# Moving Toward Improving the Delivery of Youth Interrogation Rights: Can Comprehension Be Enhanced Through Multimedia?



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**Abstract**

Across three experiments, the extent to which presenting youth interrogation rights in a multimedia format using three multimedia elements (Animation, Audio, and Caption) improved comprehension was examined. Experiments 1 and 2 employed a 2 (Animation: Present vs. Absent) X 2 (Audio: Present vs. Absent) X 2 (Caption: Present vs. Absent) between-participants design with samples of Canadian adults ($N$ = 207) and youth ($N$ = 193), respectively. Participants in both experiments were randomly shown one of eight multimedia presentations and then tested about their understanding of the youth interrogation rights content contained in the multimedia presentation. In both experiments, the multimedia presentation showing Animation and Caption yielded the highest comprehension score. Experiment 3 carried out a single-condition design with Canadian youth ($N$ = 60) to collect opinions about the multimedia elements used in the stimuli. Participants were presented with a multimedia presentation containing all three multimedia elements (i.e., Animation, Audio, and Caption) and asked to provide their feedback about the presentation more broadly (e.g., evaluating the quality, rate of speed, distraction level, and their ability to identify character within the presentation); positive reviews were reported by nearly all participants. Implications of these collective findings for protecting youth and the use of technology during police interrogations are discussed.

***Keywords:*** interrogation rights comprehension, police cautions, appropriate adults, investigative interviewing, youth

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# Chapter 1: Background and Literature Review

## Introduction

Youth are recognized as a vulnerable population due to their less well-developed cognitive and psychosocial capacities relative to adults. For example, young people are less likely to understand the risks of their actions which may impair their decision making (e.g., Cavanagh, 2022; Gardner & Steinberd, 2005; Grisso, 2013; Van Leijenhorts et al., 2008; Viljoen & Roesch, 2005). Youth are also more apt to comply with requests and directives given by authority figures and internalize any information provided to them (Grisso et al., 2003; Owen-Kostelnik et al., 2006; Redlich & Goodman, 2003). Consequently, youth are a vulnerable population when it comes to interacting with the legal system that require additional protections. In recognition of their inherent vulnerabilities, youth are provided with additional legal safeguards, relative to adults, when speaking to the police. For example, in Canada (*Youth Criminal Justice Act* [*YCJA*], 2002), the United Kingdom (*Police and Criminal Evidence Act*, 1984), and some states in the United States (see King, 2006), an appropriate adult (e.g., parent, guardian, social worker) can be, and often are, present when young people are detained (McCardle et al., 2020). Despite these legislative changes in many jurisdictions (e.g., juvenile *Miranda* warning in the United States, *In re Gault*, 1967; see *Miranda v. Arizona*, 1966; e.g., youth waiver forms in Canada, *YCJA*, 2002), research has shown that not only do youth struggle to understand their interrogation rights (e.g., Eastwood et al., 2015; Rogers et al., 2007, 2008), but that adults also fail to fully comprehend the rights afforded to youth (e.g., Cavanagh & Cauffman, 2017; Cleary & Warner, 2017). However, research has also shown that incorporating some of the psychological findings pertaining to communication

and information processing (i.e., listenability; Rubin, 1993, 2012; see e.g., Eastwood & Snook, 2012) can help improve the overall comprehension of interrogation rights for youths (e.g., Eastwood et al., 2016) and adults (Davis et al., 2011; Snook et al., 2016); but these improvements still fall short of full and complete levels of understanding.

One area of the psychological literature that has not yet been explored for assisting with comprehension of interrogation rights is multimedia learning (see Mayer, 2009). Utilizing cognitive and information processing theories, the principles of multimedia learning suggest ways to improve the learning experience and comprehension when the material is presented in multimedia format. Applying these principles to how youth interrogation rights are presented (i.e., as a multimedia presentation) may help improve overall comprehensibility of these rights for both appropriate adults and youth. Thus, the overarching goal of this research was two-fold. First, given the aforementioned procedural safeguards of allowing an appropriate adult to be present to help facilitate a young person's comprehension of their interrogation rights, I sought to examine if *adults'* comprehension of youth interrogation rights could be improved using a multimedia presentation. Second, since it has been well-documented that youth interrogation rights as they are typically presented by the police (i.e., read verbatim by a police officer) are not being understood by youth, I also endeavoured to examine if *youths'* comprehension of their interrogation rights could also be improved via a multimedia presentation.

To achieve these collective goals, it was first important to identify the type of multimedia elements that would facilitate maximized learning and comprehension of the youth interrogation rights content. Based on previous research examining multimedia learning (e.g., Mayer, 1989; Mayer & Anderson, 1991; 1992; Mayer et al., 1996; Mayer

& Gallini, 1990; Moreno & Mayer, 1999, 2002), three multimedia elements were tested; namely, Animation, Audio, and Caption elements. Through a partnership with the Centre for Innovation in Teaching and Learning at Memorial University of Newfoundland in St. John's, NL, multimedia presentations were created that varied the levels of each of the multimedia elements mentioned above (i.e., presence vs. absence), and converted into short video files for the use of research. In the remaining chapter, the lessons learned about legal rights comprehension from research to date is outlined, and how the current research aims to contribute new knowledge to this area is presented. The subsequent chapters will outline the experimental research carried out to test these ideas, while the final chapter consists of a discussion about the impact this work has for comprehension of interrogation rights.

**Adults' Understanding of Adult Interrogation Rights**

When an adult (i.e., 18 years of age and older) is detained or arrested by the police for questioning, police officers are bound to ensure that the individual understands their interrogation rights (e.g., the Right to Silence, the Right to Legal Counsel), as per the protections outlined in Sections 7 and 10(b) of the Canadian Charter of Rights and Freedoms (1982). Specifically, Section 7 of the Charter outlines that "everyone has the right to life, liberty and security of the person and the right to not be deprived thereof except in accordance with the principles of fundamental justice." According to case law (e.g., *R. v. Hebert*, 1990; *R. v. Liew*, 1999; *R. v. Singh*, 2007), this right also encompasses a residual protection for the right to silence in the pre-trial context insomuch that the arrested person has the free choice to decide whether or not to voluntarily speak to police. Moreover, the police cannot attempt to elicit statements from the detainee through

offering promises or threats. Section 10(b) states that "everyone has the right on arrest or detention to retain and instruct counsel without delay and to be informed of that right." Additional case law (e.g., *R. v. Brydges*, 1990) has outlined that this right to legal counsel includes four components. Namely, that detainees are able to (i) contact a lawyer of their choice without delay or conditions, (ii) have access to immediate legal advice regardless of their financial or social economic status (i.e., be provided duty counsel via Legal Aid), (iii) obtain basic information on how to access any of the available services that provide legal advice (e.g., a phone number to the Legal Aid office), and (iv) receive access to legal counsel for free upon being charged with a crime (as long as the accused meets the prescribed financial criteria set up by the provincial Legal Aid plans). The purpose of these rights is to not only help redress the balance of power between the detainee and police authority, but to also protect the safety and freedom of the detainee and to ensure that any information collected by the police is admissible as evidence if the case ends up going before the courts.

Despite the protective purpose that interrogation rights are meant to offer to detainees, a convergence of evidence has demonstrated that adults do not fully comprehend the information presented in interrogation rights in a range of jurisdictions, such as Canada (Chaulk et al., 2014; Eastwood & Snook, 2009; Eastwood et al., 2010; Moore & Gagnier, 2008; Patry et al., 2017), the United States (Cloud et al., 2002; Grisso, 1981; Rogers et al., 2007, 2008), and the United Kingdom (Clare et al., 1998; Fenner et al., 2002; Gudjonsson et al.,1992). For example, in a seminal study by Grisso (1981), 203 American adults were verbally presented with their *Miranda* rights (e.g., *Miranda v. Arizona*, 1966) and asked to indicate their understanding of these rights. Grisso found that

less than half of the sample fully understood their rights; similar results have been found in cognitively impaired adult populations (e.g., Fulero & Everington, 1995). In the United Kingdom, Gudjonsson and colleagues (1992) have reported that approximately two-fifths of adults understand the police caution. More recently, a Canadian study by Moore and Gagnier (2008) examined comprehension of the Right to Silence. They found that less than half (43%) of their participants ($N$ = 93 university students) fully understood this section of their rights; in fact, 15% of Moore and Gagnier's participants did not comprehend the Right to Silence at all. A follow-up study by Eastwood and Snook (2009) replicated and extended the work of Moore and Gagnier by including an assessment of university students' ($N$ = 56) understanding of the Right to Legal Counsel in addition to the Right to Silence; both rights were presented to participants in verbal and written form. For the Right to Silence, the researchers found that only 4% of their sample demonstrated full comprehension when administered verbally, whereas 48% fully understood the silence caution when delivered in written format. In terms of the Right to Legal Counsel, only 7% displayed full comprehension when presented the caution verbally, while 32% fully understood the legal counsel caution when presented in writing.

Eastwood and Snook (2012) found that increasing the *listenability* (see Rubin 1993, 2012) of the police caution can help improve understanding of interrogation rights. Specifically, they sought to redress problematic barriers within the police cautions by removing complex and difficult grammar and/or wording throughout the police caution, and added features to the caution that helped with overall clarity. More specifically, the police cautions were modified to include elements known to increase listenability by (1) providing instructions related to the forthcoming information, (2) presenting the

information in a listed and organized fashion, and (3) repeating key information multiple times. Participants were then assigned randomly to watch a video of one of the eight versions of the modified caution and asked to explain the meaning of the caution in their own words. Results indicated that the caution containing all three listenability modifications resulted in the highest levels of comprehension (73% compared to 37% for the original interrogation rights). These results were also replicated using a more realistic paradigm (e.g., mock police interviews; Snook et al., 2016; see also Davis et al. 2011; *cf.* Rendell et al., 2021, who reported that modifications to the police caution did not increase comprehension scores in a sample of adults with intellectual disabilities).

**Youths' Understanding of Youth Interrogation Rights**

Youth (i.e., between 12-17 years of age) arguably face a greater disadvantage than their adult counterparts during a police interview. Relative to adults, youth lack developmental maturity and the cognitive abilities to navigate the complexities of an interrogation setting, especially in the presence of an authority figure (Eastwood et al., 2014; Leo, 1996). Youth are more apt to comply with requests and directives given by authority figures and internalize any information provided to them during questioning (Grisso et al., 2003; Owen-Kostelnik et al., 2006; *R v. L.T.H.*, 2008; Redlich & Goodman, 2003). Research has also shown that young offenders are more susceptible to falsely confessing to wrongdoing because of police manipulation and pressure in the interrogation room (Scott-Hayward, 2007). Furthermore, young people tend to be impulsive in their decision making (Steinberg & Scott, 2003), and focus more on the short-term consequences of their decisions (Cauffman et al., 2010; Steinberg et al., 2009), especially in a police interview setting (Sharf et al., 2017). Due to the acquiescing nature

of young people and perceived power of the police as authority figures, the likelihood that a youth may waive their rights upon hearing them is high because of a lack of understanding.

Considering the vulnerabilities related to youth and the criminal justice system, many jurisdictions around the world have implemented changes to legislation in attempt to better support justice involved youth (e.g., *Police and Criminal Evidence Act*, 1984; *YCJA*, 2002; see King, 2006). In Canada, the *YCJA* (2002) was introduced with the aim of enhancing the protection of youth during the entirety of their contact with the Canadian criminal justice system. One area that the *YCJA* aimed to improve pertained to the interrogation rights afforded to youth suspects. Specifically, Section 146 (2b) of the *YCJA* outlines the current youth suspect rights and require police officers to first explain that (i) "the young person is under no obligation to make a statement," (ii) "any statement made by the young person may be used as evidence in proceedings against him or her," (iii) "the young person has the right to consult counsel and a parent or other person," and (iv) "any statement made by the young person is required to be made in the presence of counsel and any other person consulted…unless the young person desires otherwise." Moreover, Canadian case law has reinforced this legislation through ruling that all interrogation rights must be explained clearly to youth and that any waiver of legal rights will only be valid if it can be demonstrated by the police officer that the youth understood the rights and the consequences of waiving them (e.g., *R. v. L.T.H.*, 2008). Despite the intended improvements of youth suspect rights sanctioned by the *YCJA*, these rights are only truly protective if youth *understand* them well enough to be able to apply them

appropriately. Put differently, the structure and content of how youth interrogation rights are presented may be detrimental to the youths' understanding and protection.

Given the inherent vulnerability of youth, much research has been dedicated toward testing youths' understanding of their interrogation rights (e.g., Abramovitch et al., 1993, 1995; Cooke & Philip, 1998; Eastwood et al., 2015; Freedman et al., 2014; Goldstein et al., 2003; Grisso, 1981; Viljoen et al., 2007). Collectively, the research findings demonstrated that youth struggle to understand their interrogation rights. For example, Grisso (1981) tested American juveniles' ($N$ = 431) understanding of each of the *Miranda* rights (e.g., *Miranda v. Arizona*, 1966) and found that a little over a fifth fully understood their rights. In Canada, Abramovitch et al. (1993) examined a sample of students in public and private schools to determine if they had the ability to understand their interrogation rights. Specifically, youth were presented their Right to Silence and Right to Legal Counsel in both verbal and written format, and then tasked to repeat back the cautions' information in their own words. The researchers reported that 88% of youth had full or partial understanding of their Right to Silence, whereas 53% displayed full or partial understanding of their Right to Legal Counsel. A subsequent study by Abramovitch et al. (1995) yielded similar results. Specifically, Abramovitch et al. (1995) reduced both the silence and legal counsel cautions into single sentences that were then read aloud to a youth sample. The youth then reported their understanding of what these caution sentences meant. It was found that 67% and 57% of the juveniles fully understood the Right to Silence and Right to Legal Counsel cautions, respectively. More recently, Eastwood, Snook, and Luther (2015) verbally presented high school students ($N$ = 32) with their interrogation rights and requested that the students explain the meaning of these

rights. Reportedly, these students were able to recall only 40% of their interrogation rights.

When young people struggle to understand their interrogation rights, a host of negative outcomes can occur. First, youth may make uninformed decisions (e.g., waive rights without realizing the repercussions); this creates a trickle-down effect whereby the youth is exposed to coercive police tactics, may end up providing self-incriminating evidence, and may not have their lack of comprehension detected (if at all) until reaching court. Second, case law (e.g., *R. v. L.T.H.*, 2008) states that police need to demonstrate that the youth understood their interrogation rights. In other words, if understanding by a youth is not verified, then any statement given by the youth can be deemed inadmissible during court. Third, if an innocent youth is jailed, then the real offender is still at large in the community. Conversely, if a guilty youth provides self-incriminating evidence, but a lawyer is able to demonstrate that the youth did not comprehend their interrogation rights, then the guilty youth could be released back into the community. Thus, the need to ensure youth have their interrogation rights delivered to them appropriately and in understandable terms is clear.

Fortunately, there is some indication that comprehensibility of interrogation rights can be increased with proper listenability modifications to the police caution issued to youth detainees. For example, Eastwood, Snook, Luther, and Freedman (2016) created a youth police caution consisting of only the five core rights contained in the *YCJA* (2002) and relevant case law requirements (e.g., *R v. Bartle*, 1994; *R v. Brydges*, 1990). This newly created caution was a simplification of a Canadian police organization's youth waiver form. The interrogation rights were constructed to be as comprehensible as

possible by using short sentences, small sections, simplified language, explaining each key right multiple times, ensuring an overall low reading level, and listing the number of rights explicitly to aid recall. The researchers found that the created form allowed youth to recall significantly more of their interrogation rights than the original youth waiver form ($d$ = 1.40). This finding suggests that implementing a standardized, simplified waiver form may increase youth understanding of their interrogation rights and help ensure the protection of youth in the criminal justice system.

**Adults' Understanding of Youth Interrogation Rights**

Some of the key changes in youth interrogation rights brought in by legislative decisions (e.g., *Police and Criminal Evidence Act*, 1984; *YCJA*, 2002) or court rulings (see King, 2006) in different jurisdictions was the ability granted to a youth to consult with an appropriate adult (usually a parent or caregiver) prior to police beginning their interview. Moreover, this legislative change allowed the appropriate adult to support and advise the youth throughout the statement giving process – that is, if the youth agreed to the appropriate adult being with them in this capacity. However, the inherent assumption is that an appropriate adult could serve as source of support and help the youth understand difficult information (e.g., the interrogation rights). Unfortunately, available data to date is not very promising about adults' current understanding of youth interrogation rights.

Despite numerous studies having examined parental legal knowledge about the justice system more generally (e.g., Barnes & Wilson, 2008; Cavanagh & Cauffman, 2017; Rajack-Talley et al., 2005; Woolard et al., 2008), very few studies have specifically investigated parental knowledge of youth interrogation rights. Although not assessing adults' understanding of youth interrogation rights directly, a study by Woolard and

colleagues (2008) examined parents' understanding of the *Miranda* warning (e.g., *Miranda v. Arizona*, 1966). The goal of their knowledge test was to determine whether parents had sufficient understanding of the police interrogation process, relative to their youth counterpart, that would allow them to help compensate for the youths' lack of knowledge during a police interview. In their sample of 170 youth-parent dyads, the researchers reported that parents demonstrated a better understanding of the *Miranda* rights components relative to the youth; however, the researchers also discovered that the parents had many misconceptions or misunderstandings related to police interrogation practices in general. For instance, it was reported that 90% of parents incorrectly believed that the police had to notify them if their child was a witness or a suspect to a crime, 66% of parents incorrectly thought that police had to wait for them to arrive before questioning their child, and approximately half of the parents incorrectly believed that police were not allowed to lie to suspects during a police interview. More recently, Cavanagh and Cauffman (2017) assessed legal knowledge (mostly of probation- and court-related processes) among American mothers of justice-involved youth. The researchers reported that these mothers had, on average, an overall score of 66% when answering questions concerning legal knowledge (i.e., knowledge of rights, roles, and procedures in the juvenile justice system; see Cavanagh & Cauffman, 2017). Furthermore, Cleary and Warner (2017) surveyed a sample of 294 American parents to assess their general knowledge of police interrogation practices and youths' rights (e.g., right to silence, perceptions of custody, videotaping interrogations, police deception, and parental notification/involvement), and reported that, on average, parents answered less than half (46%) of the knowledge questions correctly.

In the Canadian context, it appears that only one study has examined appropriate adults' understanding of youth interrogation rights directly. In an unpublished study, Drodge (2018) sought to evaluate how well adults understand youth interrogation rights as currently administered through the police caution delivered to youth. More specifically, the goal of the study was to compare differences in comprehension across two versions of a youth police caution; namely, a simplified vs. standard youth police caution. To test this, participants ($N$ = 72) were randomly assigned to read one version of the youth police caution and then asked to answer a 15-item questionnaire (an author-constructed Youth Rights Comprehension Questionnaire for Adults scale) to assess comprehension levels of the youth interrogation rights presented. Each question assessed the comprehension of one of the rights administered through the youth police caution (e.g., the right to silence, right to consult counsel, right to decide whether an appropriate adult is present during the interrogation, and the right to know the reason for the arrest). No significant difference in terms of comprehension was found between groups, and the average comprehension score across the sample was reported to be 76%. More specifically, 15 participants scored 100% on the measure, while nine participants scored less than 50% on the comprehension measure. Although the comprehension score is reportedly higher than that of previous studies, this finding needs to be considered in light of some limitations (e.g., small sample size).

Taken together, findings from the body of research examining legal rights comprehension suggest that both appropriate adults and youths may not have sufficient knowledge of youth interrogation rights and practices to adequately serve and protect a youth during a police interrogation. Despite some research (e.g., Eastwood et al., 2016)

demonstrating ways (e.g., listenability modifications; see Rubin 1993, 2012) to increase interrogation rights understanding, the fact remains that adjustments that lead to *full* comprehension have yet to be discovered.

**Applying the Multimedia Principle to Increase Legal Rights Comprehension**

One untested option for potentially improving comprehension of interrogation rights beyond levels demonstrated by previous research is applying the principles of the cognitive theory of multimedia learning to how youth interrogation rights are delivered. In his seminal book, Mayer (2009) proposed the cognitive theory of multimedia learning to help foster understanding of material presented through computer-aided instruction. His theory rests on three key assumptions about how humans process information; namely, the dual-channel assumption (i.e., the notion that humans use two different channels to process visual and auditory information; see Clark & Paivio, 1991; Paivio, 1986, 2006; see also Baddeley, 1992, 1999; Baddeley et al., 2009), the limited-capacity assumption (i.e., the notion that humans have a finite level of cognitive and attentional resources available for processing information within a channel at any given time; see Baddeley, 1992, 1999; Baddeley et al., 2009; see also Sweller, 1999; Sweller et al., 2011), and the active-processing assumption (i.e., the notion that humans need to engage actively in the learning process in order to comprehend information by identifying relevant information, organizing the information into a coherent mental representation, and consolidating the learned information with other current knowledge; see Mayer, 2009; see also Wittrock, 1989). The cognitive theory of multimedia learning theory also relies partly on cognitive load theory which is comprised of three subtypes of cognitive load: intrinsic (i.e., the mental effort expended due to the complexity of the material and the

method in which it is presented; the cognitive resources required to understand the material); extraneous (i.e., any mental energy distracted from processing the information or task at hand, such as environmental distractions or poorly designed instruction); and germane (i.e., the cognitive resources remaining to convert the information into learned material; see Sweller, 2010). Therefore, to maximize learning through multimedia, instructional materials should strive to decrease intrinsic and extraneous cognitive load and increase resources available for germane cognitive load. That is, the information should be simplified as much as possible, and external distractions should be minimized (Kirschner, 2002; see Mayer, 2009).

Based on the theories of information processing and cognitive load, Mayer (2009) offered 12 principles of multimedia learning that instructors can use to help maximize learning and comprehension of material presented in a multimedia format: the *coherence principle*, *signaling principle*, *redundancy principle*, *spatial contiguity principle*, *temporal contiguity principle*, *segmenting principle*, *pre-training principle*, *modality principle*, *personalization principle*, *voice principle*, *image principle*, and *multimedia principle* (see Table 1 for a brief explanation of each principle). Of these principles, the multimedia principle is one of the most empirically supported principles of multimedia learning (Halpern et al., 2007; Mayer, 2009; Pashler et al., 2007). Specifically, the multimedia principle suggests that individuals learn better from materials using words and graphics rather than words alone. A multimedia presentation is any presentation that contains both words and graphics, where words can be printed or spoken text, and graphics can be illustrations such as drawings, charts, graphs, maps, photos, or dynamic graphics such as animation or video (Clark & Mayer, 2011; Mayer, 2009). In a series of

studies testing the multimedia principle, Mayer and colleagues compared the test performance of students who learned from animation and narration versus narration alone, or from text and illustrations versus text alone (e.g., Mayer, 1989; Mayer & Anderson, 1991; 1992; Mayer et al., 1996; Mayer & Gallini, 1990; Moreno & Mayer, 1999, 2002). In all comparisons, students who received a multimedia lesson consisting of words and pictures performed better on a subsequent knowledge transfer test than students who received the same information in words alone (median effect size reported across studies was $d = 1.73$; see Mayer & Moreno, 2002).

Further research has suggested that using words and graphics is particularly important for teaching novices; that is, learners who have low knowledge of the domain rather than learners who have high knowledge of the domain (Mayer & Gallini, 1990; Ollernshaw et al., 1997; Kalyuga et al., 1998, 2000). Most often, interrogation rights (whether for adults or youth) are delivered solely as audio information, with the police officer reading the rights verbatim to the detainee (e.g., Chaulk et al., 2014; McCardle et al., 2020; Sim & Lamb, 2018). Given the multimedia principle's apparent applicability to helping novices learn information unfamiliar to them (such as youth interrogation rights), presenting youth interrogation rights in multimedia format may lead to greater understanding than traditional narration of these interrogation rights.

**Why Explore Introducing Multimedia into the Interrogation Room?**

Navigating a police interrogation safely and properly is a challenging process for all parties involved. For the detainee being questioned, a police interview is (usually) a novel and unfamiliar experience, and many who find themselves sitting across a table from an interviewing officer may rely on examples from television shows or movies

about how to behave during a police interrogation (Adorjan et al., 2017). For instance, in many televised criminal dramas (e.g., *Law & Order*; see Nathan et al., 1991), the detainee is often shown talking freely and unguarded to police, leading to the suggestion that when the police question someone, they have the best interests of this person in mind and are just casually canvassing for information. However, in real life, we know from decades of research that this is usually not the case. As a detainee being questioned, the lack of familiarity with: the interview process; the police's possible motives in speaking with them; and interrogation strategies applied in these scenarios more broadly, may inadvertently misguide the detainee and result in them falling victim to a number of negative outcomes (e.g., subjected to coercive police tactics, offer incriminating statements indirectly, falsely confess to a crime; for a review on these and other concerning issues related to detainees in the interrogation room, see Kassin et al., 2010; see also Hall et al., 2020; Kaplan et al., 2020). Likewise, the interview setting is a difficult environment for the interrogating officer(s), as well. For instance, there is a significant cognitive demand placed on the interviewer(s) due to the many tasks they are expected to carry out. For example, these tasks can include (but are not limited to) developing and asking questions to the detainee; actively listening to, comprehending, and evaluating the interviewee's responses; taking notes about the reported information; monitoring and evaluating any verbal and non-verbal behavioural cues for indications of deceit; composing follow-up questions based on the detainee's responses; and/or mentally comparing any newly obtained information with available evidence collected to date in the investigation (see Driskell & Salas, 2015; Hartwig et al., 2004; Inbau et al., 2013).

Beyond these compounded tasks, officers also need to ensure that they are adhering to all legal obligations required of them vis-à-vis case law rulings and legislative decisions (e.g., *R. v. Brydges*, 1990; *R. v. Hebert*, 1990; *R. v. Liew*, 1999; *R. v. L.T.H.*, 2008; *R. v. Singh*, 2007; *YCJA*, 2002). As mentioned previously, one such requirement is ensuring that the detainees are read their interrogation rights appropriately and that follow-up verification is checked to ensure the interviewee understands these rights; this process is especially important when it comes to youth detainees. In attempt to meet these requirements, Canadian police organizations created written documents (i.e., waiver forms) that contained all of the information about youths' interrogation rights. The intent of the waiver forms was to promote youth suspects' understanding of their interrogation rights; that is, it was assumed that the information contained in these written documents were comprehendible to a youth detainee. However, research by Eastwood and colleagues (2015) challenged this assumption. In their analysis, the researchers found that these youth wavier forms tended to be lengthy, required a high reading level ability, and contained words and concepts that would be unfamiliar to a naïve youth reader (e.g., "Indictable", "Manslaughter", "Proceedings"; see Eastwood et al., 2015). More specifically, the written forms were found to be between four to six pages in length and would contain between 239 to 1,1920 words, with some sections of the waiver containing more than 75 words – an amount of information that is beyond what a person can process in working memory (Baddeley, 1994; Rogers et al., 2007). These observations led Eastwood and colleagues to conclude that these waiver forms were more than likely hindering (rather than helping) youths' ability to understand their interrogation rights – seemingly opposite to the original intent of the written waiver forms.

In addition, recent coding studies have shown that the way the police deliver interrogation rights to youth is often incomplete and lacks standardization. For example, McCardle and colleagues (2020) examined 31 audio-recorded police interrogations with youth suspects from a Canadian police agency for how interrogation rights were delivered and whether officers verified that the youth understood these rights. Overall, the researchers found that police officers did not deliver these rights in their entirety to youth in nearly 75% of the interrogations, and that officers checked for understanding rarely. In fact, the researchers found that youth were asked to explain the rights in their own words (after having the rights read to them) in less than 10% of the interrogations. Work by researchers in the United Kingdom and United States have made similar observations (e.g., Cleary & Vidal, 2016; Sim & Lamb, 2018). The findings in these studies reveal alarming statistics in terms of how officers deliver rights and assess youths' understanding of these rights. Not only do these observations indicate that more training is needed for how police interviewers deliver interrogation rights information to youth detainees, but it also reveals that there is a clear need for a standardized delivery approach to be considered and implemented within the interrogation room – a solution that a multimedia presentation might be able to offer, and hence is one reason why a multimedia approach is being considered through this line of research.

In the case of youth detainees especially, a multimedia presentation approach may offer extra benefits and protections. According to some commentators, youth are ahead of the curve (relative to their adult counterparts) when it comes to adopting, utilizing, and understanding the applicability of newer digital technologies (Graafland, 2018; Montgomery, 2000). Moreover, some literature suggests that when parents and children

watch video content together (i.e., ‘co-viewing’; see Gottschalk, 2019), this viewing environment may serve as a benefit toward the youth’s ability to understand and comprehend the material being showcased in the video. Apparently, this viewing dyad may help lead the child to dedicate more of their attentional focus toward the content, while also being able to rely on the guidance of their adult counterpart who can assist with descriptions and field any questions the child may have during viewing (Barr et al., 2008; see Organisation for Economic Co-operation and Development, 2019). Accordingly, delivering youth interrogation rights to the youth detainee in the form of a multimedia presentation in the context of a police interrogation – while in the presence of an appropriate adult supporter – may lend itself toward the youth better comprehending their rights more effectively.

**The Current Research**

The objectives of the current research were to test how well a multimedia presentation could present interrogation rights to youth, and to examine what – if any – impact such an approach would have on the comprehension of those rights. According to the above definition of a multimedia presentation (Clark & Mayer, 2011; Mayer, 2009), the words used in a multimedia presentation can be spoken (akin to an audio narration) and/or printed (akin to showing subtitled captions), while the graphics used in a multimedia presentation can be dynamic (akin to showing a cartoon animation). Therefore, to determine which type of multimedia presentation leads to maximum comprehension, these three multimedia elements are manipulated (i.e., Animation, Audio, or Caption; see Chapter 2 for more details regarding the research design and explanation of each of these multimedia elements).

To achieve the above research objectives, I aimed to test the applicability of using a multimedia presentation containing youth interrogation rights with samples of adults (Experiment 1) and youth (Experiment 2). Given the legislative changes to allow appropriate adults to accompany a youth during a police interrogation (e.g., *YCJA,* 2002), it is important to examine if a multimedia presentation would assist the appropriate adults. If such a presentation were to help appropriate adults, then the appropriate adults would, in turn, be better positioned to help assist the youth throughout the interrogation process. Furthermore, given that youth detainees arguably have the most consequential risk during a police interrogation and have been shown to struggle to understand their rights when delivered verbatim by a police officer, it is important to determine if a multimedia presentation could help them understand their rights better. If the youths can better comprehend their interrogation rights, then the youth will be able to make more informed decisions (e.g., stay silent; request a lawyer; request an adult) and be better protected during the interrogation process.

# Chapter 2: Experiment 1

## Hypotheses

The goal of Experiment 1 was to examine the effect of a multimedia presentation on a sample of Canadian adults' comprehension of youth interrogation rights. The predictions were derived from a combination of the underlying theory of Mayer's (2009) multimedia learning and on previously reported findings within the interrogation rights comprehension literature (e.g., Clare et al., 1998; Eastwood & Snook, 2009; Fenner et al., 2002). The predictions are explained below.

Based on the dual-channel processing assumption of multimedia learning, I expected that interrogation rights presented through *dual* modalities (i.e., visual and auditory) would result in higher comprehension than when presented through a *single* modality (i.e., visual alone or auditory alone); furthermore, I also expected that interrogation rights presented through *dual* modalities would result in higher comprehension than when presented through *dual, but competing* modalities (i.e., both visual). However, given the applied nature of this research within the legal rights comprehension literature, my predictions were also informed by some of the previously reported research findings in this area. Specifically, studies have shown that having participants *read* their interrogation rights (i.e., akin to captions) leads to greater comprehension than when these rights are delivered to them *verbally* (i.e., akin to audio; e.g., Clare et al., 1998; Eastwood & Snook, 2009; Fenner et al., 2002). Therefore, I reasoned that the multimedia presentation(s) containing the captions element would yield better comprehension score than the audio element, especially when paired with an animation element (as per the multimedia principle; Mayer, 2009).

Therefore, with the aforementioned theory and previous research on comprehension of interrogation rights in mind, I predicted that comprehension of youth interrogation rights delivered via multimedia presentations will foster understanding in the following order (from highest to lowest comprehension levels):

1. Animation + Caption (Condition 3)
2. Animation + Audio (Condition 2)
3. Audio + Caption (Condition 5)
4. Animation + Audio + Caption (Condition 1)
5. Caption (Condition 7)
6. Audio (Condition 6)
7. Animation (Condition 4)
8. No multimedia (Condition 8)

Moreover, given that the multimedia principle also states that people learn better from materials using words *and* graphics rather than words alone (Mayer, 2009). I also predicted a synergistic interaction between the multimedia elements that present graphics and words (i.e., Animation and Audio, Animation and Caption).

## Method

### *Participants*

In total, a sample of 301 Canadian adults was obtained through Prolific Academic (an online recruitment platform based in the United Kingdom; www.prolific.co) prior to any data analyses. Participants were compensated £2.50 (approximately $4.50 CAD) for taking part in the experiment. A total of 94 participants were removed due to one or more of the following exclusion criteria: the study was not completed in its entirety ($n$ = 36);

instructions were not followed (e.g., reported note-taking, rewinding, fast forwarding, or pausing the presentation despite instructions requesting participants to refrain from all of these actions; $n = 27$); failed attention check measures ($n = 5$); reported first language was not English ($n = 9$); or reported having a learning disability ($n = 9$). Additional participants were removed because they reported that they encountered a technical error during the multimedia presentation ($n = 8$; e.g., reported that the audio/video froze while watching the presentation). Consequently, the final sample size upon which the subsequent analyses were conducted was 207. A power analysis check with the final sample size indicated that the power to detect a medium effect size, $d = 0.50$, with an alpha level of $\alpha = .05$, was 0.95 (Cohen, 1992). The mean age of participants was 33.86 years (*SD* = 11.26, *Range* = 18-67). A summary of the remaining demographic variables is shown in Table 2.

A one-way analysis of variance indicated that there were no significant differences in participants' age as a function of condition, $F(7, 199) = 0.41$, $p = .897$. Except for citizenship, there were no significant differences in the distribution of participants' gender, ethnicity, level of education, or Province/Territory of residence between the eight conditions ($ps > .05$). There were more self-identified non-Canadian citizens in the Animation + Audio group than expected by chance, and fewer self-identified Canadian citizens in the Animation + Audio group than expected by chance, $\chi2(7, N = 207) = 15.86$, $p = .026$. There was no significant difference in performance based on citizenship.[1]

[1] When recruiting through Prolific Academic, target filters were set such that the sampling was to target Canadian participants only. However, despite applying these filters on Prolific's site, some self-identified

### *Design*

A 2 (Animation: Present vs. Absent) x 2 (Audio: Present vs. Absent) x 2 (Caption: Present vs. Absent) between-subjects design was employed, yielding eight conditions. The conditions were as follows (note, an explicit mention of the multimedia element in each of the following conditions means the particular element was present, whereas no mention of the elements means the multimedia element was absent from that condition): (1) Animation + Audio + Caption; (2) Animation + Audio; (3) Animation + Caption; (4) Animation; (5) Audio + Caption; (6) Audio; (7) Caption; (8) No Multimedia (i.e., all multimedia elements were absent).

The main dependent variable of interest was recall memory of the youth interrogation rights, as measured through coding responses to two open-ended questions. The secondary dependent variable was recognition memory of the youth interrogation rights, and was measured using a multiple-choice test and a true/false test (see Appendix A). Collectively, the recall and recognition memory questions served as the measurement of construct for comprehension and understanding. Previous studies – particularly within the interrogation rights comprehension literature (e.g., Eastwood & Snook, 2012; Eastwood et al., 2010, 2016; Freedman et al., 2014) – have used memory recall and

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non-Canadian participants appear to have completed the experiment ($n$ = 13). Given that this variable was not initially planned to be used as an exclusion criterion, a decision was made to retain these participants and simply run tests to see if there were any concerns about retaining them in my sample. A Welch's independent $t$-test indicated that there were no significant differences between Canadian and non-Canadian participants' as function of recall, $t(13.975) = -0.74$, $p = .475$, or recognition, $t_{Multiple\text{-}Choice}(13.350) = -0.17$, $p = .864$, $t_{True/False}(13.889) = .19$, $p = .850$; therefore, it was concluded that there were no concerns about retaining these participants in the sample. Furthermore, it was rationalized to retain this small group of non-Canadian adults in the sample because even though these participants may not be Canadian, they were still living in Canada and could arguably serve as an appropriate adult for a youth taken into custody by the police in Canada.

recognition tests as measurements of comprehension; consequently, the current research adopted this approach for consistency and to facilitate comparisons across studies. Furthermore, measures of participants' confidence in the accuracy of their answers were also included in the current research to enable comparison across previous research (e.g., Eastwood & Snook, 2009).

To be clear, participants in Conditions 1-7 were presented with a presentation featuring the multimedia component(s) listed above that outlined information related to youth interrogation rights. When answering the recall and recognition questions (i.e., the dependent measures), participants in Conditions 1-7 were told to think back to the presentation they viewed to help inform their responses. In contrast, participants in Condition 8 (i.e., no multimedia components) listened to a music track (the same music featured in all other presentations) and were told to think about what they knew about youth interrogation rights (i.e., reflect on their current/prior knowledge). At test time, participants in Condition 8 were told to rely on their current/prior knowledge about youth interrogation rights when answering the survey questions (see Procedure section below for more detail).

### *Materials*

**Multimedia Presentation.** The multimedia stimuli were created by the Centre for Innovation in Teaching and Learning at Memorial University of Newfoundland in St. John's, NL. The content creators were provided with a script and storyboard, and asked to create the multimedia stimuli with limited distractions and maximum simplicity. The script for the content about youth interrogation rights was based on the created youth waiver form developed by Eastwood and colleagues (2016). Specifically, the script

explained the interrogation rights afforded to youth suspects in Canada when being interviewed by a police officer, and were presented as five key points (see Appendix B). All multimedia presentations (and music clip used in the No multimedia condition) were 2 minutes and 15 seconds in length. Each presentation manipulated a combination of the aforementioned independent variables (i.e., Animation, Audio, Caption). All multimedia presentations created for this research can be viewed on my Open Science Framework page at: https://osf.io/qknxv/?view_only=99fc36f5a22d4abdb48e5afddd58877c.

**Animation Element.** The Animation element depicted genderless, raceless characters acting out the interrogation rights. Genderless, raceless characters were used to avoid biases and to represent any and all youth suspects. The relative sizes and accessories of the characters served to indicate their roles. For example, the youth character is smaller in size than adult characters, the police officer character is wearing an identifiable police hat, and the lawyer character is wearing a white collar. Simplicity of the animation design was stressed during the storyboard process as excess and unnecessary graphics have been shown to hinder learning for low-ability learners (Hegarty & Just, 1989, 1993; Mayer, 2009; Mayer & Sims, 1994); further, two-dimensional, simple illustrations have been found to be more effective in fostering learning than detailed illustrations or three-dimensional photographs (Butcher, 2006; Sanchez & Wiley, 2017). The Animation element was present in Conditions 1-4, and absent in Conditions 5-8.

**Audio Element.** The Audio element presented an auditory narration of the youth interrogation rights script (see Appendix B) voiced by an actress at a rate of 122.9 words per minute (i.e., less than 200 words per minute as recommended by previous research

guidelines; see Carver, 1982; Griffiths, 1992; Jester & Travers, 1966). The Audio element was present in Conditions 1, 2, 5, and 6, and absent in Conditions 3, 4, 7, and 8.

**Caption Element.** The Caption element visually displayed the narrated words along the bottom of the screen in white font with a bordering black background, offsetting the text from the animation and audio. Including captions in instructional videos has been suggested to help facilitate understanding the presented content (Danan, 2004; Koolstra & Beentjes, 1999; Koskinen et al., 1993). The caption was present in Conditions 1, 3, 5, and 7, and absent in Conditions 2, 4, 6, and 8. See Figure 1 for screen shot examples of the multimedia presentations.

**Background Music.** A quiet background track of light music was played in each multimedia presentation (i.e., present in Conditions 1-8). The music was a simple tune played in a major key at a tempo of 154 beats per minute. Some research suggests that background music can help keep people's attention during multimedia presentations (Bishop et al., 2008; but *cf*. Mayer, 2009).

### *Measures*

**Open-Ended Response Test.** Two open-ended questions were asked to participants after experiencing one of the eight conditions. Participants were provided with a textbox at the end of each question to write their response; no time restrictions were imposed. Note, the differences in instruction wording by condition is indicated in **bold** for Conditions 1-7 or *italics* for Condition 8; <u>underlined</u> text was used for emphasis as part of the instructions in all conditions. The first open-ended question (Q1) read as follows:

> Please try your best to recall everything you **learned** / *know* about youth legal rights **from the presentation**. Take your time and **think about the presentation** / *gather your thoughts* for a moment before proceeding. When you are ready, write out everything that you **learned** / *know* about youth legal rights **from the presentation** in your own words in as much detail as possible, and try your best not to leave anything out.

After answering this question, participants were provided with a second follow-up open-ended question to explore if they were able to remember any additional information. A follow-up question was asked to mimic what some questioning experts deem to be one way to help elicit additional information from individuals (i.e., multiple requests for free recall to enhance memory; see Fisher, 1995). Note, the additional instruction wording for Conditions 1-7 is indicated in **bold**, whereas Condition 8 did not display the bolded text; underlined text was used for emphasis as part of the instructions in all conditions. The second open-ended question (Q2) read as follows:

> Take a moment and think about what else you can remember about youth legal rights **from the presentation**. When you are ready, write out any additional things you can remember in as much detail as possible.

**Multiple-Choice Test.** A modified version of the 5-item multiple-choice measure created by Eastwood et al. (2016) was used in this experiment to assess participants' recognition knowledge of youth interrogation rights. Modifications included changing the language used for Eastwood et al.'s target population (i.e., youth) to the current experiment's target population (i.e., adults). An example item asked was "When being interviewed by a police officer, a youth needs to: (a) Answer all the questions that are

asked of them; (b) Only answer the questions that they want to answer; (c) Only answer questions that are related to a crime; (d) Only answer questions related to the youth's personal life." Participants were also asked to rate how confident they were in each of their answers using a scale from 1 (*Not at All Confident*) to 5 (*Completely Confident*). All test items were presented in a randomized order to protect against any potential order effects (see Appendix A).

**True/False Test.** A 9-item true/false test was author-constructed to assess participants' recognition knowledge of youth interrogation rights; the items on this measure covered each of the key sections of the youth interrogation rights. An example item asked was "A youth must answer the questions that the police ask them about the alleged crime: True or False." Participants were also asked to rate how confident they were in each of their answers using a scale from 1 (*Not at All Confident*) to 5 (*Completely Confident*). All test items were presented in a randomized order to protect against any potential order effects (see Appendix A).

**Attention Check.** A single attention check question was embedded within the true/false test (10th item) that told participants which answers to select (e.g., "This is an attention check question. Please select 'False' and 'Somewhat Confident' for your answers."). This item was presented randomly within the presentation of the other nine true/false questions.

**Demographic Questionnaire.** Questions pertaining to participants' age, gender, ethnicity, level of education, Canadian citizenship, and Province/Territory of residence were collected. Additional questions asked participants if English was their first language, and if they had a diagnosed learning disability (both questions were used as exclusion

criteria). The demographic questionnaire also contained a section asking whether or not the participant had heard these youth interrogation rights previously. Another section inquired about the participants' specific behaviour throughout the experiment (i.e., whether or not they used headphones; took notes about the presentation [used as an exclusion criterion]; or manipulated the multimedia presentation or music clip in any way [used as an exclusion criterion; e.g., paused presentation/music]; see Procedure section below for descriptive statistics). The final section of the demographic questionnaire asked three open-ended feedback questions, each with its own response textbox. The questions read as follows (note, the words in square brackets were not shown to participants, but serve as a note to the reader):

1. Were any of the instructions or questions unclear at any point in this study? If so, please explain.
2. Did you encounter any technical errors, problems, or distractions while completing this study? If so, please explain [used as an exclusion criterion if participant indicated any issues].
3. Do you have any comments about this survey that you would like to share with the researchers? If so, please explain.

***Procedure***

The survey was created and hosted online through Qualtrics (www.qualtrics.com). Participants, recruited through Prolific Academic, were required to complete the experiment using their own computer and asked to use headphones, if available. Half of the participants (51.7%; $n = 107$) reported using headphones during this study whereas the other half (47.8%; $n = 99$) reported that they did not use headphones; one participant

(0.5%) did not provide an answer about using headphones. There were no significant differences in the distribution of participants' use of headphones across conditions, $\chi 2(7, N = 206) = 7.57$, $p = .372$. Half of the participants (52.2%; $n = 108$) reported that they heard the youth interrogation rights previously whereas the other half (47.8%; $n = 99$) reported that they did not. There were no significant differences in the distribution of participants' familiarity of youth interrogation rights across conditions, $\chi 2(7, N = 207) = 9.08$, $p = .247$. On average, participants took 16.62 minutes ($SD = 7.03$) to complete the study. A one-way analysis of variance indicated that there were no differences in the time it took for participants to complete the survey as a function of condition, $F(7, 199) = 1.07$, $p = .388$.

The first page of the survey presented participants with an informed consent form. Prior to advancing in the survey, participants were required to indicate whether or not they wanted their data retained by the researchers (i.e., Research Participation vs. Research Observation), and their consent to partake in the study; participants who did not want to consent were instructed to close their browser to exit the study. By advancing through to the next page of the study, the participant's consent was implied.

After consent was obtained, participants were provided with a set of pre-study instructions. Specifically, participants were asked to (i) turn off any music or television in their immediate surroundings, (ii) to not answer their cell phone, (iii) to refrain from using other windows or tabs on their internet browser, and (iv) to refrain from using the 'Back' button on their browser (this feature was disabled within the study platform). Following these instructions, participants were asked to answer three forced-choice yes or no questions:

1. Right now, do you have at least 20 minutes of uninterrupted time in which you can complete this study?

2. Do you agree to complete this study in one sitting, without taking breaks, and without talking to anyone else?

3. Have you turned off any television, music, or other media devices in your immediate surroundings to reduce distraction?

If participants answered 'no' to any of these questions, then they were filtered out of the study and asked to return to the study later when they could meet these three criteria; if participants answered 'yes' to all three of these questions, then they were brought to the next page.

On the third page, participants were asked to complete a brief pre-test to ensure that the audio and video functions on their computer was working properly. To test this, participants were presented with a video clip (e.g., a car collision at an intersection) which had an audio clip overdub unrelated to the video clip (e.g., chickens clucking). After viewing, participants were instructed to answer two multiple-choice questions pertaining to what they saw and heard in the clip. If one or both answers were incorrect, then the participants were filtered out of the study and asked to return to the study later using a different computer with proper audio and video capabilities. If both answers were correct, then participants were presented with a message (on the fourth page) indicating that their audio and video capabilities appeared to be working properly, and instructed to proceed to the next page.

The fifth page provided participants with a message saying that the main study will begin on the next page, and asked them to pay close attention to the subsequent

instructions provided. Hereafter, participants were assigned randomly to one of the eight conditions. The sixth page provided participants with a set of instructions specific to their condition. Note that the differences in wording by condition is indicated in **bold** (Conditions 1-7) or *italics* (Condition 8); underlined text was used for emphasis as part of the instructions in all conditions. The instructions were as follows:

> Please read the following instructions carefully: If the police want to question a youth about a crime that they think the youth did, the police have to first deliver a set of relevant legal rights to the youth. On the next page, **you will watch a presentation that explains these rights** / *you will take a few minutes to think about youth legal rights while listening to some music*. It is important that you **pay careful attention to the content of the presentation** / *use this time to think about what youth legal rights might be*. Afterwards, you will be asked to answer some questions about **the content of the presentation** / *youth legal rights*.

After reading the instructions that pertained to their assigned condition, participants advanced to the next (seventh) page that presented them with one of the eight conditions. At the top of this page, a set of instructions were given asking participants to play the clip one time and specifically to not pause, fast forward, or rewind the clip. Importantly, participants were not able to advance pass this page until the length of time of the presentation clip had elapsed (2 minutes and 15 seconds). Following this, the recall (i.e., open-ended questions) and recognition (i.e., multiple-choice and true/false questions) tests were administered on the subsequent pages; the free-recall prompts were always presented first, followed by the recognition tests – the presentation order of the

two recognition tests were counterbalanced, and each question item on both recognition tests was presented on its own unique page.

The last three pages of the survey consisted of a page asking participants for their demographic information, a page giving the participants a final chance to change their choice of Research Participation or Research Observation, and a debriefing page that explained: the purpose of the study, a brief description of each condition, and the research predictions. Once the participants clicked the final submit button, they were redirected back to Prolific Academic's website.

### *Coding of Open-Ended Responses*

A 16-item coding guide, content dictionary, and coding process was used to code participants' responses to the open-ended question (see Appendix C). Comprehension was measured by whether the participant mentioned the five rights in their responses (i.e., coded as being present or absent). Each right (where applicable) was broken down into subcomponents to capture the complete essence of the right, and participants were awarded a point per each component of the right recalled; participants' responses did not have to be verbatim to the coding guide, but had to capture the overarching meaning of the interrogation right (see the content dictionary in Appendix C for further clarification). The scoring system was as follows:

For the first right, participants received one point if the participant stated that a *youth does not have to talk to the police officer* (Right 1).

A maximum of five points were available for Right 2. One point was awarded if the participant stated that a *youth can talk to a lawyer* (Right 2a), one point was awarded if they mentioned that the youth could talk to *their own/personal lawyer* (Right 2b), and

one point if they mentioned a youth could talk to *a free lawyer* (Right 2c); if the participant mentioned Right 2b and/or 2c only, then they were automatically awarded a point for Right 2a. The logic of this decision stemmed from the fact that Rights 2b and 2c encompassed two different types of lawyers that can be consulted, which implied that the participant understood that talking to a lawyer – regardless of whether that lawyer was their own/personal or a free one – was allowed. However, this coding was not bi-directional; that is, if the participant only mentioned that youth were able to talk to a lawyer (i.e., Right 2a), but failed to specify the type of lawyer the youth could consult (i.e., Right 2b and/or 2c), then they were awarded one point for Right 2a only. One point was awarded if the participant mentioned that youth could talk to a lawyer *right now/before the police officer asks the youth any questions* (Right 2d), and another point if it was mentioned that *youth can have the telephone number for a lawyer* (Right 2e).

A maximum of five points were available for Right 3. One point was awarded if the participant mentioned that a *youth can talk to an adult* (Right 3a), one point was awarded if they mentioned that the youth could talk to *a parent* (Right 3b), one point if they mentioned *a relative* (Right 3c), and one point for mentioning *any other adult* (Right 3d); the same decision logic mentioned above for Right 2 was also applied for Right 3 – that is, a point was given to Right 3a automatically if any of the Rights 3b, 3c, or 3d were mentioned only, but not vice versa (i.e., not bi-directional). A point was also awarded if the participant mentioned that youth could talk to an adult *right now/before the police officer asks the youth any questions* (Right 3e).

A maximum of three points were available for Right 4. One point was awarded if the participant mentioned that *youth can have a lawyer with them* (Right 4a), and another

one point was awarded if they said *youth can have an adult with them* (Right 4b). A point was also given if the participant indicated that the youth could have both or either of the lawyer and adult with them *when the police officer asks the youth questions* (Right 4c).

A maximum of two points were available for Right 5. One point was given if the participant mentioned that *anything the youth says can be used as evidence against the youth in court* (Right 5a), and another point if they said *anything the youth does can be used as evidence against the youth in court* (Right 5b).

**Inter-Rater Reliability.** The combined responses from the two open-ended questions (i.e., responses to Q1 and Q2) were coded. The author and a research assistant each coded 100% of the participants' open-ended responses. The author provided a 1-hour training session to the research assistant about the coding guide and dictionary. Any confusion or questions pertaining to the coding guide and dictionary were resolved before commencing the coding task. Prior to coding, both raters practiced on a set of responses that were removed from the dataset due to the abovementioned exclusion criteria. Both raters were blind to which conditions the responses were from. Inter-rater agreement testing across all subcomponents of the interrogation rights yielded a mean *Kappa* of .93 (*Range* = .81 – 1.00), suggesting excellent agreement between raters (Cohen, 1960; Landis & Koch, 1977).

### *Analytic Procedure*

After cleaning the data file (i.e., applying the exclusion criteria), coding of the open-ended recall responses was conducted, and an inter-rater reliability analysis was performed. After computing inter-rater reliability, disagreements were resolved through discussion between the two raters; a third judge (i.e., the author's doctoral supervisor)

was brought into the discussions for any items that could not be resolved by the two raters to make final decision. The resolved dataset was used to compute the total open-ended comprehension scores for each participant and was quantified as a proportion (i.e., mean percent score). Responses to the multiple-choice and true/false tests were also converted into proportion scores. Appropriate frequency and descriptive analyses, and comparative tests (e.g., chi-square tests, one-way analysis of variance) were conducted where required. Next, a point-biserial correlation analysis was conducted on the three dependent variables. Following this, a multivariate analysis of variance test was conducted using each dependent variable's proportion scores (i.e., open-ended, multiple-choice, and true/false scores) to examine any differences between the independent variables (i.e., Animation, Audio, and Caption); follow-up post-hoc and simple main effect tests were conducted where necessary. Finally, correlation analyses were conducted for the multiple-choice and true/false tests for correct responses and confident ratings. All analyses were conducted using SPSS Statistical Package, v.27.

To display the magnitude of any significant differences found, effect sizes were reported as Cohen's *d* and partial eta-squared, $\eta_p^2$. Effect sizes are used to determine if comparative results have meaningful differences. For ease of interpretation, Cohen (1988) proposed four levels of magnitude for the *d* statistic: (i) no effect ($d < 0.19$; no practical significance); (ii) a small effect ($0.20 \leq d < 0.49$; low practical significance); (iii) a medium effect ($0.50 < d < 0.79$; moderate practical significance); and (iv) a large effect ($d \geq 0.80$; high practical significance). Likewise, Cohen also proposed four levels of the magnitude for the $\eta_p^2$ statistic: (i) no effect ($\eta_p^2 < 0.01$; no practical significance); (ii) a small effect ($0.01 \leq \eta_p^2 < 0.05$; low practical significance); (iii) a medium effect ($0.06 \leq$

$\eta_p^2 < 0.13$; moderate practical significance); and (iv) a large effect ($\eta_p^2 \geq 0.14$; high practical significance).

## Results

### *Correlation Analyses*

Initial analyses revealed moderate to strong positive correlations between the three dependent measures. Specifically, the correlation between the open-ended and multiple-choice responses was $r(207) = .58$, $p < .001$; the correlation between the open-ended and true/false responses was $r(207) = .55$, $p < .001$; and the correlation between the multiple-choice and true/false responses was $r(207) = .64$, $p < .001$. Following this, a three-way multivariate analysis of variance was conducted to compare main and interaction effects using the independent variables as fixed factors (Animation, Audio, Caption), and participants' calculated comprehension scores from the recall and recognition questions as three unique dependent variables.

### *Open-Ended Response Test*

Collapsed across conditions, the average recall score from the open-ended responses was 54.23 (*SD* = 25.67, 95% CI = 50.71, 57.74). The mean percentage of rights recalled on the open-ended responses, and associated 95% confidence intervals (CI), for each of the eight conditions are shown in Figure 2. As can be seen, the highest level of recall was achieved in Animation + Caption condition (*M* = 66.75, *SD* = 17.09, 95% CI = 59.70, 73.80) and the lowest level of recall was achieved in the No Multimedia condition (*M* = 17.25, *SD* = 17.33, 95% CI = 10.10, 24.40). Aside from the Animation and No Multimedia conditions, the recall scores on the open-ended responses for the remaining six conditions differed by a maximum of 6.56%; recall scores differed by a maximum of

2.40% for the top three conditions (Animation + Caption, Caption, and Audio + Caption, respectively). The magnitude of the difference in recall scores between conditions (i.e., effect sizes) expressed as Cohen's *d* (Cohen, 1988) is contained in Table 3.

There was a significant main effect of Caption, $F(1, 199) = 62.26$, $p < .001$, $\eta_p^2 = .24$, with higher recall scores found for participants who read a caption of the narration ($M = 64.58$, $SD = 17.78$) than for those who did not ($M = 43.57$, $SD = 28.15$; $d = 0.90$). There was a significant main effect of Audio, $F(1, 199) = 37.82$, $p < .001$, $\eta_p^2 = .16$, with higher recall scores found for participants who heard an audio narration ($M = 62.26$, $SD = 20.63$) than those who did not ($M = 45.79$, $SD = 27.76$; $d = 0.68$). There was no significant main effect of Animation, $F(1, 199) = 1.13$, $p = .29$, $\eta_p^2 = .01$; the average recall score for participants who saw an animation was 55.59 ($SD = 24.40$), and was 52.85 ($SD = 26.94$) for those that did not ($d = 0.11$).

There was a significant two-way interaction effect of Animation and Audio, $F(1, 199) = 4.02$, $p < .05$, $\eta_p^2 = .02$. Specifically, when the audio narration was absent, the presence of an animation led to higher comprehension scores as compared to the absence of an animation, $F(1, 199) = 4.59$, $p < .04$, $\eta_p^2 = .02$. When an audio narration was present, however, the animation had no significant effect, $F(1, 199) = 0.46$, $p = .501$, $\eta_p^2 = .00$. Furthermore, when the animation was absent, the presence of an audio narration led to higher comprehension scores as compared to the absence of an audio narration, $F(1, 199) = 33.09$, $p < .001$, $\eta_p^2 = .14$. When the animation was present, the presence of the audio narration also led to higher comprehension score as compared to the absence of an audio narration, albeit to a lesser extent, $F(1, 199) = 8.64$, $p < .04$, $\eta_p^2 = .04$. Put differently, allowing participants to hear while also watching the interrogation rights

resulted in comprehension going from 41.91% (*SD* = 29.08) to 63.58% (*SD* = 19.64; *d* = 0.88).

There was also a significant two-way interaction effect of Audio and Caption, $F(1, 199) = 53.24$, $p < .001$, $\eta_p^2 = .21$. Specifically, when captions were absent, the presence of an audio narration led to higher comprehension scores as compared to the absence of audio narration, $F(1, 199) = 89.11$, $p < .001$, $\eta_p^2 = .31$. When captions were present, however, the audio narration had no significant effect, $F(1, 199) = 0.67$, $p = .415$, $\eta_p^2 = .00$. Furthermore, when audio was absent, the presence of the captions led to higher comprehension scores as compared to the absence of caption reading, $F(1, 199) = 112.65$, $p < .001$, $\eta_p^2 = .36$. When audio was present, however, reading the captions had no significant effect, $F(1, 199) = 0.18$, $p = .671$, $\eta_p^2 = .00$. That is, allowing participants to hear or read the interrogation rights resulted in a higher level of comprehension from 25.00% (*SD* = 21.17) to 66.18% (*SD* = 15.67; *d* = 2.21). The two-way interaction effect of Animation and Caption was not significant, $F(1, 199) = 1.75$, $p = .19$, $\eta_p^2 = .01$, nor was the three-way interaction of Animation and Audio and Caption, $F(1, 199) = 1.76$, $p = .19$, $\eta_p^2 = .01$.

Table 4 contains a breakdown of the recall scores of the 16 individual youth interrogation rights components for each of the eight conditions. As can be seen, most adult participants recalled that youth did not have to talk to a police officer (Component 1), could talk to a lawyer (Component 2a), and could have an adult present with them (Component 4b). A large portion of participants also recalled that youth could talk to an adult (Component 3a), could have a lawyer present with them (Component 4a), and that anything the youth says to police could be used as evidence against the youth in court

(Component 5a). Approximately half of the participants recalled that the youth could consult with a personal lawyer (Component 2b) or a free lawyer (Component 2c), and recalled that lawyers and/or adults could be with the youth when the police ask the youth questions (Component 4c).

However, a large portion of the participants failed to recall that youth could contact a variety of different types of adults (e.g., parent, relative, and another adult; Components 3b, 3c, and 3d, respectively), or could talk to a lawyer (Component 2d) or an adult (Component 3e) right away and before police started asking questions to the youth. Many participants also failed to mention that youth could have the telephone number for a lawyer provided to them (Component 2e), or that any action done by the youth could be used as evidence in court against the youth (Component 5b).

The results also showed that no participants recalled all 16 components (i.e., no perfect score). However, 6.3% ($n$ = 13) of participants recalled 15 of the 16 components contained in the youth interrogation rights. Further analysis revealed that 61% of participants ($n$ = 126) recalled more than half of the youth interrogation rights (i.e., correctly reported 9 or more of the 16 components). Slightly more than one-third of participants (32.85%; $n$ = 68) obtained a 'failing grade' on the recall comprehension test (i.e., correctly reported 7 or less of the 16 components). Across all participants, the average number of components recalled correctly was 8.68 ($SD$ = 4.11, 95% CI = 8.11, 9.24).

***Multiple-Choice Test***

The average recognition score from the multiple-choice test across all conditions was 88.50 ($SD$ = 15.80, 95% CI = 86.34, 90.67). The mean percentage recognition scores

on the multiple-choice test and associated 95% CI for each of the eight conditions are contained in Table 5. As can be seen, the highest level of recognition was achieved in the Animation + Caption condition and the lowest level of recognition was achieved in the No Multimedia condition. Aside from the Animation and No Multimedia conditions, the recognition scores on the multiple-choice test responses for the remaining six conditions differed only by a maximum of 7.91%; within the best three conditions (Animation + Caption, Caption, and Animation + Audio, respectively), recognition scores differed only by a maximum of 3.47%. The magnitude of the difference in recognition scores between conditions (i.e., effect sizes) expressed as Cohen's *d* (Cohen, 1988) is shown in Table 6.

There was a significant main effect of Animation, $F(1, 199) = 5.84$, $p = .02$, $\eta_p^2 = .03$, with higher recognition scores observed for participants who saw the animation ($M = 90.77$, $SD = 13.63$), than for those who did not ($M = 86.21$, $SD = 17.50$; $d = 0.29$). There was a significant main effect of Audio, $F(1, 199) = 9.40$, $p = .002$, $\eta_p^2 = .05$, indicating higher recognition scores were obtained for those who heard an audio narration ($M = 91.32$, $SD = 12.65$) than for participants who did not ($M = 85.54$, $SD = 18.14$; $d = 0.37$). There was a significant main effect of Caption, $F(1, 199) = 19.83$, $p < .001$, $\eta_p^2 = .09$, with higher recognition scores found for participants who saw a caption of the narration ($M = 92.57$, $SD = 11.52$) than for those who did not ($M = 84.31$, $SD = 18.38$; $d = 0.54$).

There was a significant two-way interaction effect of Audio and Caption, $F(1, 199) = 34.17$, $p < .001$, $\eta_p^2 = .15$. Specifically, when captions were absent, the presence of an audio narration led to higher comprehension scores as compared to the absence of audio narration, $F(1, 199) = 38.05$, $p < .001$, $\eta_p^2 = .16$. When captions were present, however, the audio narration had no significant effect, $F(1, 199) = 3.76$, $p = .0.54$, $\eta_p^2 =$

.02. Furthermore, when audio was absent, the presence of the captions led to higher comprehension scores as compared to the absence of caption reading, $F(1, 199) = 50.04$, $p < .001$, $\eta_p^2 = .20$. When audio was present, however, reading the captions had no significant effect, $F(1, 199) = 0.98$, $p = .323$, $\eta_p^2 = .01$. In other words, allowing participants to hear or read the interrogation rights increased recognition scores from 75.60% (*SD* = 19.50) to 95.29% (*SD* = 9.46; *d* = 1.29). The two-way interaction effect of Animation and Audio was not significant, $F(1, 199) = 2.21$, $p = .14$, $\eta_p^2 = .01$, nor was the two-way interaction effect of Animation and Caption, $F(1, 199) = 1.13$, $p = .29$, $\eta_p^2 = .01$. The three-way interaction of Animation and Audio and Caption was also not significant, $F(1, 199) = 1.68$, $p = .20$, $\eta_p^2 = .01$.

**Confidence Ratings.** The average confidence rating score for the five multiple-choice questions collapsed across conditions was 4.25 (*SD* = 0.72, 95% CI = 4.15, 4.35). Averaging across the five test items, a small positive correlation between correct answers on the multiple-choice test and confidence ratings was found, $r(207) = 0.34$ ($r_{Range} = 0.22 – 0.46$); all correlations significant, $p < .002$.

When broken down by condition, the average correlation between correct answers and confidence ratings across all five test items were each found to be positive correlations. Specifically, for the Animation + Audio + Caption condition, there was a moderate positive correlation, $r(27) = .53$ ($r_{Range} = 0.41 – 0.64$), all *p*s < .04; it should also be noted that all participants in this condition chose the correct answer for the second and fourth test items (i.e., a correlation coefficient was unable to be calculated for these items in this condition due to one variable containing a constant). For the Animation + Audio condition, there was a moderate positive correlation, $r(27) = .44$ ($r_{Range} = 0.30 – 0.63$),

$p_{Item\ \#1} < .001$, all other *p*s > .05; all participants in this condition chose the correct answer for the second and fifth test items. For the Animation + Caption condition, there was a moderate positive correlation, $r(25) = .52$ ($r_{Range} = .50 – .54$), all *p*s < .02; all participants in this condition chose the correct answer for the second and fourth test items. For the Animation condition, there was a weak positive correlation, $r(25) = .24$ ($r_{Range} = .01 – .39$), all *p*s > .05. For the Audio + Caption condition, there was a moderate positive correlation, $r(27) = .51$ ($r_{Range} = .10 – .74$), $p_{Item\ \#4} > .05$, all other *p*s < .01; all participants in this condition chose the correct answer for the third test item. For the Audio condition, there was a negligible positive correlation, $r(25) = .16$ ($r_{Range} = .09 – .23$), all *p*s > .05; all participants in this condition chose the correct answer for the second test item. For the Caption condition, there was a weak positive correlation, $r(26) = .27$ ($r_{Range} = .11 – .35$), all *p*s > .05; all participants in this condition chose the correct answer for the second and fifth test items. For the No Multimedia condition, there was a negligible positive correlation, $r(25) = .12$ ($r_{Range} = -.26 – .36$), all *p*s > .05; it should be noted that in this condition the correlation for the third test item was the only one found to be in the negative direction.

***True/False Test***

The average recognition score from the true/false test collapsed across conditions was 94.36 (*SD* = 10.32, 95% CI = 92.95, 95.78). The mean percentage recognition scores on the true/false test and associated 95% CI for each of the eight conditions are contained in Table 5. As can be seen, the highest level of recognition was achieved in the Animation + Caption condition and the lowest level of recognition was achieved in the No Multimedia condition. Aside from the Animation and No Multimedia conditions, the

recognition scores on the true/false test responses for the remaining six conditions differed only by a maximum of 3.55%; within the best top three conditions (Animation + Caption, Caption, and Animation + Audio, respectively), recognition scores differed only by a maximum of 1.10%. The magnitude of the difference in recognition scores between conditions (i.e., effect sizes) expressed as Cohen's *d* (Cohen, 1988) can be found in Table 7.

There was a significant main effect of Audio, $F(1, 199) = 8.41$, $p = .004$, $\eta_p^2 = .04$, with higher recognition scores found for participants who heard an audio narration ($M = 96.23$, $SD = 8.52$) than for participants who did not ($M = 92.41$, $SD = 11.65$; $d = 0.38$). A significant main effect of Caption was revealed, $F(1, 199) = 19.04$, $p < .001$, $\eta_p^2 = .09$, with higher recognition scores found for participants who read a caption of the narration ($M = 97.14$, $SD = 6.72$) than for those who did not ($M = 91.50$, $SD = 12.43$; $d = 0.58$). There was no significant main effect of Animation, $F(1, 199) = 0.91$, $p = .341$, $\eta_p^2 = .01$; the average recognition score for participants who saw an animation was 94.98 ($SD = 9.53$), and was 93.74 ($SD = 11.08$) for those that did not ($d = 0.12$).

There was a significant two-way interaction effect of Audio and Caption, $F(1, 199) = 15.24$, $p < .001$, $\eta_p^2 = .07$. Specifically, when captions were absent, the presence of an audio narration led to higher comprehension scores as compared to the absence of audio narration, $F(1, 199) = 23.34$, $p < .001$, $\eta_p^2 = .10$. When captions were present, however, the audio narration had no significant effect, $F(1, 199) = 0.510$, $p = .0.476$, $\eta_p^2 = .00$. Furthermore, when audio was absent, the presence of the captions led to higher comprehension scores as compared to the absence of caption reading, $F(1, 199) = 33.73$, $p < .001$, $\eta_p^2 = .14$. When audio was present, however, reading the captions had no

significant effect, $F(1, 199) = 0.09$, $p = .760$, $\eta_p^2 = .00$. Again, participants who could hear or read the interrogation rights increased recognition from 86.89% ($SD = 13.41$) to 97.82% ($SD = 5.89$; $d = 1.06$). The two-way interaction effect of Animation and Audio was not significant, $F(1, 199) = 0.03$, $p = .855$, $\eta_p^2 = .00$, nor was the two-way interaction effect of Animation and Caption, $F(1, 199) = 0.66$, $p = .418$, $\eta_p^2 = .00$. The three-way interaction of Animation and Audio and Caption was also not significant, $F(1, 199) = 0.07$, $p = .788$, $\eta_p^2 = .00$.

**Confidence Ratings.** The average confidence rating score for the nine true/false questions collapsed across conditions was 4.46 ($SD = 0.62$, 95% CI = 4.38, 4.55). Averaging across the nine test items, a weak positive correlation between correct answers on the true/false test and confidence ratings was found, $r(207) = 0.30$ ($r_{Range} = 0.06 – 0.42$), $p_{Item\ \#2} > .05$, all other correlations significant at $p$s $< .001$.

When broken down by condition, the average correlation between correct answers and confidence ratings across all nine test items were each found to be positive correlations. Specifically, for the Animation + Audio + Caption condition, there was a negligible positive correlation, $r(27) = .11$ ($r_{Range} = -0.13 – 0.38$), $p_{Item\ \#7} < .05$, all other $p$s $> .05$; it should be noted that the correlation for the first, second, and fourth test items were the only ones found to be in the negative direction; it should also be noted that all participants in this condition chose the correct answer for the fifth, eighth, and ninth test items (i.e., a correlation coefficient was unable to be calculated due to one variable containing a constant). For the Animation + Audio condition, there was a negligible positive correlation, $r(27) = .18$ ($r_{Range} = -0.14 – 0.45$), $p_{Item\ \#1\ and\ \#6} < .02$, all other $p$s $> .05$; the third test item was the only negative correlation; all participants in this condition

chose the correct answer for the second, fourth, fifth, and eighth test items. For the Animation + Caption condition, there was a moderate positive correlation, $r(25) = .44$ ($r_{Range} = .09 – .75$), $p_{Item\ \#3\ and\ \#7} < .002$, all other $p$s > .05; all participants in this condition chose the correct answer for the first, second, fourth, fifth, and eighth test items. For the Animation condition, there was a weak positive correlation, $r(25) = .30$ ($r_{Range} = -.02 – .63$), $p_{Item\ \#5,\ \#6,\ and\ \#7} < .05$, all other $p$s > .05; the second test item was the only negative correlation. For the Audio + Caption condition, there was a negligible positive correlation, $r(27) = .16$ ($r_{Range} = -.08 – .62$), $p_{Item\ \#6} < .002$, all other $p$s > .05; the eighth and ninth test items were the only negative correlations; all participants in this condition chose the correct answer for the second, third, fourth, and fifth test items. For the Audio condition, there was a moderate positive correlation, $r(25) = .54$ ($r_{Range} = .42 – .80$), all $p$s < .05; all participants in this condition chose the correct answer for the second and fourth test items. For the Caption condition, there was a moderate positive correlation, $r(26) = .44$ ($r_{Range} = -.15 – .69$), $p_{Item\ \#1,\ \#7,\ and\ \#9} < .004$, all other $p$s > .05; the sixth test item was the only negative correlation; all participants in this condition chose the correct answer for the second, third, fourth, fifth, and eighth test items. For the No Multimedia condition, there was a negligible negative correlation, $r(25) = .14$ ($r_{Range} = -.12 – .54$), $p_{Item\ \#1} < .006$, all other $p$s > .05; the eighth test item was the only negative correlation; all participants in this condition chose the correct answer for the third and fourth test items.

**Discussion**

With considerations of the cognitive theory of multimedia learning (i.e., multimedia principle; Mayer, 2009) and previous empirical findings related to comprehension of interrogation rights (e.g., Clare et al., 1998; Eastwood & Snook, 2009;

Fenner et al., 2002), the goal of Experiment 1 was to examine what effect viewing a multimedia presentation about youth interrogation rights had on Canadian adults' comprehension of those rights. To achieve this goal, three multimedia elements (i.e., Animation, Audio, and Caption) were experimentally manipulated to determine which element, or combination thereof, led to maximum understanding. Following the example of previous interrogation rights comprehension research (e.g., Eastwood & Snook, 2009, 2012; Eastwood et al., 2016), this experiment measured participants' level of understanding through both recall (open-ended responses) and recognition memory tests (multiple-choice and true/false questions); participants were also asked to rate their level of confidence when answering the recognition memory tests. The results of Experiment 1 revealed that – relative to all other conditions – the multimedia presentation containing Animation and Caption elements rendered the highest overall comprehension score (67%), followed by the presentation containing Caption only (66%); these findings were consistent across all comprehension measures (i.e., open-ended responses, and multiple-choice and true/false answers). Such findings suggest that presenting youth interrogation rights in a format that involves watching the procedural actions of the interrogation rights being acted out by characters, while also reading information pertaining to these rights, will help increase adults' overall comprehension of youth interrogation rights and supports the general premise of the multimedia principle as outlined by Mayer (2009) – specifically, the theoretical assumptions related to the active-processing hypothesis.

Thus, one possible reason why the Animation and Caption presentation rendered the highest overall comprehension is because the viewer is more actively engaged in paying attention to the words along the bottom of the screen, and using the additional

visual aid of the animation to help consolidate the information being learned. Essentially, the participants were reading about the information that they would later be tested on, and this reading was accompanied by a set of characters acting out the information contained in the captions in real time. Contradictory to the dual-channel hypothesis assumption in Mayer's (2009) theory, however, both the animation and caption multimedia elements would have been processed through the learner's visual channel only. Moreover, the fact that the Caption only presentation consistently emerged as the second-best condition across all dependent variables leads to speculation that perhaps participants viewing the Animation and Caption presentation may have directed most of their visual attention toward the words along the bottom of the screen, but that the presence of an additional visual element (i.e., animation) may have simply just aided in further understanding of the content. In fact, these observations dovetail with the findings from Eastwood and Snook (2009). Specifically, they reported that participants who read information about their rights (i.e., akin to captions) were found to have higher comprehension scores as compared to those who just listened to their rights be read to them (i.e., akin to audio).

However, regardless of which multimedia presentation emerged as 'the best' for maximizing comprehension, the pattern of results suggests a ceiling effect across the top six conditions (see Figure 2 and Table 5). More specifically, with the exception of the Animation and No Multimedia conditions, there are minimal differences in comprehension scores across both recall (open-ended responses) and recognition testing (multiple-choice, true/false); post-hoc analyses of these best-six conditions showed no

statistically meaningful differences amongst each other.[2] It may be the case that these results are occurring due to tension between some of the other multimedia learning principles. For example, although the presence of background music was controlled for across all conditions, the coherence principle of multimedia learning suggests that background music may serve as a "seductive detail" (Mayer, 2009, p. 97) and act as a piece of extraneous material that hinders (rather than helps) learners. In fact, a closer inspection of the open-ended responses revealed that 13 participants commented on the music when asked what they could recall about youth interrogation rights; two participants seemed to question why the music was included in the presentation at all, with one of these participants going as far to state that "the happy music struck me as kind of odd and out of place." The observed ceiling effect could also be due to factors related to the testing environment. That is, previous research that has been able to demonstrate increased comprehension scores for interrogation rights has been carried out within in-person laboratory settings (e.g., Davis et al., 2011; Eastwood & Snook, 2012; Eastwood et al., 2016). Perhaps there are some other unaccounted factors related to the online learning environment of this study that is contributing to these results (e.g., are participants cheating or lying when it comes to testing and following instructions?); this is only speculative and highly unlikely given that much other research has been conducted using online platforms successfully (i.e., yielding high quality data; see Palan & Schitter, 2018; Peer et al., 2017).

[2] A post-hoc one-way analysis of variance test found no meaningful differences across the best-six conditions on comprehension scores from the open-ended responses, $F(5, 151) = 0.42$, $p = .834$, $\eta_p^2 = .01$, $d_{Range} = 0.07\text{-}0.31$; the multiple-choice test, $F(5, 151) = 1.35$, $p = .245$, $\eta_p^2 = .04$, $d_{Range} = 0.04\text{-}0.70$; or the true/false test, $F(5, 151) = 0.60$, $p = .700$, $\eta_p^2 = .02$, $d_{Range} = 0.06\text{-}0.36$.

The results also showed that adults' average comprehension scores were much higher for the youth interrogation rights when tested via multiple-choice or true/false questions, as compared to the open-ended recall questions – this is an unsurprising finding given that recognition tests (as compared to recall tests) have cues embedded within the question (i.e., the correct answer is one of the available response options). Specifically, overall comprehension was found to be 94% when assessed through a true/false test, 89% when assessed through a multiple-choice test, but only 54% when assessed through free recall. When supporting a youth during a real-life interrogation, however, appropriate adults will *not* be presented with a formal questionnaire to check on their understanding of the youths' interrogation right (i.e., not given a test of their recognition memory), but instead will have to rely only on what they understood through their internal processing of the interrogation rights information (i.e., given a test of their recall memory). Considering this, a better assessment of how well adults understand youth's interrogation rights is arguably captured by their performance on the open-ended free recall test. Thus, based on this dataset, adults' comprehension of youth interrogation rights as presented in a multimedia format appears to be, on average, around 54%. While this average comprehension level is better than what some previous studies have reported (46%; e.g., Cleary & Warner, 2017), it is still concerningly low.

When examining the individual components of the youth interrogation rights recalled by the adult participants more closely, the components related to a youth's right to silence (Component 1; 82%) and right to talk to a lawyer (Component 2a; 87%) were recalled most frequently overall. Even in the poorest performing conditions (i.e., Animation and No Multimedia), these two components of the youth interrogation rights

were recalled by between half and three-quarters of participants in those groups. These results are notably higher than those reported in some previous research (e.g., Eastwood & Snook, 2012; Eastwood et al., 2010; Woolard et al., 2008). For instance, research by Snook and colleagues (e.g., Eastwood et al., 2010; Eastwood & Snook, 2012) reported that when it came to knowing that a police detainee could call/talk to a lawyer, adults' understanding of this right ranged between 25% to 59%. Additionally, these rights are arguably well-known to participants in general due to their ubiquitous reference in entertainment media and popular culture (Nguyen, 2000; Rogers, 2008; Rogers, Rogstad, et al., 2010). For example, television shows and movies (e.g., *Cops*, *Brooklyn Nine-Nine*, *21 Jump Street*, *Let's Be Cops*) often portray and/or speak these particular rights during the film script. In fact, in the children's animated movie *Shrek 2*, the fictional characters Donkey and Shrek reference the *Miranda* rights warning after being captured and put in lockup.[3] Consequently, mass consumption of media entertainment content such as these may have produced a confounding effect in the findings related to these two particular components. Put differently, it may be the case that when asked to recall the youth interrogation rights, adults in this sample may be taking the liberty to rely on their previous knowledge learned and were foregoing reference to the information portrayed in the multimedia stimuli.

While it is encouraging to see that the key components of a youth's right to silence and right to talk to a lawyer are easily recalled by many appropriate adults

[3] Donkey: "You can't lock us up like this! Let me go! Hey, what about my *Miranda* rights? You're supposed to say 'I have the right to remain silent!' Nobody said I have the right to remain silent!" / Shrek: "Donkey! You have (*emphasized*) the right to remain silent. What you lack is the capacity." (Adamson et al., 2004).

regardless of condition, the lack of demonstrated understanding related to many of the *other* important components is highly concerning. For example, the fact that a variety of people different from the youth's parents could be contacted to serve as an appropriate adult was often forgotten by this sample (Components 3b-3e; 29% – 36%; of special note, the worst component recalled by adults was that a youth could specifically contact a relative [e.g., aunt/uncle or grandparent]; Component 3c; 17%). As a comparison, three-quarters of adults mentioned that a youth could talk to an adult (Component 3a; 75%). Given this, it is conceivable that the poor performance demonstrated on the remainder of the components for Right 3 (see Appendix B) may have been due to the participants inherently collapsing the other types of adults available into their statement that 'a youth can talk to an *adult*.' In addition, the adult participants rarely demonstrated their understanding that the telephone number to a lawyer could be provided to the youth (Component 2e; 27%). This contrasts with previous findings (e.g., Eastwood & Snook, 2012; Snook et al., 2016). Again, the reason for this finding in the current study may be related to the last point, in that when compared to performance on the remaining components for Right 2 (see Appendix B), Components 2a-2d were recalled in roughly half to four-fifths of the cases. In particular, the fact that the sample of adults knew a youth could talk to a *free* lawyer (Component 2c; 62%) perhaps intuitively meant to them that the phone number would automatically be provided. Lastly, the component stating that anything the youth *does* during the police interview can be used as evidence against them in court was recalled approximately two-fifths of the time (Component 5b; 39%). Comparatively, across all conditions, three-quarters of the sample knew that anything a youth *says* could be used as evidence against them in court (Component 5a; 76%). Given

the vast difference in comprehension score between these two components, again, it is possible that the participants thought that saying ‘anything a youth *says* will be used against them in court’ encapsulated the action portion of anything they *do*. It is further possible that the secondary component (i.e., the ‘action’ portion) of Right 5 (see Appendix B) just was not salient enough to stand apart from the primary component (i.e., the ‘speaking’ portion).

Unsurprisingly, the results suggest that confidence is not a reliable indicator of comprehension. Regardless of the type of recognition test administered, a weak relationship between confidence and comprehension was observed. Admittedly, participants were not asked about how confident they were in their answers to the open-ended questions. In retrospect, this was an oversight on my part to not include confidence ratings with the free recall questions. Future studies should aim to be consistent with applying confidence ratings across all types of questions administered. Nevertheless, it is well documented that confidence levels are an unreliable indicator for how well an individual understands information (e.g., Cooke & Philip, 1998; Eastwood & Snook, 2009; Fenner et al., 2002).

## Chapter 3: Experiment 2

In Experiment 1, I examined whether adults' comprehension of youth interrogation rights could be improved if they were presented via a multimedia presentation format. The incorporation of technology into the police caution process is a response to research showing that adults understanding of youth rights – and the interrogation process more generally – is substandard (e.g., Barnes & Wilson, 2008; Cavanagh & Cauffman, 2017; Cleary & Warner, 2017; Drodge, 2018; Rajack-Talley et al., 2005; Woolard et al., 2008). The goal was to examine the potential of using a multimedia presentation outlining youths' interrogation rights and explore whether this approach helped to increase adults' comprehension of these rights. The notion behind this exploration was to determine if any appropriate adult accompanying a youth during the interrogation process could be more informed about youth interrogation rights, and thus, be able to help assist the youth to make decisions about their interrogation rights that are in their best interest.

Of course, in addition to recognizing the importance for helping appropriate adults fully understand these youth interrogation rights, the *youth* themselves also need to have a good understanding of the rights afforded to them during the interrogation process. As reviewed in Chapter 1, research has demonstrated consistently that youth have a low-level of understanding their interrogation rights (e.g., Abramovitch et al., 1993, 1995; Cooke & Philip, 1998; Eastwood et al., 2015; Freedman et al., 2014; Goldstein et al., 2003; Grisso, 1981; Viljoen et al., 2007). Therefore, it is of much importance to examine what effect presenting these multimedia presentations to *youth* has on their overall comprehension of their rights. Arguably, the youth detainee is the one who has the most to lose during the

interrogation process (e.g., having to undergo a coercive police interrogation; risk of falsely confessing; potentially going to jail), so it is imperative that youth understand what rights they have available to them – and moreover, how to invoke their rights during this process (e.g., stay silent; request a lawyer; request an adult). As reviewed earlier, youth (as compared to adults) tend to be more apt and in-tune to newer digital technologies (e.g., Montgomery, 2000), so perhaps incorporating such technology into the interrogation room would help them navigate this complex social situation.

**Hypotheses**

The goal of Experiment 2 was to conduct a direct replication of Experiment 1, albeit with a sample of Canadian youth, to examine the effect of a multimedia presentation containing content about youth interrogations rights on participants' comprehension of these rights. Based on some of the unexpected findings from Experiment 1, I updated my predictions related to the 'best-to-worst' condition for Experiment 2.

Confirming previous research (e.g., Clare et al., 1998; Eastwood & Snook, 2009; Fenner et al., 2002), the written format of the Caption element played a significant role for maximizing comprehension for the adult sample in Experiment 1; this was somewhat perplexing from a multimedia learning point of view. It was rationalized previously that the Caption multimedia presentation would only engage the visual processing channel, but Mayer's (2009) multimedia principle suggests that information processed through the single modalities would render lower levels of comprehension relative to information processed through dual modalities. Put differently, the other conditions involving words and pictures (i.e., Animation + Audio; Animation + Audio + Caption) were expected to

score higher in comprehension than conditions using words alone (i.e., Caption; Audio); this was not the case as observed in Experiment 1. Given that Experiment 2 was planned as a direct replication of the first experiment using a sample of youth, I expected to see a similar pattern emerge as observed in Experiment 1. I revised my expectations such that the comprehension of the youth interrogation rights multimedia presentations would foster understanding in a sample of youth from most to least in the (new) following order:

1. Animation + Caption (Condition 3)
2. Caption (Condition 7)
3. Audio + Caption (Condition 5)
4. Audio (Condition 6)
5. Animation + Audio + Caption (Condition 1)
6. Animation + Audio (Condition 2)
7. Animation (Condition 4)
8. No multimedia (Condition 8)

## Method

### *Participants*

In total, a sample of 312 Canadian youth were obtained through Social Media applications (e.g., Facebook, Twitter; $n$ = 48), Prolific Academic (www.prolific.co; $n$ = 106), HoneyBee Hub (www.honeybeehub.io; $n$ = 3), and Qualtrics Service Panels (www.qualtrics.com; $n$ = 155). Participants recruited through Social Media were entered into a draw for a chance to win one of three $100 Amazon eGift Cards; participants recruited from Prolific Academic and HoneyBee Hub platforms were compensated £2.50 (approximately $4.50 CAD), and $1.50 CAD, respectively; and participants recruited

from Qualtrics Service Panels were compensated through the Qualtrics company directly.[4]

A total of 94 participants were removed prior to analyses: specifically, 19 participants did not complete the study in its entirety; 22 did not follow instructions (e.g., reported note-taking, rewinding, fast forwarding, or pausing the presentation); three failed the attention check question; 30 reported that their first language was not English; and 12 reported having a learning disability. One additional participant was removed because they reported encountering a technical error during the multimedia presentation (e.g., stated that the video froze while watching the presentation). There were seven participants who did not give permission for the research to retain their data for analyses (e.g., Research Observation) and were subsequently removed.

Beyond these exclusion criteria, data from an additional 25 participants were also removed prior to analyses for the following reasons: specifically, 21 participants were removed because they reported being older than 17 years of age (i.e., above the maximum age cut-off for participation in Experiment 2), and four participants made no effort in their open-ended responses (e.g., wrote 'n/a' or '-' in their answer).

The final sample size which the subsequent analyses were conducted was 193. A power analysis check indicated that (with a medium effect size, $d = 0.50$, and alpha level of $\alpha = .05$) the power in the current sample was 0.93 (Cohen, 1992). A chi-square test

[4] Qualtrics Service Panels was hired as a third-party recruiter and operates such that researchers pay a monetary rate per recruited participant (as determined and set by Qualtrics). Qualtrics recruiters subsequently recruit participants based on the study's criteria (e.g., age, ethnicity, gender, nationality). In terms of compensation for the participants, Qualtrics uses several different incentive packages (e.g., travel vouchers, gift card draws, money, points) depending on how and where participants are recruited (B. Hoang, personal communication, January 15th, 2021).

revealed that there were no significant differences between recruitment sources between the eight conditions (*p*s > .05). The mean age of participants was 14.81 years (*SD* = 1.65, *Range* = 12-17). A summary of the remaining demographic variables is shown in Table 8.

A one-way analysis of variance indicated that there were no significant differences in participants' age as a function of condition, $F(7, 185) = 0.64$, $p = .725$. Chi-square tests revealed that there were no significant differences in the distribution of participants' gender, ethnicity, level of education, Province/Territory of residence, or citizenship between the eight conditions (*p*s > .05).

***Design and Materials***

A 2 (Animation: Present vs. Absent) X 2 (Audio: Present vs. Absent) X 2 (Caption: Present vs. Absent) between-subjects experimental design was used, yielding eight conditions. The conditions were as follows (note, an explicit mention of the multimedia element in each of the following conditions means the particular element was present, whereas no mention of the elements means the multimedia element was absent from that condition): (1) Animation + Audio + Caption; (2) Animation + Audio; (3) Animation + Caption; (4) Animation; (5) Audio + Caption; (6) Audio; (7) Caption; (8) No Multimedia (i.e., all multimedia elements were absent).

The main dependent variable was recall memory, as measured through coding the response to an open-ended question. The secondary dependent variable was recognition memory, and was measured via a multiple-choice test and true/false test (see Appendix D).

### *Measures*

**Open-Ended Response Test.** One (vs. two) open-ended response question was asked; data from the Experiment 1 suggested that the second open-ended question did not contribute extra details. Participants were provided with a textbox at the end of the question to write their response, with no limit on the amount of time needed to make a response. Note, the differences in instruction wording by condition is indicated in **bold** for Conditions 1-7 or *italics* for Condition 8; underlined text was used for emphasis as part of the instructions in all conditions. The open-ended question read as follows:

> Please try your best to recall everything you **learned** / *know* about your legal rights **from the video**. Take your time and **think about the video** / *gather your thoughts* for a moment before proceeding. When you are ready, write out everything that you **learned** / *know* about your legal rights **from the video** in your own words in as much detail as possible, and try your best not to leave anything out.

Following this question, participants were asked to rate how confident they were in their open-ended answer using a scale from 1 (*Not at All Confident*) to 5 (*Completely Confident*).

**Multiple-Choice Test.** A 5-item multiple-choice measure created for youth participants by Eastwood et al. (2016) was used in this experiment to assess the youth sample's recognition knowledge of their interrogation rights. An example item asked was "When being interviewed by a police officer, I need to: (a) Answer all the questions that they ask of me; (b) Only answer the questions that I want to answer; (c) Only answer questions that are related to a crime; (d) Only answer questions related to my personal

life." Participants were also asked to rate how confident they were in each of their answers using a scale from 1 (*Not at All Confident*) to 5 (*Completely Confident*). All multiple-choice items were presented in a randomized order to protect against any potential order effects (see Appendix D).

**True/False Test.** A 9-item true/false test was author-constructed to assess the youth participants' recognition knowledge of their interrogation rights. An example item asked was "I must answer the questions that the police ask me about the alleged crime: True or False." Participants were also asked to rate how confident they were in each of their answers using a scale from 1 (*Not at All Confident*) to 5 (*Completely Confident*). The items on the true/false test were presented in a randomized order to protect against any potential order effects (see Appendix D).

**Attention Check.** A single attention check question was used that told participants which answers to select was applied in the current experiment (e.g., "This is an attention check question. Please select 'False' and 'Somewhat Confident' for your answers."). This item was presented randomly within the presentation of the other nine true/false questions.

**Demographic Questionnaire.** Questions pertaining to participants' age, gender, ethnicity, level of education, Canadian citizenship, and Province/Territory of residence were collected. Additional questions asked participants if English was their first language, and if they had a diagnosed learning disability (both questions were used as exclusion criteria). The demographic questionnaire also contained a section asking whether or not the participant had heard these youth interrogation rights previously. Another section inquired about the participants' specific behaviour throughout the experiment (i.e.,

whether or not they used headphones; took notes about the presentation [used as an exclusion criterion]; or manipulated the multimedia presentation or music clip in any way [used as an exclusion criterion; e.g., paused presentation/music]; see Procedure section below for descriptive statistics). The final section of the demographic questionnaire asked three open-ended feedback questions, each with its own response textbox. The questions read as follows (note, the words in square brackets were not shown to participants, but serve as a note to the reader):

1. Were any of the instructions or questions unclear at any point in this study? If so, please explain.

2. Did you encounter any technical errors, problems, or distractions while completing this study? If so, please explain [used as an exclusion criterion if participant indicated any issues].

3. Do you have any comments about this survey that you would like to share with the researchers? If so, please explain.

Beyond this, three youth-specific questions were asked: namely, (i) if the youth participant's parent(s)/caregiver(s) *stayed* with them during the survey (70.46% reported an answer of no; no significant differences were found between participants in each condition who were accompanied by an adult vs. alone; $\chi 2[7, N = 193] = 2.80, p = .903$); (ii) if the youth participant's parent(s)/caregiver(s) *helped* them with the answers to any of the questions (all participants reported an answer of no; note, instructions were contained on the informed consent form and within the survey that explicitly stated that any accompanying adults were not to assist the youth with any of the answers; if participants indicated they received help from their parent/caregiver, then their data were

removed during the data cleaning stage [i.e., exclusion criteria]); and (iii) where the youth participant heard about the study from (no significant differences were found between participants in each condition as a function of which platform they were recruited from; $\chi^2[21, N = 193] = 17.80, p = .661$).

***Procedure***

The survey was created and hosted online through Qualtrics (www.qualtrics.com). All participants (regardless of the recruitment platform used) were only able to access and complete the experiment using their own computer. Participants were also asked to use headphones during the study, if available. Approximately one-third of the participants (34.7%; $n = 67$) reported using headphones during this study while approximately two-thirds (65.3%; $n = 126$) reported that they did not use headphones. There were no significant differences in the distribution of participants' use of headphones across conditions, $\chi2(7, N = 193) = 9.21, p = .238$. Half of the participants (51.3%; $n = 99$) reported that they heard the youth interrogation rights previously whereas the other half (48.7%; $n = 94$) reported that they did not. There were no significant differences in the distribution of participants' familiarity of their interrogation rights across conditions, $\chi2(7, N = 193) = 1.58, p = .979$. On average, the youth participants took 17.11 minutes ($SD = 18.01$) to complete the study. A one-way analysis of variance indicated that there were no differences in the time it took for participants to complete the survey as a function of condition, $F(7, 185) = .450, p = .869$.

The first page presented participants with an informed consent form. Consent from the youth participant, as well as from a parent/caregiver, was required prior to continuing with the experiment. Specifically, at the bottom of the consent page, there was

a small section for the parent/caregiver to indicate their consent, followed by a section where the youth participants could indicate their own consent. Any participants who did not wish to grant consent to partake in the study were instructed to close their browser to exit the experiment. By advancing through to the study, it was implied that consent was granted by the youth participant and their parent(s)/caregiver(s).[5]

After consent was obtained, participants were provided with a set of pre-study instructions. Specifically, they were asked to turn off distraction media (e.g., music, television), to not answer their cell phone, to not use the internet except for the purpose of this study, and to not use the 'Back' button on their browser (this feature was disabled within the study platform). Following these instructions, they were also asked three forced-choice yes or no questions: specifically, they were asked whether or not they (i) had sufficient time to complete the study, (ii) agreed to complete the study in one sitting, and (iii) turned off any media distractions in their environment. If the youth participants answered 'no' to any of the pre-survey questions in the current experiment, then they were filtered out of the experiment and asked to return later when they could meet these three pre-study criteria; if participants answered 'yes' to all three of these questions, then they were brought to the next page.

The third page consisted of a brief audio-video pre-test to ensure these features were working properly on the participant's computer. To test the audio-video system,

[5] For any participants recruited through Social Media (i.e., Facebook or Twitter), they were directed to a different page and given the opportunity to provide an email address that would be entered into the draw for the gift card prize, if they so chose to do. This page was separate from the remaining experiment pages so that the email addresses and data provided could not be linked in any way. All other participants recruited through the other platforms were provided with monetary compensation and were not required to be directed to an external page.

participants were presented with a video clip (e.g., kids playing in a park) with an audio overdub unrelated to the video clip (e.g., clocktower bells). After watching this video, participants had to correctly answer two multiple-choice questions about what they saw and heard in the clip. If one or both answers were incorrect, then the participants were filtered out of the experiment and asked to return later using a different computer with proper audio and video capabilities. If the answers were correct, participants were presented with a message (on the fourth page) indicating that their audio and video capabilities appeared to be working properly, and instructed to proceed to the next page.

The fifth page provided participants with a message saying that the main study will begin on the next page, and asked them to pay close attention to the subsequent instructions provided. This page also included two additional statements for clarity. Specifically, it was stated "In this study, a youth is defined as any person between the ages of 12 and 17 years old, as per the law set by Canada's Youth Criminal Justice Act (2002)" and "In this study, your legal rights refer to a set of options and choices that you have available to you when you are arrested or questioned by the police. The purpose of these legal rights is to help keep you safe and protected when talking to the police." These statements were added to this experiment to add clarity to these terms when they were used on the subsequent pages. After reading the instructions and above definitions, the youth participants were assigned randomly to one of the eight conditions. The sixth page provided participants with a set of instructions specific to their condition. Note that the differences in wording by condition is indicated in **bold** (Conditions 1-7) or *italics* (Condition 8); underlined text was used for emphasis as part of the instructions in all conditions. The instructions were as follows:

> Please read the following instructions carefully: If the police want to question you (i.e., a youth) about a crime that they think you did, the police have to first tell you about your legal rights. On the next page, **you will watch a video that explains these rights** / *you will take a few minutes to think about the legal rights you have as a youth while listening to some music*. It is important that you **pay careful attention to the content in the video** / *use this time to think about what your legal rights might be*. Afterwards, you will be asked to answer some questions about **the content in the video** / *your legal rights*.

After reading the instructions that pertained to their assigned condition, youth participants advanced to the next (seventh) page that presented them with one of the eight conditions. At the top of this page, a set of instructions were given asking participants to play the clip one time and specifically to not pause, fast forward, or rewind the clip. Importantly, participants were not able to advance pass this page until the length of time of the presentation clip had elapsed (2 minutes and 15 seconds). After participants were finished being exposed to one of the eight conditions, they were next presented with the open-ended recall and recognition questions; the open-ended question was always asked first, followed by the recognition tests (i.e., multiple-choice and true/false); the recognition tests were counterbalanced and presented on their own unique pages.

The last three pages of the survey presented youth participants with a demographic form to fill out, a page asking if they wanted their data to be retained by the researchers (i.e., Research Participation vs. Research Observation), and a debriefing page to explain what the experiment was about. The bottom of the debriefing page also asked participants to write in a random number in a textbox and click the next button to signal

completion of the study. This additional step was added to promote reading the information on the debriefing page. On the last page, participants were thanked for their time and asked to close their browser.

### *Coding of Open-Ended Responses*

A 16-item coding guide, content dictionary, and coding process was used to code participants' responses to the open-ended question (see Appendix C). Comprehension was measured by whether the participant mentioned the five rights in their responses (i.e., coded as being present or absent). Each right (where applicable) was broken down into subcomponents to capture the complete essence of the right, and participants were awarded a point per each component of the right recalled; participants' responses did not have to be verbatim to the coding guide, but had to capture the overarching meaning of the interrogation right (see the content dictionary in Appendix C for further clarification). As a reminder to the reader, the scoring system operated as follows:

For the first right, the youth participant received one point if they stated that they *do not have to talk to the police officer* (Right 1).

A maximum of five points were available for Right 2. One point was awarded if the youth participant stated that they *can talk to a lawyer* (Right 2a), one point was awarded if they mentioned that they could talk to *their own/personal lawyer* (Right 2b), and one point if they mentioned that they could talk to *a free lawyer* (Right 2c); if the participant mentioned Right 2b and/or 2c only, then they were automatically awarded a point for Right 2a. The logic of this decision stemmed from the fact that Rights 2b and 2c encompassed two different types of lawyers that can be consulted, which implied that the youth participant understood that talking to a lawyer – regardless of whether that lawyer

was their own/personal or a free one – was allowed. However, this coding was not bi-directional; that is, if youth participants only mentioned that they were able to talk to a lawyer (i.e., Right 2a), but failed to specify the type of lawyer they could consult (i.e., Right 2b and/or 2c), then the youth participant was awarded one point for Right 2a only. One point was awarded if the youth participant mentioned that they could talk to a lawyer *right now/before the police officer asks them any questions* (Right 2d), and another point if it was mentioned that they *can have the telephone number for a lawyer* (Right 2e).

A maximum of five points were available for Right 3. One point was awarded if the youth participant mentioned that they *can talk to an adult* (Right 3a), one point was awarded if they mentioned that they could *talk to a parent* (Right 3b), one point if they mentioned *a relative* (Right 3c), and one point for mentioning *any other adult* (Right 3d); the same decision logic mentioned above for Right 2 was also applied for Right 3 – that is, a point was given to Right 3a automatically if any of the Rights 3b, 3c, or 3d were mentioned only, but not vice versa (i.e., not bi-directional). A point was also awarded if the youth participant mentioned that they could talk to an adult *right now/before the police officer asks them any questions* (Right 3e).

A maximum of three points were available for Right 4. One point was awarded if the youth participant mentioned that they *can have a lawyer with them* (Right 4a), and another one point was awarded if they said they *can have an adult with them* (Right 4b). A point was also given if the youth participant indicated that they could have both or either of the lawyer and adult with them *when the police officer asks them questions* (Right 4c).

A maximum of two points were available for Right 5. One point was given if the youth participant mentioned that *anything they say can be used as evidence against them in court* (Right 5a), and another point if they said *anything they do can be used as evidence against them in court* (Right 5b).

**Inter-Rater Reliability.** The open-ended responses were coded by the author and a research assistant. Both coders each coded 100% of the youth participants' open-ended responses. The current author provided a 1-hour review training session to the research assistant about the coding guide and dictionary. Any confusion related to the coding guide and dictionary were resolved before commencing the current coding task. Prior to coding, both raters practiced on a set of responses that were removed from the dataset due to the abovementioned exclusion criteria. Neither of the coders were privy to which conditions the responses were from during the coding process. Inter-rater agreement testing across all subcomponents of the interrogation rights yielded a mean *Kappa* of .90 (*Range* = .83 – 1.00), suggesting excellent agreement between raters (Cohen, 1960; Landis & Koch, 1977).

### *Analytic Procedure*

Following the cleaning of the data file (i.e., applying exclusion criteria), the responses to the open-ended question were coded by each of the coders and an inter-rater reliability analysis was conducted. After computing inter-rater reliability, any disagreements arising between the two coders were discussed; however, if disagreements were unable to be resolved, then a third judge (i.e., the author's doctoral supervisor) was invited into the discussions to make a final decision. The resolved dataset was used to compute comprehension scores for each participant and quantified as a proportion (i.e.,

mean percent score). Responses to the multiple-choice and true/false tests were also converted into proportion scores. Appropriate frequency and descriptive analyses, and comparative tests (e.g., chi-square tests, one-way analysis of variance) were conducted where required. Next, a point-biserial correlation analysis was conducted on the three dependent variables. Following this, a multivariate analysis of variance test was conducted using each dependent variable's proportion scores (i.e., open-ended, multiple-choice, and true/false scores) to examine any differences between the independent variables (i.e., Animation, Audio, and Caption); follow-up post-hoc and simple main effect tests were conducted where necessary. Finally, correlation analyses were conducted for the open-ended response, multiple-choice, and true/false tests for correct responses and confidence ratings. All analyses were conducted using SPSS Statistical Package, v.27.

The magnitude of any effect sizes was expressed as Cohen's *d* and partial eta-squared, $\eta_p^2$. For ease of interpretation, Cohen (1988) proposed four levels of magnitude for the *d* statistic: (i) no effect ($d < 0.19$; no practical significance); (ii) a small effect ($0.20 \leq d < 0.49$; low practical significance); (iii) a medium effect ($0.50 < d < 0.79$; moderate practical significance); and (iv) a large effect ($d \geq 0.80$; high practical significance). Likewise, Cohen also proposed four levels of the magnitude for the $\eta_p^2$ statistic: (i) no effect ($\eta_p^2 < 0.01$; no practical significance); (ii) a small effect ($0.01 \leq \eta_p^2 < 0.05$; low practical significance); (iii) a medium effect ($0.06 \leq \eta_p^2 < 0.13$; moderate practical significance); and (iv) a large effect ($\eta_p^2 \geq 0.14$; high practical significance).

## Results

### *Correlation Analyses*

Initial analyses revealed moderate to strong positive correlations between the three dependent measures. Specifically, the correlation between the open-ended and multiple-choice responses was $r(193) = .48$, $p < .001$; the correlation between the open-ended and true/false responses was $r(193) = .47$, $p < .001$; and the correlation between the multiple-choice and true/false responses was $r(193) = .64$, $p < .001$. Following this, a three-way multivariate analysis of variance was conducted to compare main and interaction effects using the independent variables as fixed factors (Animation, Audio, Caption), and participants' comprehension scores from the recall and recognition questions as three unique dependent variables.

### *Open-Ended Response Test*

Collapsed across conditions, the average recall score from the open-ended responses was 36.04 (*SD* = 24.56, 95% CI = 32.56, 39.53). The mean percentage of rights recalled on the open-ended responses, and associated 95% CIs, for each of the eight conditions are shown in Figure 3. As can be seen, the highest level of recall was achieved in Animation + Caption condition (*M* = 49.46, *SD* = 22.68, 95% CI = 39.65, 59.27) and the lowest level of recall was achieved in the No Multimedia condition (*M* = 6.52, *SD* = 8.73, 95% CI = 2.75, 10.30). Aside from the Animation and No Multimedia conditions, the recall scores on the open-ended responses for the remaining six conditions differed by a maximum of 10.84%; recall scores differed by a maximum of 6.75% for the top three conditions (Animation + Caption, Caption, and Audio + Audio + Caption, respectively).

The magnitude of the difference in recall scores between conditions (i.e., effect sizes) expressed as Cohen's *d* (Cohen, 1988) is contained in Table 9.

There was a significant main effect of Caption, $F(1, 185) = 58.90$, $p < .001$, $\eta_p^2 = .24$, with higher recall scores found for participants who read a caption of the narration ($M = 46.64$, $SD = 21.99$) than for those who did not ($M = 26.19$, $SD = 22.73$; $d = 0.91$). There was a significant main effect of Audio, $F(1, 185) = 24.22$, $p < .001$, $\eta_p^2 = .12$, with higher recall scores found for participants who heard an audio narration ($M = 42.66$, $SD = 20.14$) than those who did not ($M = 28.47$, $SD = 26.98$; $d = 0.60$). There was no significant main effect of Animation, $F(1, 185) = 0.00$, $p = 1.00$, $\eta_p^2 = .00$; the average recall score for participants who saw an animation was 36.03 ($SD = 22.49$), and was 36.05 ($SD = 26.65$) for those that did not ($d = 0.00$).

There was a significant two-way interaction effect of Audio and Caption, $F(1, 185) = 36.38$, $p < .001$, $\eta_p^2 = .16$. Specifically, when captions were absent, the presence of an audio narration led to higher comprehension scores as compared to the absence of audio narration, $F(1, 189) = 62.43$, $p < .001$, $\eta_p^2 = .25$. When captions were present, however, the audio narration had no significant effect, $F(1, 189) = 0.60$, $p = .603$, $\eta_p^2 = .00$. Furthermore, when audio was absent, the presence of the captions led to higher comprehension score as compared to the absence of caption reading, $F(1, 189) = 89.14$, $p < .001$, $\eta_p^2 = .32$. When audio was present, however, reading the captions had no significant effect, $F(1, 189) = 1.53$, $p = .217$, $\eta_p^2 = .01$. Put differently, allowing participants to hear or read the interrogation rights resulted in a higher level of comprehension from 9.51% ($SD = 11.47$) to 48.30% ($SD = 24.13$; $d = 2.07$). The two-way interaction effect of Animation and Audio was not significant, $F(1, 185) = 2.23$, $p = .14$,

$\eta_p^2$ = .01, nor was the two-way interaction effect of Animation and Caption, $F(1, 185)$ = .17, $p$ = .68, $\eta_p^2$ = .00. The three-way interaction of Animation and Audio and Caption was also not significant, $F(1, 185) = 0.05$, $p$ = .83, $\eta_p^2$ = .00.

Table 10 contains a breakdown of the recall scores of the 16 individual youth interrogation rights components for each of the eight conditions. As can be seen, the majority of the youth participants recalled that they could talk to a lawyer (Component 2a) and did not have to talk to a police officer (Component 1); of note, approximately one-quarter of the youth did not recall these particular components of youth interrogation rights. Moreover, many participants correctly recalled that they could talk to an adult (Component 3a) and could have an adult present with them (Component 4b). Approximately half of the youth participants noted correctly that anything they say to police could be used as evidence against them in court (Component 5a), and also recalled that they could have a lawyer present with them (Component 4a) during police questioning (Component 4c).

However, a high portion of the youth sample were unable to recall other important components of their interrogation rights. Specifically, more than two-third of the youth failed to recall that they could contact a free lawyer (Component 2c). Approximately three-quarter failed to mention that any action done by them during the police interaction could be used as evidence in court against them (Component 5b). Three-quarters of the sample also did not correctly recall that the appropriate adult who could be available to them could be a parent (Component 3b), nor did this same amount correctly report that any adult/lawyer could be available to them right away (Components 3e and 2d, respectively). One in every five youth recalled that they could speak with their

own/personal lawyer (Component 2b), while one in every six were able to recall that the adult could be any other appropriate adult (Component 3d). Very few of the youths recalled that they could have the telephone number for a free lawyer (Component 2e) or that the adult could be a relative (Component 3c).

The results also showed that no participants recalled all 16 components. Only one participant (0.5%) recalled 15 of the 16 components contained in the youth interrogation rights. Further analysis revealed that 28% of participants ($n$ = 54) recalled more than half of the youth interrogation rights (i.e., correctly reported 9 or more of the 16 components). Approximately two-thirds of youth participants (65%; $n$ = 126) obtained a 'failing grade' on the recall comprehension test (i.e., correctly reported 7 or less of the 16 components).

**Confidence Ratings.** The average confidence rating score for the open-ended responses collapsed across conditions was 4.06 ($SD$ = 0.84, 95% CI = 3.94, 4.18). Correlating the youth participants' overall open-ended response score with their overall confidence rating that their response was correct revealed a weak positive correlation, $r(193) = .29$, $p < .001$.

When broken down by condition, both positive and negligible correlations were found between the open-ended scores and confidence ratings. Specifically, for the Animation + Audio + Caption condition, there was a weak positive correlation, $r(24) = .12$, $p > .05$. For the Animation + Audio condition, there was a negligible correlation, $r(28) = -.05$, $p > .05$. For the Animation + Caption condition, there was a moderate positive correlation, $r(23) = .48$, $p < .03$. For the Animation condition, there was a negligible correlation, $r(23) = -.09$, $p > .05$. For the Audio + Caption condition, there was a moderate positive correlation, $r(25) = .31$, $p > .05$. For the Audio condition, there was a

negligible correlation, $r(26) = -.06$, $p > .05$. For the Caption condition, there was a weak positive correlation, $r(21) = .28$, $p > .05$. For the No Multimedia condition, there was a negligible correlation, $r(23) = -.07$, $p > .05$.

***Multiple-Choice Test***

The average recognition score from the multiple-choice test across all conditions was 82.90 (*SD* = 21.60, 95% CI = 79.83, 85.97). The mean percentage recognition scores on the multiple-choice test, and associated 95% CIs, for each of the eight conditions are contained in Table 11. As can be seen, the highest level of recognition was achieved in Animation + Caption condition and the lowest level of recognition was achieved in the No Multimedia condition. Aside from the Animation and No Multimedia conditions, the recognition scores on the multiple-choice test responses for the remaining six conditions differed only by a maximum of 11.05%; within the best three conditions (Animation + Caption, Audio + Caption, and Animation + Audio + Caption, respectively), recognition scores differed only by a maximum of 3.08%. The magnitude of the difference in recognition scores between conditions (i.e., effect sizes) expressed as Cohen's *d* (Cohen, 1988) is shown in Table 12.

There was a significant main effect of Audio, $F(1, 185) = 10.69$, $p = .001$, $\eta_p^2 = .06$, indicating higher recognition scores were obtained for those who heard an audio narration (*M* = 87.18, *SD* = 19.77) than for participants who did not (*M* = 78.00, *SD* = 22.65; *d* = 0.43). There was a significant main effect of Caption, $F(1, 185) = 30.93$, $p < .001$, $\eta_p^2 = .14$, with higher recognition scores found for participants who saw a caption of the narration (*M* = 90.75, *SD* = 14.31) than for those who did not (*M* = 75.60, *SD* = 24.55; *d* = 0.75). There was no significant main effect of Animation, $F(1, 185) = .849$, $p = .358$,

$\eta_p^2$ = .01; the average recall score for participants who saw an animation was 84.08 (*SD* = 21.10), and was 81.68 (*SD* = 22.15) for those that did not (*d* = 0.11).

There was a significant two-way interaction effect of Audio and Caption, *F*(1, 185) = 7.29, *p* = .008, $\eta_p^2$ = .04. Specifically, when captions were absent, the presence of an audio narration led to higher comprehension scores as compared to the absence of audio narration, *F*(1, 189) = 18.57, *p* < .001, $\eta_p^2$ = .09. When captions were present, however, the audio narration had no significant effect, *F*(1, 189) = 0.12, *p* = .724, $\eta_p^2$ = .00. Furthermore, when audio was absent, the presence of the captions led to higher comprehension score as compared to the absence of caption reading, *F*(1, 189) = 32.79, *p* < .001, $\eta_p^2$ = .15. When audio was present, the presence of the captions also led to higher comprehension score as compared to the absence of caption reading, albeit to a lesser extent, *F*(1, 189) = 4.45, *p* < .04, $\eta_p^2$ = .02. In other words, allowing participants to hear or read the interrogation rights increased recognition from 66.52% (*SD* = 23.50) to 91.43% (*SD* = 14.72; *d* = 1.28). The two-way interaction effect of Animation and Audio was not significant, *F*(1, 185) = 1.74, *p* = .19, $\eta_p^2$ = .01, nor was the two-way interaction effect of Animation and Caption, *F*(1, 185) = 0.11, *p* = .75, $\eta_p^2$ = .00. The three-way interaction of Animation and Audio and Caption was also not significant, *F*(1, 185) = 0.13, *p* = .72, $\eta_p^2$ = .00.

**Confidence Ratings.** The average confidence rating score for the five multiple-choice questions collapsed across conditions was 4.28 (*SD* = 0.65, 95% CI = 4.19, 4.37). Averaging across the five test items, a weak positive correlation between correct answers on the multiple-choice test and confidence ratings was found, *r*(193) = .33 ($r_{Range}$ = .30 – .34); all correlations significant, *p* < .001.

When broken down by condition, both positive and negligible correlations were found between correct answers and confidence ratings across all five test items. Specifically, for the Animation + Audio + Caption condition, there was a negligible correlation, $r(24) = -.02$ ($r_{Range} = -0.15 – 0.25$), all $p$s > .05; it should also be noted that in this condition, the correlations for the first, second, and fourth test items were found to be in the negative direction; it should also be noted that all participants in this condition chose the correct answer for the fifth test items (i.e., a correlation coefficient was unable to be calculated for these items in this condition due to one variable containing a constant). For the Animation + Audio condition, there was a moderate positive correlation, $r(28) = .42$ ($r_{Range} = 0.33 – 0.50$), $p_{Item\ \#1} > .05$, all other $p$s < .04. For the Animation + Caption condition, there was a strong positive correlation, $r(23) = .64$ ($r_{Range} = .33 – .89$), $p_{Item\ \#3} > .05$, all other $p$s < .001; all participants in this condition chose the correct answer for the second and fourth test items. For the Animation condition, there was a weak positive correlation, $r(23) = .15$ ($r_{Range} = .04 – .38$), all $p$s > .05. For the Audio + Caption condition, there was a moderate positive correlation, $r(25) = .34$ ($r_{Range} = .13 – .49$), $p_{Item\ \#2\ and\ \#3} < .02$, all other $p$s > .05. For the Audio condition, there was a moderate positive correlation, $r(26) = .48$ ($r_{Range} = .29 – .71$), $p_{Item\ \#2,\ \#3,\ and\ \#5} < .04$, all other $p$s > .05. For the Caption condition, there was a weak positive correlation, $r(21) = .25$ ($r_{Range} = .15 – .41$), all $p$s > .05; all participants in this condition chose the correct answer for the second test items. For the No Multimedia condition, there was a weak positive correlation, $r(23) = .20$ ($r_{Range} = -.12 – .32$), all $p$s > .05; it should be noted that in this condition, the correlation for the fourth test item was the only one found to be in the negative direction.

***True/False Test***

The average recognition score from the true/false test collapsed across conditions was 90.79 (*SD* = 13.40, 95% CI = 88.89, 92.69). The mean percentage recognition scores on the true/false test, and associated 95% CIs, for each of the eight conditions are contained in Table 11. As can be seen, the highest level of recognition was achieved in the Animation + Caption condition and the lowest level of recognition was achieved in the Animation condition. Aside from the Animation and No Multimedia conditions, the recognition scores on the true/false test responses for the remaining six conditions differed only by a maximum of 5.17%; within the best top three conditions (Animation + Caption, Audio + Caption, and Caption, respectively), recognition scores differed only by a maximum of 1.38%. The magnitude of the difference in recognition scores between conditions (i.e., effect sizes) expressed as Cohen's *d* (Cohen, 1988) can be found in Table 13.

There was a significant main effect of Audio, $F(1, 185) = 14.60$, $p < .001$, $\eta_p^2 = .07$, with higher recognition scores found for participants who heard an audio narration ($M = 93.85$, $SD = 10.05$) than for participants who did not ($M = 87.28$, $SD = 15.76$; $d = 0.50$). A significant main effect of Caption was revealed, $F(1, 185) = 36.64$, $p < .001$, $\eta_p^2 = .17$, with higher recognition scores found for participants who read a caption of the narration ($M = 95.82$, $SD = 7.84$) than for those who did not ($M = 86.11$, $SD = 15.66$; $d = 0.78$). There was no significant main effect of Animation, $F(1, 185) = 0.210$, $p = .65$, $\eta_p^2 = .00$; the average recognition score for participants who saw an animation was 90.48 ($SD = 15.05$), and was 91.11 ($SD = 11.53$) for those that did not ($d = 0.05$).

There was a significant two-way interaction effect of Audio and Caption, $F(1, 185) = 15.76$, $p < .001$, $\eta_p^2 = .08$. Specifically, when captions were absent, the presence of an audio narration led to higher comprehension scores as compared to the absence of audio narration, $F(1, 189) = 31.91$, $p < .001$, $\eta_p^2 = .14$. When captions were present, however, the audio narration had no significant effect, $F(1, 189) = 0.01$, $p = .912$, $\eta_p^2 = .00$. Furthermore, when audio was absent, the presence of the captions led to higher comprehension score as compared to the absence of caption reading, $F(1, 189) = 47.80$, $p < .001$, $\eta_p^2 = .20$. When audio was present, however, reading the captions had no significant effect, $F(1, 189) = 2.34$, $p = .128$, $\eta_p^2 = .01$. Again, participants who could hear or read the interrogation rights increased recognition from 78.99% ($SD = 16.77$) to 95.96% ($SD = 8.33$; $d = 1.27$). The two-way interaction effect of Animation and Audio was not significant, $F(1, 185) = 0.176$, $p = .676$, $\eta_p^2 = .00$, nor was the two-way interaction effect of Animation and Caption, $F(1, 185) = 0.170$, $p = .681$, $\eta_p^2 = .00$. The three-way interaction of Animation and Audio and Caption was also not significant, $F(1, 185) = 1.644$, $p = .201$, $\eta_p^2 = .01$.

**Confidence Ratings.** The average confidence rating score for the nine true/false questions collapsed across conditions was 4.57 ($SD = 0.62$, 95% CI = 4.49, 4.66). Averaging across the nine test items, a weak positive correlation between correct answers on the true/false test and confidence ratings was found, $r(193) = .31$ ($r_{Range} = .08 – .52$), $p_{Item\ \#4} > .05$, all other correlations significant at $p$s $< .002$.

When broken down by condition, the average correlation between correct answers and confidence ratings across all nine test items were each found to be positive correlations. Specifically, for the Animation + Audio + Caption condition, there was a

negligible positive correlation, $r(24) = .09$ ($r_{Range} = -0.11 – 0.49$), $p_{Item\ \#2} < .02$, all other $p$s > .05; it should be noted that the correlation for the first, eighth, and ninth test items were the only ones found to be in the negative direction; it should also be noted that all participants in this condition chose the correct answer for the fourth, fifth, and seventh test items (i.e., a correlation coefficient was unable to be calculated for these items in this condition due to one variable containing a constant). For the Animation + Audio condition, there was a moderate positive correlation, $r(28) = .42$ ($r_{Range} = 0.02 – 0.65$), $p_{Item\ \#1,\ \#5,\ \#7,\ and\ \#8} < .02$, all other $p$s > .05; all participants in this condition chose the correct answer for the second, fourth, and ninth test items. For the Animation + Caption condition, there was a weak positive correlation, $r(23) = .29$ ($r_{Range} = -.08 – .66$), $p_{Item\ \#6\ and\ \#7} < .03$, all other $p$s > .05; the second test item was the only negative correlation; all participants in this condition chose the correct answer for the first, fourth, fifth, eighth, and ninth test items. For the Animation condition, there was a moderate positive correlation, $r(23) = .38$ ($r_{Range} = -.01 – .58$), $p_{Item\ \#3,\ \#7,\ and\ \#9} > .05$, all other $p$s < .03; the ninth test item was the only negative correlation; all participants in this condition chose the correct answer for the fourth test item. For the Audio + Caption condition, there was a moderate positive correlation, $r(25) = .27$ ($r_{Range} = .10 – .60$), $p_{Item\ \#8} < .002$, all other $p$s > .05; all participants in this condition chose the correct answer for the second, fourth, seventh, and ninth test items. For the Audio condition, there was a moderate positive correlation, $r(26) = .50$ ($r_{Range} = .39 – .67$), $p_{Item\ \#1,\ \#6} > .05$, all other $p$s < .05; all participants in this condition chose the correct answer for the second, fourth, and eighth test items. For the Caption condition, there was a weak positive correlation, $r(21) = .19$ ($r_{Range} = -.26 – .69$), $p_{Item\ \#7} < .001$, all other $p$s > .05; the first and fifth test items were the

only negative correlations; all participants in this condition chose the correct answer for the second, fourth, eighth, and ninth test items. For the No Multimedia condition, there was a weak positive correlation, $r(23) = .24$ ($r_{Range} = -.01 – .51$), $p_{Item\ \#2} < .02$, all other $p$s $> .05$; the fifth test item was the only negative correlation; all participants in this condition chose the correct answer for the eighth test item.

**Discussion**

The goal of Experiment 2 was to replicate Experiment 1 with a sample of youth and examine the extent to which youth presented with a multimedia presentation of their interrogation rights would help them to better understand these rights. Employing the same multimedia presentations used in Experiment 1, the multimedia elements of Animation, Audio, and Caption were manipulated across conditions to examine which element, or combination thereof, led to maximum understanding for a sample of Canadian youth. The results showed that the multimedia presentation with Animation and Caption elements produced the highest overall comprehension score (49%), followed by the presentation containing Audio and Caption elements (48%); both findings were consistent across all dependent measures assessing comprehension. Accordingly, these data suggest that presenting youth with their interrogation rights in a format that involves watching the procedural actions of the interrogation rights being acted out by characters while also reading information pertaining to these rights, will help increase youths' overall comprehension of their rights. However, the effect of this combination of multimedia elements on overall comprehension is not markedly different from a presentation wherein a youth can hear a narration of their rights while also reading the narrated information

pertaining to – in fact, the difference between the top two conditions is merely one percent.

In the current experiment, the top two conditions that emerged as the best presentations for rendering the highest comprehension levels of youth interrogation rights are a bit paradoxical when it comes to the multimedia principle and to certain theoretical aspects Mayer's cognitive theory of multimedia learning (see Mayer, 2009). For example, in the presentation containing Animation and Caption elements (i.e., the 'best' condition for comprehension), the combination of these elements satisfy the basic tenet of the multimedia principle (i.e., requiring both words and graphics to maximize learning in a multimedia presentation, as compared to having words alone). That is, in this condition, the animation element is a dynamic graphic, and the caption element are printed words. However, both elements are stimuli that would be processed via the visual channel in humans' information processing system. Thus, despite being the 'best' condition rendering the highest comprehension scores, it appears to contradict Mayer's dual-processing hypothesis, and instead is processing the information in a single channel. Comparatively, when contrasted with the 'second best' presentation for comprehension (i.e., Audio and Caption elements), we can see that the elements in this condition *do* satisfy the dual-processing hypothesis in that the narration element will be processed via the auditory channel and the caption element will be processed via the visual channel; however, these elements deviate away from the premise of the multimedia principle. That is, both elements are just words, thus meeting only one of the criteria for the multimedia principle (i.e., no graphics). It is not immediately clear why these paradoxical results were found and seems to contradict the cognitive theory of multimedia learning. Although

speculative, it may be the case that multimedia learning principles do not lend themselves as well to helping people understand legal material (*cf.* cause-and-effect or "scientific explanations"; see e.g., Mayer et al., 1996, p. 64). Furthermore, perhaps a lack of control over the environment under which participants completed the experiment contributed to these observations (e.g., distractions may have been present).

Regardless of the possible reasons for these observations, there is a ceiling effect among the top six conditions in Experiment 2 (see Figure 3 and Table 11). More specifically, with the exception of the Animation and No Multimedia conditions, there are minimal differences in comprehension scores across the recall (open-ended responses) and recognition (multiple-choice, true/false) test measures; *post-hoc* analyses of these best-six conditions did not reveal any meaningful differences amongst each other.[6] The possible explanations for why a ceiling effect was observed across these six conditions include tension between the various multimedia learning principles, extraneous distractions (e.g., music within the presentation), and the testing environment (e.g., online paradigm). Perhaps the best explanation for this pattern may be due to simplified nature of the youth interrogation rights script used in the presentations (see Eastwood et al., 2016). The script used to present youth interrogation rights in the multimedia presentations was adopted from the created waiver form produced by Eastwood and colleagues (2016). Essentially, the current research took a version of a youth interrogation rights waiver form that has been already demonstrated to render high comprehensibility

[6] A post-hoc one-way analysis of variance test found no meaningful differences across the best-six conditions on comprehension scores from the open-ended responses, $F(5, 141) = 0.90$, $p = .481$, $\eta_p^2 = .03$, $d_{Range} = 0.02\text{-}0.54$; the multiple-choice test, $F(5, 141) = 1.66$, $p = .149$, $\eta_p^2 = .06$ $d_{Range} = 0.04\text{-}0.61$; or the true/false test, $F(5, 141) = 1.16$, $p = .332$, $\eta_p^2 = .04$, $d_{Range} = 0.03\text{-}0.64$.

(80%), and attempted to examine if comprehensibility could be increased further by applying the principles of multimedia learning to the youth waiver. Put differently, due to the basic language used in the youth interrogation rights script, this may have led to increased comprehension of interrogation rights scores across conditions (aside from the Animation and No Multimedia conditions) for participants in this sample. Perhaps the differences between the various multimedia conditions would have been more pronounced if a standard, more complex police caution script of youth interrogation rights was used instead; an area of consideration for future studies.

Averaging across conditions, the youths' comprehension score as per the open-ended recall test is concerningly low (36%). Even after removing the two worst conditions (i.e., Animation and No Multimedia), the average comprehension score across the remaining conditions is still quite low (average of 45% across best-six conditions), and only slightly below the 'best' condition (i.e., Animation + Caption; 49%). These findings are inconsistent with the comprehension rates reported by Eastwood and colleagues (2016) in their youth sample (81%) and were unexpected. Given that a youth's response to an open-ended question is how police officers verify the youth's understanding in real-life interrogations (see McCardle et al., 2020; see also Sim & Lamb, 2018), the demonstrated lack of comprehension as shown in this sample raises concerns for how well youth would be able to show their level of understanding when it comes to their interrogation rights – especially when shown in multimedia format. Interestingly, however, the results of this experiment also revealed that youths' comprehension scores were much higher on the recognition measures (i.e., multiple-choice and true/false tests) as compared to the open-recall response. It is unsurprising that recognition scores are

generally higher than recall scores given that the correct answer is displayed as one of the response options. Consequently, any cued association between the question and answer on recognition tests may give the test taker an advantage, as compared to recall test questions that forces the test taker to rely solely on their ability to freely remember the answers, and may also be due to how the information is stored and retrieved in memory (see Loftus, 1971). Given the vast difference across recall versus recognition measures in the youths' ability to answer questions correctly about their interrogation rights, it bears consideration as to whether checking youths' understanding of their rights could be verified through sets of recognition tests instead of recall tests. As noted in the literature review (see Chapter 1), research shows that police officers rarely verify youths understanding of their interrogation rights, and if verification is checked then it is done through a simple question of 'do you understand?' (Cooke & Philips, 1998; McCardle et al., 2020; *cf.* Snook et al., 2010, for how understanding is verified in adult samples).

An examination of the 16 individual youth interrogation rights components revealed that – similar to their adult counterparts – the two best components recalled by youth were the components about the right to remain silent (Component 1; 72%) and the right to talk with a lawyer (Component 2a; 73%). These findings align well with data reported by Eastwood and colleagues (2016). More specifically, in the Eastwood et al. study, the right to silence and right to talk to a lawyer were recalled correctly approximately 85% and 93% of the time, respectively, by the youth participants. These two particular rights may be generally well-known to youth due to their presence in popular media and entertainment (e.g., *Shrek 2*, *21 Jump Street*; see Nguyen, 2000; Rogers, 2008; Rogers, Rogstad, et al., 2010). Consequently, having some degree of

familiarity with these rights from other external sources may be aiding in the youths' ability to show that they have this knowledge.

However, there were some components that were not recalled as well by youth in the current sample as compared to previous research (Eastwood et al., 2016). For example, two-thirds of youth in the current sample recalled that they could talk to an adult (Component 3a), but almost four-fifths of youth in Eastwood et al.'s (2016) youth sample corrected recalled this information. Moreover, 85% of youth from the Eastwood et al. study – as compared to slightly more than half (53%) of the current sample –recalled that anything they say could be used against them as evidence in court (Component 5a). The most drastic difference between these two studies, however, was found for the component about having access to free legal advice (Component 2c); as a comparison, 70% of youth from the Eastwood et al. sample correctly recalled this information, whereas less than 30% of the current sample recalled this knowledge correctly. Eastwood et al.'s youth sample also demonstrated high levels of comprehension when it came to recalling that a lawyer or adult could be with them during any given statement (79%); in contrast, youth in the current study demonstrated much lower rates of comprehension for these components (50%, 57%, and 40% for Components 4a, 4b, and 4c, respectively). Granted, the slightly better scores observed by the youth sample used by Eastwood et al., as compared to the current sample, may be due to the fact that Eastwood et al.'s sample were slightly older than participants in the present experiment (mean age of 16.11 vs. 14.81 years, respectively), and they also had higher levels of education. For instance, Eastwood et al.'s sample consisted of youth with an education level of grades 9 through 11, inclusive; comparatively, approximately only half of the youth participants in the current

sample had education levels similar to Eastwood et al.'s youth sample (to break it down even further, approximately 35% of the current sample had an education level between grades 4-8, while 9% had an education beyond grade 11). Furthermore, the observed differences across these studies may also be due to the fact that Eastwood et al. broke the youth interrogation rights into six components whereas the present research broke the components into 16 unique categories. The higher degree of specificity in the current study likely contributed to some of the observed differences between previous research and the findings reported here.

Notwithstanding the above comparisons, it is worth noting that there were many other components of the interrogation rights that were recalled infrequently by youth. For example, very few youths recalled that they could talk to an adult who was a relative (Component 3c), or that they could have the telephone number for a lawyer (Component 2e); collectively, these were the two worst components recalled by participants regardless of condition. Less than one-quarter of the sample correctly recalled that the lawyer they could speak with could be their own/personal lawyer (Component 2b), or that they could speak to *any* lawyer prior to the police asking them questions (Component 2d). Likewise, less than one-quarter of the sample recalled that they could speak with their parents (Component 3b) or any other appropriate adult (Component 3d) before the police asked them any questions (Component 3e). These types of resources are arguably some of the best supports that a youth detainee can have during a novel and complex police interrogation, and it is highly concerning that youth are demonstrating that they do not have this important knowledge – or at least cannot recall it when asked – when it comes to their rights within an interrogation setting. However, it is conceivable that youths' lack

of understanding as it relates to being able to call on various types of lawyers (i.e., own/personal, free) and adults (i.e., parents, relatives, or other appropriate adults) may be due to them collapsing this knowledge into their answers for the more broad categories of these rights (i.e., Components 2a and 3a; talking to a lawyer and adult, respectively, in more general terms). Lastly, the component stating that anything the youth *does* during the police interview can be used as evidence against them in court was recalled infrequently, with almost three-quarters of participants failing to report this fact (Component 5b). Again, the lowered demonstrated knowledge with this particular component may be due to participants collapsing this into their recalled response anything they *say* may be used as evidence against them in court (Component 5a). Still, with that said, many youths performed poorly on both of these components (i.e., Components 5a and 5b) and did not seem to understand that their actions and words could be used as evidence against them at a later time – a stark difference from that found by Eastwood et al. (2016).

Although a measure of participants confidence rating was added to the open-ended recall question in the current experiment, as expected, the relationship between the youths' confidence ratings and their comprehension across all dependent measures was weak. These results further support the notion reported in previous research that confidence is not a reliable indicator of interrogation rights comprehension (e.g., Cooke & Philip, 1998; Eastwood & Snook, 2009; Fenner et al., 2002).

## Chapter 4: Experiment 3

Across Experiments 1 and 2, the extent to which presenting youth interrogation rights to adults (Experiment 1) and youth (Experiment 2) via a multimedia format would increase understanding of youth interrogation rights was examined. While a similar pattern of results emerged from both experiments (i.e., a multimedia presentation consisting of Animation and Caption elements yielded the highest comprehension scores, relative to other conditions), the amount of understanding achieved did not reach levels reported by similar studies (e.g., Eastwood & Snook, 2012; Eastwood et al., 2016). Moreover, a consistent ceiling effect emerged among a variety of testing conditions. Given the novelty of introducing multimedia technology into the interrogation rights comprehension research area, along with the fact that comprehension scores were lower than expected (as compared to previous simpler interventions; see e.g., Eastwood et al., 2016; Snook et al., 2016), a third experiment was carried out to consider whether an explanation for these earlier findings could be found through participants' perceptions and sentiments of the multimedia content.

The purpose of Experiment 3 was to garner opinions about the multimedia presentation (i.e., Animations, Audio, Captions, and background music). For instance, despite purposefully creating the animation characters to be simplistic and avoid gender biases – that is, being presented as cylinder-shaped ghost-like coloured characters (vs. as obvious male/female) wearing key identifiable garments (e.g., the police officer character wearing a police hat; the youth character being smaller in size relative other characters) – I wondered if participants found the initial design of these characters to be too unrealistic and/or if the design served as a distraction for the comprehension task. I was also curious

if participants were able to identify each animated character accurately. During the content creation phase of the multimedia presentations, it was thought that the inclusion of specific characteristic features (e.g., smaller character size indicating a youth; a character wearing a police hat indicating a police officer) would help viewers with character identification; however, no pilot study was carried out to verify this prior to conducting Experiments 1 and 2. In addition, I wanted to obtain perceptions about the pace of the animation, audio, and captions. Although recommendations about what rates of speed to use throughout the multimedia presentations were informed from previous research guidelines (e.g., Carver, 1982; Griffiths, 1992; Jester & Travers, 1966), perceptions about the pace of delivery could provide insights into the findings from the first two experiments. Given Mayer's (2009) concerns about including background music in multimedia presentations, I also wondered if participants found the background music distracting. During my data inspection from the earlier experiments, I noted that some participants commented on the background music and stated that they were confused as to why this element was included within the presentation they viewed. As an example, one participant was quoted as saying "the happy music struck me as kind of odd and out of place." This participant's comment dovetails with suggestions by Mayer (2009) that background music in multimedia learning might serve as a seductive detail and distract the learner from focusing on (and understanding) the learning content (*cf.* Bishop et al., 2008). Finally, given the limited-capacity assumption within the theoretical framework of the cognitive theory of multimedia learning (i.e., that humans have a finite level of cognitive and attentional resources available for processing information; Mayer, 2009; see Baddeley et al., 2009; see also Sweller et al., 2011), I was interested to determine

which multimedia elements received the participants' most attentional focus. For example, if participants were putting most of their focus on the background music and ignoring the other, more important multimedia elements in the presentation for learning about youth interrogation rights, then this may help explain the levels of comprehension found in the previous two experiments.

**Hypotheses**

To achieve the primary objective of Experiment 3, questions regarding participants' opinions about: the presentation quality; the speed of each of the main multimedia elements (i.e., Animation, Audio, Caption); and the perceived level of distraction of each of these multimedia elements, as well as the background music, were asked. Participants were also tested on their ability to identify each animated character, and asked to rank order which multimedia elements contained within the presentation received most of their attentional resources. Answers to these questions were collected through a series of 5-point rating scales and open-ended responses (see Measures section below and Appendix E for more details). Any knowledge gained from these insights can help guide decisions going forward about what aspect/elements of the multimedia presentations may need tweaking. Given the exploratory nature of Experiment 3, no formal hypotheses were proposed as it related to participants' evaluation of the multimedia presentation content. As a secondary objective of Experiment 3, the dependent measures to assess comprehension in Experiment 2 were retained in the current experiment to serve as a replication, and for the procedural aspect of this research to be as similar as possible across experiments.

## Method

### *Participants*

In total, a sample of 105 Canadian youth was obtained through Qualtrics Service Panels (www.qualtrics.com) and compensated through the Qualtrics company directly.[7] Thirty-five participants were initially removed due to one or more of the following exclusion criteria: requested that their data not be retained for analyses ($n$ = 4); reported first language was not English ($n$ = 30); or reported having a learning disability ($n$ = 1). An additional ten participants were removed for following reasons: three participants were removed because they reported that they encountered a technical error or distraction during the multimedia presentation; five were removed due to a lack of effort in their open-ended response answer (e.g., wrote gibberish, such as 'sdfghdfgh' in their answer); one was removed due to evidence of duplication (i.e., showed evidence of doing the study twice); and one participant timed out during the survey (i.e., showed evidence of taking too long to respond).

The final sample consisted of 60 youth. The mean age of participants was 15.48 years (*SD* = 1.35, *Range* = 12-17). A summary of the remaining demographic variables is contained in Table 14.

[7] As reminder from Footnote 4, Qualtrics Service Panels was hired as a third-party recruiter and operates such that researchers pay a monetary rate per recruited participant (as determined and set by Qualtrics). Qualtrics recruiters subsequently recruit participants based on the study's criteria (e.g., age, ethnicity, gender, nationality). In terms of compensation for the participants, Qualtrics uses several different incentive packages (e.g., travel vouchers, gift card draws, money, points) depending on how and where participants are recruited (B. Hoang, personal communication, January 15th, 2021).

### *Design and Materials*

A single group, post-test only design was employed. Specifically, the multimedia presentation containing all three elements applied in Experiments 1 and 2 (i.e., Condition 1; Animation + Audio + Caption) was used as the single testing stimulus. This single group design was used to ensure all participants were exposed to all three multimedia elements contained in the multimedia presentations (i.e., Animation, Audio, Caption).

The primary purpose of this experiment was to collect participants' opinions about the various multimedia features shown throughout the presentation. This was achieved by administering an evaluation questionnaire about the various features presented in the multimedia presentation. As well, and as mentioned above, the main dependent variables from Experiment 2 (i.e., recall and recognition comprehension tests) were also administered to conduct a small replication of these measures across experiments for this single condition (Animation + Audio + Caption). Comprehension was assessed through the dependent variables of recall memory (as measured through coding the response to an open-ended question) and recognition memory (as measured through a multiple-choice test and true/false test; see Appendix D).

### *Measures*

**Multimedia Presentation Evaluation Questionnaire.** An 11-item author-constructed evaluation questionnaire was created that ask participants about specific multimedia features shown in the presentation. For example, the item assessing general quality of the presentation asked "Overall, the quality of the video presentation was," and participants responded to this item using a scale from 1 (*Poor*) to 5 (*Excellent*); an item assessing the rate of speed of the captions asked "The speed of the words shown along the

bottom of the screen were," and participants responded to this item using a scale from 1 (*Extremely Slow*) to 5 (*Extremely Fast*); an item assessing how whether the animated characters rendered distraction asked "The characters in the video were," and participants responded to this item using a scale from 1 (*Not at All Distracting*) to 5 (*Extremely Distracting*). As can be seen by the example items listed here, participants indicated their agreement with each statement using a 5-point scale (see Appendix E). Additional items related to questions asking participants to rank which multimedia elements (e.g., animation, audio, caption, background music) received most of their attentional focus, asking participants to identify the role of each animated character (e.g., youth, adult, lawyer, police officer, judge), and an open-ended question allowing participants to share, in their own words, any other opinions they had about the presentation. With the exception of the aforementioned open-ended opinion question always being presented last, all other test items were presented in a randomized order to protect against any potential order effects.

**Open-Ended Response Test.** One open-ended response question was asked to participants to assess their comprehension, and they were provided with a textbox at the end of the question to write their answer; no limit was imposed for the time needed to respond. <u>Underlined</u> text was used for emphasis as part of the instructions. The question was presented as follows:

> Please try your best to recall everything you learned about your legal rights from the video. Take your time and think about the video for a moment before proceeding. When you are ready, write out everything that you learned about your

legal rights from the video in your own words in as much detail as possible, and try your best not to leave anything out.

Participants were also asked to rate how confident they were in their open-ended answer, using a scale from 1 (*Not at All Confident*) to 5 (*Completely Confident*).

**Multiple-Choice Test.** A 5-item multiple-choice measure created for youth participants by Eastwood et al. (2016) was used in this experiment to assess the youth sample's recognition knowledge of their interrogation rights. An example item asked was "When being interviewed by a police officer, I need to: (a) Answer all the questions that they ask of me; (b) Only answer the questions that I want to answer; (c) Only answer questions that are related to a crime; (d) Only answer questions related to my personal life." Participants were also asked to rate how confident they were in each of their answers using a scale from 1 (*Not at All Confident*) to 5 (*Completely Confident*). All multiple-choice items were presented in a randomized order to protect against any potential order effects (see Appendix D).

**True/False Test.** A 9-item true/false test was author-constructed to assess the youth participants' recognition knowledge of their interrogation rights. An example item asked was "I must answer the questions that the police ask me about the alleged crime: True or False." Participants were also asked to rate how confident they were in each of their answers using a scale from 1 (*Not at All Confident*) to 5 (*Completely Confident*). The items on the true/false test were presented in a randomized order to protect against any potential order effects (see Appendix D).

**Attention Check.** A single attention check question was embedded within the true/false test (10th item) that told participants which answers to select (e.g., "This is an

attention check question. Please select ‘False’ and ‘Somewhat Confident’ for your answers.”). This item was presented randomly within the presentation of the other nine true/false questions.

**Demographic Questionnaire.** Questions pertaining to participants’ age, gender, ethnicity, level of education, Canadian citizenship, and Province/Territory of residence were collected. Additional questions asked participants if English was their first language, and if they had a diagnosed learning disability (both questions were used as exclusion criteria). The demographic questionnaire also contained a section asking whether or not the participant had heard these youth interrogation rights previously. Another section inquired about the participants’ specific behaviour throughout the experiment (i.e., whether or not they used headphones; took notes about the presentation [used as an exclusion criterion]; or manipulated the multimedia presentation clip in any way [used as an exclusion criterion; e.g., paused presentation]; see Procedure section below for descriptive statistics). The final section of the demographic questionnaire asked three open-ended feedback questions, each with its own response textbox. The questions read as follows (note, the words in square brackets were not shown to participants, but serve as a note to the reader):

1. Were any of the instructions or questions unclear at any point in this study? If so, please explain.
2. Did you encounter any technical errors, problems, or distractions while completing this study? If so, please explain [used as an exclusion criterion if participant indicated any issues].

3. Do you have any comments about this survey that you would like to share with the researchers? If so, please explain.

Beyond this, three youth-specific questions were asked: namely, (i) if the youth participant's parent(s)/caregiver(s) *stayed* with them during the survey (86.44% reported an answer of no), (ii) if the youth participant's parent(s)/caregiver(s) *helped* them with the answers to any of the questions (all participants reported an answer of no; note, instructions were contained on the informed consent form and within the survey that explicitly stated that any accompanying adults were not to assist the youth with any of the answers; if participants indicated they received help from their parent/caregiver, then their data were removed during the data cleaning stage [i.e., exclusion criteria]); and (iii) where the youth participant heard about the study from.[8]

***Procedure***

The survey was created and hosted online through Qualtrics (www.qualtrics.com). All participants were only able to access and complete the study using their own computer. On average, participants took 21.12 minutes (*SD* = 9.34) to complete the study. Participants were asked to use headphones during the study if they had them available. One-quarter of the participants (25.0%; *n* = 15) reported using headphones, whereas three-quarters (75.0%; *n* = 45) reported that they did not use headphones.[9] Participants

[8] Although all participants in Experiment 3 were recruited solely through Qualtrics Service Panels, the company had no limitations on which platforms they could use for recruitment purposes (e.g., Kijiji, Facebook, Twitter, etc.); due to Qualtrics' own in-house procedure for recruiting participants, no analyses were able to be conducted to examine for any differences between participants as a function of recruitment platform used by Qualtrics.

[9] Independent *t*-tests were conducted to examine for any significant differences in comprehension scores as a function of participants' headphones use: no differences were found for open-ended recall comprehension between participants who used headphones (*M* = 52.50, *SD* = 19.02) as compared to participants who did not (*M* = 47.92, *SD* = 21.53), *t*(58) = -0.734, *p* = .466, *d* = 0.23; no differences were found for recognition

were also asked if they had heard of these rights before. Approximately three-fifths of the participants (61.7%; $n$ = 37) reported that they heard the youth interrogation rights previously whereas approximately two-fifths (38.3%; $n$ = 23) reported that they did not.[10]

Experiment 3 is a replication and extension of Experiment 2. Specifically, the first page presented an informed consent form to the youth participants and their parent(s)/caregiver(s). Consent from both the youth and the parent(s)/caregiver(s) was required prior to continuing with the experiment. At the bottom of the consent page, there was a small section for the parent(s)/caregiver(s) to indicate their consent, followed by a section where the youth participants had to also indicate their consent. Any participants who did not wish to grant consent and partake in the study were instructed to close their browser to exit the study. By advancing through to the study, it was implied that consent was granted by the youth participant and the parent(s)/caregiver(s).

After consent was obtained, participants were provided with a set of pre-study instructions where they were asked to reduce distractions (e.g., turn off music, television; not answer their cell phone; not use the internet except for the purpose of this study). Participants were also instructed to not use the 'Back' button on their browser (this

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comprehension as assessed by the multiple-choice test between participants who used headphones ($M$ = 93.33, $SD$ = 12.34) as compared to participants who did not ($M$ = 87.11, $SD$ = 14.87), $t(58) = -1.46$, $p$ = .150, $d$ = 0.45; additionally, no differences were found for recognition comprehension as assessed by the true/false test between participants who used headphones ($M$ = 94.81, $SD$ = 8.26) as compared to participants who did not ($M$ = 92.59, $SD$ = 10.59), $t(58) = -.739$, $p$ = .463, $d$ = 0.23.

[10] Independent $t$-tests were conducted to test for any significant differences in comprehension scores as a function of whether or not participants had heard of these rights before: no differences were found for recall comprehension between participants who heard these rights before ($M$ = 50.34, $SD$ = 18.80) as compared to participants who did not ($M$ = 47.01, $SD$ = 24.12), $t(58) = -.597$, $p$ = .553, $d$ = 0.15; no differences were found for recognition comprehension as assessed by the multiple-choice test between participants who heard these rights before ($M$ = 91.35, $SD$ = 12.06) as compared to participants who did not ($M$ = 84.35, $SD$ = 17.01), $t(58) = -1.87$, $p$ = .067, $d$ = 0.47; no differences were found for recognition comprehension as assessed by the true/false test between participants who heard these rights before ($M$ = 93.69, $SD$ = 9.64) as compared to participants who did not ($M$ = 92.27, $SD$ = 10.82), $t(58) = -.531$, $p$ = .598, $d$ = 0.14.

feature was disabled within the study platform). Following this, participants were also asked three forced-choice yes or no questions: specifically, they were asked whether or not they (i) had sufficient time to complete the study, (ii) agreed to complete the study in one sitting, and (iii) turned off any media distractions in their environment. If participants answered 'no' to any of the pre-survey questions, then they were filtered out of the study and asked to return at a later time when they would be able to meet these three criteria; if participants answered 'yes' to all three of these questions, then they were brought to the next page.

The third page consisted of a brief audio-video pre-test to determine if these features were working properly on the participant's computer. After watching a video clip (e.g., kids playing in a park) that was overdubbed with an entirely different audio (e.g., clocktower bells), participants had to correctly answer two multiple-choice questions about what they saw and heard in the clip. If one or both answers were incorrect, then the participants were filtered out of the study and asked to return to the study later using a different computer device with proper audio and video capabilities. If the answers were correct, participants were presented with a message (on the fourth page) indicating that their audio and video capabilities appeared to be working properly, and instructed to proceed to the next page.

The fifth page explained that the main study will begin on the following page, and asked participants to pay close attention to the subsequent instructions provided. The fifth page also included two statements for clarity. Specifically, it was stated "In this study, a youth is defined as any person between the ages of 12 and 17 years old, as per the law set by Canada's Youth Criminal Justice Act (2002)" and "In this study, your legal rights refer

to a set of options and choices that you have available to you when you are arrested or questioned by the police. The purpose of these legal rights is to help keep you safe and protected when talking to the police." These statements were added to this study to add clarity to these terms when they were used on the subsequent pages. After reading the instructions and above definitions, all participants next watched the multimedia presentation that consisted of Animation, Audio, and Captions (i.e., Condition 1 as reported in Experiments 1 and 2). The sixth page provided participants with a set of instructions specific to this condition. Note that underlined text was used for emphasis as part of the instructions. The instructions were as follows:

> Please read the following instructions carefully: If the police want to question you (i.e., a youth) about a crime that they think the youth did, the police have to first tell you about your legal rights. On the next page, you will watch a video that explains these rights. It is important that you pay careful attention to the content in the video. Afterwards, you will be asked to answer some questions about the content in the video.

After reading these instructions, participants advanced to the next (seventh) page that contained the multimedia presentations. At the top of this page, a set of instructions were given asking participants to play the clip one time and were asked not to pause, fast forward, or rewind the clip. Participants were not able to advance pass this page until the length of time of the presentation clip had elapsed (2 minutes and 15 seconds). The subsequent pages presented participants with the open-ended recall, recognition tests (multiple-choice and true/false), and the multimedia evaluation questionnaire; the open-ended question was always asked first, followed by the recognition tests

(counterbalanced, and presented on their own unique pages), followed by the evaluation questionnaire.

The last three pages of the survey contained a demographic form, a page asking if they wanted their data to be retained by the researchers (i.e., Research Participation vs. Research Observation), and a debriefing page. On the last page, participants were thanked for their time and asked to close their browser.

### *Coding of Open-Ended Responses*

A 16-item coding guide, content dictionary, and coding process was used to code participants' responses to the open-ended question (see Appendix C). Comprehension was measured by whether the participant mentioned the five rights in their responses (i.e., coded as being present or absent). Each right (where applicable) was broken down into subcomponents to capture the complete essence of the right, and participants were awarded a point per each component of the right recalled; participants' responses did not have to be verbatim to the coding guide, but had to capture the overarching meaning of the interrogation right (see the content dictionary in Appendix C for further clarification). As a reminder to the reader, the scoring system operated as follows:

For the first right, the youth participant received one point if they stated that they *do not have to talk to the police officer* (Right 1).

A maximum of five points were available for Right 2. One point was awarded if the youth participant stated that they *can talk to a lawyer* (Right 2a), one point was awarded if they mentioned that they could talk to *their own/personal lawyer* (Right 2b), and one point if they mentioned that they could talk to *a free lawyer* (Right 2c); if the participant mentioned Right 2b and/or 2c only, then they were automatically awarded a

point for Right 2a. The logic of this decision stemmed from the fact that Rights 2b and 2c encompassed two different types of lawyers that can be consulted, which implied that the youth participant understood that talking to a lawyer – regardless of whether that lawyer was their own/personal or a free one – was allowed. However, this coding was not bi-directional; that is, if youth participants only mentioned that they were able to talk to a lawyer (i.e., Right 2a), but failed to specify the type of lawyer they could consult (i.e., Right 2b and/or 2c), then the youth participant was awarded one point for Right 2a only. One point was awarded if the youth participant mentioned that they could talk to a lawyer *right now/before the police officer asks them any questions* (Right 2d), and another point if it was mentioned that they *can have the telephone number for a lawyer* (Right 2e).

A maximum of five points were available for Right 3. One point was awarded if the youth participant mentioned that they *can talk to an adult* (Right 3a), one point was awarded if they mentioned that they could *talk to a parent* (Right 3b), one point if they mentioned *a relative* (Right 3c), and one point for mentioning *any other adult* (Right 3d); the same decision logic mentioned above for Right 2 was also applied for Right 3 – that is, a point was given to Right 3a automatically if any of the Rights 3b, 3c, or 3d were mentioned only, but not vice versa (i.e., not bi-directional). A point was also awarded if the youth participant mentioned that they could talk to an adult *right now/before the police officer asks them any questions* (Right 3e).

A maximum of three points were available for Right 4. One point was awarded if the youth participant mentioned that they *can have a lawyer with them* (Right 4a), and another one point was awarded if they said they *can have an adult with them* (Right 4b). A point was also given if the youth participant indicated that they could have both or

either of the lawyer and adult with them *when the police officer asks them questions* (Right 4c).

A maximum of two points were available for Right 5. One point was given if the youth participant mentioned that *anything they say can be used as evidence against them in court* (Right 5a), and another point if they said *anything they do can be used as evidence against them in court* (Right 5b).

**Inter-Rater Reliability.** Coding of the open-ended responses were conducted by the current author and a research assistant. Both coders each coded 100% of the youth participants' open-ended responses. The current author provided 1-hour review training session to the research assistant about the coding guide and dictionary. Any confusion arising that related to the coding guide and dictionary were resolved before commencing the current coding task. Prior to coding, both raters practiced on a set of responses that were removed from the dataset due to the abovementioned exclusion criteria. For the coding of this dataset (as compared to the coding of Experiment 1 and 2 datasets), the research assistant was not privy to the design of the current experiment (i.e., single-group design), and therefore was not aware that all responses came from the same multimedia presentation condition. This knowledge was purposely kept hidden from the research assistant to avoid any preconceived biases that may have accompanied her coding if aware of the design. Inter-rater agreement testing across all subcomponents of the interrogation rights yielded a mean *Kappa* of .92 (*Range* = .82 – 1.00), suggesting almost perfect agreement between raters (Cohen, 1960; Landis & Koch, 1977).

### *Analytic Procedure*

After cleaning the raw data file (i.e., applying exclusion criteria), the responses to the open-ended question were coded by each coder and an inter-rater reliability analysis was performed. Any disagreements arising between the two coders were discussed; however, if disagreements were unable to be resolved, then a third judge (i.e., the author's doctoral supervisor) was invited into the discussions to make a final decision. The resolved dataset was used to compute comprehension scores for each participant and quantified as a proportion (i.e., mean percent score). Responses to the multiple-choice and true/false tests were also converted into proportion scores. Appropriate frequency and descriptive analyses, and comparative tests (e.g., chi-square tests) were conducted where required. Point-biserial correlations were computed on the three comprehension measures. Correlation analyses were conducted for the open-ended response, multiple-choice, and true/false tests for correct responses and confidence ratings. All analyses were conducted using SPSS Statistical Package, v.27.

## Results

### *Multimedia Presentation Evaluation Questionnaire*

A breakdown of participants' feedback responses to the evaluation questionnaire as a function of question category (i.e., quality, rate of speed, level of distraction, and character identification) is contained in Table 15. As can be seen, over half of the participants reported that the overall quality of the multimedia presentation was 'good'; approximately one-third of participants reported the quality being 'excellent'. The majority of participants reported that the speed of characters (i.e., animation), narration (i.e., audio), and words along the bottom of the screen (i.e., caption) were average. Of

note, one-quarter and approximately one-third of participants reported that they thought the speed of the characters/animation and narration/audio was ‘somewhat slow’, respectively. Most of participants reported that they found the characters (i.e., animation), the narration (i.e., audio), the words along the bottom of the screen (i.e., captions), and the background music to be ‘not at all distracting’. Of note, however, there were a few participants that they found these elements to be ‘slightly distracting’; even fewer reported that these elements were ‘moderately distracting’. The vast majority of participants were able to correctly identify the animated characters shown throughout the multimedia presentation. The only notable minor exception to this was that 8% ($n$ = 5) of participants incorrectly identified the adult character as the lawyer or vice versa (7%; $n$ = 4).

Table 16 contains the results of the multimedia elements that the participants reported paying most attention when watching the presentation. As can be seen, over half of participants reported that their attention was focused the most on the audio element (i.e., narration). Participants indicated, on average, that the animation and caption elements received the second-most attention. A little less than half of participants reported that the animation element received the third-most focus of their attention. A little more than half of participants reported that the background music contained in the multimedia presentation received the least attention.

***Correlation Analyses***

Correlation analyses among comprehension measures revealed weak to strong positive correlations between the three comprehension dependent measures. Specifically, the correlation between the open-ended and multiple-choice responses was $r(60) = .37$, $p$

< .004; the correlation between the open-ended and true/false responses was $r(60) = .38$, $p < .004$; and the correlation between the multiple-choice and true/false responses was $r(60) = .68$, $p < .001$.

***Open-Ended Response Test***

Participants' average recall score from the open-ended response was 49.06 (*SD* = 20.87, 95% CI = 43.67, 54.45). Table 17 contains a breakdown of the participants' recall scores of the 16 individual youth interrogation rights components. As can be seen, the majority of the youth participants recalled that they did not have to talk to a police officer (Component 1), could talk to a lawyer (Component 2a) or adult (Component 3a), and remembered that anything said to police during the interview could be used as evidence against them in court (Component 5a). Moreover, many participants correctly recalled that they could have an adult (Component 4b) or lawyer (Component 4a) present with them; approximately half of the youth participants, however, were able to recall that these people could be present with them when the police were asking the youth questions (Component 4c). However, a high portion of the youth sample were unable to recall other important components of their interrogation rights. Specifically, only two-fifths of the youth correctly recalled that they could contact their own lawyer (Component 2b) or a free lawyer (Component 2c), or knew that any adult/lawyer could be available to them right away (Components 3e and 2d, respectively). More than two-thirds failed to mention that any action done by them during the police interaction could be used as evidence in court against them (Component 5b). Approximately three-quarters of the sample also did not correctly recall that the appropriate adult who could be available to them could be a parent (Component 3b); most participants also failed to report that the adult could be a

relative (Component 3c) or any other appropriate adult (Components 3d). Very few of the youths recalled that they could have the telephone number for a free lawyer (Component 2e). Figure 4 shows a side-by-side comparison of this data with the data from the equivalent condition in Experiment 2 (i.e., Condition 1). As can be seen, scores of each of the 16 components for this multimedia presentation show that nearly identical trends are occurring across Experiments 2 and 3.

These results also indicated that none of the participants recalled all 16 components. Only one participant (1.7%) recalled 14 of the 16 components contained in the youth interrogation rights. Further analysis revealed that 52% of participants ($n$ = 31) recalled more than half of the youth interrogation rights (i.e., correctly reported 9 or more of the 16 components). Approximately two-fifths of youth participants (42%; $n$ = 25) obtained a 'failing grade' on the recall comprehension test (i.e., correctly reported 7 or less of the 16 components).

**Confidence Ratings.** The average confidence rating score for the open-ended responses was 4.32 ($SD$ = 0.93, 95% CI = 4.08, 4.56). Correlating the youth participants' overall open-ended response score with their overall confidence rating that their response was correct revealed a moderate positive correlation, $r(60) = .52$, $p < .001$.

### *Multiple-Choice Test*

On average, for the recognition score from the multiple-choice test, participants scored 88.67 ($SD$ = 14.43, 95% CI = 84.94, 95.40).

**Confidence Ratings.** The average confidence rating score for the five multiple-choice questions was 4.48 ($SD$ = 0.53, 95% CI = 4.35, 4.62 ). Averaging across the five test items, a weak positive correlation between correct answers on the multiple-choice test

and confidence ratings was found, $r(60) = .19$ ($r_{Range} = -.06 – .40$); $p_{Item\ \#1, \#2, \#3} > .05$, all other correlations significant, $p < .008$; the second test item was the only negative correlation.

***True/False Test***

On average, for the recognition score from the true/false test, participants scored 93.15 (*SD* = 10.04, 95% CI = 90.55, 95.74.

**Confidence Ratings.** The average confidence rating score for the nine true/false questions was 4.77 (*SD* = 0.42, 95% CI = 4.66, 4.88). Averaging across the nine test items, a weak positive correlation between correct answers on the true/false test and confidence ratings was found, $r(60) = .32$ ($r_{Range} = .23 – .41$), $p_{Item\ \#1, \#3} > .05$, all other correlations significant at $p$s $< .03$; all participants in this condition chose the correct answer for the second, fourth, and ninth test items.

**Discussion**

The main goal of Experiment 3 was to obtain participants' thoughts about the various features (i.e., multimedia elements, background music) shown within the multimedia presentation. Based on the ceiling effect findings from Experiments 1 and 2, I endeavoured to explore whether any of the multimedia components may have distracted the participants from learning about the youth interrogation rights. Specifically, participants were asked about the overall quality of the presentation, the rate of speed for each of the three multimedia elements, and the degree to which each of the elements and background music was distracting. Participants were also surveyed to determine if they were able to correctly identify each of the five characters shown throughout the multimedia presentation. To examine this, the research design in the current experiment

employed one experimental group condition only that contained all multimedia elements and background music (i.e., Condition 1 as reported in Experiment 1 and 2). Despite being a single-group design (i.e., not comparing across conditions), participants' comprehension of the presentation content was still collected through recall (i.e., open-ended response) and recognition (i.e., multiple-choice and true/false tests) memory questions to serve as a simple replication check on comprehension – a secondary goal of this experiment.

Overall quality of the multimedia presentation was rated positively. Nearly 90% of participants indicated that they felt the multimedia presentation was either 'good' or 'excellent', and these endorsements were also found in the participants' solicited opinions of the presentation at the end of this evaluation measure. For example, a 14-year-old female participant stated "In my opinion I think the video is a great way to showcase a youth's rights, it was very straight to the point and not at all distracting so you can actually focus to what is being said and remember it"; a 16-year-old male participant agreed by stating "The video was well made and very informative. The simplistic character design doesn't take away any attention from the main purpose. overall, well done!" There were, however, a minor group of participants who reported that they found the presentation to be of average or poor quality. Although no direct follow-up questions were asked to participants about these lower ratings, some of the opinion comments provided by these participants offered suggestions about how the presentations could have been improved. For instance, a 17-year-old female said "It was okay and it got the point across. I understood everything easily. Perhaps it would have been better if it were slightly more engaging." In any future iterations of the multimedia content, these

comments could be addressed by involving the viewer as an active (vs. passive) participant during the presentation, such as allowing the learners to control the pace of their learning to increase performance (*cf*. segmenting principle; see Mayer, 2009). One future adjustment could be the inclusion of a 'next' button(s) that requires the viewer to engage in an action (i.e., clicking a 'next' button) to move onto the next interrogation right information. Alternatively (or in addition to the prior suggestion), inserting recognition-styled quiz questions after the presentation of each interrogation right would require direct engagement from the viewer throughout the entire presentation, as compared to putting in all their engagement at the end of the presentation when answering the recall and recognition questions (see Aronson et al., 1990, 1998, for suggestions on how to promote experimental realism and engage participants in social psychological research).

The rate of speed for each multimedia element contained in the presentation (e.g., animation characters, narration audio, and captioned words) was consistently rated as average by most participants. This response rating was interpreted as a positive rating to mean that viewers were satisfied with the overall pace of each multimedia element contained within the presentation. That is, on either end of the response scale for the rate of speed questions were varying degrees of pace (e.g., extremely slow and somewhat slow vs. somewhat fast and extremely fast), that were interpreted as being a negative judgment on speed – being too slow could result in boredom and lack of attention, whereas being too fast could result in confusion and misunderstanding of the content. Granted, there was a subset of participants that indicated that the narration and animations elements were 'somewhat slow'. Further inspection of the dataset determined that these

participants were among the older cohort of youth (e.g., 16- and 17-year-olds) that formed the sample, so it makes sense that youth of these age groups were likely apt with stronger visual and verbal reasoning as compared to younger cohorts (e.g., 12- and 13-year-olds). Indeed, as one 17-year-old female put it: "The video was very good, although I found it to be somewhat slow. It's good to remember that the person watching the video is most likely not in kindergarten therefore does not need to be spoken to as if they are. Other than the speed, the video was very informative and interesting, though I may only feel that way since I was very focused on retaining the information." This anecdote response indicates that there may be some benefit of matching presentations to developmental stages (e.g., a presentation aimed at 12- to 14-year-olds vs. 15- to 17-year-olds). By tailoring aspects of the presentation (e.g., speed of narration) to the various developmental levels, perhaps better comprehension as a function of age/development could be achieved; of course, this is speculative and remains as a testable question for future research. In addition, an oversight related to the speed themed questions was the fact that no feedback was sought related to the speed of the background music. Future replications of this work should include a question asking about the speed of the background music – that is, if the background music is to be retained in newly created presentations going forward (see Mayer, 2009; *cf.* Bishop et al., 2008).

Despite the majority of participants indicating that the multimedia elements (animated characters, audio narration, captioned words, or background music) were not at all distracting, there were a few participants who rated these elements as slightly distracting. In particular, the background music received most of the criticism in this regard. Specifically, the background music was rated by some participants as being

slightly or moderately distracting, and was further reflected on in some of the additional opinion comments. For instance, one 16-year-old female participant said, “the background music can be lowered a bit, as it was a bit distracting from the voice”, while a 15-year-old female said, “The music should be toned down or like pick something else.” Others went a bit further in their review and commented that not only did they find the music distracting, but they also found it to be annoying. For example, one 16-year-old female said “…Also the music isn’t distracting just annoying…”, while another 16-year-old non-binary person stated “…The background music was annoying though, in my opinion. It was a bit loud, and seemed too upbeat for the theme of the video.” The fact that approximately one-quarter (28%) of the participants rated the background music as being distracting to some degree and/or explicitly commented on (and questioned) the use of background music in this multimedia presentation at all suggests that future content created for the purpose of comprehending interrogation rights should forego the inclusion of background music of any kind. Although division within the literature exists when it comes to the value and use of background music in multimedia presentations (Bishop et al., 2008; *cf.* Mayer, 2009), the ratings and sentiments expressed by some participants in this sample align with the argument made by Mayer (2009). That is, it appears that background music serves as an extraneous factor and further hinders (vs. helps) the learner in their process of understanding and retaining information. Moreover, while most participants (57%) reported that they paid the least amount of attention to the background music during their viewing, there still was a quarter of participants who reported putting most of their focus on the music (as compared to the other multimedia elements). Removing the background music entirely would limit the number of elements that

viewers divide their attention between, and moreover would lower the need to carrying out attentional multitasking while watching the multimedia presentation; all of which may help with increasing overall comprehension of the youth interrogation rights content.

As for the participants' ability to identify each character shown in the multimedia presentation, virtually all participants were able to carry out this task correctly. The character who was misidentified most frequently was the lawyer (i.e., the green-coloured character wearing a white starched neckband as shown in Figure 1), who was mistaken as the adult character by five participants and mistaken as the judge character by one participant; overall, misidentification of the animated characters occurred quite infrequently. This suggests that the identity of these cylinder-shaped ghost-like coloured characters was clear to the vast majority of participants. Nevertheless, adding simple modifications could be made to ensure that all characters are correctly identified at a higher rate. For example, as hinted at by a 15-year-old female participant who said that, "The characters can get a tad confusing as they are round blobs with different shades of green/blue, so I would suggest changing the character colours a little (add some warm colours, like red, orange and yellow)", the use of more distinct colours and/or a colour legend could be added to indicate which animated character represents which person within the justice system (e.g., "Green = Lawyer"). Alternatively, a small label attached to each character – similar to that of a t-shirt with a name on it – could be added into the animation so that it is crystal clear to the viewer who the characters represent during the multimedia presentation. Moreover, future studies may consider presenting the characters as single items to judge rather than in a scene. For example, in the image provided to participants for the question testing character identification, one scene was shown as an

interrogation room and the other was a courtroom. The high correct answers may have been fueled by cues available from the image scene. Removing the extra-available cues from an image scene may be a better way to test the participants' ability to correctly identify the animated characters.

The participant feedback suggested that most attention was directed toward the audio narration in the multimedia presentation, as compared to the other multimedia elements (animation, caption, background music). These findings may help explain why overall comprehension (at least in terms of open-ended responses) was low. For example, according to work by Eastwood and Snook (2009), there was a significant increase in comprehension scores of the police caution (e.g., right to silence and right to legal counsel) for participants that received the rights in written format (i.e., akin to captions), as compared to when these rights were presented in verbal format (i.e., akin to audio). In other words, comprehension scores of interrogation rights may operate as a function of delivery modality. In the current dataset, a minor group of participants indicated that their primary focus was on the caption element (akin to reading their own rights, as suggested by Eastwood & Snook, 2009), and captions was actually tied for second-most attentional focus along with animation. The tie between animation and caption for 'second' is interesting when considering findings from earlier experiments. In Experiments 1 and 2, the presentation containing animations and captions consistently emerged as the condition eliciting highest comprehension. As mentioned earlier, the removal of the background music element would lessen the elements that would be demanding attention from the participants and future studies should consider replicating this feedback experiment again using multimedia conditions that are absent of background music. Replication of this

experiment, with the aforesaid suggested changes, should also be done using a group of 'appropriate adults.' Obtaining the feedback and opinions on the multimedia presentation from potential adult supporters of the youth detainee may also yield valuable insights that could be incorporated into future iterations of the multimedia content created, and may also offer ideas for how any suggested changes could increase *adults*' comprehension of youth interrogation rights.

The average comprehension score for participants as assessed through the open-ended responding revealed that the youth participants' understanding of their interrogation rights was poor (49%). However, when assessed through recognition style questions (multiple-choice and true/false test), comprehension scores were markedly improved (89% and 93%, respectively). These comprehension trends are like that observed with the youth participants from Experiment 2. The literature is clear that police officers verify youths' understanding infrequently, and when it is checked by officers, it is done so at a very surface-level (e.g., Cooke & Philips, 1998; McCardle et al., 2020; *cf.* Snook et al., 2010, for a comparison to how understanding is verified in adult samples) without having any in-depth follow-up. Moreover, these verification-of-understanding checks neither appear to contain any fail-safe mechanisms in place to ensure the youth truly understands the rights afforded to them, nor do they probe any further when a youth may report 'yes, I understand' (when in fact, they do not). Perhaps there is a case to be made for officers to include recognition style questions when trying to check if a youth truly does understand of their interrogation rights. Given that a youths' open-ended response is the typical way police officers assess the youths' understanding of their interrogation rights (see McCardle et al., 2020) – and has been clearly shown to be a

subpar approach, as exemplified by the literature and the current research program – perhaps police interviewers might consider incorporating multiple-choice and true/false tests as a secondary way to verify comprehension. At the very least, incorporating this type of assessment (i.e., recognition questions) in addition to current verification practices (i.e., recall questions) could serve as additional data to help the officer determine the youth's understanding of their interrogation rights.

In terms of the 16 individual youth interrogation rights components, the data revealed that the right to remain silent (Component 1; 88%) and the right to talk to a lawyer (Component 2a; 87%) were the two best components recalled by youth participants – a finding consistent with the previously reported literature (e.g., Eastwood et al., 2016, reported 85% for the right to silence and 93% for the right to speak with a lawyer), as well as results from Experiment 1 (100% and 93%, respectively) and Experiment 2 (92% and 88%, respectively) in the current research program. Given the popularity and ubiquitous display of these two rights throughout popular media and entertainment that many youths (and adults) have arguably been exposed to (e.g., *Shrek 2*, *21 Jump Street*; see Nguyen, 2000; Rogers, 2008; Rogers, Rogstad, et al., 2010), it is unsurprising that this result emerged. In other words, one argument could be that these two rights might be considered common knowledge in today's youth culture. In saying that, however, the consistency of these results across three experiments (and more broadly in the research literature) may simply be emerging due to the serial position effect – the tendency to better recall information at the beginning or end of a list due to the information's particular position on the list (see Ebbinghaus, 1913). In addition to perhaps being highly familiar, the placement of the right to silence and right to talk to a lawyer at

the beginning of the script (e.g., primacy effect) may have further assisted participants' ability to recall this information from their memory during test time. That is, having more time to mentally rehearse these initial rights may have aided the participants' abilities to correctly recall this information when asked about it.

While the graphical pattern of comprehension does not adhere perfectly to a traditional learning curve as suggested by Ebbinghaus (1913; i.e., U-shaped), there appears to be (somewhat of) an upward trend in correctly recalled information for the latter interrogation rights (e.g., Components 4 and 5). Challenging this serial position effect (i.e., U-shaped learning curve) explanation, however, is the fact that there is a clear spike in the intermediate sequence position related to information about the youth's right to talk with an adult (e.g., Component 3a). While the youth interrogation rights used in this research program were broken down into 16 unique components for the purpose of coding and analyzing comprehension of said rights, the main tenets of these protective rights could simply be expressed as five 'main' rights overall. For example, the right to silence (Component 1), the right to talk to a lawyer (Component 2a), the right to talk to an adult (Component 3a), the right to have lawyer/adult present (Components 4a/4b), and the right that anything done (verbally or by action) can be used as evidence against the detainee (Components 5a/5b) are – at the most basic level – a youth's fundamental interrogation rights. Indeed, when examining how well participants recalled these specific components in their open-ended responses, these five particular components were recalled quite frequently. As an example, the comprehension score related to the right to talk to a lawyer (Component 2a) was 87% (see Table 17). The lack of in-depth comprehension, however, begins to be revealed when examining how well participants

can recall the more intricate details of each of these five main rights. Continuing with the previous example, for instance, the four additional subcomponents related to talking to a lawyer (e.g., Components 2b = 40%; 2c = 40%; 2d = 40%; and 2e = 7%) were recalled quite infrequently relative to the main component (Component 2a; see Table 17). These additional details (i.e., knowing that the lawyer could be the youths' own/personal lawyer [Component 2b] or a free lawyer [Component 2c], and that said lawyer can be obtained right now before the police talk to them [Component 2d], as well as being provided a telephone number to a lawyer [Component 2e]) are all vital pieces of information that youth detainees should know when about to be interrogated by police. However, they seem to be eclipsed by the main overarching right that they are related to – the right to talk to a lawyer (Component 2a). Thus, a simple way to explore this proposed explanation of the findings (i.e., the serial position effect) is to present the rights in a different order and examine the comprehension trends thereafter. Future studies should consider exploring what effect changing the presentation order of each component within youth interrogation rights has on overall comprehension.

Synthesizing all the data obtained from this study more broadly, the conclusions that can be drawn from this experiment is that the multimedia presentation created seems to be a good start for examining the impact and benefit of incorporating technology into the interrogation room for the purposes of help detainees understand their interrogation rights.

## Chapter 5: General Discussion

Using the principles of multimedia learning as the theoretical foundation (Mayer, 2009), coupled with the previous research findings related to interrogation rights comprehension (e.g., Eastwood & Snook, 2009), three multimedia elements (i.e., Animation, Audio, Caption) were tested to determine which element, or combination thereof, led to the highest comprehension of a youth interrogation rights multimedia presentation. Across Experiment 1 (adult sample) and Experiment 2 (youth sample), it was found that the Animation and Caption multimedia presentation rendered the highest comprehension scores relative to the other multimedia combinations for both experimental samples. These findings suggest that presenting youth interrogation rights in a format that involves watching the procedural actions of the youth interrogation rights being acted out, while also reading information pertaining to these rights, can help increase adults' and youths' overall comprehension of these rights. This finding supports the premise of the multimedia principle as outlined by Mayer (2009). However, for adults (Experiment 1), the Caption multimedia presentation tended to generate the second-best comprehension score, whereas the Audio and Caption multimedia presentation emerged as producing the second-best comprehension score for youth (Experiment 2). Despite this slight difference, it is important to note that the overall scoring difference observed here between the best and the 'runner-up' multimedia presentations in both samples is negligible; the scores differed by approximately one percent for both samples.

Apart from the Animation and No Multimedia conditions, the comprehension levels among the top six multimedia presentation conditions in Experiments 1 and 2 were similar (on average, 64% and 44% for adults and youth, respectively) – and this was

consistent across all comprehension measures. Notably, the estimated levels of comprehension found in these experiments is below those achieved in previous studies. For example, Eastwood and Snook (2012) were able to achieve average comprehension levels of 73% for adults when learning adult legal rights, whereas Eastwood et al. (2016) were able to achieve average comprehension levels of 81% for youth when learning youth legal rights. It might be the case that the estimated levels of comprehension found here are lower than previous research findings because of the natural variations that occur when using a different experimental paradigm (e.g., in person vs. online testing). Alternatively, there may also be a ceiling effect, whereby the results are due to tension with some of the other multimedia learning principles. For example, although background music was controlled for across all conditions, the coherence principle of multimedia learning suggests that the use of background music may have acted as a distraction for the participants. More specifically, the music may have acted as a "seductive detail" (Mayer, 2009, p. 97) and served as a piece of extraneous material that hindered – rather than helped – the learner. In fact, some participants in Experiments 1 and 2 commented on this in the additional comments section of the surveys. Specifically, as one participant put it, they thought the background music seemed to be "a bit weird and oddly placed." It may also be the case the participants' lack of control to learn the material at their own pace may have played a hindering role as well (i.e., a reading/learning speed was forced onto participants due to the parameters of the multimedia presentations, e.g., all presentations being 2 minutes 15 seconds, with the interrogation rights scripted voiced at 122.9 words per minute).

In contrast to what would be expected by Mayer's (2009) multimedia principles – that is, dual channel processing leads to higher comprehension – data from Experiments 1 and 2 showed that the single channel processing of the Caption-only and Audio-only conditions led to similar levels of comprehension for both samples. Although speculative, it may be the case that multimedia learning principles does not lend itself as well to helping people understand legal material as it does with other types of content, such as cause-and-effect or "scientific explanations" (see e.g., Mayer et al., 1996, p. 64). Furthermore, given the nature of online research, there was no control over the environment where participants completed the experiment (e.g., distractions may have been present). It is also possible that high comprehension scores in these conditions (and observed ceiling effect across many other conditions) were observed due to the simplified nature of the youth interrogation rights script used in this research program (see Eastwood et al., 2016); using a simplified version of the interrogation rights may have led to increased comprehension of interrogation rights scores across conditions (aside from the Animation and No Multimedia conditions) for the participants in Experiments 1 and 2. Perhaps the differences between the experimental multimedia conditions might have been more pronounced if a standard police caution script of youth interrogation rights had been used; a notion that should be tested in future studies.

To explore whether the background music or any other features of the multimedia presentations unduly influenced the findings from Experiments 1 and 2, Experiment 3 was carried out as an exploratory analysis to collect such feedback from participants. Generally, youth participants in this sample categorized the quality of the multimedia presentation positively (i.e., stating it was 'good' or 'excellent'), indicated that speed of

each multimedia element was appropriate, found each of the multimedia elements to be largely ‘not distracting at all’, and were able to correctly identify each of the five characters shown throughout the presentation. To my knowledge, this program of research is the first attempt of its kind to create a multimedia presentation for the purpose of helping youth better understand their interrogation rights. Notwithstanding the facts that this experimental work represents a preliminary exploration of using such a novel approach for administering interrogation rights and that more research certainly needs to be done, the findings from Experiment 3 were encouraging given that they suggest the initial goals of creating content that was simple, focused, and of high quality were met.

A consistent – and interesting – finding across all three experiments was that comprehension scores were markedly much higher for the youth interrogation rights when participants were tested via multiple-choice or true/false questions, as compared to scores found through open-ended recall responses. Specifically, when assessed through a true/false test, comprehension was determined to be high with scores of 94%, 91%, and 93% for participants in Experiments 1 (adults), 2 (youth), and 3 (youth), respectively. Similarly, when assessed through a multiple-choice test, comprehension scores across all three experiments were found to be 89%, 83%, and 89%, respectively. Comparatively, comprehension scores as assessed through open-ended responses were concerningly low (54%, 36%, and 49%, respectively), and, in fact, were much lower than what has been found in previous research studies that modified the presentation of interrogation rights (e.g., Davis et al., 2011; Eastwood et al., 2016; Snook et al., 2016). Given the cues associated with the questions on the recognition tests (i.e., the correct answer is embedded within the available response options), it is unsurprising that these scores on the multiple-

choice and true/false tests were much higher than the scores obtained on the open-ended response tests (i.e., where no cues are provided in the available answers). In reality, however, if police check on the appropriate adult's or youth's comprehension of youth interrogation rights, they will *not* verify the detainee's (or their support person's) knowledge and understanding through a multiple-choice or true/false questionnaire test. Rather, the police will likely ask for the youth detainee and/or the accompanying appropriate adult to explain the meaning of the presented rights back to them. In other words, the interviewing officer's assessment of the interviewees' interrogation rights understanding (if done at all) is more akin to the open-ended recall test used in the present experiments. Thus, an approach that police interviewers may wish to consider going forward is to explore and verify the detainee's understanding of their rights in ways different from asking them directly. At the very least, including some type of test akin to a multiple-choice and/or true/false test could help officers (and lawyers during the court process) decide if the arrestee did have a strong comprehension of the rights afforded to them during the police interview, as per the requirements of case law rulings (e.g., *R. v. L.T.H.*, 2008).

Unsurprisingly, and aligning with previous research (e.g., Cooke & Philip, 1998; Eastwood & Snook, 2009; Fenner et al., 2002), the results across all experiments suggest that confidence is not a reliable indicator of comprehension. Regardless of the test administered, across all experiments, a low relationship between confidence and comprehension was found. Admittedly, participants in Experiment 1 were not asked how confident they were in their answers to the open-ended questions about what they learned in the multimedia presentations. In retrospect, this was an oversight to not include

confidence ratings with these questions. However, this was rectified in Experiments 2 and 3, and a low relationship between confidence and comprehension for the open-ended recall test was still found.

**Practical Implications and Knowledge Dissemination**

More research is needed before any practical changes or implications can be put into practice. Available data suggests that police officers are inconsistent with how the delivery of rights are presented to youth and how well the youth's understanding of their rights is verified (e.g., Cleary & Vidal, 2016; McCardle et al., 2020; Sim & Lamb, 2018). Given these diverse practices, it leads to concerns about how fully informed detainees are about the rights available to them. In the case of youth detainees who may rely on an appropriate adult for support in this manner, research has demonstrated that adults not only struggle to understand their own rights (e.g., Chaulk et al., 2014; Fenner et al., 2002; Rogers et al., 2007, 2008), but also fail to fully comprehend youth interrogation rights (e.g., Cavanagh & Cauffman, 2017; Cleary & Warner, 2017; Drodge, 2018; Eastwood et al., 2015; Woolard et al., 2008). Thus, incorporating the use of a multimedia presentation as the mode of delivery for interrogation rights certainly has the potential to help alleviate these types of concerns by bringing a more standardized approach.

In addition – and semi-related to the concerns about the (in)consistency of how interrogation rights are delivered and verified for comprehension – having a mechanism in place that accurately and consistently presents interrogation rights information to a detainee will help ensure that all stakeholder parties involved are protected appropriately. For instance, by removing the police officer from the task of verbally presenting interrogation rights to detainees not only safeguards against any indirect mistakes

(innocent or otherwise) that could be made on part of the officer (e.g., incorrectly articulating the rights or missing some rights altogether), but it also can help lend itself toward limiting any social dynamic challenges that are associated to police interviews. It is well established that authority figures (such as police officers) can render undue duress to subordinates (such as detainees). Milgram's (1963) study of obedience provided one of the first glimpses into how an authority person (i.e., an experimenter) can influence the behaviour of a subordinate (i.e., a participant). Removing an 'authority' person (i.e., the police officer) from the purview of a detainee and replacing with a multimedia presentation may prevent any undue outcomes related to social influence, and assist with ensuring that all required interrogation rights information – as outlined by legislation and case law (*R. v. Brydges*, 1990; *R. v. Hebert*, 1990; *R. v. Liew*, 1999; *R. v. L.T.H.*, 2008; *R. v. Singh*, 2007; *YCJA*, 2002) – is presented correctly and in its entirety to police detainees. However, it is important to underscore again that any such changes of implementing multimedia technology into the interrogation room – and potentially replacing the officer administering the interrogation rights – would require the support and buy-in from legislators, courts, and police agencies, as well.

To my knowledge, this body of work is the first of its kind to examine a new multimedia-based method for presenting youth interrogation rights to youth and appropriate adults – at least in Canada. There appears to be some not-for-profit organizations in the United Kingdom (see e.g., National Appropriate Adult Network, 2022) and New Zealand (see e.g., Talking Trouble Aotearoa New Zealand [TTANZ], 2022) that serve as advocacy and support groups whose missional goal is to assist youth and appropriate adults by providing important information related to the criminal justice

processes. As an example, following a report carried out by Point Research and TTANZ (see Metzger et al., 2018) that examined the experiences of young people who had (negative) interactions with the justice system in New Zealand, the verbatim comments from 13 youth and whānau interviewees were adapted into animation images and videos. Granted, the creation of these multimedia resources was not for the purpose of assisting youth/appropriate adults with their comprehension of youth interrogation rights, per se, but rather were made to communicate information about common misunderstandings that youth experience when interacting with the police and justice system more broadly (see TTANZ, 2022; see also Metzger et al., 2018). According to one representative of the TTANZ group, there appears to be substantial interest in implementing some of the methodology and findings from my current program of research (e.g., use of captions in animated videos) into their efforts for helping to clarify interrogation rights to young people in their country (S. Kedge, personal communication, September 5, 2021). Data garnered from this line of research has been shared widely with the academic community (see Dissemination section, p. vi), and should also be shared with criminal justice practitioners and agencies, as well as with youth justice advocacy organizations (e.g., the Center on Wrongful Convictions of Youth; see Northwestern University, 2020) to help contribute cutting edge knowledge toward policy reform in police interrogations of youth. With that stated, however, the loftiness of these type of goals and partnership potentials need to be tempered by the fact that more work is needed before we are at the stage of implementing such changes into the interrogation room.

**Experimental Limitations**

The findings reported in this body of work need to be considered in terms of some important limitations. First, the main dependent measures assessing comprehension have concerns of construct validity. That is, memory recall and recognition tests were used to evaluate participants' level of understanding. Despite previous research using similar measures (e.g., Davis et al., 2011; Eastwood & Snook, 2012; Eastwood et al., 2010, 2016; Freedman et al., 2014), memory and comprehension are related, but distinguishable concepts. However, some would argue that in order to be able to initially comprehend some form of learned information, one would need to retrieve the said information from their memory in order to process it (for an informative review of comprehension and memory, see Harris et al., 2006). Nevertheless, different measures of learning that better capture understanding (e.g., knowledge transfer; see Mayer, 2009) may need to be incorporated into future studies. In addition to the dependent measure concerns, caution should also be considered in terms of how the participants' open-ended comprehension scores were determined. The coding guide and content dictionary used here was created for the purpose of being able to compare among different experimental conditions, but given that this scoring system was author-constructed, it is not a standardized test. In short, this scoring system may not have captured participants' understanding of their rights accurately – at least from an open-ended response point of view. Contrasting the recall (open-ended response) and recognition (multiple-choice, true/false) comprehension scores across all three experiments clearly shows that there was a drastic difference in participants' apparent level of understanding of the youth interrogation rights content; moreover, this leads to questions about how one should interpret the variance in scores as

a function of test type (i.e., recall vs. recognition). Notwithstanding the known differences between recall and recognition memory tasks (i.e., recall requires greater cognitive effort than recognition; see Danckert & Craik, 2013; *cf.* Tulving & Thomson, 1973), the distinct difference in recall versus recognition scores may have been fueled, in part, by the fact that the recall scoring system was broken down into 16 different components contained within the youth interrogation rights script (i.e., 16 possible points; see Appendix C). Comparatively, the number of components used in some other legal rights comprehension research that utilized a similar coding scheme and point system (e.g., Eastwood & Snook, 2009, 2012; Eastwood et al., 2010 [Study 2], 2016) has ranged from six (Eastwood et al., 2016) to 10 components (Eastwood & Snook, 2009). The only exception to this is the work by Eastwood et al. (2015, Study 2), in which the researchers utilized a 26-component point system to evaluate youths' understanding of a youth waiver form; youth in their study demonstrated concerningly low levels of understanding (on average, 40%), but it should be noted that the youth wavier form used was of medium complexity. In the case of the Eastwood et al. (2016) study, in which a simplified version of a youth interrogations rights script was used (i.e., the same one used in the current research program), youths' comprehension scores were found to be, on average, around 80%. Replication of the current research should perhaps consider using the 6-component scoring system employed by Eastwood et al. (2016) to explore if this approach yields higher recall comprehension scores.

Second, although conducting research on the internet has become a standard approach for many psychological and behavioural studies in the social sciences, there are still some concerns that have been identified with collecting data online. For instance, one

issue is that online convenience samples may not be generalizable to the population due to these samples being WEIRD – White, Educated, Industrialized, Rich, and Democratic (Henrich et al., 2010). Conducting research studies online has the potential to limit accessibility to certain populations (e.g., non-White, less educated) and may result in an overrepresentation of certain groups (i.e., participants with WEIRD characteristics). Indeed, as the demographic data from my three experimental samples show, the results found here are (at best) only representative of highly educated Caucasian's living in the Province of Ontario who are motivated to participate in online studies. Further to the limitation about participants, is the fact that none of the participants' data that was retained for analyses included people with intellectual or learning disabilities. Granted, the decision to apply this as an exclusion criterion (along with other exclusion criteria, such as requiring English as a first language) was to maintain as much experimental control and similarity between participants across experiments. Despite this, it cannot be ignored that persons (especially youth) with intellectual or learning disabilities who are involved with the justice system are an important and vulnerable group that needs to be protected, and especially so when it comes to understanding their interrogation rights. Fortunately, some research has been conducted in this area (e.g., Lieser et al., 2019; see Rost & McGregor, 2012, for research related to adults with intellectual disabilities and legal rights comprehension), but more work needs to be done. It should go without saying, but populations who are marginalized and/or have individual limitations should be considered in future studies testing the value of utilizing a multimedia presentation of youth interrogation rights in the police interview room.

Thirdly, another related issue with respect to using online samples pertains to how the data and comprehension responses were collected from participants. In contrast to the reality of a typical police interrogation where information is collected *verbally* from detainees, my experiments collected participants' information *in written format*. That is, participants were required to type/click their answers into response boxes/options. Thus, the quality of the information provided by writing out their answers may have been impacted by the individuals' typing and spelling abilities, or due to fatigue effects of having to take the time to write out their answers (see Porter, 2004). A further concern with online testing is related to the study environment. Despite efforts made to maintain some level of control in terms of the participants' study environment (e.g., asked to wear headphones, asked to complete the study in a distraction-free environment), there is no way to confirm under what specific environmental conditions the participants completed these experiments. Even with explicit request for participants to follow the experimental instructions closely, evidence from some of the open-ended response questions at the end of the survey questionnaire indicate that distractions were present in some cases. As an example, when asked if any errors, problems, or distractions were encountered, a participant in Experiment 1 commented "Yes, just as was first starting the study, my adult son had burnt his hand. I closed the webpage and when I got back I was able to start again from the beginning."; this particular participant was removed from the dataset prior to analyses since their comment suggested they were distracted during data collection. To be clear, any time a recruited participant indicated any sort of distraction or having encountered some other problem during any of the experiments (e.g., technical issues), they were removed from the initial dataset as per the exclusion criteria. With that said,

however, there were numerous respondents that left these open-ended feedback responses blank. While it may be tempting to assume that a blank response to questions asking about the participants' study experience indicates that no problems and/or distractions were encountered, we simply cannot be completely certain of this since participants were free to choose which questions they preferred to answer. Despite the nuisances associated with online data collection approaches, there are documented benefits of crowdsourcing platforms for data quality (e.g., an effective means of obtaining reliable data; see Palan & Schitter, 2018; Peer et al., 2017), and increasing the ability to obtain a sample of people beyond a local homogenous group (e.g., a cross-Canadian sample) – which in the present research program, lent itself as a methodological strength for these experiments and yielded adequate sample sizes. Future studies, nonetheless, should consider replicating this work in the laboratory setting and conducting verbal interviews with participants to combat the aforesaid concerns.

Fourth, in terms of the learning principles associated with the cognitive theory of multimedia learning (Mayer, 2009), a variety of other learning principles were not used during the initial creation of the stimuli content; that is, given that the literature suggested the multimedia principle was the most robust principle for multimedia learning, this principle was of primary focus during the creation of the research stimuli used in the current research program. However, other multimedia learning principles remain to be explicitly tested or incorporated more fully into the stimuli content created for the purpose of this line of research. There are at least three other multimedia learning principles as outlined by Mayer (2009) that could be implemented into future versions of the multimedia content created for these experiments. First, the segmenting principle

outlines that when a learner is directly involved in the learning process and is granted some degree of control over the pace of the learning, then the learner will retain and understand more information, as compared to when learner control is unavailable. For instance, allowing viewers to watch the content multiple times (as opposed to forcing a one-time viewing, as was done in the current research program), breaking up the content into shorter segments (such as showing each right one at a time), and/or forcing the viewer to indicate when they are ready to move on to the subsequent material (e.g., clicking a 'next' button), might further strengthen a viewer's ability to better comprehend the interrogation rights content shown here. Second, the signaling principle suggests that when attention is drawn toward important or essential content cues, then the learner will retain and understand more information, as compared to when signaling cues are unavailable. Given the fact that several interrogation right components were remembered infrequently by participants (e.g., recalling that a telephone number to a lawyer could be provided; Component 2e), incorporating the signaling principle may help viewers better recall – and comprehend – information that was consistently and seemingly forgotten at test time. For example, the words "you can have the telephone number for a lawyer" could be underlined or highlighted in the caption conditions, or verbally emphasized by the narrator in the audio conditions. Moreover, the images of the telephones shown in the animation condition could be highlighted through circling or having arrows pointing at the telephones to emphasize this particular component of the youth interrogation rights. Adding some simple signaling cues into the content might lend itself toward improving comprehension for the youth interrogation rights components identified as being remembered seldomly. Third, the pre-training principle explains that if users are privy to

some key concepts or characteristics that will be included within the multimedia presentation *prior* to viewing the content, then this insider knowledge may help strengthen the viewer's comprehension of the material being shown, as compared to when pre-training opportunities are unavailable. For example, before being shown a multimedia presentation containing youth interrogation rights, viewers could be alerted to the fact that five rights will be explained to them. Viewers could also be presented with a legend that explains who each of the characters are in the presentation (e.g., indicating that the green character with the white neckband is the lawyer; the yellow character with the hat is the police officer). Doing so would reduce the likelihood that participants would need to dedicate some cognitive resources toward figuring out whose-who on the fly while viewing the multimedia presentation. While data from Experiment 3 suggests that most participants identified the characters correctly, there were a small number of participants that appeared to confuse the animated characters with one another. Removing any potential pitfalls for the viewer may assist them in achieving a higher comprehension score on the material (i.e., dedicate their limited cognitive resources toward understanding the content, as compared to trying to decipher which character is representative of whom). Mayer and colleagues have demonstrated the effect of incorporating these additional learning principles on multimedia learning outcomes, and any future iterations to the multimedia content created here for the purpose of this research program should consider the addition of these particular multimedia learning principles (see Mayer & Chandler, 2001; Mayer et al., 2003, for research pertaining to the segmenting principle; see Harp & Mayer, 1998; Mautone & Mayer, 2001; Stull & Mayer, 2007, for research

pertaining to the signaling principle; see Mayer, Mathias, & Wetzell, 2002; Mayer, Mautone, & Prothero, 2002, for research pertaining to the pre-training principle).

**Future Directions**

Notwithstanding the experimental shortcomings outlined above, there continues to be ripe, new areas within the realm of interrogation rights comprehension research that should be considered by future researchers. Future studies should examine how the findings reported here may be impacted under more ecologically valid settings, and with individuals of various backgrounds and limitations (e.g., Indigenous populations; persons with intellectual and/or learning disabilities). For example, it is well documented that various human conditions and states, such as having an intellectual disability (e.g., O'Connell et al., 2005), a mental health disorder (e.g., Cooper & Zapf, 2008), or experiencing stress (e.g., Rogers, Gillard, et al., 2010; Scheer & Madon, 2012) can negatively affect a person's ability to understand and recall information related to their interrogation rights. It remains to be seen, however, what effect presenting a detainee their interrogation rights vis-à-vis a multimedia presentation might have on their comprehension when they are experiencing real-world situational conditions, such as stress – an emotional state common in police detainees given the potential for negative consequences related to a police interrogation (e.g., going to jail).

While the overarching goal with this work was related to examining a novel way to improve comprehension of interrogation rights content, another important line of research that should be considered is assessing adults' and youths' appreciation and understanding of the significances related to *waiving* their rights. Understanding the meaning of the specific content outlined in an interrogation rights wavier form or

presentation is certainly valuable to maximize safeguards for detainees, but being fully cognizant of the type of consequences that may occur by waiving these rights (e.g., being subjected to a coercive interrogation, incriminating oneself) is equally – if not more – important protective information, as well. As research has demonstrated, detainees will waive their rights frequently (Leo, 1996; Leo & White, 1999; Rogers, 2008), whereas other research has suggested that detainee's decision to waive their rights is a function of guilt versus innocence (e.g., Kassin & Norwick, 2004). In both cases, it seems that impression management is at the heart of the detainee's strategy for waiving their rights, with guilty people assuming that they will look suspicious if they invoke their rights, whereas innocent people assume that their honesty and willingness to cooperate with police questioning will protect them. Unfortunately, there are numerous wrongful convictions cases across Canada and the United States that suggest the latter approach is not as protective as one may think it is (see Innocence Canada, 2022; Innocence Project, 2022). Nonetheless, further research related to people's understanding of waiving their rights is certainly needed.

Presenting youth interrogations rights in the form of multimedia represents a novel attempt at trying to explore solutions for improving youth detainees' (and appropriate adults') understanding of these rights. Another angle future researchers may consider incorporating is examining whether having the detainees repeat aloud each of the rights after they are presented – a concept referred to as the production effect by some cognitive psychologists (see MacLeod et al., 2010). In brief, the notion of the production effect suggests that an individual's memory of recently learned information is enhanced when that information is produced in some way by the individual (e.g., written or

spoken), as compared to when no production is made (e.g., reading information silently; MacLeod & Bodner, 2017). Thus, it would be interesting to explore if interrogation rights comprehension scores as obtained through a multimedia presentation could be increased by having viewers of the presentation produce the information in some capacity in real time. Essentially, this approach would combine the multimedia principle (and/or other principles of multimedia learning; Mayer, 2009) with the production effect (MacLeod et al., 2010) to explore if comprehension of youth interrogation rights could be increased beyond levels found here.

**Concluding Thoughts**

Technology is continually being embraced to improve all areas of day-to-day life and work, including within the criminal justice system (e.g., police body cameras; Blaskovits & Bennell, 2019; jury decision-making; Errickson et al., 2020). One consequential area that has escaped an infusion of technology (but would be beneficial to both the police and adult/youth detainees) has been the delivery of interrogation rights. Comprehension of interrogation rights has been studied for over four decades, and yet despite attempts to change the presentation of these rights to improve overall understanding of the rights afforded to police detainees (e.g., Eastwood & Snook, 2012; Eastwood et al., 2016), the general conclusion from the interrogation rights comprehension literature is that people – both adults and youths – do not fully understand the rights afforded to them, or know how to apply their rights when they find themselves in police interview settings. Moreover, data across jurisdictions also demonstrate that police sometimes struggle to administer these rights fully and completely (e.g., McCardle et al., 2020; Sim & Lamb, 2018), and in some cases make no attempt to verify the

detainee's level of comprehension (e.g., Cleary & Vidal, 2016). Youth are a particularly vulnerable population when it comes to interacting with the police, and consequently need extra protections. It seems that governing bodies globally (at least in Canada, the United States, and the United Kingdom) recognize that more protections for justice-involved youth are needed, as evidenced by changes in legislation (e.g., King, 2006; *Police and Criminal Evidence Act*, 1984; *YCJA*, 2002) to incorporate the option of allowing a youth to be accompanied by an appropriate adult during a police interview. Despite these political changes being a step in the right direction, the ability of appropriate adults to truly serve as additional safeguards for youth are only as protective to the degree in which appropriate adults *understand* the youth interrogation rights. This research program has taken the first step toward using multimedia learning principles to improve comprehension and learning of youth interrogation rights. My hope in trying to pioneer a new line of research involving learning technologies to help facilitate increased comprehension only scratches the surface of the remaining work that needs to be done in this area. It is anticipated that the continued exploration of multimedia learning principles within this domain will lead to improvements in comprehension, and more broadly, help ensure that youth are fully equipped to make informed decisions when facing a police interrogation.

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## Tables

**Table 1**

*12 Principles of Multimedia Learning (Mayer, 2009)*

| Principles thought to minimize extraneous processing | |
|---|---|
| Coherence | People learn better when extraneous material is excluded rather than included. (p. 89) |
| Signaling | People learn better when cues that highlight the organization of the essential material are added. (p. 108) |
| Redundancy | People learn better from graphics and narration than some graphics, narration, and printed text. (p. 118) |
| Spatial Contiguity | People learn better when matching words and pictures are presented near rather than far from each other on the screen. (p. 135) |
| Temporal Contiguity | People learn better when matching words and pictures are presented simultaneously rather than successively. (p. 153) |
| Principles thought to manage essential processing | |
| Segmenting | People learn better when a multimedia message is presented in user-paced segments rather than as a continuous unit. (p. 175) |

| | |
|---|---|
| Pre-Training | People learn better from a multimedia message when they know the names and characteristics of the main concepts. (p. 189) |
| Modality | People learn better from pictures and spoken words than from pictures and printed words. (p. 200) |
| Principles thought to maximize generative processing | |
| Multimedia | People learn better from words and pictures than from words alone. (p. 223) |
| Personalization | People learn better from multimedia presentations when words are in conversational style rather than formal style. (p. 242) |
| Voice | People learn better when narration is spoken in a human voice rather than in a machine voice. (p. 242) |
| Image | People do not necessarily learn better when the speaker's image is added to the screen. (p. 242) |

**Table 2**

*A Summary of Demographic Variables for Participants (N = 207) from Experiment 1*

| Demographic Variable | Percentage |
|---|---|
| Gender | |
| Female (*n* = 105) | 50.7% |
| Male (*n* = 101) | 48.8% |
| Other (*n* = 1) | 0.5% |
| Ethnicity | |
| White/Caucasian (*n* = 154) | 74.4% |
| Asian (*n* = 37) | 17.9% |
| Other (*n* = 6) | 2.9% |
| Black/African (*n* = 5) | 2.4% |
| Indigenous/Aboriginal (*n* = 2) | 1.0% |
| Hispanic/Latino (*n* = 2) | 1.0% |
| Middle Eastern (*n* = 1) | 0.5% |
| Highest Level of Education | |
| Bachelor's Degree (e.g., BA, BSc) (*n* = 84) | 40.6% |
| Some University (*n* = 32) | 15.5% |
| Graduate Degree (e.g., MSc) (*n* = 27) | 13.0% |
| Diploma/Certificate (*n* = 27) | 13.0% |
| High School Graduate (*n* = 26) | 12.6% |
| Doctoral Degree (e.g., PhD) (*n* = 4) | 1.9% |
| Other (*n* = 3) | 1.4% |
| Some High School (*n* = 2) | 1.0% |
| No High School (*n* = 1) | 0.5% |
| Not Reported (*n* = 1) | 0.5% |

| | |
|---|---|
| Citizenship | |
| Canadian (*n* = 194) | 93.7% |
| Other (*n* = 13) | 6.3% |
| Province/Territory of Residence | |
| Ontario (*n* = 94) | 45.4% |
| British Columbia (*n* = 29) | 14.0% |
| Alberta (*n* = 25) | 12.1% |
| Nova Scotia (*n* = 11) | 5.3% |
| Does not currently reside in Canada (*n* = 11) | 5.3% |
| Manitoba (*n* = 10) | 4.8% |
| Saskatchewan (*n* = 8) | 3.9% |
| Newfoundland and Labrador (*n* = 7) | 3.4% |
| Quebec (*n* = 5) | 2.4% |
| New Brunswick (*n* = 5) | 2.4% |
| Prince Edward Island (*n* = 1) | 0.5% |
| Yukon (*n* = 1) | 0.5% |
| Northwest Territories (*n* = 0) | 0.0% |
| Nunavut (*n* = 0) | 0.0% |

**Table 3**

*Difference in Magnitude (Effect Size expressed as Cohen's d with 95% CIs) for Recall Scores from Open-Ended Responses Across the Eight Conditions (Experiment 1; N = 207 Adults)*

| Condition | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Animation + Audio + Caption | - | - | - | - | - | - | - |
| 2. Animation + Audio | -0.07 [-0.61, 0.46] | - | - | - | - | - | - |
| 3. Animation + Caption | 0.27 [-0.28, 0.81] | 0.31 [-0.24, 0.86] | - | - | - | - | - |
| 4. Animation | -1.39 [-2.00, -0.78] | -1.19 [-1.78, -0.59] | -1.72 [-2.37, -1.06] | - | - | - | - |
| 5. Audio + Caption | 0.13 [-0.41, 0.66] | 0.19 [-0.35, 0.72] | -0.13 [-0.67, 0.42] | 1.51 [0.88, 2.12] | - | - | - |
| 6. Audio | 0.05 [-0.50, 0.59] | 0.12 [-0.43, 0.66] | -0.22 [-0.77, 0.34] | 1.43 [0.80, 2.05] | -0.08 [-0.63, 0.46] | - | - |
| 7. Caption | 0.22 [-0.32, 0.76] | 0.28 [-0.27, 0.81] | -0.07 [-0.62, 0.48] | 1.77 [1.11, 2.41] | 0.07 [-0.47, 0.61] | 0.17 [-0.38, 0.72] | - |
| 8. No Multimedia | -2.41 [-3.11, -1.68] | -2.04 [-2.71, -1.36] | -2.88 [-3.67, -2.07] | -0.78 [-1.35, -0.21] | -2.52 [-3.24, -1.78] | -2.45 [-3.18, -1.70] | -3.03 [-3.84, -2.21] |

*Note.* Direction of comparison is Column – Row.

**Table 4**

*Percentage of Each of the 16 Youth Interrogation Rights Components Recalled in the Open-Ended Response Across the Eight Conditions in Experiment 1 (N = 207)*

| Condition | Youth Legal Right Component | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2a | 2b | 2c | 2d | 2e | 3a | 3b | 3c | 3d | 3e | 4a | 4b | 4c | 5a | 5b |
| Animation + Audio + Caption | 27 | 25 | 16 | 20 | 14 | 9 | 23 | 10 | 4 | 7 | 13 | 21 | 25 | 18 | 27 | 8 |
| (*n* = 27) | (100%) | (93%) | (59%) | (74%) | (52%) | (33%) | (85%) | (37%) | (15%) | (26%) | (48%) | (78%) | (93%) | (67%) | (100%) | (30%) |
| Animation + Audio | 25 | 23 | 15 | 18 | 17 | 7 | 22 | 11 | 5 | 7 | 14 | 21 | 24 | 17 | 22 | 12 |
| (*n* = 27) | (93%) | (85%) | (56%) | (67%) | (63%) | (26%) | (82%) | (41%) | (19%) | (26%) | (52%) | (78%) | (89%) | (63%) | (82%) | (44%) |
| Animation + Caption | 25 | 25 | 19 | 19 | 9 | 7 | 22 | 11 | 7 | 11 | 7 | 23 | 23 | 18 | 24 | 17 |
| (*n* = 25) | (100%) | (100%) | (76%) | (76%) | (36%) | (28%) | (88%) | (44%) | (28%) | (44%) | (28%) | (92%) | (92%) | (72%) | (96%) | (68%) |
| Animation | 10 | 19 | 2 | 4 | 5 | 2 | 18 | 12 | 2 | 3 | 4 | 13 | 15 | 11 | 8 | 3 |
| (*n* = 25) | (40%) | (76%) | (8%) | (16%) | (20%) | (8%) | (72%) | (48%) | (8%) | (12%) | (16%) | (52%) | (60%) | (44%) | (32%) | (12%) |
| Audio + Caption | 25 | 26 | 16 | 21 | 16 | 10 | 23 | 10 | 7 | 10 | 12 | 22 | 22 | 19 | 24 | 15 |
| (*n* = 27) | (93%) | (96%) | (59%) | (78%) | (59%) | (37%) | (85%) | (37%) | (26%) | (37%) | (44%) | (82%) | (82%) | (70%) | (89%) | (56%) |
| Audio | 23 | 25 | 17 | 19 | 17 | 8 | 20 | 5 | 5 | 11 | 14 | 16 | 20 | 16 | 24 | 11 |
| (*n* = 25) | (92%) | (100%) | (68%) | (76%) | (68%) | (32%) | (80%) | (20%) | (20%) | (44%) | (56%) | (64%) | (80%) | (64%) | (96%) | (44%) |
| Caption | 24 | 25 | 19 | 24 | 10 | 11 | 21 | 8 | 5 | 9 | 10 | 23 | 25 | 20 | 25 | 14 |
| (*n* = 26) | (92%) | (96%) | (73%) | (92%) | (39%) | (42%) | (81%) | (31%) | (19%) | (35%) | (39%) | (89%) | (96%) | (77%) | (96%) | (54%) |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No Multimedia | 11 | 12 | 1 | 4 | 1 | 0 | 6 | 6 | 0 | 2 | 1 | 3 | 11 | 8 | 3 | 0 |
| (*n* = 25) | (44%) | (48%) | (4%) | (16%) | (4%) | (0%) | (24%) | (24%) | (0%) | (8%) | (4%) | (12%) | (44%) | (32%) | (12%) | (0%) |
| Overall | 170 | 180 | 105 | 129 | 89 | 56 | 155 | 73 | 35 | 60 | 75 | 142 | 165 | 127 | 157 | 79 |
| (*n* = 207) | (82%) | (87%) | (51%) | (62%) | (43%) | (27%) | (75%) | (35%) | (17%) | (29%) | (36%) | (69%) | (80%) | (61%) | (76%) | (39%) |

*Note.* Component 1 refers to the right that a *youth does not have to talk to the police officer*; 2a refers to the right that a *youth can talk to a lawyer*; 2b refers to the fact that the lawyer can be the youth's *own/personal lawyer*; 2c refers to the fact that the lawyer can be a *free lawyer*; 2d refers to the fact that access to a lawyer can be obtained *right now/before the police officer asks the youth any questions*; 2e refers to fact that *youth can have the telephone number for a lawyer*; 3a refers to the right that a *youth can talk to an adult*; 3b refers to the fact that the adult can be the youth's *parent*; 3c refers to the fact that the adult can be a *relative*; 3d refers to the fact that the adult can be *any other appropriate adult*; 3e refers to the fact that access to an adult can be obtained *right now/before the police officer asks the youth any questions*; 4a refers to the right that *a youth can have a lawyer with them*; 4b refers to the right that a *youth can have an adult with them*; 4c refers to the fact that the youth can have the lawyer and/or adult with them *when the police officer asks the youth questions*; 5a refers to the fact that *anything the youth says can be used as evidence against them in court*; 5b refers to the fact that *anything the youth does can be used as evidence against them in court.*

**Table 5**

*Mean Percentage Comprehension Scores for Recognition Scores from Multiple-Choice and True/False Test Responses Across Eight Condition (N = 207) in Experiment 1*

| Condition | Multiple-Choice Test | True/False Test |
|---|---|---|
| Animation + Audio + Caption | 91.11 (11.54) | 96.30 (6.89) |
| | [86.54, 95.68] | [93.57, 99.02] |
| Animation + Audio | 93.33 (12.40) | 97.12 (5.84) |
| | [88.43, 98.24] | [94.81, 99.43] |
| Animation + Caption | 96.80 (7.48) | 98.22 (6.15) |
| | [93.71, 99.89] | [95.68, 100.00] |
| Animation | 81.60 (17.24) | 88.00 (13.95) |
| | [74.48, 88.72] | [82.24, 93.76] |
| Audio + Caption | 88.89 (13.96) | 96.71 (8.04) |
| | [83.37, 94.41] | [93.53, 99.89] |
| Audio | 92.00 (12.91) | 94.67 (12.47) |
| | [86.67, 97.33] | [89.52, 99.82] |
| Caption | 93.85 (10.98) | 97.44 (5.72) |
| | [89.41, 95.13] | [95.13, 99.74] |
| No Multimedia | 69.60 (20.10) | 85.78 (13.04) |
| | [61.30, 77.90] | [80.40, 91.16] |

*Note.* The Standard Deviations are contained within the round brackets, while the 95% Confidence Intervals are contained within square brackets.

**Table 6**

*Difference in Magnitude (Effect Size expressed as Cohen's d with 95% CIs) for Recognition Scores from Multiple-Choice Test Responses Across Eight Conditions (Experiment 1; N = 207)*

| Condition | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Animation + Audio + Caption | - | - | - | - | - | - | - |
| 2. Animation + Audio | 0.19 [-0.35, 0.72] | - | - | - | - | - | - |
| 3. Animation + Caption | 0.58 [0.02, 1.13] | 0.34 [-0.51, 0.88] | - | - | - | - | - |
| 4. Animation | -0.65 [-1.21, -0.09] | -0.79 [-1.35, -0.22] | -1.14 [-1.74, -0.54] | - | - | - | - |
| 5. Audio + Caption | -0.17 [-0.71, 0.36] | -0.34 [-0.87, 0.20] | -0.70 [-1.26, -0.13] | 0.47 [-0.09, 1.02] | - | - | - |
| 6. Audio | 0.07 [-0.47, 0.62] | -0.11 [-0.65, -0.44] | -0.46 [-1.01, 0.11] | 0.68 [0.11, 1.25] | 0.23 [-0.32, 0.78] | - | - |
| 7. Caption | 0.24 [-0.30, 0.78] | 0.04 [-0.50, 0.58] | -0.31 [-0.86, 0.24] | 0.85 [0.27, 1.42] | 0.39 [-0.15, 0.94] | 0.15 [-0.40, 0.70] | - |
| 8. No Multimedia | -1.33 [-1.92, -0.72] | -1.43 [-2.04, -0.82] | -1.79 [-2.45, -1.13] | -0.64 [-1.21, -0.07] | -1.12 [-1.70, 0.53] | -1.33 [-1.94, -0.71] | -1.51 [-2.12, -0.88] |

*Note.* Direction of comparisons is Column – Row.

**Table 7**

*Difference in Magnitude (Effect Size expressed as Cohen's d with 95% CIs) for Recognition Scores from True/False Test Responses Across Eight Conditions (Experiment 1; N = 207)*

| Condition | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Animation + Audio + Caption | - | - | - | - | - | - | - |
| 2. Animation + Audio | 0.13 [-0.41, 0.66] | - | - | - | - | - | - |
| 3. Animation + Caption | 0.29 [-0.25, 0.84] | 0.18 [-0.36, 0.73] | - | - | - | - | - |
| 4. Animation | -0.76 [-1.32, -0.20] | -0.87 [-1.43, -0.29] | -0.95 [-1.53, -0.36] | - | - | - | - |
| 5. Audio + Caption | 0.06 [-0.48, 0.59] | -0.06 [-0.59, 0.48] | -0.21 [-0.76, 0.34] | 0.77 [0.20, 1.33] | - | - | - |
| 6. Audio | -0.16 [-0.71, 0.38] | -0.26 [-0.80, 0.29] | -0.36 [-0.92, 0.20] | 0.50 [-0.06, 1.07] | -0.20 [-0.74, 0.35] | - | - |
| 7. Caption | 0.18 [-0.36, 0.72] | 0.06 [-0.48, 0.59] | -0.13 [-0.68, 0.42] | 0.89 [0.31, 1.46] | 0.10 [-0.44, 0.64] | 0.29 [-0.27, 0.84] | - |
| 8. No Multimedia | -1.02 [-1.60, -0.44] | -1.14 [-1.72, -0.55] | -1.22 [-1.82, -0.61] | -0.17 [-0.72, 0.39] | -1.02 [-1.59, 0.43] | -0.70 [-1.27, -0.12] | -1.17 [-1.76, -0.57] |

*Note.* Direction of comparisons is Column – Row.

**Table 8**

*A Summary of Demographic Variables for Participants (N = 193) from Experiment 2*

| Demographic Variable | Percentage |
|---|---|
| Gender | |
| Male (*n* = 112) | 58.0% |
| Female (*n* = 81) | 42.0% |
| Ethnicity | |
| White/Caucasian (*n* = 134) | 69.4% |
| Asian (*n* = 28) | 14.5% |
| Black/African (*n* = 13) | 6.7% |
| Other (*n* = 7) | 3.6% |
| Middle Eastern (*n* = 5) | 2.6% |
| Hispanic/Latino (*n* = 3) | 1.6% |
| Indigenous/Aboriginal (*n* = 1) | 0.5% |
| Pacific Islander (*n* = 1) | 0.5% |
| Not reported (*n* = 1) | 0.5% |
| Highest Level of Education | |
| Grade 10 (*n* = 40) | 20.7% |
| Grade 11 (*n* = 39) | 20.2% |
| Grade 8 (*n* = 31) | 16.1% |
| Grade 9 (*n* = 29) | 15.0% |
| Grade 7 (*n* = 18) | 9.3% |
| Grade 12 (*n* = 14) | 7.3% |
| Grade 6 (*n* = 14) | 7.3% |
| First-year University/College (*n* = 3) | 1.6% |
| Grade 5 (*n* = 3) | 1.6% |

| | |
|---|---|
| Grade 4 (*n* = 1) | 0.5% |
| Not Reported (*n* = 1) | 0.5% |
| Citizenship | |
| Canadian (*n* = 190) | 98.4% |
| Other (*n* = 3) | 1.6% |
| Province/Territory of Residence | |
| Ontario (*n* = 77) | 39.9% |
| Alberta (*n* = 30) | 15.5% |
| British Columbia (*n* = 22) | 11.4% |
| Nova Scotia (*n* = 21) | 10.9% |
| Quebec (*n* = 11) | 5.7% |
| Newfoundland and Labrador (*n* = 9) | 4.7% |
| Manitoba (*n* = 8) | 4.1% |
| Saskatchewan (*n* = 7) | 3.6% |
| New Brunswick (*n* = 5) | 2.6% |
| Does not currently reside in Canada (*n* = 2) | 1.0% |
| Yukon (*n* = 1) | 0.5% |
| Northwest Territories (*n* = 0) | 0.0% |
| Nunavut (*n* = 0) | 0.0% |
| Prince Edward Island (*n* = 0) | 0.0% |

**Table 9**

*Difference in Magnitude (Effect Size expressed as Cohen's d with 95% CIs) for Recall Scores from Open-Ended Responses Across Eight Conditions in Experiment 2 (N = 193 Youth)*

| Condition | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Animation + Audio + Caption | - | - | - | - | - | - | - |
| 2. Animation + Audio | -0.23 [-0.78, 0.32] | - | - | - | - | - | - |
| 3. Animation + Caption | 0.33 [-0.25, 0.90] | 0.54 [-0.02, 1.10] | - | - | - | - | - |
| 4. Animation | -1.90 [-2.58, -1.19] | -1.67 [-2.31, -1.02] | -1.99 [-2.70, -1.27] | - | - | - | - |
| 5. Audio + Caption | 0.24 [-0.33, 0.80] | 0.46 [-0.09, 1.00] | -0.09 [-0.65, 0.48] | 1.93 [1.23, 2.61] | - | - | - |
| 6. Audio | -0.02 [-0.57, 0.54] | 0.18 [-0.35, 0.72] | -0.31 [-0.88, 0.25] | 1.57 [0.92, 2.20] | -0.23 [-0.78, 0.32] | - | - |
| 7. Caption | 0.19 [-0.39, 0.78] | 0.39 [-0.18, 0.96] | -0.10 [-0.69, 0.49] | 1.69 [0.99, 2.38] | -0.02 [-0.60, 0.56] | 0.19 [-0.38, 0.77] | - |
| 8. No Multimedia | -2.52 [-3.28, -1.74] | -2.27 [-2.97, -1.55] | -2.50 [-3.27, -1.71] | -0.53 [-1.12, 0.06] | -2.44 [-3.18, -1.68] | -2.01 [-2.69, -1.31] | -2.12 [-2.86, -1.37] |

*Note.* Direction of comparison is Column - Row.

**Table 10**

*Percentage of Each of the 16 Youth Interrogation Rights Components Recalled in the Open-Ended Response Across the Eight Conditions in Experiment 2 (N = 193)*

| | Youth Legal Right Component | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Condition | 1 | 2a | 2b | 2c | 2d | 2e | 3a | 3b | 3c | 3d | 3e | 4a | 4b | 4c | 5a | 5b |
| Animation + Audio + Caption | 22 | 21 | 6 | 6 | 8 | 2 | 19 | 6 | 1 | 3 | 7 | 14 | 15 | 11 | 17 | 6 |
| (*n* = 24) | (92%) | (88%) | (25%) | (25%) | (33%) | (8%) | (79%) | (25%) | (4%) | (13%) | (29%) | (58%) | (63%) | (46%) | (71%) | (25%) |
| Animation + Audio | 23 | 23 | 2 | 3 | 5 | 0 | 19 | 6 | 0 | 5 | 5 | 20 | 21 | 15 | 18 | 8 |
| (*n* = 28) | (82%) | (82%) | (7%) | (11%) | (18%) | (0%) | (68%) | (21%) | (0%) | (18%) | (18%) | (71%) | (75%) | (54%) | (64%) | (29%) |
| Animation + Caption | 21 | 21 | 7 | 10 | 8 | 3 | 17 | 10 | 4 | 6 | 5 | 15 | 17 | 13 | 17 | 8 |
| (*n* = 23) | (91%) | (93%) | (30%) | (44%) | (35%) | (13%) | (74%) | (44%) | (17%) | (26%) | (22%) | (65%) | (74%) | (57%) | (74%) | (35%) |
| Animation | 5 | 9 | 2 | 1 | 0 | 0 | 5 | 5 | 1 | 0 | 1 | 4 | 7 | 4 | 2 | 0 |
| (*n* = 23) | (22%) | (39%) | (9%) | (4%) | (0%) | (0%) | (22%) | (22%) | (4%) | (0%) | (4%) | (17%) | (30%) | (17%) | (9%) | (0%) |
| Audio + Caption | 24 | 20 | 9 | 12 | 12 | 3 | 17 | 3 | 1 | 4 | 12 | 17 | 19 | 15 | 16 | 6 |
| (*n* = 25) | (96%) | (80%) | (36%) | (48%) | (48%) | (12%) | (68%) | (12%) | (4%) | (16%) | (48%) | (68%) | (76%) | (60%) | (64%) | (24%) |
| Audio | 22 | 21 | 7 | 11 | 7 | 2 | 20 | 11 | 1 | 5 | 6 | 13 | 15 | 9 | 16 | 10 |
| (*n* = 26) | (85%) | (81%) | (27%) | (42%) | (27%) | (8%) | (77%) | (42%) | (4%) | (19%) | (23%) | (50%) | (58%) | (35%) | (62%) | (39%) |
| Caption | 16 | 18 | 9 | 11 | 6 | 2 | 16 | 6 | 0 | 6 | 9 | 12 | 12 | 9 | 15 | 11 |
| (*n* = 21) | (76%) | (86%) | (43%) | (52%) | (29%) | (10%) | (76%) | (29%) | (0%) | (29%) | (43%) | (57%) | (57%) | (43%) | (71%) | (52%) |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No Multimedia | 6 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 1 | 1 |
| (*n* = 23) | (26%) | (30%) | (0%) | (9%) | (0%) | (0%) | (0%) | (0%) | (0%) | (0%) | (0%) | (9%) | (17%) | (4%) | (4%) | (4%) |
| Overall | 139 | 140 | 42 | 56 | 46 | 12 | 113 | 47 | 8 | 29 | 45 | 97 | 110 | 77 | 102 | 50 |
| (*n* = 193) | (72%) | (73%) | (22%) | (29%) | (24%) | (6%) | (59%) | (24%) | (4%) | (15%) | (23%) | (50%) | (57%) | (40%) | (53%) | (26%) |

*Note.* Component 1 refers to the right that a *youth does not have to talk to the police officer*; 2a refers to the right that a *youth can talk to a lawyer*; 2b refers to the fact that the lawyer can be the youth's *own/personal lawyer*; 2c refers to the fact that the lawyer can be a *free lawyer*; 2d refers to the fact that access to a lawyer can be obtained *right now/before the police officer asks the youth any questions*; 2e refers to fact that *youth can have the telephone number for a lawyer*; 3a refers to the right that a *youth can talk to an adult*; 3b refers to the fact that the adult can be the youth's *parent*; 3c refers to the fact that the adult can be a *relative*; 3d refers to the fact that the adult can be *any other appropriate adult*; 3e refers to the fact that access to an adult can be obtained *right now/before the police officer asks the youth any questions*; 4a refers to the right that *a youth can have a lawyer with them*; 4b refers to the right that a *youth can have an adult with them*; 4c refers to the fact that the youth can have the lawyer and/or adult with them *when the police officer asks the youth questions*; 5a refers to the fact that *anything the youth says can be used as evidence against them in court*; 5b refers to the fact that *anything the youth does can be used as evidence against them in court.*

**Table 11**

*Mean Percentage Comprehension Scores for Recognition Scores from Multiple-Choice and True/False Test Responses Across Eight Condition in Experiment 2 (N = 193)*

| Condition | Multiple-Choice Test | True/False Test |
|---|---|---|
| 1. Animation + Audio + Caption | 90.83 (15.58) | 94.91 (8.01) |
| | [84.25, 97.41] | [91.52, 98.29] |
| 2. Animation + Audio | 82.86 (25.37) | 92.86 (13.60) |
| | [73.02, 92.69] | [87.59, 98.13] |
| 3. Animation + Caption | 93.91 (11.18) | 96.62 (6.21) |
| | [89.08, 98.75] | [93.93, 99.30] |
| 4. Animation | 68.70 (19.84) | 76.81 (20.08) |
| | [60.12, 77.28] | [68.13, 85.49] |
| 5. Audio + Caption | 92.00 (14.14) | 96.44 (6.97) |
| | [86.16, 97.84] | [93.57, 99.32] |
| 6. Audio | 83.85 (20.41) | 91.45 (9.59) |
| | [75.60, 92.09] | [87.58, 95.33] |
| 7. Caption | 85.71 (15.68) | 95.24 (10.29) |
| | [78.58, 92.85] | [90.56, 99.92] |
| 8. No Multimedia | 64.35 (26.94) | 81.16 (12.73) |
| | [52.70, 76.00] | [75.66, 86.66] |

*Note.* The Standard Deviations are contained within the round brackets, while the 95% Confidence Intervals are contained within square brackets.

**Table 12**

*Difference in Magnitude (Effect Size expressed as Cohen's d with 95% CIs) for Recognition Scores from Multiple-Choice Test Responses Across Eight Condition (Experiment 2; N = 193)*

| Condition | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Animation + Audio + Caption | - | - | - | - | - | - | - |
| 2. Animation + Audio | -0.37 [-0.92, 0.18] | - | - | - | - | - | - |
| 3. Animation + Caption | 0.23 [-0.35, 0.80] | 0.55 [-0.02, 1.11] | - | - | - | - | - |
| 4. Animation | -1.24 [-1.87, -0.61] | -0.61 [-1.18, -0.05] | -1.57 [-2.22, -0.90] | - | - | - | - |
| 5. Audio + Caption | 0.08 [-0.48, 0.64] | 0.44 [-0.11, 0.98] | -0.15 [-0.72, 0.42] | 1.36 [0.73, 1.99] | - | - | - |
| 6. Audio | -0.38 [-0.94, 0.18] | 0.04 [-0.49, 0.58] | -0.60 [-1.17, -0.02] | 0.75 [0.17, 1.33] | -0.46 [-1.02, 0.10] | - | - |
| 7. Caption | -0.33 [-0.92, 0.26] | 0.13 [-0.44, 0.70] | -0.61 [-1.21, 0.00] | 0.95 [0.32, 1.57] | -0.42 [-1.01, 0.17] | 0.10 [-0.48, 0.68] | - |
| 8. No Multimedia | -1.21 [-1.83, -0.58] | -0.71 [-1.28, -0.14] | -1.43 [-2.08, -0.78] | -0.18 [-0.76, 0.40] | -1.30 [-1.92, -0.67] | -0.82 [-1.40, -0.23] | -0.96 [-1.58, -0.32] |

*Note.* Direction of comparison is Column - Row.

**Table 13**

*Difference in Magnitude (Effect Size expressed as Cohen's d with 95% CIs) for Recognition Scores from True/False Test Responses Across Eight Condition in (Experiment 2; N = 193)*

| Condition | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Animation + Audio + Caption | - | - | - | - | - | - | - |
| 2. Animation + Audio | -0.18 [-0.73, 0.37] | - | - | - | - | - | - |
| 3. Animation + Caption | 0.24 [-0.34, 0.81] | 0.35 [-0.21, 0.90] | - | - | - | - | - |
| 4. Animation | -1.19 [-1.81, -0.57] | -0.95 [-1.53, -0.37] | -1.33 [-1.97, -0.69] | - | - | - | - |
| 5. Audio + Caption | 0.21 [-0.36, 0.77] | 0.33 [-0.22, 0.87] | -0.03 [-0.59, 0.54] | 1.33 [0.70, 1.95] | - | - | - |
| 6. Audio | -0.39 [-0.95, 0.17] | -0.12 [-0.65, 0.42] | -0.63 [-1.20, -0.05] | 0.95 [0.35, 1.54] | -0.59 [-1.15, -0.03] | - | - |
| 7. Caption | 0.04 [-0.55, 0.62] | 0.19 [-0.38, 0.76] | -0.16 [-0.76, 0.43] | 1.14 [0.50, 1.77] | -0.14 [-0.72, -0.44] | 0.38 [-0.20, 0.96] | - |
| 8. No Multimedia | -1.30 [-1.92, -0.66] | -0.89 [-1.46, -0.30] | -1.54 [-2.20, -0.88] | 0.26 [0.32, 0.84] | -1.51 [-2.15, -0.86] | -0.92 [-1.51, 0.33] | -1.21 [-1.85, 0.56] |

*Note.* Direction of comparison is Column - Row.

**Table 14**

*A Summary of Demographic Variables for Participants (N = 60) from Experiment 3*

| Demographic Variable | Percentage |
|---|---|
| Gender | |
| Male (*n* = 24) | 40.0% |
| Female (*n* = 33) | 55.0% |
| Other (*n* = 3) | 5.0% |
| Ethnicity | |
| White/Caucasian (*n* = 29) | 48.3% |
| Asian (*n* = 11) | 18.3% |
| Black/African (*n* = 8) | 13.3% |
| Other (*n* = 6) | 10.0% |
| Indigenous/Aboriginal (*n* = 4) | 6.7% |
| Middle Eastern (*n* = 2) | 3.3% |
| Hispanic/Latino (*n* = 0) | 0.0% |
| Pacific Islander (*n* = 0) | 0.0% |
| Not reported (*n* = 0) | 0.0% |
| Highest Level of Education | |
| Grade 10 (*n* = 18) | 30.0% |
| Grade 11 (*n* = 17) | 28.3% |
| Grade 12 (*n* = 7) | 11.7% |
| Grade 9 (*n* = 7) | 11.7% |
| Grade 8 (*n* = 7) | 11.7% |
| Grade 7 (*n* = 2) | 3.3% |
| Grade 6 (*n* = 1) | 1.7% |
| First-year University/College (*n* = 1) | 1.7% |

| | |
|---|---|
| Grade 5 (*n* = 0) | 0.0% |
| Grade 4 (*n* = 0) | 0.0% |
| Not Reported (*n* = 0) | 0.0% |
| Citizenship | |
| Canadian (*n* = 60) | 100.0% |
| Other (*n* = 0) | 0.0% |
| Province/Territory of Residence | |
| Ontario (*n* = 39) | 65.0% |
| Alberta (*n* = 7) | 11.7% |
| British Columbia (*n* = 3) | 5.0% |
| Manitoba (*n* =3) | 5.0% |
| Quebec (*n* = 2) | 3.3% |
| Newfoundland and Labrador (*n* = 2) | 3.3% |
| Saskatchewan (*n* = 2) | 3.3% |
| Nova Scotia (*n* = 1) | 1.7% |
| New Brunswick (*n* = 1) | 1.7% |
| Does not currently reside in Canada (*n* = 0) | 0.0% |
| Yukon (*n* = 0) | 0.0% |
| Northwest Territories (*n* = 0) | 0.0% |
| Nunavut (*n* = 0) | 0.0% |
| Prince Edward Island (*n* = 0) | 0.0% |

**Table 15**

*Frequencies (and Percentage) of Participants' Responses to Question Items on the Multimedia Presentation Evaluation Questionnaire (N = 60)*

| Question Category | Response Options | | | | |
|---|---|---|---|---|---|
| Quality | Poor | Fair | Average | Good | Excellent |
| Overall | 1 (2%) | 0 (0%) | 6 (10%) | 32 (53%) | 21 (35%) |
| Rate of Speed | Extremely Slow | Somewhat Slow | Average | Somewhat Fast | Extremely Fast |
| Animated Characters | 1 (2%) | 15 (25%) | 42 (70%) | 1 (2%) | 1 (2%) |
| Audio Narration | 1 (2%) | 19 (32%) | 38 (63%) | 1 (2%) | 1 (2%) |
| Captioned Words | 0 (0%) | 4 (7%) | 53 (88%) | 3 (5%) | 0 (0%) |
| Level of Distraction | Not at All Distracting | Slightly Distracting | Moderately Distracting | Very Distracting | Extremely Distracting |
| Animated Characters | 49 (82%) | 10 (17%) | 1 (2%) | 0 (0%) | 0 (0%) |
| Audio Narration | 50 (83%) | 8 (13%) | 1 (2%) | 1 (2%) | 0 (0%) |

| | | | | | |
|---|---|---|---|---|---|
| Captioned Words | 50 (83%) | 9 (15%) | 1 (2%) | 0 (0%) | 0 (0%) |
| Background Music | 43 (72%) | 12 (20%) | 5 (8%) | 0 (0%) | 0 (0%) |

| Character Identification | Youth | Adult | Lawyer | Police Officer | Judge |
|---|---|---|---|---|---|
| Youth | 59 (98%) | 0 (0%) | 0 (0%) | 1 (2%) | 0 (0%) |
| Adult | 0 (0%) | 56 (93%) | 4 (7%) | 0 (0%) | 0 (0%) |
| Lawyer | 0 (0%) | 5 (8%) | 54 (90%) | 0 (0%) | 1 (2%) |
| Police Officer | 0 (0%) | 0 (0%) | 0 (0%) | 60 (100%) | 0 (0%) |
| Judge | 0 (0%) | 0 (0%) | 1 (2%) | 0 (0%) | 59 (98%) |

**Table 16**

*Frequencies (and Percentages) of Participants' Attentional Rankings as a function of Multimedia Element*

| Multimedia Element | Ranking | | | |
|---|---|---|---|---|
| | Most Focused | 2nd Focused | 3rd Focused | Least Focused |
| Animated Characters | 8 (13%) | 20 (33%) | 27 (45%) | 5 (8%) |
| Audio Narrations | 31 (52%) | 15 (25%) | 6 (10%) | 8 (13%) |
| Captioned Words | 6 (10%) | 20 (33%) | 21 (35%) | 13 (22%) |
| Background Music | 15 (25%) | 5 (8%) | 6 (10%) | 34 (57%) |

**Table 17**

*Percentage of Each of the 16 Youth Interrogation Rights Components Recalled in the Open-Ended Response in Experiment 3 (N = 60)*

| | Youth Legal Right Component | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Condition | 1 | 2a | 2b | 2c | 2d | 2e | 3a | 3b | 3c | 3d | 3e | 4a | 4b | 4c | 5a | 5b |
| Animation + Audio + Caption | 53 (88%) | 52 (87%) | 24 (40%) | 24 (40%) | 24 (40%) | 4 (7%) | 49 (82%) | 16 (27%) | 6 (10%) | 11 (18%) | 24 (40%) | 38 (63%) | 45 (75%) | 32 (53%) | 50 (83%) | 19 (32%) |

*Note.* Component 1 refers to the right that a *youth does not have to talk to the police officer*; 2a refers to the right that a *youth can talk to a lawyer*; 2b refers to the fact that the lawyer can be the youth's *own/personal lawyer*; 2c refers to the fact that the lawyer can be a *free lawyer*; 2d refers to the fact that access to a lawyer can be obtained *right now/before the police officer asks the youth any questions*; 2e refers to fact that *youth can have the telephone number for a lawyer*; 3a refers to the right that a *youth can talk to an adult*; 3b refers to the fact that the adult can be the youth's *parent*; 3c refers to the fact that the adult can be a *relative*; 3d refers to the fact that the adult can be *any other appropriate adult*; 3e refers to the fact that access to an adult can be obtained *right now/before the police officer asks the youth any questions*; 4a refers to the right that *a youth can have a lawyer with them*; 4b refers to the right that a *youth can have an adult with them*; 4c refers to the fact that the youth can have the lawyer and/or adult with them *when the police officer asks the youth questions*; 5a refers to the fact that *anything the youth says can be*

*used as evidence against them in court*; 5b refers to the fact that *anything the youth does can be used as evidence against them in court.*

**Figures**

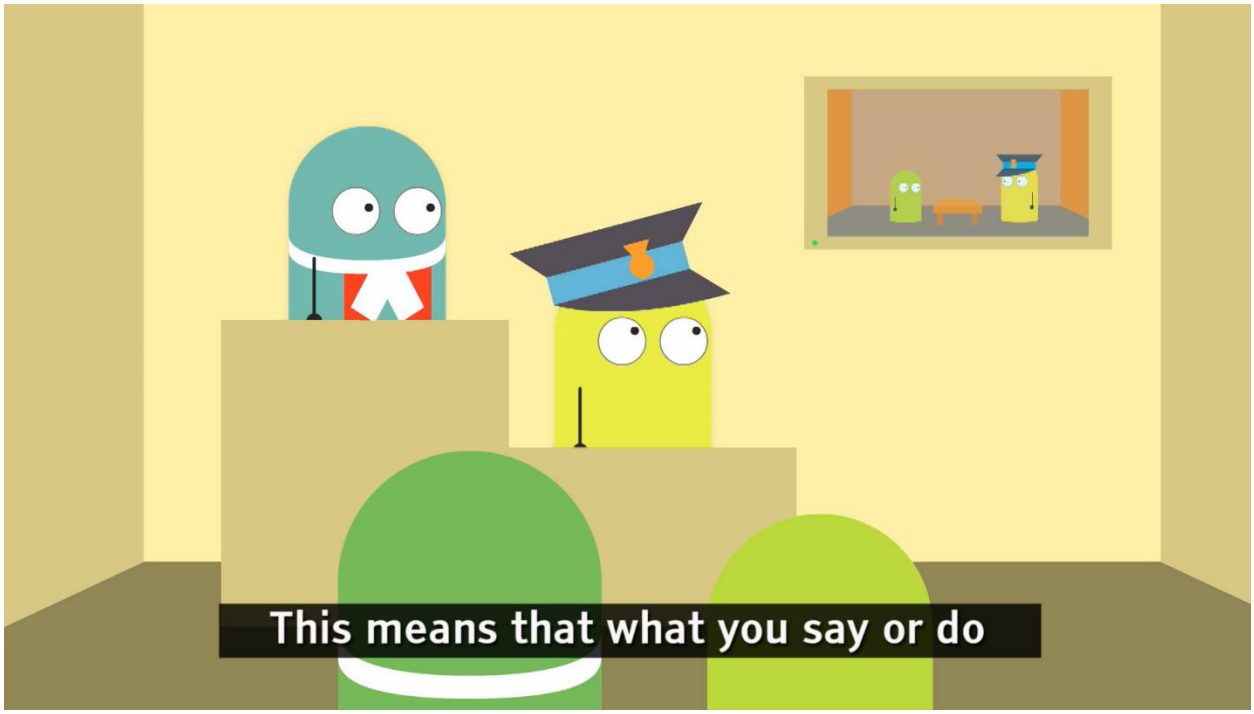




*Figure 1*. Screen shot examples of the content presented in multimedia presentations.

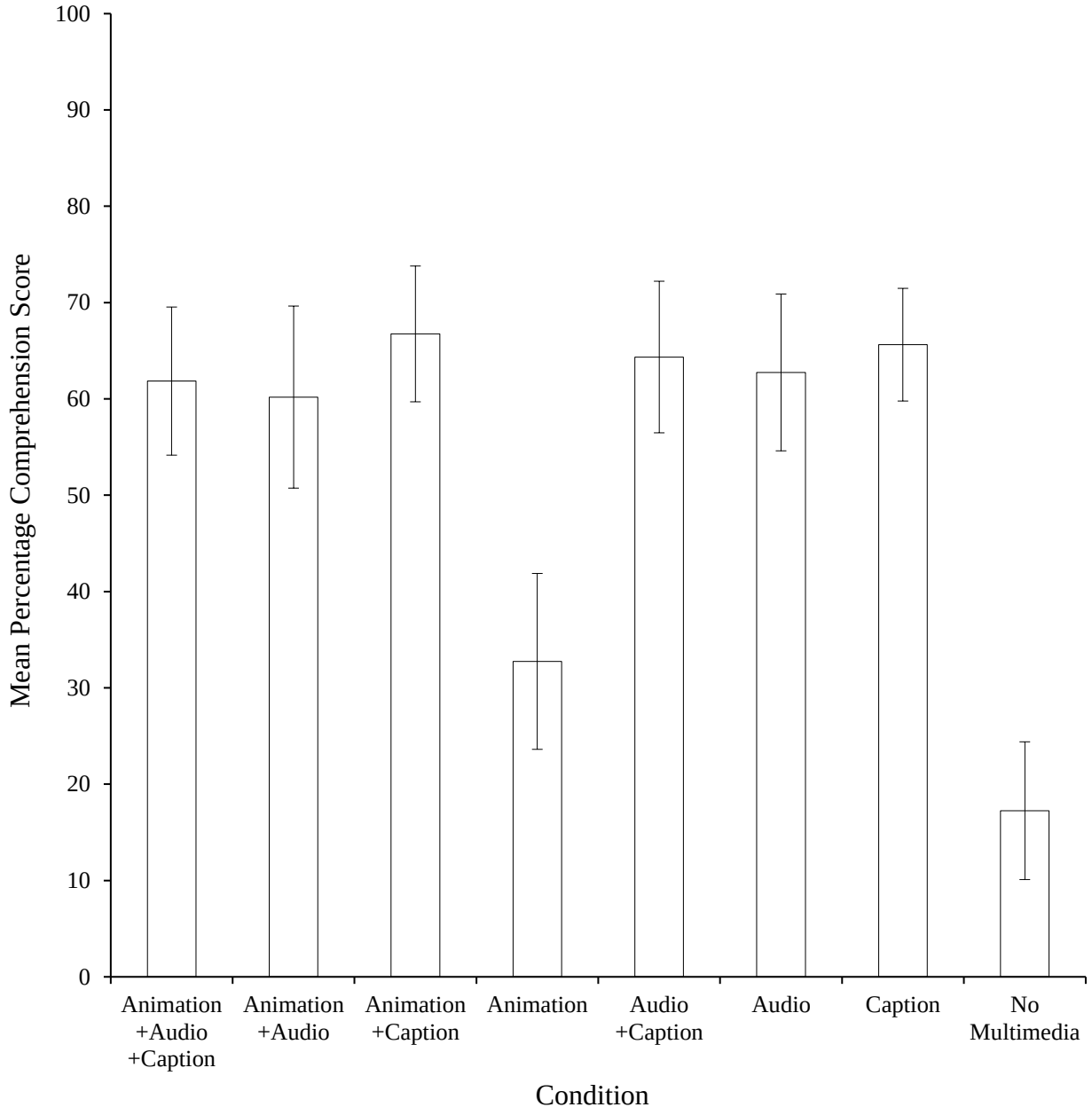



*Figure 2*. The mean percentage recall scores and associated 95% confidence interval for responses to the open-ended questions per condition in Experiment 1 ($N$ = 207).

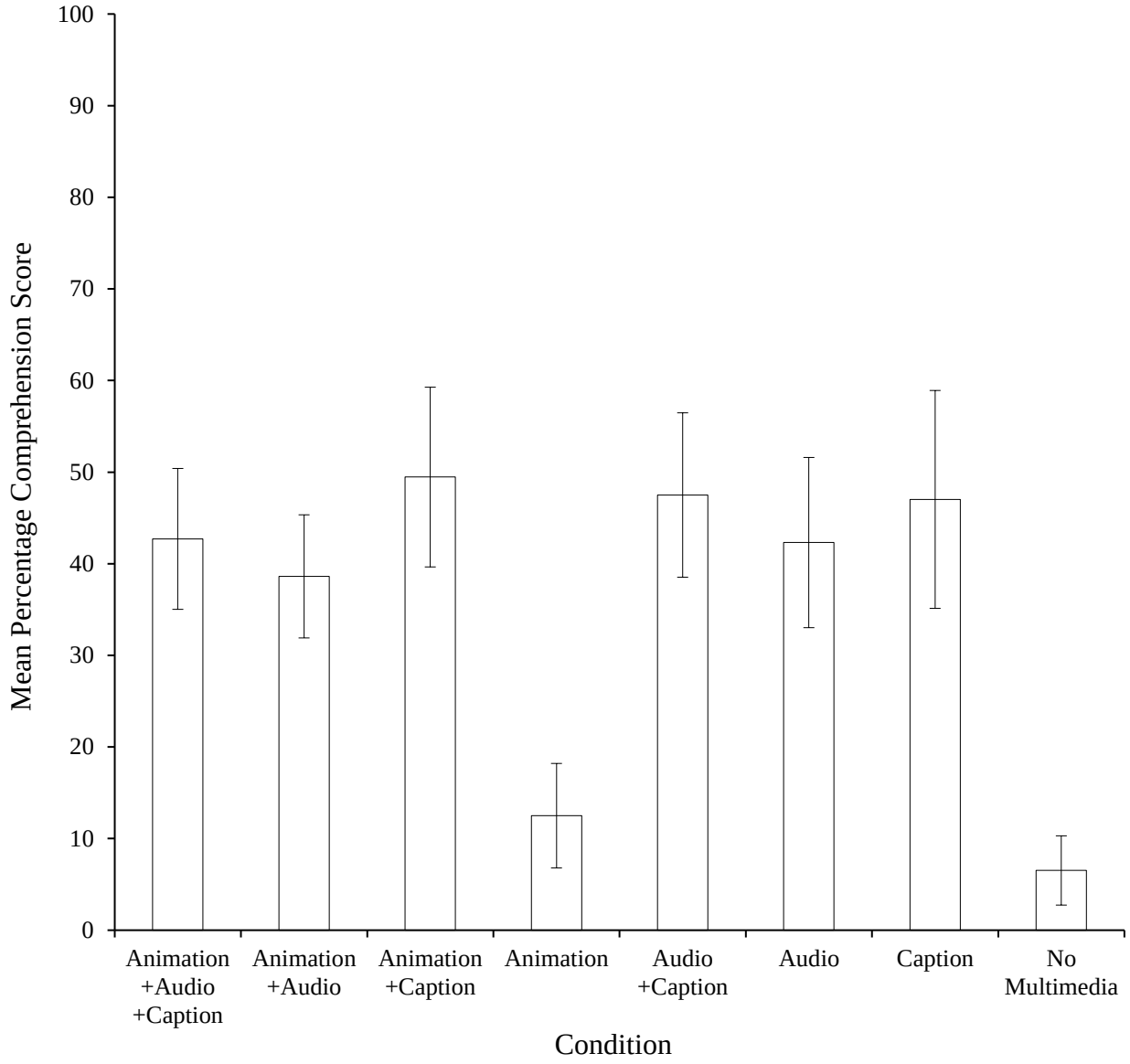



*Figure 3*. The mean percentage recall scores and associated 95% confidence interval for responses to the open-ended questions per condition in Experiment 2 ($N$ = 193).

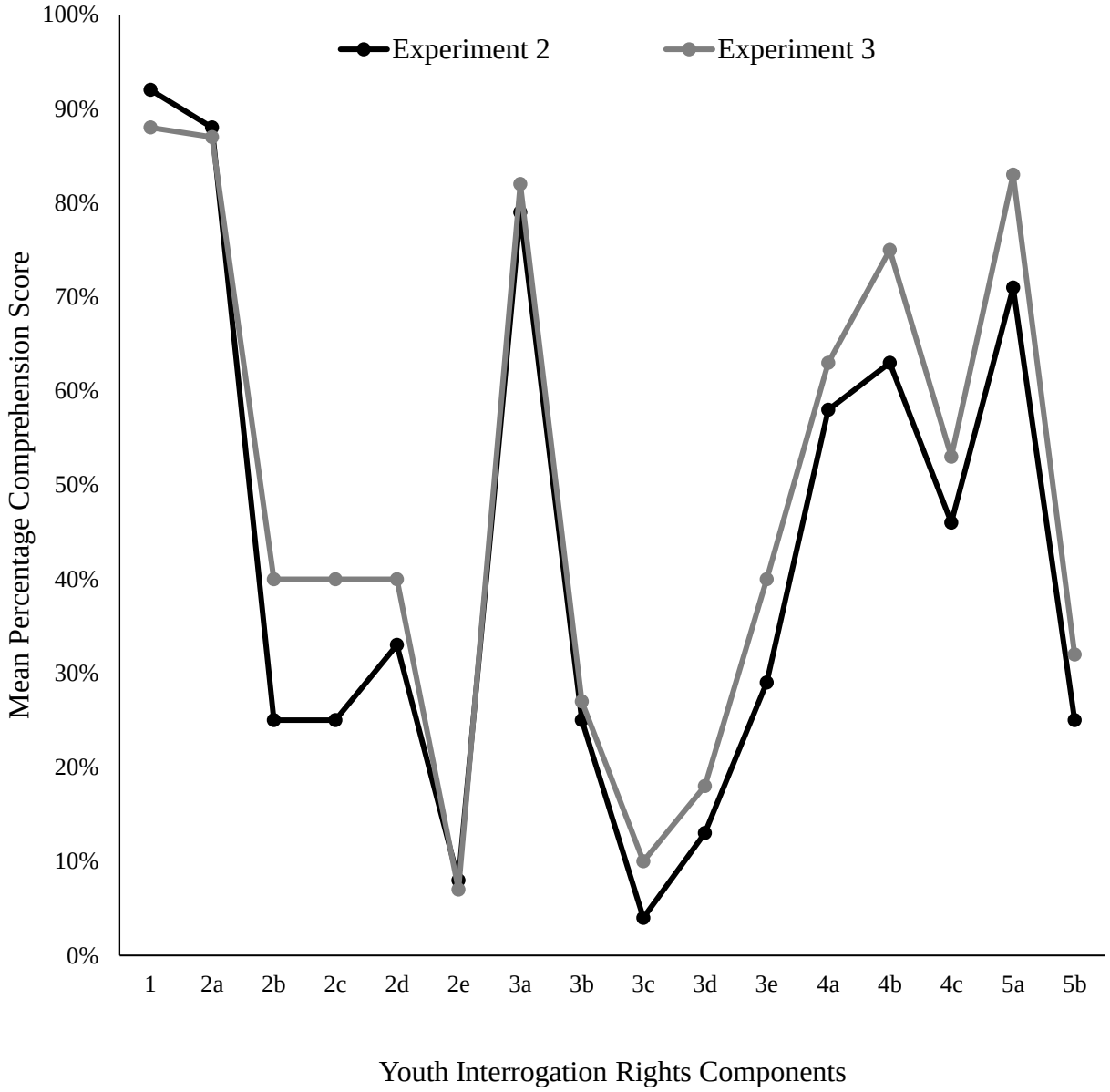



*Figure 4*. Comparison of each of the 16 Youth Interrogation Rights Components for the multimedia presentation containing Animation, Audio, and Caption elements (i.e., Condition 1) across Experiments 2 ($n$ = 24) and 3 ($n$ = 60).

# Appendix A

## Recognition Tests Used for Experiment 1

**Multiple-Choice Test** (Adapted from Eastwood et al., 2016; Correct Answer = *)

1. When being interviewed by a police officer, a youth needs to:
(a) Answer all the questions that are asked of them
*(b) Only answer the questions that they want to answer
(c) Only answer questions that are related to a crime
(d) Only answers questions related to the youth's personal life

2. If a youth answers questions from a police officer during an interview, then:
*(a) The youth's answers will be recorded and may be used in court
(b) The youth can change their answers later if they decide to
(c) A youth's answers cannot be used in court because they are a minor
(d) The youth's lawyer can choose what answers are used in court

3. In a police interview, a youth is allowed to call all of the following people EXCEPT:
(a) Their parents
(b) A lawyer
*(c) A classmate
(d) A youth is allowed to contact all of these people

4. If a youth calls someone during a police interview, then:
(a) This person(s) must be with the youth when they answer questions
*(b) It is up to the youth whether or not this person(s) is with them when answering questions
(c) It is up to the police whether or not this person(s) is with the youth when answering questions
(d) This person(s) cannot be with the youth when they answer questions

5. If the youth decides that they want to call a lawyer during a police interview, then:
(a) The youth has to contact their own personal lawyer that they have paid for
(b) The police interviewer decides what lawyer can be contacted
(c) The youth is not allowed to contact a lawyer during a police interview
*(d) A youth can contact a free lawyer who will give them advice at no cost

**True/False Test** (Author-constructed; Correct Answer = *)

1. A youth must answer the questions that the police ask them about the alleged crime. (True or *False)

2. A youth has the right to talk to a lawyer before the police asks questions about the alleged crime. (*True or False)

3. If a youth wants to talk with a lawyer, the youth must know the lawyer's phone number. (True or *False)

4. A youth can get help from their own lawyer or a free lawyer. (*True or False)

5. A youth is only able to talk to an adult after the police have finished asking their questions. (True or *False)

6. A youth is able to call another youth for advice prior to answering police questions. (True or *False)

7. The police decide who is allowed in the room when asking a youth questions. (True or *False)

8. A youth can have both a lawyer and a parent in the interview room with them at the same time during police questioning. (*True or False)

9. The police can use anything a youth says as evidence in court to prove the youth committed the crime. (*True or False)

## Appendix B

## Youth Interrogation Rights Instructional Video Script

You are here today because a police officer wants to talk to you.

Before this happens, I want to tell you five important points you need to know. These points are called your rights.

Number one. You do not have to talk to the police officer. This means that you can choose to talk to the police officer, or choose not to talk to the police officer.

Number two. You can talk to your lawyer right now. Or, you can have the telephone number to call a free lawyer. This means you can get help from your own lawyer, or a free lawyer, before the police officer asks you any questions.

Number three. You can talk to an adult right now. This adult can be a parent, relative, or another adult you choose. This means that you can talk to an adult before the police officer asks you any questions.

Number four. If you do talk to a lawyer or adult, you can decide if you want one or both of them here with you when the police officer asks you questions. This means that it is your choice to have a lawyer, adult, or both of them with you when the police officer asks you questions.

Number five. Anything that you say or do can be used as evidence against you in court. This means that what you say or do can be used later to show that you did the crime.

Please let the police officer know if you have any questions.

## Appendix C

## Coding Dictionary Legend and Explanation:

**Q1** = Question 1 (Open-ended)

- The first free recall question asked of participants after being presented one of the eight conditions.
- Differences in wording by condition indicated by **bolded** (Conditions 1-7) or *italics* (Condition 8) fonts.
    - Wording contained within square brackets was presented in Conditions 1-7, but not Condition 8.

      Please try your best to recall everything you **learned** / *know* about youth legal rights [**from the presentation**]. Take your time and **think about the presentation** / *gather your thoughts* for a moment before proceeding. When you are ready, write out everything that you **learned** / *know* about youth legal rights [**from the presentation**] in your own words in as much detail as possible, and try your best not to leave anything out.

- Points are awarded in the Q1 column if the components of the Rights are mentioned in the participants first answer (i.e., their response to Q1).

**Q2** = Question 2 (Follow-up)

- The second free recall question asked of participants after being presented one of the eight conditions.
- Differences in wording by condition indicated by **bolded** (Conditions 1-7) or *italics* (Condition 8) fonts.
    - Wording contained within square brackets was presented in Conditions 1-7, but not Condition 8.

      Take a moment and think about *what else* you can remember about youth legal rights [**from the presentation**]. When you are ready, write out any *additional things* you can remember in as much detail as possible.

- Points are awarded in the Q2 column if the components of the Rights are mentioned in the second answer (i.e., their response to Q2).
    - The reason for the separation between Q1 and Q2 is to be able to determine how much more information or knowledge may have occurred by including a follow-up probing question.

  - Repeated information provided in response to Q2 that was already stated in response to Q1 is not awarded any points.

✓ = indicates possible alternative words or phrases that can be used to express key component within the right [i.e., the *italicized* word(s)].

- Each Right is subdivided into its core components with the substantive part of the right underlined. that is specifically mentioned in the script. Each component is important and awarded 1 point uniquely. These components are indicated by the letters 'a' through 'e' (where applicable).
  - There are **16 points** total.

- Some components are indented on the coding guide. Any components that are indented pertain to the previous component mentioned, but are still unique and awarded 1 point each.
  - For example, Right 2a states that Youth can talk to a lawyer. Right 2b and 2c state that the lawyer can be their Own/personal lawyer or a free lawyer, respectively. This is a simple way to drill down into the information that is presented in the video. It is possible that participants will mention that they can talk to a lawyer (Right 2a), but fail to mention the two additional components related to Right 2a (i.e., Right 2b and 2c).

**Individual Total** pertains to the total number of points accumulated in Q1 and Q2, individually.

**Grand Total** is the sum of the individual totals from Q1 and Q2 and will not exceed 24 (i.e., the maximum total number of points able to be attained).

**Percentage Score is** mathematical product of the Grand Total score divided by 16 and multiplied by 100%. A percentage score is being used as a means to gauge or grade how well participants scored on comprehending the content in the video.

**Important to note:** Experiment 1's sample were Canadian **adults**. However, the language used throughout the video presentations was targeted for youth (e.g., "You do not have to talk to the police officer"). Consequently, some of the adult participants may provide answers that pertain to themselves (e.g., "I do not have to talk to the police", or "You do not have to speak to the cop"), whereas others may use more appropriate language in terms of who the videos were made for (e.g., "A youth does not have to talk to the police"). Study participants were told that the videos were created for youth, but regardless of this information, participants responses may read as if the rights pertain to them directly. Regardless of the point of view given in their response (i.e., spoken in 1st person, 3rd person, or in terms of youth), treat and code the responses as one in the same.

**Right 1**

*You do not have to talk to the police officer. This means you can choose to talk to the police officer, or choose not to talk to the police officer.*

**Component 1a** - Youth <u>does not have to *talk*</u> to the police officer

- ✓ speak, say, converse, engage with

Correct Examples:

- "You don't have to say anything to incriminate yourself"
- "You do not have to speak to the police"
- "I have the right to remain silent"
- "I don't have to say anything at all"
- "I can be silent"
- "I have a choice in whether or not I talk to a police officer"
- "It's up to me if I answer the questions"
- "If I want to, I can be silent

**Right 2**

*You can talk to your lawyer right now. Or, you can have the telephone number to call a free lawyer. This means you can get help from your own lawyer, or a free lawyer, before the police officer asks you any questions.*

**Component 2a** - Youth <u>can *talk* to a lawyer</u>...

- ✓ speak, say, converse, engage with, get help from, can consult, obtain legal advice from

Correct Examples:

- "you got a right to an attorney"
- "you have a right to a lawyer"
- "To have legal counsel to defend myself"
- "right to legal counsel"
- "obtain counsel"
- "you are entitled to legal representation"
- "right to retain counsel"
- "if I need a lawyer I can have one"
- " right to retain a lawyer"

- "right for counsel"
- " to get legal counsel"
- " I have the right to ask for a lawyer of my choice"

**Component 2b** - *Own/personal* lawyer

✓ private lawyer,

Correct Examples:

- "I can consult a lawyer I pay for"

**Component 2c** - A *free* lawyer

✓ Duty counsel

Correct Examples:

- "I can get help from an appointed lawyer for free"
- "contact a lawyer or legal aid"
- "or call duty counsel free of charge"
- "when you get arrested you have the right for legal aid"
- "if you haven't got a lawyer duty counsel will inform you"
- " right to speak to duty counsel"
- "you can call legal aid"
- "you have the right to obtain counsel and free of charge"
- "you can call the duty counsel free of charge"
- "will not cost me anything"
- "I will not have to pay for a lawyer"

**Component 2d** - …*right now*

✓ Immediately, right away, before questioning, before talking to anyone

Correct Examples:

- "before police officer asks the youth any questions"

**Component 2e** - Youth can have *telephone number* for a lawyer

✓ Contact information, phone number

Correct Examples:

- "he would provide the phone numbers"
- "they provide/give the number"
- "need any advice for any legal information I can get the contact number"
- "if I don't have lawyer he would provide a number for counsel for me"
- "If I can't afford one, I guess legal aid and that they're going to give me a phone number to call them"

**Right 3**

*You can talk to an adult right now. This adult can be a parent, relative, or another adult you choose. This means that you can talk to an adult before the police officer asks you any questions.*

**Component 3a -** Youth <u>can *talk* to an adult</u>…

✓ speak, say, converse, engage with, get help from, can consult

Correct Examples:

- "I have a right to talk to an adult"
- "I can consult with a person over 18 years of age for help"

**Component 3b -** <u>*Parent*</u>

✓ Guardian, caregiver

Correct Examples:

- "My mom can be a person that I talk to"

**Component 3c -** <u>*Relative*</u>

✓ Uncle, Aunt, Adult Cousin, Grandparent

Correct Examples:

- "Ol' Uncle bird dog can be brought in to the room"

**Component 3d** – *Other Adult*

✓ Teacher, Adult Friend

Correct Examples:

- "Any other adult can be talked with"
- "I can ask Bob Loblaw to help me. His research helps kids in the justice system!"

**Component 3e** – …*right now*

✓ Immediately, right away, before questioning, before talking to anyone

Correct Examples:

- "before police officer asks the youth any questions"

**Right 4**

*If you do talk to a lawyer or adult, you can decide if you want one or both of them here with you when the police officer asks you questions. This means that it is your choice to have a lawyer, adult, or both of them with you when the police officer asks you questions.*

**Component 4a -** Youth can have a *lawyer* with them…

✓ Representation, Counsel,

Correct Examples:

- "You have the right to have a lawyer with you in the room"

- "Children have the right to an attorney with them"

**Component 4b** - Youth <u>can have an *adult* with them</u>…

✓ Parent, Relative, Family member

Correct Examples:

- "My Dad can come in the room with me."
- "You can have a parent present."

**<u>Important to note for Right 4 (a/b):</u>**

- If participant provides any indication that <u>both</u> an adult and lawyer can be in the interrogation room, then award a point for both
  - Example: "I can have both an adult or lawyer with me"
  - Example: "My mom can be with me and my lawyer can be with me"

**Component 4c** - …<u>*when the police officer asks the youth questions*</u>

✓ During questioning

Correct Examples:

- "while I'm being questioned"
- "during the time that officers interrogate me"

**Right 5**

*Anything that you say or do can be used as evidence against you in court. This means that what you say or do can be used later to show that you did the crime*

**Component 5a** – Anything the youth <u>*says* can be used as evidence against the youth in court</u>

✓ Spoken, words said,

Correct Examples:

- "like anything I say can be used as evidence in the courtroom"
- "it could be used against you in court"
- "He can use it against me in the court of law"
- " anything that you say can and will be used against you in a court of law"
- "anything you says can be used as evidence"
- "…and if I speak then he said might be against me as the evidence"
- "What the youth says can be used to show the youth did the crime"

**Component 5b** - Anything the youth *does* can be used as evidence against the youth in court

✓ I do, actions,

Correct Examples:

- "anything I do can be used in court"
- "My actions in this interview will be used as evidence"
- "What the youth does can be used to show the youth did the crime"

## Coding Guide

Participant: _____ Condition: _____

| Right | | Q1 | Q2 |
|---|---|---|---|
| **1** | a. Youth does not have to talk to the police officer | | |
| **2** | a. Youth can talk to a lawyer… | | |
| | b. Own/personal lawyer | | |
| | c. A free lawyer | | |
| | d. …right now / …before the police officer asks the youth any questions | | |
| | e. Youth can have telephone number for a lawyer | | |
| **3** | a. Youth can talk to an adult… | | |
| | b. Parent | | |
| | c. Relative | | |
| | d. Other Adult | | |
| | e. ….right now / …before the police officer asks the youth any questions | | |
| **4** | a. Youth can have a lawyer with them... | | |
| | b. Youth can have an adult with them... | | |
| | c. …when the police officer asks the youth questions | | |
| **5** | a. Anything the youth says can be used as evidence against the youth in court | | |

| | | |
|---|---|---|
| _____ | b. Anything the youth does can be used as evidence against them in court | |
| | **Individual Total:** | |
| | **Grand Total:** | **/ 16** |
| | **Percentage Score:** | |

## Appendix D

## Recognition Tests Used for Experiments 2 and 3

**Multiple-Choice Test** (Adapted from Eastwood et al., 2016; Correct Answer = *)

1. When being interviewed by a police officer, I need to:
(a) Answer all the questions that they ask of me
*(b) Only answer the questions that I want to answer
(c) Only answer questions that are related to a crime
(d) Only answers questions related to my personal life

2. If I answer questions from a police officer during an interview, then:
*(a) My answers will be recorded and may be used in court
(b) I can change my answers later if I decide I want to
(c) My answers cannot be used in court because they are a minor
(d) My lawyer and I can choose what answers are used in court

3. In a police interview, I am allowed to call all of the following people EXCEPT:
(a) My parents
(b) A lawyer
*(c) A classmate
(d) I am allowed to contact all of these people

4. If I call someone during a police interview, then:
(a) This person(s) must be with me when I answer questions
*(b) It is up to me whether or not this person(s) is with me when I answer questions
(c) It is up to the police whether or not this person(s) is with me when I answer questions
(d) This person(s) cannot be with me when I answer questions

5. If I decide that I want to call a lawyer during a police interview, then:
(a) I have to contact my own personal lawyer I have paid for
(b) The police interviewer decides what lawyer I can contact
(c) I am not allowed to contact a lawyer during a police interview
*(d) I can contact a free lawyer who will give me advice at no cost

**True/False Test** (Author-constructed; Correct Answer = *)

1. I must answer the questions that the police ask me about the alleged crime. (True or *False)

2. I have the right to talk to a lawyer before the police ask questions about the alleged crime. (*True or False)

3. If I want to talk with a lawyer, then I must know the lawyer's phone number. (True or *False)

4. I can get help from my own lawyer or a free lawyer. (*True or False)

5. I am only able to speak to an adult after the police have finished asking their questions. (True or *False)

6. I am able to call another youth for advice prior to answering police questions. (True or *False)

7. The police decide who is allowed in the room when asking me questions. (True or *False)

8. I can have both a lawyer and a parent in the interview room with me at the same time during police questioning. (*True or False)

9. The police can use anything I say as evidence in court to prove that I committed the crime. (*True or False)

## Appendix E

## Multimedia Evaluation Questionnaire Used for Experiment 3

1. Overall, the quality of the video presentation was:
1 = Poor, 2 = Fair, 3 = Average, 4 = Good, 5 = Excellent

2. The speed of the video presentation was:
1 = Extremely Slow, 2 = Somewhat Slow, 3 = Average, 4 = Somewhat Fast, 5 = Extremely Fast

3. The speed of the woman's voice was:
1 = Extremely Slow, 2 = Somewhat Slow, 3 = Average, 4 = Somewhat Fast, 5 = Extremely Fast

4. The speed of the words shown along the bottom of the screen were:
1 = Extremely Slow, 2 = Somewhat Slow, 3 = Average, 4 = Somewhat Fast, 5 = Extremely Fast

5. I found the background music to be:
1 = Not At All Distracting, 2 = Slightly Distracting, 3 = Moderately Distracting, 4 = Very Distracting, 5 = Extremely Distracting

6. The characters in the video were:
1 = Not At All Distracting, 2 = Slightly Distracting, 3 = Moderately Distracting, 4 = Very Distracting, 5 = Extremely Distracting

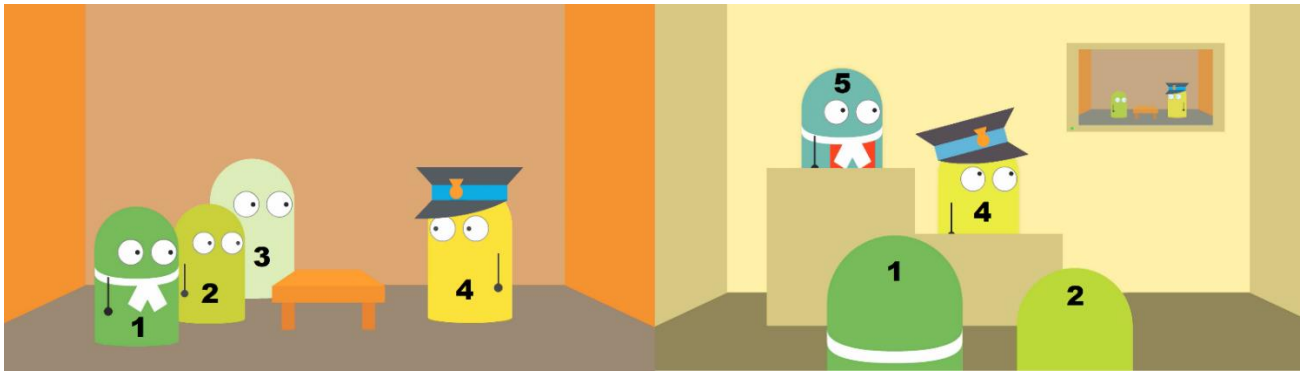
7. I found the woman's voice in the video to be:
1 = Not At All Distracting, 2 = Slightly Distracting, 3 = Moderately Distracting, 4 = Very Distracting, 5 = Extremely Distracting

8. The words shown along the bottom of the screen were:
1 = Not At All Distracting, 2 = Slightly Distracting, 3 = Moderately Distracting, 4 = Very Distracting, 5 = Extremely Distracting

9. Please rank which features of the presentation you were <u>most</u> focused on when watching the video. Rank each of the features below using the following scale: 1 = Most Focused; 2 = Second Most Focused; 3 = Third Most Focused; 4 = Least Focused

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Watching the characters | | | | |
| Listening to what the woman was saying | | | | |
| Reading the words along the bottom of the screen | | | | |
| Listening to the background music | | | | |

10. The image below contains two still-frames taken from the video. Each character from the video shown in the image has a number attached to it.




Please identify who each character is by answering the questions below:

The character with the number **1** on it is a(n):
A. Lawyer
B. Adult
C. Youth
D. Police Officer
E. Judge

The character with the number **2** on it is a(n):
A. Lawyer
B. Adult
C. Youth
D. Police Officer
E. Judge

The character with the number **3** on it is a(n):
A. Lawyer
B. Adult
C. Youth
D. Police Officer
E. Judge

The character with the number **4** on it is a(n):
A. Lawyer
B. Adult
C. Youth
D. Police Officer
E. Judge

The character with the number **5** on it is a(n):

A. Lawyer
B. Adult
C. Youth
D. Police Officer
E. Judge

11. In your own words, what was your opinion of the video presentation? (Your feedback about the video can be good or bad. There is no right or wrong answer. We value your opinion).
[Open-ended response textbox]