has been documented in children from as young as five years old (Rhodes & Anastasi, 2012; Wiese, Komes, & Schweinberger, 2013). While it is a reliable finding that adults are more accurate in their identifications than are seniors (Havard & Memon, 2009), this effect has been recently called into question. Specifically, it has been suggested that because many identification procedures employed by researchers (including the present study) have used lineups composed of young members, seniors have been placed at a disadvantage, while the performance of younger adults has flourished by virtue of the OAB (Havard & Memon, 2009; Hole & Bourne, 2010).

Anecdotally, in this study it was found that some seniors questioned whether the culprit and the lead researcher were the same person. The lead researcher clarified this misconception; however, it is possible that the lead researcher may have served as a second CB actor for some participants, and thus affected their CB and subsequent identification accuracy. In a real world context, however, this scenario is highly likely with a culprit who has characteristics that are very common in a given region (e.g., brown hair, brown eyes).

Future research on CB should employ a procedure where participants view either a same-age or other-age culprit in a CB mock theft video and draw comparisons between the rates of CB and identification accuracy between the conditions. Moreover, future study of the OAB phenomenon in a CB paradigm could also investigate the prevalence rates of CB that occur if the bystander substituted for the culprit actor is from a different age group. This procedure could be employed with consideration given to the culprit's gender (e.g., male culprit and female CB actor) as well.

Finally, the delay between the presentation of the video stimulus to participants and their subsequent identification of the culprit may not have been sufficient enough in this study in order to observe some of the age-related differences in identification accuracy often observed in the identification literature (Hole & Bourne, 2010). It has been found that longer delays between observing a mock-theft and providing an identification of the culprit will produce greater age-differences in accuracy, whereas with minimal delay there are often no age differences in accuracy (Hole & Bourne, 2010).

Conclusion

In this study, few age-related differences in identification accuracy were found. This is contrary to findings of past research, which suggests that difficulties in eyewitness identification increase over the lifespan (Memon & Gabbert, 2003; Memon et al., 2002; Rose et al., 2005). In addition, seniors in the change blindness condition did not make more identification errors compared to young adults. Overall, seniors were not found to be more susceptible to change blindness compared to young adults, a finding that is incongruent with the literature on change blindness in non-forensic settings (Rizzo et al., 2009; Veiel et al., 2006).

Furthermore, change blindness did not influence identification accuracy in change blindness participants compared to control participants. As discussed, this was a surprising finding given the total rate of change blindness (33%) in our sample. The findings that were observed in this study are encouraging for the potential of the sequential lineup procedure to reduce false identifications caused by change blindness. Nevertheless, no conclusions regarding causality can be drawn from the present data because our materials did not include the simultaneous lineup procedure. However, our results were in contrast to past research on change blindness and the outstanding procedural difference between the present study and the past research is the lineup procedure chosen to address identification, the sequential lineup. This suggests that perhaps the sequential lineup helps reduce false identifications caused by change blindness. If future change blindness research can find a similar pattern of results using both the simultaneous and sequential lineups in a single study (with culprit-absent and

culprit-present conditions), additional recommendations can be made to police regarding the use of the sequential lineup procedure in real-world cases.

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Appendix A

Informed Consent Form for Students

Title: *Age-Related Differences in Eyewitness Memory*

Researchers: *Jonathan Canning, Department of Psychology,*

Memorial University of Newfoundland, jmc175@mun.ca

Supervisor: Dr. James Drover, Department of Psychology, jrdrover@mun.ca

You are invited to take part in a research project entitled "*Age-related Differences in Eyewitness Memory*."

This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any other information given to you by the researcher.

It is entirely up to you to decide whether to take part in this research. If you choose not to take part in the research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future. There will be no consequences to your grades whether or not you decide to participate, or to withdraw from the study.

Introduction:
Past research has suggested that there may be important differences in the memory of younger and older adults for a crime scene. It has been reported, for instance, that younger adults recall more information about a crime than older adults. However, older adults are often found to be just as accurate in their recollections as younger adults.

Purpose of study:
I am interested in the way age affects the information recalled by adults about a crime when familiarity with where the crime occurs is changed.

What you will do in this study:
You will be asked to watch a video about a mock-theft and tell us what you remember in a brief interview. All interviews will be audio recorded and stored in a secure location accessible to only the primary researcher and his supervisor/research assistants (see Storage of Data).

You will be asked to provide demographic information in a brief questionnaire and complete a vision test. Your vision will be tested using a computerized visual acuity test known as the Early Treatment Diabetic Retinopathy Study Test. Here, row of letters varying in size will be presented on a computer monitor. Each row will contain five letters. You will be asked to identify the letters on each row. To progress to the next row, you must name at least four out of the five letters correctly. The smallest letter row for which you can identify at least four letters correctly will be taken as your measure of visual acuity. Please note that your visual acuity will be tested to ensure that your performance in this study is not affected by your vision.

Length of time:
Participation for this study is not expected to exceed 30 minutes.

Possible Risks and/or Benefits:
There are no obvious risks related to participation in this study. As a benefit, this study may assist police in interviewing eyewitnesses.

Anonymity and Confidentiality:
All data collected for the purpose of this research project are both anonymous and confidential. Any data received from your participation will be assigned a number and will be analyzed on a group basis.

Reporting of Results:
The data from this research project will be used in fulfillment of the requirements for a Master's thesis. The data from this research project will be presented at scientific conferences. The data also will be submitted for publication in academic journals. You will remain anonymous; all data will be reported in an aggregated or summarized form so that it will not be possible to identify you.

Storage of Data:
Data will be stored with my supervisor, Dr. James Drover, in a filing cabinet in his office at Memorial University, for a minimum of five years as per Memorial University policy on integrity in scholarly research. These data will then be destroyed.

Questions:
You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact myself, Jonathan Canning at jmc175@mun.ca or (709) 864-8876 or my supervisor, Dr. James Drover at, jrdrover@mun.ca or (709) 864-8383

Appendix B

Informed Consent Form: Psychology Research Experience Pool

Title: *Age-related Differences in Eyewitness Memory*

Researchers: *Jonathan Canning, Department of Psychology,*

Memorial University of Newfoundland, jmc175@mun.ca

Supervisor: Dr. James Drover, Department of Psychology, jrdrover@mun.ca

You are invited to take part in a research project entitled "*Age-related Differences in Eyewitness Memory*."

This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any other information given to you by the researcher.

It is entirely up to you to decide whether to take part in this research. If you choose not to take part in the research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future. There will be no consequences to your grades whether or not you decide to participate, or to withdraw from the study.

Introduction:
Past research has suggested that there may be important differences in the memory of younger and older adults for a crime scene. It has been reported, for instance, that younger adults recall more information about a crime than older adults. However, older adults are often found to be just as accurate in their recollections as younger adults.

Purpose of study:
I am interested in the way age affects the information recalled by adults about a crime when familiarity with where the crime occurs is changed.

What you will do in this study:
You will be asked to watch a video about a mock-theft and tell us what you remember in a brief interview. All interviews will be audio recorded and stored in a secure location accessible to only the primary researcher and his supervisor/research assistants (see Storage of Data).

You will be asked to provide demographic information in a brief questionnaire and complete a vision test. Your vision will be tested using a computerized visual acuity test known as the Early Treatment Diabetic Retinopathy Study Test. Here, row of letters varying in size will be presented on a computer monitor. Each row will contain five letters. You will be asked to identify the letter on each row. To progress to the next row, you must name at least four out of the five letters correctly. The smallest letter row for which you can identify at least four letters correctly will be taken as your measure of visual acuity. Please note that your visual acuity will be tested to ensure that your performance in this study is not affected by your vision.

Length of time:
Participation for this study is not expected to exceed 30 minutes.

Withdrawal from the study:
You are free to withdraw from the study at any time, until the submission of this thesis, without having to give a reason; doing so will not affect you now or in the future. If you decide to withdraw, note that any data obtained from your participation will **be** removed from this study.

Possible Risks and/or Benefits:
There are no obvious risks related to participation in this study. As a benefit, this study may assist police in interviewing eyewitnesses

Compensation: You will receive one credit point toward your Psychology course per hour of participation or part thereof.

Anonymity and Confidentiality:
All data collected for the purpose of this research project are both anonymous and confidential. Any data received from your participation will be assigned a number and will be analyzed on a group basis.

Please note that your course instructor will not have access to detailed Psychology Research Experience Pool participation details. He or she will only be able to view the total number of credit points earned by students, and will not know whether you have participated in this, or any other study, nor whether any credit points earned from participation in any study were earned from Research Participation, Research Observation, or completion of the alternative assignment.

Reporting of Results:
The data from this research project will be used in fulfillment of the requirements for a Master's thesis. The data from this research project will be presented at scientific conferences. The data will also be submitted for publication in academic journals. You will remain anonymous; all data will be reported in an aggregated or summarized form so that it will not be possible to identify you.

Storage of Data:
Data will be stored with my supervisor, Dr. James Drover, in a filing cabinet in his office at Memorial University, for a minimum of five years as per Memorial University policy on integrity in scholarly research. These data will then be destroyed.

Research Participation vs. Research Observation:
Your participation in this study is intended to be an educational Research Experience. You therefore have the choice of whether or not to provide data to researchers for inclusion in their analysis. If you consent to provide your data for analysis, please check the box below labeled "Research Participation". However, if you wish to observe the process of research participation without providing data to researchers for inclusion in their analysis, then you may choose to do so, without any loss of experience or credit. If you consent to observe the research experience without providing any data, please check the box below labeled "Research Observation". Please note that you may choose to change your Research Experience from Participation to Observation at any point in time, without loss of experience or credit.

Questions:
You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact myself, Jonathan Canning at jmc175@mun.ca or (709) 864-8876 or my supervisor, Dr. James Drover at, jrdrover@mun.ca or (709) 864-8383

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in
Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 864-2861.

Appendix C

Informed Consent Form for Courses Receiving Course Credit

Title: *Age-related Differences in Eyewitness Memory*

Researchers: *Jonathan Canning, Department of Psychology,*

Memorial University of Newfoundland, jmc175@mun.ca

Supervisor: Dr. James Drover, Department of Psychology, jrdrover@mun.ca

You are invited to take part in a research project entitled "*Age-related Differences in Eyewitness Memory*."

This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any other information given to you by the researcher.

It is entirely up to you to decide whether to take part in this research. If you choose not to take part in the research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future. There will be no consequences to your grades whether or not you decide to participate, or to withdraw from the study.

Introduction:
Past research has suggested that there may be important differences in the memory of younger and older adults for a crime scene. It has been reported, for instance, that younger adults recall more information about a crime than older adults. However, older adults are often found to be just as accurate in their recollections as younger adults.

Purpose of study:
I am interested in the way age affects the information recalled by adults about a crime when familiarity with where the crime occurs is changed.

What you will do in this study:
You will be asked to watch a video about a mock-theft and tell us what you remember in a brief interview. All interviews will be audio recorded and stored in a secure location accessible to only the primary researcher and his supervisor/research assistants (see Storage of Data).

You will be asked to provide demographic information in a brief questionnaire and complete a vision test. Your vision will be tested using a computerized visual acuity test known as the Early Treatment Diabetic Retinopathy Study Test. Here, row of letters varying in size will be presented on a computer monitor. Each row will contain five letters. You will be asked to identify the letter on each row. To progress to the next row, you must name at least four out of the five letters correctly. The smallest letter row for which you can identify at least four letters correctly will be taken as your measure of visual acuity. Please note that your visual acuity will be tested to ensure that your performance in this study is not affected by your vision.

Length of time:
Participation for this study is not expected to exceed 15-20 minutes.

Withdrawal from the study:
You are free to withdraw from the study at any time, until the submission of this thesis, without having to give a reason; doing so will not affect you now or in the future. If you decide to withdraw, note that any data obtained from your participation will **be** removed from this study.

Possible Risks and/or Benefits:
There are no obvious risks related to participation in this study. As a benefit, this study may assist police in interviewing eyewitnesses.

Compensation: You will receive course credit as determined by your course instructor. Please note that your course instructor will not know whether any credit points earned from participation in this study were earned from Research Participation or Research Observation.

Anonymity and Confidentiality:
All data collected for the purpose of this research project are both anonymous and confidential. Any data received from your participation will be assigned a number and will be analyzed on a group basis.

Reporting of Results:
The data from this research project will be used in fulfillment of the requirements for a Master's thesis. The data from this research project will be presented at scientific conferences. The data will also be submitted for publication in academic journals. You will remain anonymous; all data will be reported in an aggregated or summarized form so that it will not be possible to identify you.

Storage of Data:
Data will be stored with my supervisor, Dr. James Drover, in a filing cabinet in his office at Memorial University, for a minimum of five years as per Memorial

University policy on integrity in scholarly research. These data will then be destroyed.

Research Participation vs. Research Observation:
Your participation in this study is intended to be an educational Research Experience. You therefore have the choice of whether or not to provide data to researchers for inclusion in their analysis. If you consent to provide your data for analysis, please check the box below labeled "Research Participation". However, if you wish to observe the process of research participation without providing data to researchers for inclusion in their analysis, then you may choose to do so, without any loss of experience or credit. If you consent to observe the research experience without providing any data, please check the box below labeled "Research Observation". Please note that you may choose to change your Research Experience from Participation to Observation at any point in time, without loss of experience or credit.

Questions:
You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact myself, Jonathan Canning at jmc175@mun.ca or (709) 864-8876 or my supervisor, Dr. James Drover at, jrdrover@mun.ca or (709) 864-8383

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in
Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 864-2861.

Appendix D

Informed Consent Form for Seniors

Title: *Age-related Differences in Eyewitness Memory*

Researchers: *Jonathan Canning, Department of Psychology,*

Memorial University of Newfoundland, jmc175@mun.ca, (709) 769-3928

Supervisor: Dr. James Drover, Department of Psychology, jrdrover@mun.ca

You are invited to take part in a research project entitled "*Age-related Differences in Eyewitness Memory*."

This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any other information given to you by the researcher.

It is entirely up to you to decide whether to take part in this research. If you choose not to take part in the research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future.

Introduction:
Past research has suggested that there may be important differences in the memory of younger and older adults for a crime scene. It has been reported, for instance, that younger adults recall more information about a crime than older adults. However, older adults are often found to be just as accurate in their recollections as younger adults.

Purpose of study:
I am interested in the way age affects the information recalled by adults about a crime when familiarity with where the crime occurs is changed.

What you will do in this study:
You will be asked to watch a video about a mock-theft and tell us what you remember in a brief interview. All interviews will be audio recorded and stored in a secure location accessible to only the primary researcher and his supervisor/research assistants (see Storage of Data).

You will be asked to provide demographic information in a brief questionnaire and complete a vision test. Your vision will be tested using a computerized visual acuity test known as the Early Treatment Diabetic Retinopathy Study Test. Here, row of letters varying in size will be presented on a computer monitor. Each row will contain five letters. You will be asked to identify the letters on each row. To progress to the next row, you must name at least four out of the five letters correctly. The smallest letter row for which you can identify at least four letters correctly will be taken as your measure of visual acuity. Please note that your visual acuity will be tested to ensure that your performance in this study is not affected by your vision.

Length of time:
Participation for this study is not expected to exceed 30 minutes.

Possible Risks and/or Benefits:
There are no obvious risks related to participation in this study. As a benefit, this study may assist police in interviewing eyewitnesses.

Anonymity and Confidentiality:
All data collected for the purpose of this research project are both anonymous and confidential. Any data received from your participation will be assigned a number and will be analyzed on a group basis.

Reporting of Results:
The data from this research project will be used in fulfillment of the requirements for a Master's thesis. The data from this research project will be presented at scientific conferences. The data also will be submitted for publication in academic journals. You will remain anonymous; all data will be reported in an aggregated or summarized form so that it will not be possible to identify you.

Storage of Data:
Data will be stored with my supervisor, Dr. James Drover, in a filing cabinet in his office at Memorial University, for a minimum of five years as per Memorial University policy on integrity in scholarly research. These data will then be destroyed.

Questions:
You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact myself, Jonathan Canning at jmc175@mun.ca or (709) 864-8876 or my supervisor, Dr. James Drover at, jrdrover@mun.ca or (709) 864-8383

Appendix E

Pilot Study

We conducted a multi-part pilot study to construct and subsequently evaluate our assessment instruments. Part one of the pilot study involved asking participants (n = 10) to view the video stimulus and provide a description of the perpetrator. Foils for the sequential lineup were chosen on the basis of how closely they matched the description of the perpetrator provided by pilot study participants (see Table 9).

Table 9

Description of Culprit Obtained from Pilot Testing

Culprit Description
Caucasian (i.e., white) male
Early 20's
Short dark brown hair
Brown eyes
Medium/average build
No distinguishing facial features
Clean shaven/no facial hair

Part two of the pilot study involved the recruitment of a group of participants who provided their image (i.e. photograph) for use in the sequential lineup procedure. Participants for this part of the pilot study were recruited via mass e-mail and posters and

were compensated $10 for their participation. The e-mail/poster featured a description of the perpetrator and it was stated that researchers were looking for participants who matched the features listed in the description provided. It was stated that monetary compensation would be provided. Ten individuals provided their photograph for this study.

In the third part of the pilot study, participants (n = 10) viewed a series of 8 x 11 photos (from a head-and-chest perspective) and rated each on a 1 (very similar) to 7 (very dissimilar) scale based on their similarity to a 8 x 11 image of the culprit. This was designed to determine which foil photographs most resembled the photograph of the culprit. The mean similarity rating of the six foil photographs that were chosen to be included in the study was 4.35. This rating is comparable to past research (Davies & Hine, 2007; Levin et al., 2002). Similarity rankings for each of the foil photographs can be seen in Table 10.

Table 10

Similarity Rankings (Means and Standard Deviations) for Each of the Six Foil Photographs Obtained in Pilot Testing

	Similarity Rankings					
	Foil 1	Foil 2	Foil 3	Foil 4	Foil 5	Foil 6
Mean	4.7	4.6	4.6	3.8	4.7	3.7
SD	1.70	1.51	1.65	1.93	.95	1.25

Appendix F

Demographic Information

Please circle or fill in the option that best describes you:

1. **Gender**
   a. Male
   b. Female

2. **Age**
   What is your age? ____

3. **How would you classify yourself?**
   a) Arab
   b) Asian/Pacific Islander
   c) Black
   d) Caucasian/White
   e) Hispanic
   f) Indigenous or Aboriginal
   g) Latino
   h) Multiracial
   i) Would rather not say
   j) Other

4. **Marital Status**
   What is your marital status?
   a) Now married
   b) Widowed
   c) Divorced
   d) Separated
   e) Never married

5. Education

What is the highest degree or level of school you have completed? If currently enrolled, mark the previous grade or highest degree received.

a) No schooling completed
b) Nursery school to 8th grade
c) 9th, 10th or 11th grade
d) 12th grade, no diploma
e) High school graduate - high school diploma or the equivalent (for example: GED)
f) Some college/trade school credit
g) Completed college/trade school – certificate or the equivalent
h) Some university credit, but less than 1 year
i) 1 or more years of university, no degree
j) Associate degree (for example: AA, AS)
k) Bachelor's degree (for example: BA, AB, BS)
l) Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
m) Professional degree (for example: MD, DDS, DVM, LLB, JD)
n) Doctorate degree (for example: PhD, EdD)

6. Employment Status

Are you currently...?

a) Employed for wages
b) Self-employed
c) Out of work and looking for work
d) Out of work but not currently looking for work
e) A homemaker
f) A student
g) Retired
h) Unable to work

Appendix G

Interview Script

Prior to asking the undergraduates or seniors any questions about the video the interviewer will explain to the participant that he is interested in knowing what the participant saw in the video.

Probe for colour regarding all clothing and items.

What did you see in the video?
This will be followed up with utterances of what else do you remember until the participant cannot supply any additional information.

If the participant mentions the VICTIM:

Was it a man or a woman?

What did the person look like?

Followed up with what else can you remember about what the person looked like until no additional information is being provided.

What was the person wearing?

Followed up with what else can you remember about what the person was wearing until no additional information is being provided

Tell me everything that the person did.

Followed up with what else can you remember about what the person was wearing until no additional information is being provided

If the participant mentions the THIEF:

Was it a man or a woman?

What did the person look like?

Followed up with what else can you remember about what the person looked like until no additional information is being provided.

What was the person wearing?

Followed up with what else can you remember about what the person was wearing until no additional information is being provided.

Tell me everything that the person did.

Followed up with what else can you remember about what the person was wearing until no additional information is being provided.

If the participant mentions the CB ACTOR:

Was it a man or a woman?

What did the person look like?

Followed up with what else can you remember about what the person looked like until no additional information is being provided.

What was the person wearing?

Followed up with what else can you remember about what the person was wearing until no additional information is being provided.

Tell me everything that the person did.

From the beginning, have them restate what he did in the video. Follow-up with what else can you remember until no additional information is being provided.

If the participant mentions the theft:

What was stolen? (Not to be asked if the participant has already said what was stolen).

Where did it happen?

Tell me more about the place where it happened?

This can followed up with utterances of what else do you remember about where it happened until the participant cannot supply any additional information.