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Empathy in Police Officers Undergoing De-escalation Simulation Training: A Comparison Between Virtual Reality and Live Action Modalities

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EMPATHY IN POLICE OFFICERS UNDERGOING DE-ESCALATION SIMULATION TRAINING: A COMPARISON BETWEEN VIRTUAL REALITY AND LIVE ACTION MODALITIES

by

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Abstract

This study compared empathy among police officers undergoing mental health crisis de-escalation training in virtual reality and live action training modalities. The study included police officers across different police services in Ontario (N=63) and evaluated the efficacy of the Mental Health Crisis Response Training (MHCRT, Lavoie et al., 2020) program delivered across virtual reality and live action modalities against a control group that did not receive the training program. After collection of participants' demographics, empathy scores, and de-escalation competency scores, a series of correlations, ANOVAs and ANCOVAs were conducted. Results showed that participants receiving MHCRT virtual reality and live action formats demonstrated no significantly different effects on empathy based on modality, with both formats displaying an increase in empathy over time. General empathy was found to be related to having multiple de-escalation strategies in the participants' repertoire, while state empathy towards the specific character in crisis was not significantly related to specific de-escalation strategies. This relationship between general empathy and de-escalation competencies provides evidence for the importance of empathy among police officers, specifically with regard to hiring practices and specialization in mental health crisis response teams. The evaluation of the MHCRT program in both live action and virtual reality training modalities contributes to the limited research on the outcome of scenario-based police training programs and its efficacy in enhancing empathy and de-escalation competencies among police officers. This scenario-based MHCRT program is the first of its kind and opens the door to the possibility of cross-province scalability and standardization for police de-escalation training, with an emphasis on a relational policing approach to serving community members in mental health crisis.

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Chapter 1: Introduction

In modern Canadian communities, the lack of mental health programs and resources in place have resulted in nearly inevitable contact between police officers and people living with mental illness. Police officers have in recent times become 'de facto frontline mental health workers' (Iacobucci, 2014, p. 74) due to their frequent interactions with people living with mental illness and those in mental health crisis. There are over a million police interactions with people living with mental illness and substance use disorders every year in Canada (Boyce et al., 2015). While most of these encounters are resolved peacefully, there are patterns of concern, such as disproportionate criminalization, injury through police use of force, and police-involved fatalities of people with mental illness (Fuller et al., 2015; Hallett et al., 2021; Kesic et al., 2013; Morabito et al., 2017; Nicholson & Marcoux, 2018; Saleh et al., 2018). People with lived experience of mental illness have called for increased understanding and empathy in the way that police interact with the community when they are in need of help (Brink et al., 2012; Wittmann et al., 2021).

To work towards improving police encounters with people in crisis for all stakeholders, it is valuable for police officers to adopt a humanized perspective in examining these cases to emphasize that these situations involve community members who deserve dignity, compassion, and protection. To illustrate, take the recent example of a fatal police encounter involving Regis Korchinski-Paquet, a 27-year-old Black Indigenous woman in Toronto on May 27, 2020. According to Ontario's Special Investigations Unit (SUI, 2021), following the experience of a seizure earlier in the day, Ms. Korchinski-Paquet, her brother, and her mother placed separate calls to the Toronto Police Service to attend their high rise apartment in response to a domestic disturbance. At police arrival, family members were outside the home. Six officers entered the

apartment at which time Ms. Korchinski-Paquet retreated to the balcony. Attending police officers had limited time to communicate or de-escalate the situation and disengaged shortly after Ms. Korchinski Paquet began to scale the balcony railing. Less than one minute after police left the apartment, Ms. Korchinski-Paquet fell 24 floors to her death. While the SIU report concluded that officers had acted lawfully during their encounter with Ms. Korchinski-Paquet, the tragedy of her death still begs the question of how a different police response could have led to a safer outcome. Ms. Korchinski-Paquet's death and others like it highlight the need to improve police interactions with people in crisis, including specialized police training for all frontline patrol officers that prioritizes de-escalation skills and promotes mental health knowledge and compassion for the person in crisis.

Unfortunately, tragic events like these are not isolated events. Between 1990 to 2016, the Office of the Independent Police Review Director estimates that 142 people been involved in fatal encounters with Ontario police (McNeilly, 2017). While the use of lethal force is extremely rare in Ontario, a significant number of fatal cases involve a person in mental health crisis (PMHC) (McNeilly, 2017). For example, CBC journalists Nicholson and Marcoux (2018) estimated that 42% of people who were killed in interactions with police were in mental health distress. While more detailed information is needed to understand the nature of these cases, these instances have bolstered rising public concern that police encounters with people in mental health crisis needs to be improved. A mounting number of inquiries and seminal reports (e.g., Iacobucci, Loku, Dubé) have squarely focused on the need to address police responses in these cases.

The American Psychiatric Association defines mental illness as a constellation of health conditions that can alter individuals' emotions, thinking, and behaviour (American Psychiatric

Association, 2018). It is important to distinguish between a mental illness, which is an umbrella term that includes a wide range of conditions such as mood disorders, eating disorders, and psychotic disorders, from a mental health crisis. A mental health crisis is defined as a situation where an individual is exhibiting distress, disturbance, or disorientation in their behaviour, emotions, or thinking that places the person's safety at risk (Lavoie et al., 2022). Examples may include severe agitation, suicidal thoughts or behaviour, substance abuse or overdose, or a disconnect from reality (Lavoie et al., 2022). While most people with the experience of mental health crisis live with a mental disorder, such a disorder is not a necessary condition to experience a mental crisis. The term "person in crisis" in the policing context was coined by Justice Frank Iacobucci in a seminal report from the Toronto Police Service entitled 'Police Encounters with People in Crisis', and defined them as individuals,

> whose behaviour brings them into contact with police either because of an apparent need for urgent care within the mental health system, or because they are otherwise experiencing a mental or emotional crisis involving behaviour that is sufficiently erratic, threatening or dangerous that the police are called in order to protect the person or those around them (Iacobucci, 2014, p. 4).

Police are typically the first and only service responders to attend situations involving PMHC (Myrstol & Hawk-Tourtelot, 2011). While mental health crisis calls can be some of the most challenging calls for police services, it has been consistently reported that Canadian police officers have inadequate training to respond to mental health calls (Coleman & Cotton, 2014; Dubé, 2016; Iacobucci, 2014). Thus, it is crucial to work to improve specialized training that frontline police officers receive for mental health crisis intervention so that police-public

encounters are safer. One way to do so is by meaningfully including people with lived experience of mental health crises to better inform this training (Coleman & Cotton, 2014a).

One of the key recommendations made by Justice Iacobucci (2014) was for collaboration between police services and mental health researchers. Mental health research can be made more effective with the inclusion of stakeholders including people with lived experience of mental illness, mental health clinicians, mental health nurses, and other organizations dedicated to mental health advocacy working alongside researchers and police organizations to build a shared understanding and respect (Coleman & Cotton, 2014b; Iacobucci, 2014; Usher & Trueman, 2015). Through these collaborative efforts, a community co-designed model lead by Lavoie, Alvarez and colleagues (2022) has produced a "Relational Policing Approach" to training, which involves the officer approaching a person in crisis in a humanized, respectful, and empathetic way with a concern for the person's well-being. Within a relational policing approach, emphasis is placed on building trust and involving the person in the decision-making by seeking out their concerns, needs, and preferred resolution for the situation (Lavoie et al., 2022). Focusing on the aspect of empathy is a central tenet of relational policing, as empathy includes considering the perspective of the person in crisis in decision making. Police officers working to form an understanding of the situation of the PMHC will render decisions that consider the person as experts in their own mental health. Applying this person-centred and empathetic approach to policing is a progressive step to improving upon current police training standards in crisis response.

The Current Study

The present study was part of a larger initiative that focused on examining an innovative form of scenario-based training in de-escalation and specialized mental health crisis response

delivered on a fully immersive virtual reality platform. This experiential, problem-based program was designed to: 1) enhance mental health awareness to help officers identify signs of mental illness and crisis; and 2) practice de-escalation strategies and alternatives to the use of force. This training was centered on competencies co-developed by stakeholders that adhere to a relational policing approach. The capacity for empathy was theorized to be a promising asset among officers providing a humanized response to people in mental health crisis.

This study was specifically focused on examining state empathy among police officers when responding to mental health crisis simulations delivered in virtual reality (VR) as compared to live action. The findings from this study supplement the emerging literature on using VR as a tool for training police officers in response to mental health crises. Further, results of this research add to the limited available research investigating how empathy plays a role in police officer de-escalation competency acquisition, specifically across training contexts such as VR simulations. De-escalation is the act of transferring the state of an interaction from high tension to a state of lessened tension (Richards, 2007). This research makes a contribution because it evaluates and adds to the knowledge on police mental health crisis response by focusing on training objectives that centre on empathetic and humanized approaches to enhance de-escalation skillsets among officers.

Chapter 2: Police Mental Health Crisis Training

Mental Health Crisis Calls

Responding to mental health crisis calls represent some of the most difficult calls for police services. Canadian police officers have reported feeling ill equipped to respond to these types of calls as well as frustration towards being unable to connect people with mental illness (PMI) with proper care for their mental health needs (Iacobucci, 2014). Officers report feeling unprepared to deal with PMI or PMHC's behaviour if they were to become less compliant and more challenging towards the officer (Soares & Pinto da Costa, 2019). Further, police officers generally have a desire to receive increased support from other mental health professionals in responding to mental health calls and receive further training in mental health crisis response (Soares & Pinto da Costa, 2019).

Numerous factors contribute to PMI having limited access to treatment in the community, following de-institutionalization of long-term residential mental health care from decades ago, including a reduction in available mental health beds, inadequate community treatment options and resources, long wait times to access services, and strict civil commitment criteria in times of crisis (Shore & Lavoie, 2019). Poor access to care results in symptoms remaining untreated and more frequent occurrence of crisis situations (Shen & Snowden, 2014). People who need help call the police because there is often no other crisis service to summon that is available 24/7. Police officers often respond repeatedly to the same citizens (Markowitz, 2011). Officers play a vital role in determining the outcome of these crisis situations (Shore & Lavoie, 2019), as they are typically the first point of contact and a bridge between PMHC and mental health resources (Livingston, 2018).

Overview of Mental Health Crisis Training in Police Services

Before the present study's mental health crisis training can be discussed and evaluated, it is important to review the landscape of mental health crisis training programs already available in Canada to better understand how and why a relational policing training program was developed. At this time, there is currently no provincial standard or requisite for qualification for mental health training provided to new officers across police services in Ontario (Dubé, 2016). Ontario's Ombudsman Dubé recently denounced the lack of progress made by the Ministry of the Solicitor General in establishing such a training standard (Dubé, 2022). Indeed, there are inconsistencies among police services across the province and country in how mental health training is offered, the amount of training required for newly hired police officers, as well as who provides the mental health training (Coleman & Cotton, 2014b). Some research suggests that police officers acquire their knowledge on mental health from other experienced officers or through on-the-job experience rather than through formal training (Cummings & Jones, 2010). In recent years, Fiske et al. (2020) surveyed police departments across the United States and found that there was an increase in the last 20 years for police officer mental health knowledge training, as most police departments reported using some form of specialized team to respond to mental health crisis calls. However, police officers are typically not trained specifically in de-escalating mental health crisis situations (Coleman & Cotton, 2014b; Dubé, 2016; Iacobucci, 2014).

Coleman and Cotton's (2014) Training and Education about Mental Illness for Police Officers (TEMPO) report reviewed police training across the nation. The TEMPO report noted that programs in Canada have shown a tendency to focus on 'behaviourally oriented learning' or to include a limited array of topics (Coleman & Cotton, 2014b, p. 29). The Canadian training program identified in this report as best developed and comprehensive is that of the Halifax

Regional Police (HRP). The HRP has approached mental health training in a matrix format, including four levels of training. The 100 level involves basic police training and has the learning objectives of introducing new police recruits to general categories of mental illness and mental health crisis, and how to respond to crisis calls. The 200 level is continuing education for first responders and builds upon the previous level for officers who had not received the basic first level of training. The 300 level is Crisis Intervention Team (CIT) training, which has the objective of increasing awareness and understanding of mental health crisis to see from the perspective of the person in crisis and their families. This 300-level also develops the officers' skills in interacting with PMHC. Finally, the 400 level is advanced training for Mental Health Mobile Crisis Team (MHMCT) police officers, which includes at least four job-shadowing shifts with other MHMCT officers. The learning objective of the 400 level is for officers to gain further knowledge on mental illness recognition and skills for responding to PMHC. The HRP matrix training uses lecture, online, scenarios, and experiential learning techniques and involves collaboration with PMI and mental health professionals. The Halifax program is described as the 'gold standard' and is an example that guided the creation of the TEMPO framework, however it has yet to be empirically tested and validated for its efficacy in mental health de-escalation.

Another example of mental health crisis training in Canadian police services is the Toronto Police Response to Emotionally Disturbed Persons. The Toronto Police Service (TPS) offers training that educates police officers on how to appropriately conduct interactions with 'emotionally disturbed persons' (Coleman & Cotton, 2014b), a term which has fallen out of favour in recent years. The training focuses on improving communication skills and de-escalation tactics, which includes developing rapport with PMHC. Officers are exposed to information on the most up to date practices in mental health, crisis resolution, and use-of-force

methods (Coleman & Cotton, 2014b). Scenario-based training is a technique utilized in the TPS training, which involves staging commonly encountered crisis situations using role-players to provide applied, competency-based learning opportunities for officers in. Scenario-based training provides learners with the opportunity to interactively practice and demonstrate learned de-escalation and communication techniques (Lavoie et al., 2022). Along with scenario-based training, the TPS training program also includes a 90-minute lecture format that discusses communication and mental disorders. Within the lecture, the safety of both the individual in crisis and the police officer are emphasized. However, the TPS program has yet to be tested for program efficacy.

A third police mental health training program in Canada discussed in the TEMPO report is the Crisis Intervention and De-escalation (CID) training. CID has been implemented as a requirement following the Braidwood Commission for all first responder police officers in British Columbia to complete as of 2012, in response to the tragic death of Robert Dziekanski caused by police use of conductive energy weapons (CEWs) in 2007 (Coleman & Cotton, 2014b). The objective of the CID training is similar to the TPS training, as it places emphasis on providing officers with effective crisis intervention communication skills to de-escalate crisis scenarios (BC Ministry of Justice, 2012). The CID training includes both an online training module and an in-person training module, including additional materials that accompany the training program (e.g., guide for mental health disorders with commonly prescribed medication). The CID training has yet to be evaluated for program efficacy.

Perhaps the most widely studied training program in mental health crisis response is the Crisis Intervention Team (CIT) model, which focuses on providing a specialized approach to mental health calls. The CIT model originated in Memphis, Tennessee in 1988 after the fatal

shooting of a PMHC by a Memphis police officer (Dupont & Cochran, 2000). The CIT model was developed in collaboration with law enforcement, mental health professionals, and mental health advocates with the objective of de-escalation and diverting PMI away from the criminal justice system and towards appropriate mental health resources (Watson & Fulambarker, 2012) . CIT training includes specialized training for certain groups of police officers in identifying the presence of mental illness or crisis, effectively responding and de-escalating (Watson et al., 2010). Further, CIT's main elements include creating a link between police and mental health community resources (Coleman & Cotton, 2014), and transitioning the role of police away from the traditional view of policing towards a 'service-oriented model', which looks at responding to mental illness calls as a concern of the community's safety and health (Watson et al., 2008).

As for CIT effectiveness, Compton et al. (2008)'s comprehensive review of 20 studies found that CIT may have positive effects on police officers' beliefs, attitudes, and knowledge related to situations involving PMI. Further, CIT-trained police officers are reported to have felt more prepared to responding to crisis calls involving PMI. Compton also determined that CIT programs lead to less arrests and decreased criminal justice costs. In contrast, a meta-analysis conducted by Taheri (2014) found evidence that CIT training had no effect on officer use of force with PMHC. Another study by Morabito et al. (2010) found that non-CIT trained officers used significantly less force compared to CIT trained officers, whereas other studies had a null effect of CIT training on officer use of force. That CIT training has produced mixed effects on reducing police use of force in situations involving PMHC does raise concerns. Haigh et al. (2018) suggested that a limitation of CIT training in US police departments is that it fails to display significant decreases in mental illness stigma among officers who completed the training as compared to officers who did not take part in CIT training. Further, this study found that

regardless of CIT training, police officers with higher interpersonal anxiety felt less comfortable taking mental health calls and had greater concerns of needing to use force in response to those calls. Conversely, police officers who felt more confident in being able to recognize mental disorders expressed greater comfort in responding to mental health calls. These findings therefore suggest that it would be beneficial for mental health training for police to address police officer anxiety related to PMI. Further, improving police officers' ability to identify mental illness would also be valuable as a training objective, as this recognition shapes the way police officers' respond to situations involving PMI (Watson et al., 2004). This body of research on police mental health training thus guides recommendations for future program improvement such as that examined by the present study.

Recommendations for Police Mental Health and Crisis Training

Despite that over the past 20 years there have been increases in mental health training delivered to police officers (Fiske et al., 2020), training is often de-contextualized and offered in lecture format (Lavoie et al., 2022). A recommendation for improving mental health police training includes shifting towards training that involves the application of skills and an interactive format (Fiske et al., 2020). Pinfold et al. (2003) found that personal contact training with a PMI leads police trainees to feel better prepared and confident to respond to future crisis calls with PMI. Therefore, a recommendation for future training involves police services collaborating with individuals with lived experiences of mental illness for training purposes. Further, Brink et al. (2012) determined that PMI are open to the opportunity of working with police services to further develop police training programs as well as bring an alternate, and authentic perspective of mental illness to which police members may not have otherwise been exposed. This inclusion of lived experience of mental illness in police training would then

contribute to police officers having a more well-rounded understanding of PMI beyond the illness (such as periods of recovery) and aside from predominantly interacting with people with mental illness in response to police calls. Another recommendation provided by Iacobucci (2014) in an independent review for the TPS included that police services work with mental health organizations to "identify key resource people or liaisons, so that every TPS officer has contact in the mental health system that they feel comfortable contacting for advice and who is able to knowledgeably give that advice" (p. 13).

Additional recommendations included police departments collaborating with scholars to evaluate the effectiveness of protocol and training using both quantitative and qualitative research methods (Iacobuccci, 2014). Further, Iacobucci identified that there should be more standardization in police training for mental health, as well as the use of practical and scenario-based training methods, which could include the ability of officers to identify mental health crises or mental illness. Officers with the ability to accurately identify mental illness or crises, and anti-stigma training to engage in accurate risk assessment, and in a position to offer safer and more effective response to that person's needs.

The Ontario Ombudsman report (Dubé, 2016; 2022) reviewed dozens of inquiries involving escalated calls between police and PMHC that resulted in the citizen's death. Dubé (2016) described how "Ontario officers have plenty of training on how to use their guns, but not enough on how to use their mouths" (p. 6), arguing that Ontario police's use of force training focuses heavily on using weapons and rarely focuses on using verbal tools to de-escalate a situation involving an armed PMHC. Dubé emphasized that police training does not effectively teach officers de-escalation techniques. A method of training police officers in de-escalation is to shift police officers' orientation towards thinking of themselves as frontline workers rather than

as crime fighters when called to crises situations (Iacobucci, 2014). Both Dubé and Iacobucci recommend scenario-based training in mental health for police responding as frontline workers to mitigate escalation and reduce police use of force and associated harms from occurring in response to individuals experiencing mental health crises. However, the presence of a police officer in itself can be an escalating factor for many individuals, especially for those in communities with challenging histories with police or experiences of being over-policed (Lavoie et al., 2022). Officers should therefore be mindful of their presence when attending crisis situations.

Police Mindset

Research shows that the approach that officers use to respond to a crisis can have an escalating (or de-escalating effect). In particular, authoritarian or forceful policing styles may inflame crisis situations and contribute to increased use of police force (Kesic, Thomas, & Ogloff, 2013). Therefore, the professional mindset that officers adopt can have a significant effect on the outcome of responding to situations involving PMHC. As the current study endorses a relational policing approach, other types of policing approaches must first be discussed. To start, a traditional policing practice follows a more authoritarian approach, where the main mission of the officer is viewed as fighting crime (McLean et al., 2020). This traditional view of policing thus does not place the emphasis on building a police-community relationship when attending to PMHC.

In response to negative police-citizen encounters, some policing experts have placed an emphasis on shifting from a “warrior” to a “guardian” mindset (Cohen, 2017). This distinction of mindsets within the police service is called the Warrior/Guardian framework, with each mindset linked to distinct patterns in attitude (McLean et al., 2020). In turn, each mindset is connected to

different attitudinal and behavioural outcomes (McLean et al., 2020). The warrior mindset refers to officers seeing themselves as warriors who are combatting crime (McLean et al., 2020). More specifically, the warrior approach to policing emphasizes officer safety and prioritizing the officer's main mission as fighting crime, which is seen as following a traditional practice of policing (McLean et al., 2020). From a psychological perspective, warrior-minded police officers see themselves as the line between good and evil in society (McLean et al., 2020), and is undergirded by an "us-versus-them" attitude (Cohen, 2017). The main problem with officers possessing a warrior mindset is that those officers are likely to be more hypervigilant to perceived threats in the environment and at times respond to those threats with unnecessary force (Stoughton, 2014). This hypervigilance paired with police officers' perception of individuals with serious mental illness, such as schizophrenia, as more dangerous can lead to unnecessary escalation of the situation (Corrigan et al., 2003; Watson et al., 2004).

Conversely, a guardian mindset is an alternative to the warrior mindset, which prioritizes service over fighting crime (Stoughton, 2014), and values working with the public to reduce crime (McLean et al., 2020). Further, the guardian mindset places emphasis on the officer building relationships between the police and the community (Stoughton, 2014). In other words, the guardian mindset prioritizes the police-community relationship (McLean et al., 2020). The guardian mindset is consistent with a relational policing model, which places emphasis on a person-centred approach (Lavoie et al., 2022), especially since the guardian mindset is associated with a higher prioritization of communication in encounters with citizens (McLean et al., 2020). However, part of adopting a guardian mindset involves addressing police officers' biased attitudes towards mental illness. Thus, transitioning police training programs towards

engendering a guardian mindset is especially beneficial in the context of responding to PMI and individuals experiencing mental health crises.

Stigma and Officer Perceptions of Mental Illness

The public, not just police officers, are likely to hold biased attitudes towards people with mental illness or in mental health crisis. Within the literature on mental illness stigma, the most common stereotypes attributed to those with mental illness included dangerousness, violence, incompetence, and unpredictability (Borinstein, 1992; Fox et al., 2018). Moreover, the most common forms of prejudice towards PMI by the public were fear, pity, and anger (Corrigan, 2005; Corrigan et al., 2004). Key variations of discriminatory acts against PMI included: avoidance, withholding help, and segregation (Corrigan & Rüsch, 2002; Corrigan & Watson, 2002). As a framework, stigma theory can be used to address biased attitudes held by members of the public, including police officers, towards those living with mental illness.

Generally, Goffman's (1963) theory asserts that stigma involves a combination of societal stereotypes and personal characteristics tied to unacceptable or undesirable characteristics (Goffman, 1963; Horsfall et al., 2010). Using Goffman's framework, the type of stigma surrounding mental illness involves beliefs around the individual's character (El-Badri & Mellsop, 2007; McDaid, 2008). PMI who are stigmatized are blamed for their disorder, which is then directly linked to a part of their character being flawed (Horsfall et al., 2010). For example, common myths about people with mental illness include that they are weak, lazy, morally inferior, able to control their illness but choose not to, or get "away" with transgressions because they are ill (Canadian Mental Health Association, 2016).

Drawing from stigma theory, Soares and Pinto da Costa (2019) examined Portuguese police officers' perceptions of PMI and found that police officers were shown to perceive PMI as

unpredictable, dangerous and lacking in clear judgement, especially if the officers were untrained in mental health education. Conversely, a study conducted by Watson, Corrigan, and Ottati (2004) provided US police officers with a vignette that described one specific individual in the role of either a witness, victim, suspect, or someone needing assistance. In half of the vignettes provided to officers, the character was labelled as having schizophrenia, and the remaining vignettes did not include this label. After reading over the vignette, the officers completed a questionnaire on attitudes towards PMI. The researchers found that US participants viewed individuals labelled with schizophrenia in a vignette as more dangerous, less responsible, more deserving of pity, and more worthy of being helped compared to an individual not labelled with a mental illness. While these studies were conducted outside of Canada, the results can inform research on Canadian police officers. Limited research on Canadian police perceptions of PMI has been published in recent years (Cotton, 2004; Trovato, 2000). Cotton (2004) found that approximately half of Canadian police officers surveyed held the belief that PMI are less of a danger than most people assume, whereas just over a third of the officers surveyed were neutral or disagreed with the same statement. Additionally, Trovato (2000) and Cotton (2004) found that officers expressed an obligation towards helping PMI while simultaneously wanting to protect the public from them. Therefore, similar perceptions of PMI held by police officers are somewhat consistent across different countries. Notably, these studies are about 20 years old and should be revisited.

Regardless of these perceptions of PMI, research robustly shows that the presence of mental illness plays little role in explaining the perpetration of violence (CMHA, 2011). Most violence is committed by people without a mental illness. Rather, people living with mental illness are more likely to be victims of violence as opposed to perpetrators (Hiday et al., 2001;

Teplin et al., 2005). One of the risk factors for violent behaviour within both PMI and the general population is substance use (Swanson et al., 2015; Van Dorn et al., 2012) and recent criminal victimization (Canadian Institute for Health Information, 2008; Hiday et al., 2001). This relationship is of importance as it runs in contrast to the misperception of PMI being innately dangerous. While mental illness on its own is weakly related to violence, there are specific symptoms of mental illness that are predictive of engaging in violence including feeling threatened (e.g., paranoia) (Asnis et al., 1997) and the presence of threat/control override delusions (Buckley et al., 2003). Therefore, the inaccurate perception of PMI being inherently dangerous fails to consider the rates of victimization faced by this particularly vulnerable group, and instead takes the approach that the behaviour is innate or caused by mental illness (CMHA, 2011). An uninformed perception of PMI being dangerous can result in police officers responding with unnecessary use of force during a mental health crisis call for service.

In sum, police interactions with people in mental health crisis requires an intervention, as lethal police interactions with people in mental health crisis are disproportionate, and these rates of fatality have increased, with 178 out of 711 deaths occurring within the last three years since the year 2000 (Nicholson & Marcoux, 2018; Saleh et al., 2018; Tracking (In)Justice, 2022). Research consistently reports that police use more (lethal and non-lethal) force in incidents involving PMI compared to those without a disorder (Morabito et al., 2017), such as frequent CEW deployment, commonly known as Tasers (Taheri, 2014). Several recommendations specific to police training have been made to address these shortcomings include prioritizing de-escalation strategies, enhancing mental health awareness, using scenario-based training to practice communication, increasing opportunities for positive contact with PMI, and emphasizing empathy (Iacobucci, 2014). While the specific context in which empathy should be

implemented into police training was not explicitly described in the reports on recommendations for police training, police officers themselves have expressed that an empathic approach was a key strategy to respond to calls with PMHC (Soares & Pinto da Costa, 2019). These recommendations were thus taken into consideration when developing the program of the current study, with a focus particularly on empathy to better understand its role in improving police training.

Chapter 3: Empathy

Overview of Empathy as a Construct

Empathy is a construct that does not have a specific universal definition; however, it has been defined as one's ability to comprehend and share another individual's feelings (Hogan, 1969). The construct of empathy is two-dimensional and involves both understanding another person's situation or feelings (cognitive empathy), as well as feeling another person's emotions (affective empathy) (Hogan, 1969). Some researchers also argue that there is a third dimension to empathy, referred to as associative empathy (Kampmann et al., 2016; Navarro-Haro et al., 2017; Shen, 2010). Associative empathy is described as the extent to which an individual identifies or connects with how another person feels (Shen, 2010), and functions to help one foster social relationships with others (Campbell & Babrow, 2004). Associative empathy however has been far less researched than cognitive empathy and affective empathy. While this paper overall positions empathy as a positive construct, the limitations of empathy should also be noted. It has been argued that empathy as a construct has power attached to it, given that empathy is something that is offered from oneself onto another individual (Boler, 1997). Further, Bloom (2016) argues that empathy has assumptions and bias embedded within it. Similar to Boler, Bloom suggests that it is easier to extend empathy onto individuals whom we consider as similar to ourselves. Bloom further describes this aspect of empathy by explaining that one feels more empathy towards someone who is cooperating with them rather than someone who is competing against them; therefore, a power struggle lies within the experience of extending empathy to another. Given that police officers tend to view PIC as non-compliant (Soares & Pinto da Costa, 2019), we can expect that there would be a challenge in offering empathy to PIC.

Measurement of empathy as a construct is typically distinguished between trait and state empathy, where trait empathy is defined as one's dispositional tendency to feel empathy towards another person's experiences in general (Davis, 1983). On the other hand, state empathy is an individual's transient emotional experience elicited by another person's feelings (Preston & De Waal, 2002; Van der Graaff et al., 2016). State empathy is thus situational and directly related to its subject (Preston & De Waal, 2002). Moreover, state empathy involves somatic and automatic responses to another individual's feelings (e.g., experiencing pain when seeing someone else physically hurt, or feeling sadness when someone else is expressing those same feelings), whereas trait empathy is more general and dispositional. While there are distinct differences in the mechanisms between state and trait empathy, they are also related to one another (Batson, 2009; Van der Graaff et al., 2016). For instance, individuals with higher trait empathy generally have higher state empathy as well (Van der Graaff et al., 2016), as an individual's trait empathy influences the degree to which they use empathy-related processes when attending to emotionally responsive situations (Davis, 1996).

When people feel empathetic, their prevalence of pro-social behaviours increases, which is usually seen as helping others (Batson et al., 2015). However, when an individual is judged as being different, they are viewed as being a member of the 'outgroup' – a phenomenon known as "othering" (Gutsell & Inzlicht, 2012). Studies have shown that it is more difficult to feel empathy towards people perceived as belonging to an outgroup, and conversely easier to feel empathy towards people seen as similar or part of the 'ingroup' (Avenanti et al., 2010; Gutsell & Inzlicht, 2012). By casting individuals who appear or act differently into an outgroup, Segal (2021) argues that feelings of fear are triggered as humans are predisposed to view members of the outgroup as threatening. The presence of fear prevents the ability of complex cognitive

functioning, such as that needed to experience empathy (Segal, 2021). The effect of othering can therefore interfere with one's ability to be empathetic towards individuals viewed as different.

A relevant implication of this relationship would be with police officers viewing PMHC as different from themselves and part of their outgroup and thus seeing them as more threatening. The result of othering PMHC could then lead to a lessened ability of police officers to empathize with PMHC, and potentially less inclination towards helping the person in crisis. Instead, learning about and becoming familiar with others viewed as different from self may help individuals overcome their fear, and in turn increase their capacity for empathy. This can be done through taking the perspective of others and putting effort into understanding their personal experiences in order to break down boundaries between "us vs. them" (Segal, 2021).

Empathy and Police Officers

In the context of police officers, empathy plays a notable role. Police officers are often attending to situations that are complex and emotional (Inzunza, 2015); therefore, if officers are too emotionally engaged it could prevent them from making logical, information-based decisions (Inzunza, 2015). Conversely, police officers could also encounter difficulties if they are unable to understand the individuals that they are attending to on both an emotional and cognitive level. As for research on police officer's empathy, the majority of the literature focuses on their attitudes towards victims of sexual assault (Turgoose et al., 2017).

In rape and sexual assault cases, police officers working with victims can have exposure to "traumatic material and victims' distress" (Turgoose et al., 2017, p. 3). By implication, it can be theorized that if police officers in these cases have significantly high affective empathy, this could cause them to experience burnout or vicarious trauma due to experiencing the associated trauma that many victims of sexual assault experience. The potential impact of working with

traumatised individuals, not exclusively victims of sexual assault, is referred to as compassion fatigue (Figley, 2002; Turgoose et al., 2017). Some of the impacts of compassion fatigue include a reduction in interest or capacity to take in other individuals' trauma (Figley, 2002), emotional and physical fatigue, and a significant reduction in empathy and compassion for others (Elwood et al., 2011; Evces, 2015; Mathieu, 2007).

Another form of psychological or emotion exhaustion includes burnout (Turgoose et al., 2017). Burnout is correlated with feeling hopeless and experiencing difficulties with performing effectively at one's job (Stamm, 2010). Both burnout and compassion fatigue are prevalent within service professions, such as emergency workers (Cicognani et al., 2009) and healthcare workers (Gleichgerrcht & Decety, 2014; Hegney et al., 2014). Turgoose and colleagues investigated police officers working with victims of sexual assault and focused on their compassion fatigue, burnout, and empathy. They found that police officers who have served longer in sexual assault units experienced higher levels of compassion fatigue and burnout. Importantly, Turgoose et al. found that compassion fatigue was unrelated to police officer's empathy towards sexual assault victims. These results challenge the model that posits that individuals with higher dispositional or trait empathy are more likely to develop compassion fatigue and burnout (Halpern, 2003; Roter et al., 1997). Another study that focused on empathy and burnout in participants responding to sexual assault victims found that participants who felt more personal distress in general took on sexual assault victims' feelings of blame, resulting in them distancing themselves more from the victim (Martingano, 2020). Conversely, participants who felt more empathic concern resulted in greater feelings of anger on behalf of the victim, and consequently resulted in the participant feeling more motivated to help the victim. More research is required to better understand the role that empathy plays in police practice, with the promising

suggestion that increasing empathic concern through a person-centred training model could lead to greater motivation for helping PMHC access appropriate care.

Empathy in Police Officers Responding to PMHC

Given that most research examining police officers' empathy levels has focused on sexual assault cases, limited research has been conducted in relation to police officers' empathy levels towards individuals experiencing mental health crises. Typically, research has investigated police officers' overall perceptions of individuals with mental illness or experiencing mental health crises (e.g., Desmarais et al., 2014; Watson et al., 2004) rather than focusing on the specific aspect of empathy toward these individuals. However, focusing on police officers' empathy towards PMI or PMHC is of interest as it could theoretically combat/disrupt officers' negative perceptions (i.e., stigma towards PMI or PMHC) or discrimination, and in turn foster a more humanistic approach to responding to mental health calls for police service. Research conducted by Herrera et al. (2018) examined the role of empathy in a non-policing sample responding to individuals in crises. They found that individuals are more likely to advocate for individuals in crises if they have more empathy for them. Extrapolating these findings, without empathy, police officers are theoretically less likely to come to understand what individuals are experiencing and how to meet their needs. Potentially, police will respond to individuals undergoing mental health crises more successfully if they are able to properly understand their situation and needs. It is worth noting, however, that greater empathy does not automatically lead to a better understanding of the PMHC specific situation – empathy refers to understanding and sharing another persons' *feelings*. Thus, perhaps empathy on the part of the officer promotes the interest to learn more about the PMHCs' situation and needs and increase the officers' willingness to help, offer care, and engage in person-centred decision-making.

Based on research involving police officers and attitudes towards PMI, police officers recognize that an empathic approach is key in responding effectively to mental health (MH) calls (Soares & Pinto da Costa, 2019). Applying Soares and Pinto da Costa's findings to the present study, perhaps police officers trained to use a relational policing approach, which relies on empathy, would allow for more effective de-escalation of PMHC. Further, a better understanding of how a client is feeling increases the quality of the interaction, and results in a collaborative outcome that is helpful to the person in crisis. Focusing on empathy in police officer training thus follows a humanistic approach and is consistent with relational policing approaches and the guardian framework, as training then places emphasis on caring for community members in need rather than hypervigilance against perceived threats. Hiring for empathetic capacity (i.e., officers with greater trait empathy), and developing and reinforcing empathy towards PMI and PMHC in police training promotes police as community helpers rather than warriors, especially since they are in most cases the sole responders to mental health calls. Officers with higher trait empathy are going to be more likely to take time and listen to the person they are responding to, allowing the officer to identify the needs of the person in crisis and offer appropriate choices as elicited by the person in crisis (e.g., community service, resources, emergency care) to resolve the situation. Listening to the person in need also permits the officer to learn more about the context of events leading up to the current situation and help officers check their assumptions and bias. Therefore, the situational and dispositional aspects of empathy of police attitudes when responding to individuals experiencing mental health crises is a central area of research interest for this study.

Chapter 4: Scenario-Based Training

A training tool that has been researched to improve empathy is virtual reality (VR) technology due to its immersive nature (Herrera et al., 2018; Shin, 2018). VR and live-action training (i.e., with simulated patients) are both forms of scenario-based training. Scenario-based training uses an active learning approach and can prepare learners to respond appropriately to complex events that are highly stressful (Jenkins et al., 2021). Scenario-based training is popular in professions that have high-risk outcomes like injury and death, such as jobs in law enforcement (Jenkins et al., 2021). Using scenario-based training in policing provides learners with the ability to rehearse communication and de-escalation tactics in an interactive form through role playing (Alvarez, 2021; Lavoie et al., 2022). This training allows for high-fidelity situations to be played out to train officers on the ability to think critically and conscientiously within the stress of the scenario (Alvarez, 2021). Typically, this type of police training is in the form of live action scenarios being role played with another police officer playing the role of a person in crisis (Lavoie et al., 2022), however, ideally professional actors are used for the role of PIC when resources permit. To understand why the two modalities of scenario-based training were chosen for this study, each type will be discussed further, starting with virtual reality.

Virtual Reality

VR involves computer generated three dimensional (3D) immersive environments (Herrera et al., 2018). Some VR applications allow learners to move around and interact freely in the simulated environment in an “open world” while interacting with their surroundings and animated characters (Herrera et al., 2018), with minimal pre-determined narratives or controlled direction. Research involving VR has increasingly described the platform as an “empathy machine”, originating from a 2015 Ted talk by Chris Milk (2015). This description is due to the

modality's capacity to allow individuals to experience a scenario from another individual's perspective or point of view (Milk, 2015), however, not all VR experiences necessarily involve taking another person's point of view. For instance, Horizon Worlds is an example of a VR environment that involves users hanging out in the Metaverse as themselves in a self-created avatar form without viewing from another user's perspective. VR can help convey another character's experiences and emotions to the learner (Shin, 2018). Users might experience, for example, another person's affect or experiences more strongly than in real life due to being in the same immersed virtual environment as the other character. Perspective taking in VR is enabled by viewing, moving around, and feeling perceptual cues in the environment synced to the other person's experiences (Shin & Biocca, 2017). The immersive nature of VR is what allows for users to better understand scenarios from another person's perspective, therefore, potentially leading to improvements in empathy levels. Extensive research on using VR to take another individual's perspective has shown it to be effective at improving empathy (Herrera et al., 2018). The opportunity for the learner to take the VR perspective of the person in crisis (PIC) was available in a portion of this study's training, and the discussion of the PIC's perspective of the situation was thoroughly discussed with the group of participants. Therefore, this aspect could promote empathy for PMHC when entering the scenario in VR.

A study conducted by Shin (2018) found that immersive properties of a VR story promote the perception that the story is in fact real. Shin also found that the VR user's own trait empathy levels prior to immersion in VR ultimately determined the level to which they felt empathy and engagement within the VR environment. Users with little trait empathy prior to the VR experience in turn did not feel a strong level of empathy or engagement after the immersion. Therefore, level of trait empathy prior to VR immersion plays a role in how much state empathy

can be developed from a VR scenario. Herrera et al. examined how the use of VR affected participant's feelings of empathy towards homeless individuals depicted within the virtual environment. They compared participants using VR and participants involved in less immersive tasks. Those who undertook the VR tasks were found to have more positive attitudes towards homeless people, an effect that was longer-lasting than the control group (i.e., up to two months after the study). Overall, while the literature does not currently promote VR's capacity to increase cognitive empathy, VR has been shown to improve upon affective empathy (Martingano et al., 2021). Therefore, these results provide potential for police involved in VR training to create more favourable and longer-lasting attitudes towards the PMI in comparison to using traditional training methods.

As VR involves immersing individuals in simulated scenarios, it has been a prospective method of training in many different fields, such as medicine, military, and law enforcement for a number of years (Stone, 2001), and even tackle some stigma within the given training topic. An example of this includes research on the design of digital games to educate individuals on stigma associated with substance use by working with groups of people with lived experience of addiction (Danilovic, 2022). The inclusion of people with lived experiences at the very outset as key players on the development team for digital games and software allows their expertise to drive authentic portrayals of a specific experiences, whether that be of individuals recovering from addiction or mental illness.

Limited literature has been published on the use of VR as a training method specifically for police officers prior to 2022. One study involving VR use and police officer participants examined police officers' stress responses during VR simulated critical incident scenarios (Groer et al., 2010). This study found that police officers experienced heightened levels of stress after

participation in the simulated job scenarios. Groer and colleague's preliminary results demonstrating that VR can simulate stressful scenarios that police officers may encounter in the field indicate that VR could also potentially be used for training police in elevated interactions with people experiencing mental health crises. Research in the past year on police training and VR have been conducted in other countries, such as the US (Kent & Hughes, 2022), Netherlands (Kleygrewe et al., 2023), and other countries in Europe (Zechner et al., 2023), however, limited research has been conducted within the Canadian context. Therefore, there is a gap in the literature on Canadian police officer training in VR.

Smith and Carter (2010) conducted a study that aimed to evaluate whether navigating through a virtual environment is effective in training police officers in effectively identifying indicators of anti-social behaviour, such as broken windows or alcohol containers on the ground. The study compared the virtual environment to effects produced by a paper-based version of the simulation. The performance metrics collected from each participant included the number of anti-social behaviour indicators identified and how long it took for the participant to complete each task. Officers performed similarly in virtual environments and paper-based scenarios; however, officers did elicit more detailed descriptions of observation logs, that is, noted observations of anti-social behaviour indicators that are generated by adding notes to objects, in the virtual modality. Officers also indicated a preference for the virtual environment as a tool of training. Despite that there was no reasoning provided for the preference choice, it is possible that police officers were more engaged in the virtual reality training. In sum, VR training is certainly a promising option to continue researching as a modern training modality for police.

Live-Action vs. Virtual Reality Modalities in Scenario-based Training

Live-Action

Scenario-based training is supported by adult learning literature and allows officers to practice applied skills in realistic environments that mirror the real world. Live-action training environments are conducted in person and may involve several actors or "simulated patients" who must be trained for the role in advance. The actors rehearse and study the character for standardization of realistic portrayal of the character across multiple actors (if several actors are used). Since the actors are responding to trainees in real time, a script cannot necessarily be precisely followed and therefore, a rich understanding of the character's backstory and motives is required. Along with character attributes and behaviour, physical appearance is an aspect that would be considered, such as clothing and hair. Physical sets are constructed to portray the simulated environment in the scenario; this may include the use of set pieces and props within the scene. Realistic portrayal of character and set environment in live action would be consulted under the guidance of Subject Matter Experts and director trainers. Live-action scenario training in the educational context allows for engaging in the scenario to be the curriculum, where participation equates to applying learned skills. The trainee's participation in the live-action scenario allows for mistakes to be made and learned from in a controlled environment.

Live-Action Advantages

One main benefit of using a live-action scenario-based training modality is that trainees can apply skills they have learned directly to a scenario that has been crafted to mimic a situation they might typically encounter. Additionally, instructors can pause a live-action scenario and provide feedback at any time, to then "hit play" on the scenario and allow the trainee to apply this feedback in real time without any unnecessary gaps in learning application. Scenarios can

also be videotaped for playback, allowing trainers to highlight specific areas of a learner's performance and provide relevant notes afterwards. Last, another main benefit of live-action training is that there is no real learning curve for trainees when they begin the scenario. The learner can bring in the same type of tools and uniform they would normally use in the field and interact with an actor as they would with a civilian. For instance, a police officer could wear their regular uniform, vest, and have prop items in their duty belt. Live action scenarios are a familiar modality in police training and there is not the additional task of learning how to use controllers or unfamiliar tools such as in VR. While there are certainly many benefits to using live-action training, it can be challenging to conduct.

Live-Action Limitations

While actors portraying a crisis role are professionals and trained for the demands of high-intensity and repeated role playing, they still can become fatigued after multiple iterations of the scenario due to the intensity of the role (e.g, yelling, crying, simulated self-harm) all while providing instantaneous responses to learners' behaviours, which itself represents a high cognitive load. As such, multiple actors may need to be trained and scheduled for the training session, with rest and nutrition periods integrated throughout the day. Soundscapes and physical sets must be designed and constructed in a singular location which is time consuming, costly, and requires additional personnel. All trainees must travel to attend a singular location to receive the training. Poor weather conditions in the Canadian climate, or pandemic outbreaks can severely disrupt the success of in-person scenario-based training, no matter how much time has been dedicated to preparing for the event. Additionally, as scenarios can be videotaped for playback, this would require the use of a camera set up (i.e., tripod, DSLR camera, and

microphone), which could act as a distraction for some learners if the recording equipment is in an obvious location.

VR Advantages

In comparison to live-action scenario training environments, VR formats poses several advantages. The characters and environments are pre-designed and available in the VR equipment at a significant cost savings. The scenarios are delivered in a more standardized way; however, character responses are limited to a few possible pre-designed branches. The possibility of providing remote training while pandemic restrictions are in place could increase the scale of how many officers can be trained because the equipment is easily transportable to locations urban or remote, as opposed to requiring trainees to travel. While virtual reality can attempt to imitate training scenarios acted out in live-action in small sets, virtual reality environments can also advance a step further by creating larger realistic training environments (e.g., a street scape with moving traffic) that are not easily replicated in the real world (Patterson et al., 2009). An example of virtual simulations that are not easily duplicated for live-action training includes firefighters undergoing training in a simulation of a burning building (Backlund et al., 2007). Another example includes virtual simulations of a hospital undergoing a mass casualty event (Pucher et al., 2014). Training situations that convey high risk and high pressure scenarios are important, however, they are expensive and difficult to orchestrate for live-action training (Shubeck et al., 2016).

VR environments also allow for trainer feedback throughout the program as necessary similar to live action, with the addition of game-like functions (i.e., visual prompts that pop-up in the learner's VR headset) within the training program (Shubeck et al., 2016). These features help to promote motivation and increase the learner's engagement (Papastergiou, 2009). If further

feedback is required through video playback, scenarios can be screen-recorded through the laptop and/or VR headset, allowing for recording to be done conspicuously and without adding any additional distractions in which a camera set-up might add in live-action. The scenarios in VR can also be recorded at 360 degrees of the environment from different vantage points to later discuss corresponding training objectives with learners, whereas a camera set-up in live action would require multiple cameras to show different perspectives. For example, the scenario can be recorded from the view of the person in crisis in the VR environment and played back to the learner afterwards to show specific competencies, such as maintaining an appropriate amount of distance between the officer and character in crisis. Alternately, when VR environments are not set up to accommodate learning or training, the user can be overwhelmed (Jestice & Kahai, 2010). VR can also be disorienting to some users, facial expressions are still being perfected, and nuanced behaviour is limited. Therefore, a balance between guidance and exploratory freedom is important for virtual reality programs to be effective.

Shubeck, Craig, and Hu (2016) evaluated the effectiveness of training in civilian aeromedical evacuation sustainment through comparing live-action and VR training methods. They found that participants in both live-action and virtual reality training sessions improved their performance significantly on the scenarios such that the learning gains of each scenario type were comparable. Stocker et al. (2011) also looked at the effectiveness of live-action training compared to VR training. This research examined the training of preparing personnel to work in hazardous environments and found that there was no significant difference between the learning of participants in live action versus VR training. Together, these studies show that there are no distinguishable differences between live-action and VR simulations on measured learning outcomes. These findings of live-action and VR training being comparable in learning

effectiveness are of importance, particularly given that VR training is less expensive, more accessible to learners, and increasingly scalable across large organizations.

Virtual Reality Training and Canadian Police

As for examples of VR training in the Canadian police context, Halton Regional Police and London Police Service have implemented de-escalation-adjacent VR training (CBC News, 2019). Halton Regional Police Service has launched an empathy-based training program for responding to simulated scenarios of PMHC (CBC News, 2019, p. 1). This "immersive technology is the first in Canada" and allows police officers to take the perspective of both the officer responding to the call as well as the person in crisis (CBC News, 2019, p. 1). Further, a Halton police officer stated that the perspective taking in the simulated VR scenarios will help teach officers how to de-escalate and minimize the stress of the person in crisis when attending to real-life scenarios (CBC News, 2019). An evaluation of this program has not yet been undertaken to test efficacy in producing these objectives. In sum, police services appear to be open to and engaged with this innovative method of crisis response training. Given that these VR training programs are recently emerging, there is limited research on the outcome of the programs as well as its efficacy in developing empathy or de-escalation competencies in police officers. The present study is designed to address this gap.

Chapter 5: Objectives and Methodology

This study forms part of a larger study in which the objective was to evaluate the user experience and comparative efficacy of a segment of the scenario-based Mental Health Crisis Response Training (MHCRT) program offered in virtual reality and live action modalities in relation to a control group. The MHCRT is an evidence-based, provincially vetted program designed to train police officers in de-escalation and communication competencies in the context of mental health crisis response. The virtual reality format of the MHCRT is one of the first scenario-based program for police officers to learn and practice de-escalation techniques using open world virtual reality technology in Canada. The main study used a pre-post-test control group design to compare groups of officer learners on behavioural (e.g., de-escalation skills), cognitive (i.e., bias) and affective (e.g., anxiety) outcomes following training. This initiative was broadly centered on evaluating whether scenario-based training offered in VR is as effective in skills acquisition among officer participants as compared to the more commonly used Live Action (LA) training scenarios and a control group.

The current thesis study examined police officer participant's empathy levels when responding to a simulated character in crisis in either live-action (LA) and virtual reality (VR) crisis scenarios. The objective of the study was to investigate the impact of scenario-based MHCRT on empathy formation, to understand if delivery format mattered, and to gain insight into how empathy levels are associated with de-escalation competencies.

Research Questions

The study focused on addressing the following research questions:

1. Does MHCRT scenario-based training improve empathy scores irrespective of live action (LA) or VR modality?

2. Does modality (LA or VR) affect empathy scores?
3. Do demographic variables such as years serving as a police officer, age, gender, or prior completion of CIT training affect empathy scores?
4. What is the relationship between empathy scores and de-escalation strategy use?

Hypotheses

The hypotheses for the present study proposed that MHCRT scenario-based training would have an effect on empathy. More specifically, the relationships that were hypothesized include:

H_1: Empathy scores will increase following MHCRT scenario-based training across both modalities as compared to a control group.

H_2: Empathy scores will vary significantly between the two modality groups, with VR showing a greater effect on empathy scores.

H_3: Age, gender, and years serving as a police officer will affect empathy scores.

H_4: Higher scores on de-escalation strategy use will correspond with higher empathy scores. Further, empathy will be correlated with competencies that are relationally oriented, such as validation, and active listening, as opposed to safety-oriented items (e.g., time and distance, which refers to officers slowing down the pace of the encounter to decrease the intensity of it and using physical barriers/cover as needed to increase protection).

Methodology

Data Collection

Data was collected during the larger study of the MHCRT training over two consecutive weeks from March 1, 2022 to March 11, 2022. The data for the officers participating in the live

action scenarios was collected across three days from March 1, 2022 to March 3, 2022 at the Ontario Police College training facility in Aylmer, ON. Subsequently, the data for the officers in the VR scenarios was collected across four days from March 8, 2022 to March 11, 2022 at a VR studio located in Toronto, ON. Prior to attending the scenario days, participants (excluding those in the control group) completed online modules as part of the MHCRT program. The online modules contained four sections of learning material focused on de-escalation, mental illness, mental crises, cultural safety, stigma and bias, and relational policing. The total time commitment for completion of the online modules prior to the day of data collection was approximately 4 hours. Prior to arriving on location for data collection, participants also completed a pre-survey which took approximately 15-20 minutes. The data collection time commitment for each participant was an additional 4.5 hours at the respective location.. The inclusion criteria for participation in this study was that participants were frontline officers employed at any Ontario police service.

Participant Recruitment

Recruitment invitations were sent to police services across Ontario, a total of 55 services, by email. The email invitations were sent to the Chiefs of Police and Training Divisions of all Ontario municipal and First Nation police services via internal memo. These memos included a brief description of the overarching study and the invitation for interested patrol officers to contact the research team for more information and to sign up for the study. Information about the study and consent documents were also sent through a link to participants for signature. Notably, data collection was postponed twice due to the outbreak of the Omicron variant during the COVID-19 pandemic. COVID precautions were taken as a result, including having participants grouped into no more than six people to maximize social distancing. COVID tests

were provided upon arrival to all members of the research and participants. Additionally, COVID safety protocols and general safety guidelines were followed throughout data collection.

Participants

The sample (*N*=63) consisted of police officers serving in Southern and Northern Ontario. The police officers included in the study included those from Barrie, Sudbury, Halton, Hamilton, Hanover, Kingston, London, Niagara, Nishnawbe Aski, Ontario Provincial Police (OPP), Peel, Port Hope, Strathroy-Caradoc, Toronto, Waterloo, West Grey, and York police services. The sample was predominantly male (74.6%) and white (77.8%), as shown in Table 1. Female participants (23.8%) and other ethnicities (19.0%) accounted for the balance of the sample, with a small number choosing not the disclose their gender (1.6%) and ethnicity (1.6%). The remainder of responses for ethnicity included Black (3.2%), Asian (1.6%), Indigenous (1.6%), Middle Eastern (3.2%), and other (9.5%). The mean age of the sample was 34.15 years old (*SD* = 8.60), with majority of participants responding that they are married (formally or common law) (60.3%). Lastly, most participants had some form of post-secondary education, with the highest form of education being a college diploma (46.0%) and then university degree (34.9%).

Table 1

Sample Demographics

		N	%	*M*	*SD*
Age		62		34.15	8.60
	Missing	1			
Gender					
	Male	47	74.6		
	Female	15	23.8		
	Missing	1	1.6		

Ethnicity			
	White	49	77.8
	Black	2	3.2
	Asian	1	1.6
	Indigenous	1	1.6
	Middle Eastern	2	3.2
	Other	6	9.5
	Prefer not to say	1	1.6
	Missing	1	1.6
Marital status			
	Single/never married	21	33.3
	Married (formally or common law)	38	60.3
	Separated/divorced/widowed	2	3.2
	Prefer not to answer	1	1.6
	Missing	1	1.6
Education			
	High school diploma	5	7.9
	College diploma	29	46.0
	University degree	22	34.9
	Graduate school degree	6	9.5
	Missing	1	1.6

Note. *N* = number of respondents; % = percentage of respondents; *M* = mean; *SD* = standard deviation.

Measures

A series of behavioural, affective, cognitive and user experience outcomes were measured throughout the larger study. Measures captured information on: (1) demographics, (2) attitudes towards people with mental illness, (3) mental health knowledge, (4) empathy, (5) de-escalation strategies, (6) anxiety, (7) cognitive load and, (8) user experience feedback. Described below are measures utilized only in this specific thesis study.

Demographic and Police Background Information. All participants completed a pre-survey capturing demographics (i.e., gender, age, ethnic background, marital status), education, years of police service, officer rank, police training history, familiarity with mental illness, and confidence in current mental health training.

State Empathy. The Comprehensive State Empathy Scale (CSES; Levett-Jones et al., 2017) was used to measure state empathy among officers directed toward a specific character in crisis in the simulation. This scale was originally developed to measure the influence of a simulation on students in professional programs with respect to empathy levels experienced towards distinct groups of people. The tool captures situational cognitive and affective empathy through six subscales: 1) empathic concern, 2) distress, 3) shared affect, 4) empathic imagination, 5) helping motivation, and 6) cognitive empathy. The CSES comprises 30 self-report items where the respondent is asked to rate the extent to which they experienced each feeling in response to a specific character presented in a recently experienced simulation on a 5-point Likert scale (e.g., 1=completely untrue, 5=completely true). Higher scores reflect greater empathy directed toward the scenario character in crisis. The reliability of the scale was found to be good (Cronbach α=.87, *N*=63, 30 items).

General Empathy for People with Mental Illness. Three additional empathy questions were included in the pre- and post-surveys and measured general empathy among participants. The three questions included: 1) I have empathy for people with mental illness; 2) I can relate to the experiences of those with mental illness; 3) I can understand what it might feel like for a person with mental illness to be in crisis. These three items were self-rated on a 5-point Likert scale (e.g., 1=Strongly Disagree, 5=Strongly Agree), and the three scores were aggregated for a total general empathy score out of 15. This total general empathy score involves broader empathy questions unrelated to a specific person but rather focused on people with mental illness as a group.

De-escalation Competencies. Participants were assessed using the De-escalating Persons in Crisis Competencies Scale (Lavoie et al., 2020). The DePICT™ is a 14-item rater-observer

assessment scale that measures an officer trainee's demonstrated ability to de-escalate and respond to a person in crisis. The tool provides a standardized and intuitive method of evaluating the presence of target competencies that correspond to de-escalation strategies, enhanced communication and relational policing approaches during a 10-minute evaluation scenario. Assessors rate the presence of competencies on a 4-point scale (0=Absent, 1=Weak, 2=Moderate, 3 =Strong). DePICT^{TM} scores range from 0-42, where higher scores indicate higher levels of demonstrated de-escalation and mental health crisis intervention competencies. Three trained raters on the research team scored the scenarios in real time using pen and paper. The reliability of the scale was found to be good (Cronbach α=.89, *N*=63, 14 items). The inter-rater reliability between the raters coding the DePICT^{TM} was high, shown by an intraclass correlation coefficient of .95 with a 95% confidence interval between .89-.98.

Research Design

Procedure. Within the study invitation email, participants were provided a link for online access (hosted by Qualtrics) to an information document and informed consent form. The general objective of the research study was described in the information document, along with the reminder that participants can withdraw their participation from the study at any point and that their personal information and response would be confidential. Consenting participants were assigned a unique study ID, assigned to an experimental group based on availability and random assignment. Selected participants received a link to register and complete the MHCRT online modules before attending the research site (participants assigned to the control group did not complete the online modules). The MHCRT online modules were accessible on the virtual academy at the provincial police college and took the average learner four hours to complete prior to arriving to the research site. Participants also completed a 15-minute pre-survey online.

Participants then attended a research site to participate in either live action (LA) or virtual reality (VR) simulations, as assigned. To keep exposure low during pandemic data collection, participants took part in small groups of four to six, with one group run in the morning session and another group run in an afternoon session. Those assigned to the LA group and half of the control group attended the Ontario Police College in Aylmer, Ontario. The VR participants and the remainder of the control group attended a VR studio in Toronto, Ontario. Upon arrival at their designated research site, participants received a brief orientation by the research team. VR participants took part in a 10-minute acclimation tutorial to learn how to use hand controllers and move around the virtual space in headset. All participants then independently took part in one 10-minute MHCRT evaluation scenario to collect a baseline measure of each participants' de-escalation competencies (as measured by the DePICT™).

After completing the pre-evaluation scenario, officers were debriefed for five minutes on their performance. They were then taken to a space to complete the three-minute paper and pencil Comprehensive State Empathy Scale (Levett-Jones et al., 2017) as well as other tests for the larger study. The group of six participants in the MHCRT experimental condition then together took part in one MHCRT Forum Scenario, a group problem-solving experiential learning exercise that is 90-minutes in length, in their assigned VR or LA modality. The Forum Scenario with both VR and LA groups were facilitated by a principal researcher and a police officer expert with experience in providing MHCRT instruction. Following this content delivery, participants individually took part in a 10-minute post-training MHCRT evaluation scenario in their assigned VR or LA formats.

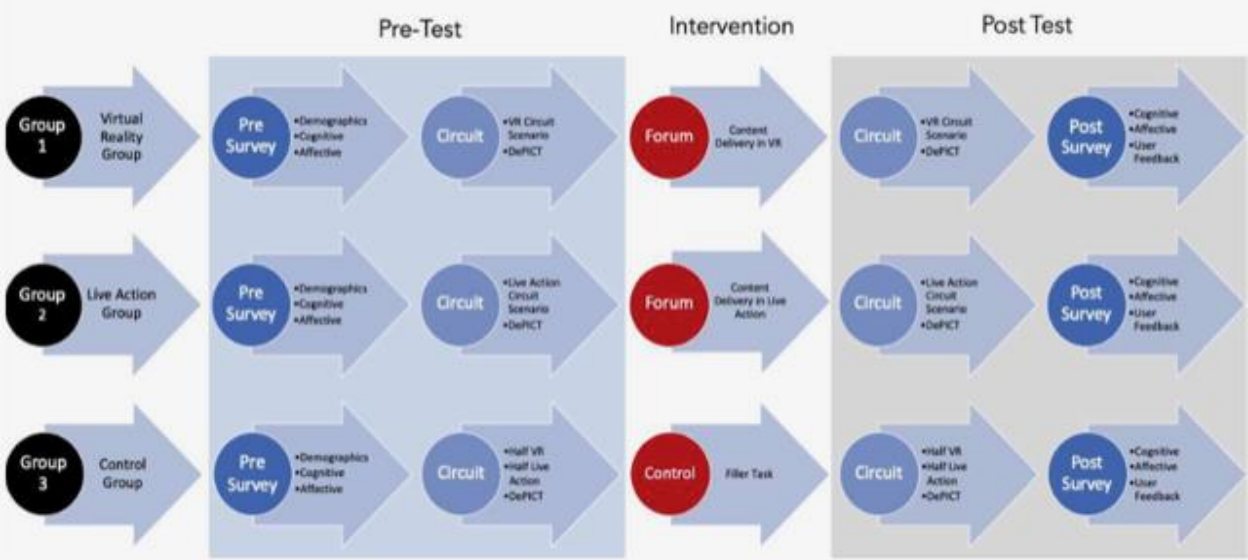
Participants assigned to the control group took part in a pre-survey, a pre-evaluation scenario that was the same as described above for the experimental groups, followed by

participation in a distracter task (i.e., a 90-minute team building exercise of building a pyramid out of marshmallows, dried spaghetti, and paper). Control group participants then individually took part in a second evaluation scenario where DEPICT scores were rated to capture practice and fatigue effects.

After the final evaluation scenario was complete, all participants in all experimental groups were invited to a room to complete a 25–30-minute post-survey, including the Comprehensive State Empathy Scale, and additional measures for the larger study. At the end of each research day, participants were thanked for their participation and provided with a debriefing form which included further information on the details of the study as well as resources for any mental health services if needed.

Figure 1

Outline of the Procedural Steps of the Study



MHCRT Training Program Format

Online Modules. All participants except those in the control group received a link to access the online training modules of the MHCRT to be completed prior to attending the

research site. There were four modules for the MHCRT online materials, each taking approximately an hour to complete (a total time commitment of four hours for all modules). Each specific module covered a different relevant topic within the MHCRT. Specifically, the first module focused on the foundational aspects of police responses to mental health crises. These concepts included an overview of mental health crises calls currently made to police services, an overview of mental illness and mental health crises, how to identify them, and common stereotypes. The second module focused on a relational policing approach, including the competencies and techniques that can be used to safely de-escalate situations with people in mental health crisis. The third module addresses stigma and biases towards individuals with mental illness and how these attitudes can affect interactions. The fourth modules specifically focused on interactions between police officers and racialized minorities that are experiencing mental health crises.

Forum Scenario. In the Forum Scenario which represents the formative training, groups of 6 officers participated in group problem-solving with the ability to pause, rewind, or replay at any point in the scenario. The specific scenario within the Forum session involves the character of Umar who is the person in mental health crisis to which participants are attending. Umar is a 24-year-old Nigerian man on the autism spectrum. Police have been called to attend the scene based on reports of a Black man behaving erratically and hitting the bus shelter excessively. Umar has difficulty with verbal communication and takes time to process and respond to questions. Therefore, the de-escalation competencies of emphasis in this Umar scenario are: 1) Approaches, contains, and controls the scene for effective risk management; 2) Manages time and distance; 3) Employs calming paralanguage; 4) Exhibits calming body language; 5) Demonstrates self-awareness, flexibility, and self-regulation; 6) Actively listens and permits

emotional expressiveness; 7) Demonstrates validation of person's emotions and experience; and 8) Seeks information and uses additional resources.

In the Forum Scenario, participants were presented with a pre-recorded "Springboard video" which depicts an encounter between a police officer and a person in mental health crisis that results in unnecessary escalation of the situation. The group then discussed their observations from the springboard video about how the officer handled the encounter and observed behaviour of the person in crisis. Additionally, participants were asked whether there were things they would have done differently. After discussing the springboard video, one or two participants were invited to take part in the scenario and practice alternative approaches identified in the group discussion, while the rest of the group was able to provide feedback. After a series of alternate interventions in the scenario, a video with subject matter experts discussing the scenario and providing key insights was played to the group. The participants were then able to try out the scenario once again, while implementing the techniques described in the expert content delivery video. The Forum Scenario ended with the facilitator leading a discussion about the key takeaways from the session.

Evaluation Scenario. In the evaluation scenario, participants had the task of responding to a character in the simulated environment as they typically would respond in the field. Participants were provided with simulated tools in both VR and LA environments that they would normally have on duty, specifically their duty belt, radio, CEW, and firearm. In this specific evaluation scenario, officers were responding to the character of Jamie (see Figure 2 below).

Figure 2

Virtual Jamie Character

Jamie is a 33-year-old Caucasian male and displays evidence of a bruised eye and injured ribs (communicated through the actions of the character hunched over and grabbing his ribs as if in pain). Jamie had been assaulted in a home invasion three weeks prior resulting in him experiencing symptoms of Post-Traumatic Stress Disorder (PTSD); Jamie has called the police service, fearing that his attackers are coming back. On the day he called the police, Jamie had been smoking cannabis and heard noise at his door. This combination of events elevated his PTSD symptoms, resulting in him calling the police and alerting them that his assailants have returned to harm him. The DePICT™ competencies of particular focus in this evaluation scenario are: 1) Approaches, contains, and controls the scene for effective risk assessment; 2) Expresses concern for welfare and willingness to help; 3) Actively listens and permits emotional expressiveness; 4) Demonstrates validation of a person's emotions and experience; and 5) Engages in clear and transparent decisions-making.

When participants prepared to begin the evaluation scenario, the dispatch information was read out to them by a member of the research team (i.e., "*Call from Jamie, resident of rooming house at 105 McCowan Ave. Indicates there are some people outside threatening to hurt him. Negative history for wants but has history of possession, resist arrest, theft, and breach*

of recog.") The scenario then began when the participants knock on the door in the simulated environment. Jamie starts the scenario off agitated and upset at how long the police have taken to attend the scene. He displays signs of fear, hyper-vigilance, and desperation and retreats to crouch in a corner of the room. There is evidence of cannabis use and empty beer bottles on the coffee table in the room. There is also a baseball bat near the couch in the room, which Jamie grabs later in scenario and exclaims that he is doing so "to protect myself", from the assailants he is worried are outside. Jamie puts the bat down if the officer effectively validates his emotions and assures Jamie that they will protect him. Further, Jamie will provide more information about himself if the officer actively listens to him in a non-judgemental way.

*Research Ethics***.** Approval from the Wilfrid Laurier University's and Toronto Metropolitan University's Research Ethics Boards (REB) was obtained, as the research study involved participant of human participants. The REB application was submitted and approved prior to the start of the data collection for the study. Participants were reminded of their participant rights throughout the duration of the study, including their participation being entirely voluntary and that the data collected would remain confidential. Further, participants were ensured that any responses would stay anonymous with any personal or identifying information excluded. To protect the identity of participants throughout research, each participant was assigned a unique study ID for data collection. The unique study IDs assigned to each participant were then used to link all collected information including pre and post surveys, observer-rater coding for two evaluation scenarios, and video tagging. Additionally, the de-identified data collected was stored on a password protected computer, accessible to only the research team. The dataset will be destroyed by the primary investigator 10 years post data collection by

permanently deleting the files from the computer. Video files were stored on password protected computers and will be destroyed from all storage drives once research is completed.

Analytical Plan

In this section, the analytical plan to address each of the four research questions is outlined. Findings from each of these analyses is presented later in the results section.

Research Question 1. A Repeated Measures ANOVA and an ANCOVA were conducted to answer the first research question: "Does MHCRT scenario-based training have an effect on empathy scores irrespective of live action or virtual reality modality?" A Repeated Measures ANOVA compares group means across variables that have been measured repeatedly among the same participants (Field, 2009), and is often relied on as a program evaluation method to examine improvements in outcomes following a training intervention. This analysis examines whether there are significant differences between mean *change* scores of different training groups measured across time points. The repeated measures analysis reduces error as a result of participants' individual differences, thereby allowing for more power to measure differences between groups (Field, 2009). The repeated measures ANOVA was thus chosen for this research question given that the focus for this question was whether completing MHCRT scenario-based training improved pre-post state empathy scores. The sample was divided into two groups for this mean group comparison: 1) participants who received MHCRT scenario-based training in either LA or VR format, and 2) control participants who did not receive MHCRT training. Changes between state empathy scores measured at baseline and after training were analyzed and compared between the MHCRT and control group.

Additionally, an Analysis of Covariance (ANCOVA) was chosen to address this research question to investigate mean empathy scores measured at posttest while controlling for the

effects of empathy measured at baseline. Similar to an ANOVA, ANCOVA is also a common method to detect differences in treatment groups in the context of program evaluation. It constitutes a powerful test because it reduces within-group error variance and eliminates confounds (Field, 2009). For this analysis, group differences in posttest state empathy levels between MHCRT Training recipients and the control group were examined while controlling for baseline state empathy measures. Using an ANCOVA analysis controls for the effects of confounds such as capacity for empathy because participants act as their own controls.

For both the ANOVA and ANCOVA, CSES total scores and six subscale scores were included in separate analyses. The CSES subscales include empathic concern, distress, shared affect, empathic imagination, helping motivation, and cognitive empathy. Total CSES scores include the average of all the subscales' mean scores, whereas the CSES subscales are a mean of each of the items included in that specific subscale.

Research Question 2. Similar to the first research question, a Repeated Measures ANOVA and an ANCOVA were conducted to answer the second research question: "Does modality (LA or VR) have an effect on empathy scores, irrespective of receiving MHCRT Training?" This research question focuses on the effect of modality on state empathy scores rather than MHCRT training. Therefore, a Repeated Measures ANOVA was chosen to examine whether there was a significant *change* in state empathy scores from pre- to posttest as a result of the type of training modality the participant received. The sample was divided into two groups for this mean group comparison: 1) participants who completed the evaluation scenario in live action (irrespective of receiving or not receiving MHCRT training), and 2) participants who completed the evaluation scenario in VR. Changes between state empathy scores measured at baseline and after training were analyzed and compared between the LA and VR group.

An ANCOVA was also used to examine mean empathy scores measured at posttest while controlling for the effects of empathy measured at baseline. Group differences in posttest state empathy levels between LA and VR modality groups were examined while controlling for baseline state empathy measures. Some of the confounding effects controlled by using an ANCOVA analysis includes years served as a police officer, years on patrol, completion of CIT training, and receiving MHCRT Training. For this ANCOVA analysis, total CSES scores were used which include the mean of all subscales' mean scores.

Research Question 3. To examine the third question addressing whether years served as a police officer, years on patrol, age, gender, or completion of CIT training were related to state empathy scores, two types of correlation analyses were executed to model bivariate relationships between state empathy scores and these variables of interest. A Pearson's correlation was used to estimate the relationship between state empathy scores with years serving as a police officer, years on patrol, and age. The Pearson's correlation included CSES total scores measured at baseline and years serving as a police officer, years on patrol, and age. Baseline CSES total scores were chosen rather than posttest total scores because pre-test was considered a purer measure of state empathy for each participant, without the benefits of experiencing MHCRT training or practice. Additionally, point-biserial correlations were conducted to investigate the bivariate relationship between state empathy scores and categorical variables, gender, and completion of CIT training. A point-biserial correlation accommodates for correlations between a continuous variable (e.g., state empathy score) and a dichotomous categorical variable (e.g., gender: male, female, completion of CIT training: yes, no) (Field, 2009). The point-biserial correlation included baseline CSES total scores, as well as gender and completion of CIT training also measured at baseline.

Research Question 4. The fourth research question investigated whether there was a relationship between empathy and de-escalation strategy use. To measure de-escalation competencies, participants were scored during the pre and post evaluation scenarios using the DePICT™ (Lavoie et al., 2020). For this analysis, baseline DePICT ™ total and individual item scores were used as it was a better indicator of baseline de-escalation skills without the advantage of practice effects (the same results were found with post DePICT™ total and individual item scores). As for empathy, the distinction between state empathy and general empathy is made by using pre-test CSES total scores (i.e., state empathy) and an aggregate of three general empathy items (i.e., general empathy). The CSES scores look at state empathy as each of the CSES items are specific to the character in the test scenario. The general empathy questions involved broader empathy questions unrelated to the specific character in crisis, but rather focused on people with mental illness in general.

A series of Spearman correlation analyses was conducted to examine de-escalation strategies and empathy. A Spearman correlation was chosen because it does not require variables to have a continuous level of measurement as it ranks the distribution of the variables (Field, 2009). Additionally, a Spearman correlation does not require data to be normally distributed (Field, 2009). As DePICT™ scores and empathy scores are not fully continuous, the Spearman correlation was chosen for investigating this research question. A series of bivariate Spearman correlation analyses was conducted including baseline CSES total score with baseline DePICT ™ total and item scores. A second series of Spearman correlation analyses was run with baseline general empathy aggregate score with baseline DePICT™ total and item scores.

Chapter 6: Results

Data Cleaning and Imputation

A total of 63 participants completed the study. There were 16 responses missing from the pretest CSES items, and 16 responses missing from the posttest CSES. For 18 of the missing responses, data imputation was conducted to estimate those data points. The mean substitution technique for single imputation was used (Zhang, 2016). There were a remaining four responses missing from the pre-test CSES, and 10 responses missing from the posttest scale after imputation. The mean substitution technique of single imputation could not be used on four missing responses due to those responses being from the same participant and all within one subscale of the CSES. The remaining 10 responses missing from the CSES posttest were from the same participant at the end of their survey with the last two CSES subscales left without responses, possibly due to fatigue or distraction. Mean substitution was not able to be used for those 10 data points in this case. Two outliers were detected in for DePICT^{TM} total scores at baseline**.** These participants were consequently excluded from the correlation analyses using DePICT^{TM} total scores.

Sample Descriptives

Participants responded with how long they had served as a police officer, with the majority being in their first five years of service as a police officer (54%), shown in Table 2. The mean time served as a police officer was 7.26 years, (*SD*=7.54), Md = 3.5 years, range = 0-28 years). The majority of participants were within their first five years of serving on patrol (54%). With respect to rank, most participants were Constables (90.5%), followed by Sergeants (4.8%), and Training Constables (3.2%). Just less than half of the participants indicated that they had previous experience with CIT training (42.9%). Additionally, 61.9% of participants indicated

that they had previous training, employment, or volunteer experience in mental health, social work, counselling, therapy, psychology, or the health sciences.

Table 2

Sample Descriptors.

		N	%	*M*	*SD*
Years served as a police officer				7.26	7.54
	0 to 4 years	34	54.0		
	5 to 10 years	10	15.9		
	11 to 15 years	8	12.7		
	16 to 20 years	6	9.5		
	21 to 25 years	2	3.2		
	26 to 30 years	2	3.2		
	Missing	1	1.6		
Officer rank					
	Constable	57	90.5		
	Sergeant	3	4.8		
	Training Constable	2	3.2		
	Missing	1	1.6		
Years served on patrol				5.68	5.58
	0 to 4 years	35	55.6		
	5 to 10 years	14	22.2		
	11 to 15 years	7	11.1		
	16 to 20 years	3	4.8		
	21+ years	1	1.6		
	Missing	3	4.8		
Type of unit					
	Patrol	45			
	Traffic	1			
	Training	6			
	Mental Health Unit	16			
	Community Partnership and Engagement	8			
	Detective	1			
	Other	2			
Level of Experience					
	Less than 2 years	20	31.7		

	More than 2 years	21	33.3
	Mental health unit or CIT trained with more than 6 years	21	33.3
	Missing	1	1.6
Completion of CIT Training			
	Yes	27	42.9
	No	33	52.4
	Prefer not to answer	2	3.2
	Missing	1	1.6
Previous experience in mental health, social work, counselling, therapy, psychology, or health sciences			
	Yes	39	61.9
	No	24	38.1

Note. *N* = number of respondents; % = percentage of respondents; *M* = mean; *SD* = standard deviation.

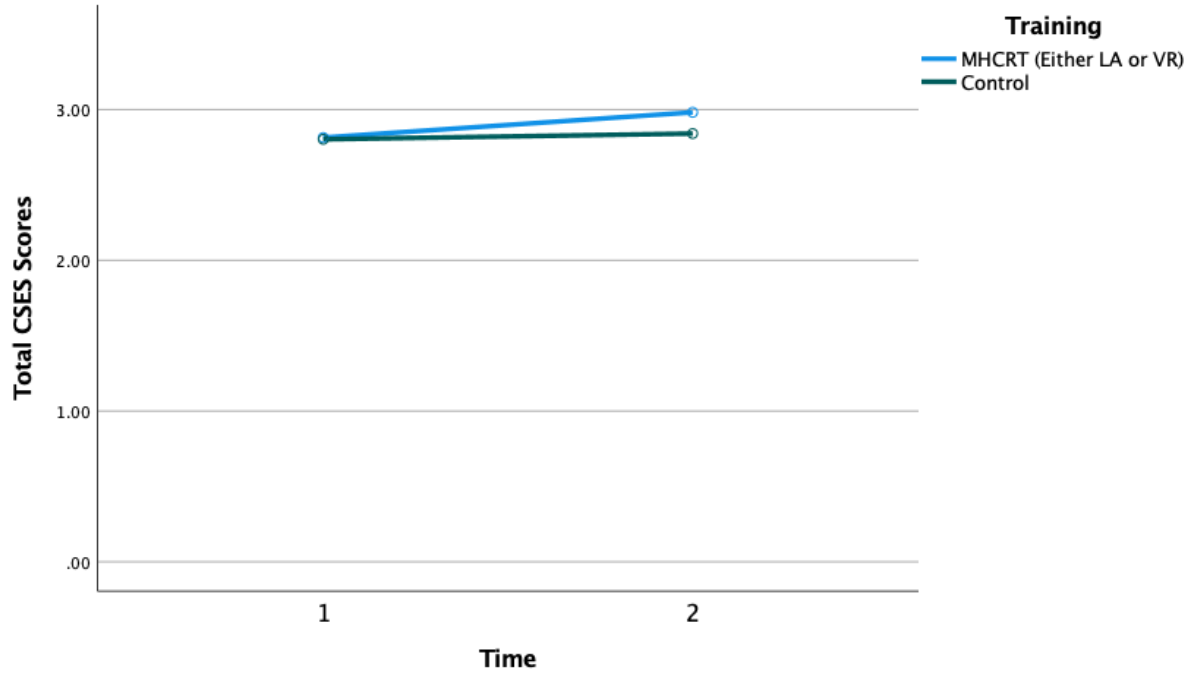
Inferential Analyses

RQ1: MHCRT Effect on State Empathy

CSES Total Scores. A Repeated Measures ANOVA was conducted to examine within-subject mean changes in empathy total scores over time (between pre- and posttest) considering the between-subjects factor of receiving MHCRT training or control (irrespective of VR or LA modality). The results revealed a significant effect of Time on total empathy scores, $F(1, 58) = 5.10$, $p = .028$, $\eta_p^2 = .08$, mean difference = .10 $SE = .05$, $p = .028$, showing that all participants increased total empathy scores between pre- and posttest across both MHCRT and control groups (shown in Figure 3). However, the effect of Time x Training was not significant, indicating that the MHCRT curricular content did not contribute to significant changes in state empathy between pre- and post-measurements in comparison to the control group.

Figure 3

State Empathy at Time 1 (Pretest) and Time 2 (Posttest) by MHCRT Program Compared to Control



An ANCOVA was also conducted to take into consideration the participants' baseline CSES total. There was a significant relationship between pre- and post-CSES scores, $F(1, 57) = 1.13$, $p = .007$, $\eta_p^2 = .12$. However, when controlling for baseline empathy levels, there were no significant results to suggest participation in the MHCRT curriculum improved CSES total scores measured at posttest, $F(1, 60) = 2.19$, $p = .145$, $\eta_p^2 = .04$, mean difference = .13 $SE = .09$, $p = .145$. These results indicate that the MHCRT online content and forum curriculum did not significantly improve state empathy beyond practice effects when compared to the control group.

CSES Subscales. A series of Repeated Measures ANOVAs were conducted to examine CSES subscales between the MHCRT and control groups. A repeated measures ANOVA revealed a significant effect of time on empathic concern, $F(1, 61) = 10.67$, $p = .002$, $\eta_p^2 = .15$, mean difference = .24 $SE = .08$, $p = .002$, and empathic imagination, $F(1, 61) = 9.93$, $p = .003$, $\eta_p^2 = .14$, mean difference = .26 $SE = .08$, $p = .003$. These results suggest a reliable increase in

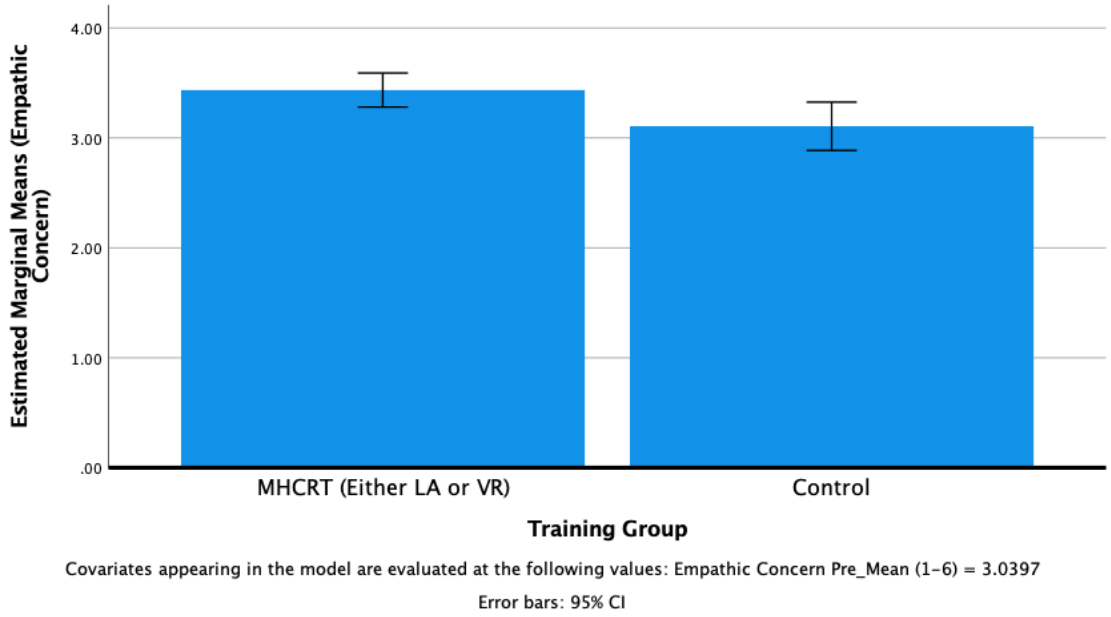
empathic concern and empathic imagination scores from pre- to posttest across both MHCRT and control groups. However, there were no significant Time x Training effects among the CSES subscales between the groups (empathic concern: $F(1, 61) = 2.81$, $p = .099$, $\eta_p^2 = .04$; distress: $F(1, 61) = 2.59$, $p = .113$, $\eta_p^2 = .04$; shared affect: $F(1, 61) = 1.29$, $p = .261$, $\eta_p^2 = .02$; empathic imagination: $F(1, 61) = 2.10$, $p = .153$, $\eta_p^2 = .03$; helping motivation: $F(1, 61) = .03$, $p = .863$, $\eta_p^2 = .001$; cognitive empathy: $F(1, 61) = 3.30$, $p = .074$, $\eta_p^2 = .05$) indicating little evidence that the MHCRT leads to appreciable changes in state empathy directed toward a character in crisis when compared to a control group. Notably, cognitive empathy, $F(1, 61) = 3.30$, $p = .074$, $\eta_p^2 = .05$, did approach significance for a Time x Training interaction effect with the MHCRT group increasing in cognitive empathy from pre- to posttest ($M_1 = 2.98$, $SD_{T1} = .11$ and $M_{T2} = 3.25$, $S_{T2} = .12$) and controls decreasing in cognitive empathy ($M_1 = 3.21$, $SD_{T1} = .15$ and $M_{T2} = 3.20$, $S_{T2} = .17$).

In a series of ANCOVA analyses, pre-test CSES subscale scores were used as a covariate when examining group differences among MHCRT Training and the control group on posttest CSES subscale scores. From the ANCOVA, there were significant results for MHCRT effect on post CSES subscale empathic concern scores after controlling for baseline empathic concern scores, $F(1, 61) = 5.952$, $p = .018$, $\eta_p^2 = .090$, mean difference = .329 $SE = .135$, $p = .018$ (see Figure 4). These results suggest that after receiving the MHCRT, officers displayed significantly greater empathic concern compared to those who did not receive any training. The remaining state empathy subscales did not have significant results for an effect of MHCRT (distress: $F(1, 61) = 1.86$, $p = .178$, $\eta_p^2 = .03$, mean difference = .15 $SE = .11$, $p = .178$; shared affect: $F(1, 61) = 1.16$, $p = .286$, $\eta_p^2 = .02$, mean difference = .18 $SE = .17$, $p = .289$; empathic imagination: $F(1, 61) = 2.89$, $p = .094$, $\eta_p^2 = .05$, mean difference = .26 $SE = .16$, $p = .094$; helping motivation: $F(1,$

61) = .031, p = .861, η_p^2 = .001, mean difference = .03 SE = .16, p = .861; cognitive empathy: F(1, 61) = 2.34, p = .131, η_p^2 = .04, mean difference = .24 SE = .16, p = .131).

Figure 4

Effect of MHCRT Training Compared to Control Group on Empathic Concern

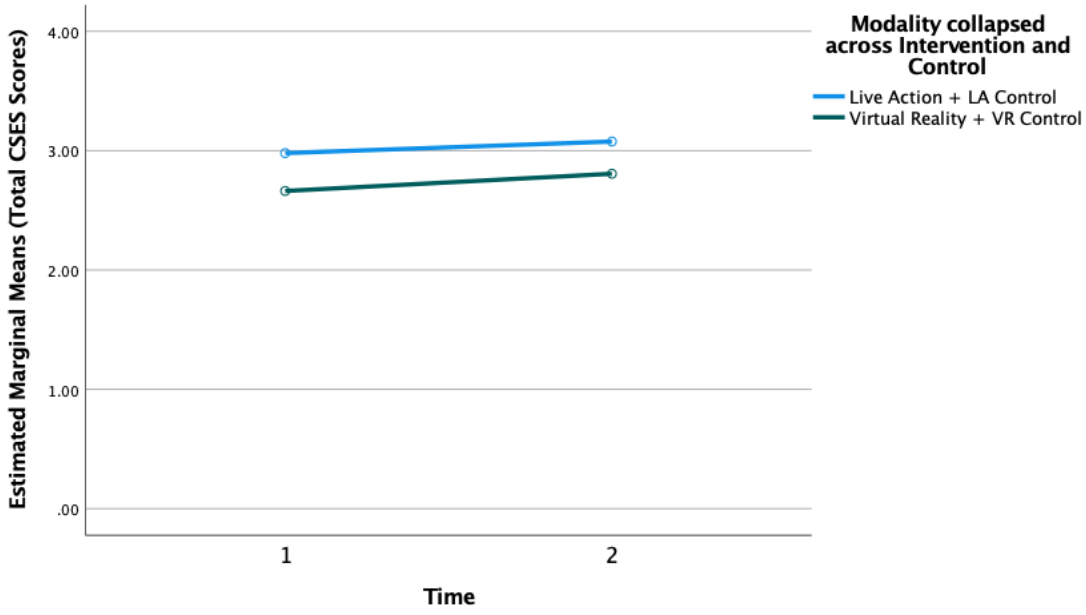


RQ 2: Training Modality Effect on State Empathy

CSES Total Scores. A Repeated Measures ANOVA was conducted to test within-subject mean change of total state empathy scores among participants between the LA and VR groups across time (from pre to posttest). While the results revealed a significant main effect of time on total empathy (F(1, 58) = 7.46, p = .008, η_p^2 = .11, mean difference = .12 SE = .04, p = .008], suggesting a reliable increase in total empathy scores between pre- and posttest across both LA and VR groups (shown in Figure 5), there was no Time x Training Modality interaction ((F(1, 58) = .29, p = .594, η_p^2 = .005). This result indicates that modality did not contribute to significant changes in total state empathy between pre- and post-measurements.

Figure 5

Total State Empathy at Time 1 (Pretest) and Time 2 (Posttest) by Live Action vs Virtual Reality



An ANCOVA was also conducted to investigate if training modality (e.g., live action or virtual reality) influenced state empathy. Baseline CSES total scores were controlled for in the ANCOVA. Similar to the above findings, there was no significant between-subject effects of MHCRT modality on total state empathy scores between live action and virtual reality groups, $F(1, 58) = 6.52$, $p = .013$, $\eta_p^2 = .10$, after controlling for baseline state empathy scores.

CSES Subscales. A series of Repeated Measures ANOVAs were conducted to examine CSES subscales between LA and VR groups, including controls in both. Similar to the results from the first research question, the Repeated Measures ANOVA revealed a significant effect of time on empathic concern, $F(1, 61) = 15.646$, $p < .001$, $\eta_p^2 = .204$, mean difference = .282, $SE = .071$, $p < .001$, and empathic imagination, $F(1, 61) = 14.539$, $p < .001$, $\eta_p^2 = .192$, mean difference = .298, $SE = .078$, $p < .001$. Again, these results suggest a reliable increase in empathic concern and empathic imagination scores across time for both LA and VR groups. However, there were no significant Time x Training effects among the CSES subscales between

the two groups (empathic concern: $F(1, 61) = 1.70$, $p = .197$, $\eta_p^2 = .03$; distress: $F(1, 61) = .27$, $p = .606$, $\eta_p^2 = .05$; shared affect: $F(1, 61) = .74$, $p = .393$, $\eta_p^2 = .01$; empathic imagination: $F(1, 61) = .20$, $p = .653$, $\eta_p^2 = .003$; helping motivation: $F(1, 61) = 2.20$, $p = .144$, $\eta_p^2 = .04$; cognitive empathy: $F(1, 61) = 1.28$, $p = .262$, $\eta_p^2 = .02$), indicating that there is little evidence that modality leads to appreciable differences in state empathy directed toward a character in crisis.

In a series of ANCOVA analyses, pre-test CSES subscale scores were used as a covariate when examining group differences between LA and VR groups on posttest CSES subscale scores. From the ANCOVA analyses, there were no significant results for the effect of modality on state empathy subscales (empathic concern: $F(1, 61) = .192$, $p = .663$, $\eta_p^2 = .003$; distress: $F(1, 61) = .039$, $p = .845$, $\eta_p^2 = .001$; shared affect: $F(1, 61) = 1.455$, $p = .233$, $\eta_p^2 = .024$; empathic imagination: $F(1, 61) = .452$, $p = .504$, $\eta_p^2 = .007$; helping motivation: $F(1, 61) = 1.904$, $p = .173$, $\eta_p^2 = .032$; cognitive empathy: $F(1, 61) = .266$, $p = .608$, $\eta_p^2 = .004$).These results suggest that, similar to the above ANOVA results, MHCRT modality impacts state empathy subscales similarly whether administered by either live action or virtual reality..

RQ 3: State Empathy and Sample Descriptive Variables

A Pearson's correlation was conducted to examine the relationship between baseline CSES total scores and continuous officer descriptive variables, such as age, total years served on patrol and total years served as a police officer. There were no significant results for the relationship between baseline state empathy total scores and years served on patrol ($r(60) = -.028$, $p = .830$), years served as a police officer ($r(60) = -.03$, $p = .801$), or age ($r(60) = .01$, $p = .923$).

Additionally, a series of point-biserial correlation analyses investigating the bivariate relationship between baseline CSES total scores and categorical officer descriptive variables,

such as gender and completion of CIT training revealed no significant relationships between baseline CSES total scores and gender ($r_{pb}(58) = -.14$, $p = .289$), or between baseline CSES total scores and completion of CIT training ($r_{pb}(58) = .18$, $p = .182$). Altogether, these results suggest that state empathy was not influenced by background demographic variables including gender, age, nor was it impacted by police training variables such as years served as an officer or completion of CIT training.

RQ 4: De-escalation Scores and Empathy Scores

State Empathy. To examine relationships between de-escalation competencies and state empathy, a series of Spearman's correlation analyses were conducted with DePICT™ total and items scores measured at baseline and baseline CSES total scores. There were significant positive correlations between empathic concern and total DePICT™ scores, DePICT™ item #4 'Humanizes and promotes dignity', and DePICT™ item #7 'Calming body language' (see Table 3 and Table 4), indicating that empathic concern was positively related to total baseline DePICT™ scores, and the specific de-escalation competencies of "Humanization" and "Body Language". For the remainder of the CSES scores, there were no significant results detected, suggesting that possession of greater state empathy was not generally related to de-escalation, and is instead limited to a single de-escalation strategy.

Table 3

Spearman's Correlation Analysis with CSES (Pretest) and DePICT^{TM} Items #1-7 (Pretest) Scores.

	Approaches, Contains, Controls the Scene		Time and Distance		Concern for Welfare, Willingness to help		Humanizes, Dignity		Calming Paralanguage		Uses non-stigmatizing and respectful Language		Calming Body Language	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*
CSES Total Score Pre	0.21	0.104	0.19	0.146	0.01	0.943	0.17	0.211	0.02	0.895	0.13	0.347	0.14	0.309
Empathic Concern	0.10	0.468	0.20	0.128	0.11	0.398	.26*	0.044	0.17	0.205	0.20	0.124	0.25*	0.054
Distress	0.11	0.385	0.16	0.212	-0.09	0.506	0.03	0.838	-0.12	0.364	-0.04	0.767	-0.02	0.864
Shared Affect	0.20	0.133	0.07	0.578	-0.03	0.805	0.05	0.714	-0.06	0.670	0.04	0.749	0.01	0.919
Empathic Imagination	0.20	0.114	0.14	0.293	0.06	0.630	0.18	0.172	0.02	0.869	0.21	0.108	0.12	0.375
Helping Motivation	0.15	0.266	0.21	0.112	0.04	0.745	0.12	0.349	0.09	0.514	0.10	0.438	0.02	0.876
Cognitive Empathy	0.08	0.555	0.20	0.126	-0.03	0.824	0.17	0.191	0.17	0.185	0.21	0.112	0.20	0.127

Note. *r* = Spearman's correlation; *p* = significance; * = significant at the .05 level, *N*=62.

Table 4

Spearman's Correlation Analysis with CSES (Pretest) and DePICT™ Items #8-14 and Total (Pretest) Scores.

	Self-Awareness, Flexibility, Regulation		Actively Listens and permits emotional expressiveness		Identifies signs and adapts response to MHC behaviors		Validation of Person's emotions and experiences		Seeks Information, Uses additional resources		Fosters Person-centred response		Engages in Clear and Transparent Decision-Making		DePICT™ Total	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*
CSES Total Score Pre	0.04	0.781	-0.02	0.895	0.06	0.676	0.12	0.371	0.00	0.994	0.05	0.733	-0.01	0.951	0.17	0.210
Empathic Concern	0.14	0.268	0.14	0.297	0.05	0.733	0.21	0.107	0.04	0.785	0.06	0.646	-0.04	0.753	0.26*	0.047
Distress	-0.16	0.230	-0.01	0.942	0.01	0.960	-0.12	0.344	0.08	0.564	-0.15	0.247	-0.07	0.601	-0.04	0.781
Shared Affect	-0.07	0.589	-0.03	0.801	0.17	0.186	0.06	0.653	0.22	0.086	0.01	0.913	-0.01	0.966	0.14	0.284
Empathic Imagination	0.08	0.537	0.01	0.971	0.00	0.975	0.16	0.234	-0.02	0.868	0.15	0.257	0.00	0.984	0.17	0.194
Helping Motivation	0.18	0.178	-0.01	0.918	-0.03	0.798	0.17	0.200	-0.12	0.345	0.15	0.241	0.06	0.662	0.16	0.224
Cognitive Empathy	0.13	0.325	0.05	0.715	0.03	0.797	0.17	0.196	0.03	0.831	-0.06	0.649	0.10	0.434	0.17	0.187

Note. *r* = Spearman's correlation; *p* = significance; * = significant at the .05 level, *N*=62.

General Empathy. A series of Spearman correlation coefficients were conducted to investigate relationships between general empathy towards people with mental illness (using baseline aggregated general empathy scores), and de-escalation strategy (using baseline DePICT™ total and item scores). Significant correlations were found between general empathy questions and several DePICT™ items measured at baseline. General empathy scores were significantly positively correlated with DePICT™ item #3 'Concern for welfare and willingness to help', $r(60) = .26$, $p = .043$; DePICT™ item #4 'Humanizes and promotes dignity', $r(60) = .40$, $p = .002$; DePICT™ item #5 'Calming paralanguage', $r(60) = .34$, $p = .008$; DePICT™ item #6 'Uses non-stigmatizing and respectful language', $r(60) = .36$, $p = .005$; and DePICT™ item #8 'Self-awareness, flexibility, and self-regulation', $r(60) = .26$, $p = .042$. A significant positive correlation was also detected between baseline general empathy scores and total DePICT™ score, $r(60) = .36$, $p = .005$, suggesting that greater general empathy is related to the use of specific de-escalation competencies.

Chapter 7: Discussion and Conclusion

Key Findings and Contributions

The purpose of this study was to evaluate police officers' empathy formation from participation in the MHCRT scenario-based program by comparing virtual reality and live action modalities to a control group of officers who did not receive the training. Additionally, the study examined whether there was a relationship between empathy, de-escalation strategy use, and police participant demographic variables.

The key findings of this study were that: 1) While MHCRT instruction did not contribute to an increase in state empathy compared to a control group, this training curriculum did contribute to specifically increasing empathic concern; 2) Both virtual reality and live action modalities were comparable in their impact on empathy formation; 3) State empathy was not influenced by background demographic variables including gender, or age, nor was it impacted by police training variables such as years served as an officer or completion of CIT training; 4) While state empathy was not generally related to de-escalation competencies, empathetic concern was positively correlated with humanization de-escalation strategies; 5) General empathy towards people with mental illness was related to five DePICT^{TM} competencies connected to relational policing. These findings are discussed in further detail below. Taking all the study's findings into consideration helps to develop a better understanding of the role of empathy in police training and how it can be implemented to improve effective de-escalation in police responses to situations involving PMHC.

MHCRT and State Empathy

While MHCRT in either delivery format (VR or LA) did not contribute to improvement in state empathy compared to a control group, this training did significantly increase empathic

concern. The MHCRT's muted effect on state empathy was inconsistent with the literature that demonstrated the capacity of both MHCRT scenario-based training (Lavoie & Alvarez, 2022) and related police training such as CIT training to increase empathy (Compton et al., 2014; Ellis, 2014; Hacker & Horan, 2019). These results ran contrary to the hypothesized findings and could be a result of the limited delivery of the program. The full MHCRT program includes seven online modules, three 90 minute Forum Scenarios and four 10-minute evaluation scenarios. In this study, due to constraints, only a single Forum Scenario (Umar) and a single evaluation scenario (Jamie) was delivered.

Moreover, the Forum scenario focused on risk assessment and management competencies. The evaluation scenario involved a character with PTSD and cannabis intoxication who summoned police and was armed with a baseball bat to protect himself. The Jamie scenario was focused on the de-escalation competencies of approaching, containing, and controlling the scene for effective risk assessment as well as active listening, demonstrating validation of emotions and experience, expressing concern for welfare, engaging in clear and transparent decision-making. Of note is the inclusion of the baseball bat in the evaluation scenario held by the character in crisis to protect himself. Here the participants must manage a new risk that was not presented in the Forum scenario. While there is the need to accurately assess and effectively control this risk, the participants were also required to demonstrate validation of Jamie's primary requests which involved taking seriously his fear of the assailants returning to harm him. An example of validating this concern might be the police action of calling backup to check around the perimeter of the property for the assailants Jamie has described. However, with Jamie picking up a baseball to protect himself from harm during the scenario, participants likely considered the bat a threat in an enclosed space that jeopardized their

own safety. This threat could be amplified by the existing belief held by a third of officers surveyed by Cotton (2004) that PMI are as much or more of a danger than most people assume. Therefore, the element of Jamie holding the bat may have diminished the capacity of participants from forming empathy towards the character as he may present himself as more of a risk to officer safety.

This notion is consistent with Stigma Theory (Goffman, 1963), in which stigma and fear are connected to individuals perceived to be in an "outgroup" or "othered" as different from oneself. In particular, stigma around PMHC and the negative stereotype of individuals with mental illness being viewed as inherently dangerous, violent, or unpredictable (Borinstein, 1992; Fox et al., 2018). Participants may have anticipated the Jamie character to be in mental health crisis when they began the scenario because they had previously seen the scenario at baseline, they were aware they were involved in a study focused on mental health crisis response, or they assessed the character's signs and symptoms indicative of a mental illness. The participants thus may have judged that Jamie could be unpredictable and dangerous in using the baseball bat to harm them, as reflected in Cotton et al.'s (2004) study that found police officers more likely to view individuals labelled with schizophrenia as more dangerous when compared to an individual not labelled with a mental illness. Therefore, it is postulated that the stereotypes associated with PMI coupled with the presence of an imminent safety risk, could have hindered empathy formation among participants. The mechanism that explains the blocking of empathy lies in research that suggests that threat perception and the experience of fear hijacks the cognitive processes that are necessary to experience empathy for others (Gutsell & Inzlicht, 2012). The presence of the weapon in the hands of a character in crisis coupled with threat perceptions

connected to those who are “othered” as different, and perceived as dangerous can contribute to fear inhibiting empathy (Gutsell & Inzlicht, 2012).

The MHCRT curriculum did focus on demystifying stigma related to PMHC which theoretically should work to reduce threat perceptions and enhance empathy towards people with mental illness. The Jamie evaluation scenario was based on realistic mental health crisis situations developed through a cross-disciplinary group of subject matter experts where depicting elevated crises containing safety risks was essential because these are the situations in which police use of deadly force have been prevalent. Given that three other evaluation scenarios were developed within the MHCRT program, there is the potential to test whether another character in crisis with less imminence of risk to officer safety may have been able to generate more empathy compared to the Jamie evaluation scenario. Therefore, the ability to test a diversity of scenarios with varying levels of risk toward the officer (i.e. the presence of weapons) in the future would allow for a better understanding of developing empathy towards different PIC characters.

Training Modality and State Empathy

Despite that MHCRT training was found to have a significant improvement on just the empathic concern subscale of the state empathy scale, both live action and virtual reality training modalities showed comparable impacts on this variable. This finding is inconsistent with the original hypothesis that VR would show a greater effect on empathy scores due to the ability of perspective taking available with the modality. This finding is also inconsistent with the literature on VR effectively increasing empathy more than a less immersive modality (Herrera et al., 2018). However, the overall finding of comparable results between the two methods of delivery does follow research from Stocker et al. (2011) and Shubeck et al. (2016), where VR and live action modalities resulted in no significant differences in performance measures.

Additionally, these results also follow literature from Martingano et al., (2021) and Shin (2018) with the VR modality bringing about a significant elevation on empathic concern, and provides promising results given that VR is a more cost effective and a scalable solution to training. Additionally, these findings show that despite differences in the delivery of scenarios in VR and LA, the training effects still prevail regardless of modality.

Modality Differences. There were several differences between Live Action and VR delivery of the scenarios. As for the specific portrayal of the Jamie character, he was presented with a black eye and in casual attire. In VR, some may argue that the Jamie character could be perceived by the participants as having a 'cartoony' aesthetic, potentially impacting empathy formation in virtual reality because he appears less human. However, character drawing style in cartoons has been shown to not have significant effects on empathy formation of viewers when comparing between a realistic style of character versus a cartoony rendering (Lee et al., 2017; Park et al., 2019). Rather, the content of what cartoon characters were conveying had more to do with viewers' empathy towards them (Lee et al., 2017; Park et al., 2019). Therefore, the way in which Jamie was visually depicted in the virtual environment might have less to do with the officers' empathy formation than the actual voice, mannerisms, and narrative of the character.

When developing the Jamie character in VR, voice recordings were completed with a professional actor and paired with body movements, mannerisms and actions rendered through motion capture technology. Jamie's actions and dialogue were developed using a community co-design model which involved a diverse team. The development group consisted of theatre makers, people with lived experience of mental illness, communication, anti-discrimination, and cultural safety experts, community advocates, forensic psychologists, mental health clinicians,

and police trainers who designed and tested the narrative branching in the scenario (Alvarez, 2021).

Other differences in the evaluation scenario based on modality centered on the conclusion of the scenario. Through content branching, the Jamie character's end state in VR was him curling up on the ground and expressing his fear and panic through heavy breathing. After Jamie lies on the ground, any other dialogue options would involve him standing back up abruptly and were incongruous with the overwhelmed and panicked sounds he was making on the floor. Conversely, in live action scenarios there was no specific end state dialogue or action that made it so the scenario could not continue progressing. Additionally, in VR there is a designated set of dialogue and actions available as responses to the officer in the scenario. Therefore, predetermined dialogue for Jamie was only able to be used in VR which may have affected the results on empathy formation in the VR group, which follows Shin (2018)'s findings that level of immersion in the VR environment are linked to empathy. Alternately, in the LA group there was not the same set of dialogue constraints and actors could respond precisely to what was asked by attending officers.

Further distinctions in the character portrayal based on delivery format were brought about by logistical demands. There was a singular Jamie avatar depicting the PIC character in virtual reality controlled by three trained researchers, whereas in live action there was a rotation of three unique professional actors trained on embodying the role of Jamie. These actors were all extensively briefed through a 12-hour rehearsal together involving a close analysis of the scenario outline, backstory on the Jamie character, the character's hooks to calm him or triggers that would cause him to further escalate, and improvisations that followed the scenario outline in response to a range of possible officer responses to ensure that their depictions were

standardized. The use of the three rotating actors could have affected empathy formation due to the 'othering' effect (Segal, 2021; Avenanti et al., 2010; Gutsell & Inzlicht, 2012). More specifically, certain actors' portrayals or the actors' characteristics could have lent themselves to being viewed as more similar (ingroup) or different (outgroup) to the officer, and in turn gaining more empathy from officers than other actors' portrayal (Avenanti et al., 2010; Gutsell & Inzlicht, 2012). Conversely, in VR only having one specific avatar of Jamie with finite branching might have provided a more consistent character portrayal across all participants. Perhaps the content branching and specific portrayal of Jamie overall did not pull at the heart strings that other characters may have, as the content of what characters convey has been shown to have more to do with viewers' empathy towards them rather than their appearance, whether that be more realistic or cartoony (Lee et al., 2017; Park et al., 2019).

As empathic concern was the only empathy-related variable that displayed significant increases across modalities, the comparison with other variables should be discussed. The items within the empathic concern subscale include the participants feelings of the following towards Jamie: 1) compassionate, 2) moved, 3) soft-hearted, 4) sympathetic, 5) tender, 6) warm. It would make sense why police officer participants would express these feelings of concern towards Jamie following MHCRT training, as he displays an overwhelming panic and desperation for his safety. This is also consistent with the literature on police officers viewing PMI as more deserving of pity (Watson et al., 2004). Interestingly, there was no effect on helping motivation, which involves a strong urge to help and get involved with coming to a solution for Jamie in the scenario, combatting Watson et al.'s (2004) findings that officers viewed PMI as more worthy of being helped. However the effect of "othering" could be at play within this scenario, as the motivation to help has been shown to decrease towards members of outgroups (Segal, 2021).

Additionally, participants had the opportunity to go through the Jamie scenario twice. Therefore, practice effects were at play (and controlled for) within this analysis as subjects could learn and improve upon how they performed on the second iteration of the Jamie scenario.

While there is the opportunity to speculate whether one modality could improve empathy formation more than the other, the null result of differences of empathy between LA and VR is overall a promising result. This means that participants overall did form empathy in a similar way. With this fact in mind, the effects of this type of mental health crisis response training, and even other types of training, can be delivered using the more cost-effective and scalable method of virtual reality.

State Empathy and Sample Descriptive Variables

State empathy was not influenced by selected measured background demographic variables including gender or age, nor was it impacted by police training variables such as years served as an officer or completion of CIT training. This finding is inconsistent with the hypothesis that descriptives would have an effect on empathy scores. The null results concerning demographic variables were mixed with the literature on empathy and these characteristics, as Hojat et al. (2020) found a significant relationship between medical student demographics (i.e., gender), with higher empathy in women. Additionally, no significant correlations were found between empathy and age in the medical student study, consistent with our findings. In Hojat et al.'s study, the empathy tool used was geared more towards general empathy towards a group of people rather than a specific patient.

While these demographic and training variables produced null results for a correlation with state empathy, this can be interpreted as an encouraging outcome. These findings demonstrate that any officer, regardless of training, time served as an officer, or personal

characteristics, can still undergo this type of mental health crisis training and benefit from improvement in empathic concern in the same way.

De-escalation Strategies and Empathy

While state empathy was not found to have a significant relationship with de-escalation competencies, general empathy did display several significant positive relationships with total DePICT^{TM} and item scores including 'concern for welfare and willingness to help', 'humanizes and promotes dignity', 'calming paralanguage', 'uses non-stigmatizing and respectful language', and 'self-awareness, flexibility, and self-regulation', as hypothesized. The results of general empathy having a positive relationship with the 'concern for welfare and willingness to help' and 'humanizes and promotes dignity' DePICT^{TM} items corresponds with the literature, as Herrera et al.'s (2018) study showed that empathy was found to be related to advocating for individuals in crisis. Additionally, the 'uses non-stigmatizing and respectful language' 'item having a positive relationship with general empathy follows the literature on an empathic approach for police officers being more effective in terms of responding to crisis situations with PMI (Soares & Pinto da Costa, 2019). Studies have shown that PMHC value a compassionate and empowering approach from police officers in crisis situations, and this approach allows for a more positive interaction overall (Lamanna et al., 2018; Livingston et al., 2014; Winness et al., 2010). Police officers themselves have also expressed that general empathy is an important trait necessary for successful police practice in crisis situations (McGriff et al., 2010). The ability to empathize with PMHC allows officers to understand the feelings of the person and understand that empowering them with choices to resolve the situation will foster a better interaction. Further, these results provide support in favour of the relational policing approach, which places emphasis on the role

of empathy in crisis situations and involving the PMHC in decision-making by asking what their needs are or what has helped them in the past.

The relationship between general empathy and de-escalation competencies demonstrates that general empathy towards PMI as a group (rather than towards the specific Jamie character) corresponds with increased use of de-escalation strategies. The significant positive relationships between general empathy towards this group and the DePICT™ items #3 'concern for welfare and willingness to help' and #4 'humanizes and promotes dignity' are especially relevant to a relational policing model. Therefore, there is evidence that the MHCRT program, in helping officers develop their relational policing skillsets, also contributes to improving empathy towards people with mental illness more broadly.

These results correspond to what has been discussed already about empathy promoting helping behaviors and the blocking effects of "othering" on empathy (Segal, 2021). Given that the MHCRT included two online modules and a forum scenario specifically dedicated to imparting anti-bias training designed to diminish mental health status (and race-based bias), it is expected that participants exposed to this training would have an improved capacity for general empathy towards people with mental illness. Because trained participants developed an understanding of the lived experiences of people with mental illness, fear/threat perceptions associated with outgroup members or "othering" decreased. One of the key messages in the training was debunking the widely held stereotype that people with mental illness are inherently dangerous or more prone to violence – this learning objective should contribute to less general fear and better risk assessment by officer participants. Moreover, the trauma-informed approach used in the MHCRT imparting the lesson that traumatic experiences happen to individuals that results in behaviors being driven by fear is useful in explaining the motivations of many people

in crisis as being a result of what has happened, as opposed to personal character flaws. Altogether, the curriculum is designed to improve general empathy towards people with mental illness.

The relationship between general empathy and the specific DePICT™ competencies related to a relational policing model is something that could inform hiring practices at police departments. Officers possessing greater general empathy towards people with mental illness may be predisposed to improved relational policing skills and therefore, may be more adept to specialized mental health crisis response teams.

VR User Considerations and Empathy

In the VR environment specifically, the use of hand controllers was required for participants to teleport in the scene. The use of teleportation was a feature that was used by learners to move throughout the entire scenario environment as the physical rooms participants occupied for the evaluation scenario (approximately 10x10ft) were not large enough to be room-scale with the virtual environment. While observing participants in the VR evaluation scenarios, some experienced difficulties with using the hand controllers for teleportation. Some of the DePICT™ competencies being assessed in the scenario were 'Manages time and distance', 'Approaches, contains, and controls the scene for effective risk management', and 'Exhibits calming body language', which included how close officers may get to the character in crisis. Moving too close to the Jamie character could result in lower scores across these competencies if safety risks have not first been properly managed, especially with the added element of the baseball bat in the scene, which may invariably result in officers drawing a use of force option because they have put themselves at risk. Further, while maintaining space between the officer and Jamie could be scored higher for the managing time and distance (DePICT™ item #2) or

risk management (DePICT^{TM} item #1) competencies, it may prevent officers from picking up on further details from the scene that could assist in resolution, such as Jamie's black eye, or the cannabis and beer bottles on the coffee table.

As previously discussed, the Jamie character in VR had a pre-set inventory of dialogue options to respond to officers. With these predetermined character responses, some parts of Jamie's story may be harder to elicit (as compared to Live Action). For example, the VR Jamie avatar did not have the option to specify that he had consumed cannabis earlier that day. This detail that could be obtained by the officer in live action could have prevented state empathy formation for Jamie in VR, as compared to general empathy for PMI in general. The DePICT^{TM} item #10 identifying signs of mental health crisis behavior, such as asking about drug use, could vary between the LA and VR modalities due to this constriction of character responses, factor of teleportation, and potentially less visibility of the drugs on the coffee table present in VR. Additionally, with the limited responses available in VR, officers may also have slightly more difficulty in coaxing out Jamie's story which would be relevant for the de-escalation competencies of 'Actively listens and permits emotional expressiveness' and 'Seeks information and uses additional responses'. Jamie also would not be able to provide information in VR on what has worked for him in the past with calming himself down, something that would follow the competency of 'Fosters a person-centred response'. While decreases in DePICT^{TM} scores among VR participants compared to LA participants were not found, it is worth noting that VR users may benefit more from additional opportunities to practice communicating.

Limitations

While this study tackled multiple research questions and successfully evaluated empathy in police officers undergoing live action and virtual reality MHCRT, there still were limitations.

The sample size of 63 participants was limited due to the outbreak of the Omicron COVID-19 variant during data collection. Adding additional participants to increase sample size would in turn increase statistical power to detect effects.

Part of the MHCRT Training included the completion of online modules prior to the day of on-site data collection. The online component of the training could have affected results for MHCRT Training effect on empathy, as this portion of the training was not monitored to ensure that participants were meaningfully engaging in the content. One participant not in the control group indicated they had not completed any of the online components of the MHCRT Training while another 4 (6.6%) indicated they had only partially completed it, likely affecting the results on the overall effect of training on empathy. The average time of completion for the online modules was approximately 1 hour (M = .876, SD = 1.724, excluding two outliers of over 100+ hours). As the estimated time of completion was approximately 4 hours, the average of just under 1 hour suggests either a portion of participants did not fully complete the modules and/or modules were glossed over quickly rather than fully engaging with the information. Therefore, the online self-moderated portion of the MHCRT was certainly not completed meaningfully by all participants in the experimental conditions, likely affecting the results on MHCRT training effect on empathy. Additionally, the study was designed to test only part of the total MHCRT. The complete MHCRT package includes 7 online modules, 3x90 minutes Forum Scenarios and 3x10-minute evaluation scenarios. In this case, participants received 5 online modules, 1x90 Forum Scenario and 1x10 evaluation scenarios. Therefore, a full program evaluation was not possible and the results from MHCRT training and empathy is not an absolute assessment.

The length of the evaluation scenario was 10 minutes, generally a lot less time than officers would typically have when responding to these types of calls, but more time than the few

minutes that a typical police training scenario would unfold. A few participants had mentioned that, especially when expressing their discouragement regarding an ambiguous end of the scenario, they normally would spend an hour or more to find a more positive outcome in the field. Nevertheless, the length of the scenario may have played a role in how state empathy towards Jamie and de-escalation strategies interacted.

A further limitation of the study that derived from the null results looking at MHCRT effect on state empathy is that this study only included one character in crisis for state empathy questionnaire responses. The police officers in the live action and virtual reality training groups were exposed to another character in crisis through the Forum Scenario, however, the CSES questionnaire only contained questions related to the Jamie character. The depiction of the Jamie character could have hindered state empathy from improving due to him being less likeable of a character or more threatening due to the possession of a weapon. Thus, the inclusion of different characters through stimulus sampling in testing could control for the likability of a particular character. Additionally, potentially the end-state (collapsing to the floor and quietly sobbing) and limited dialogue options for the Jamie character in VR prevented improvement in state empathy scores.

Further, as previously discussed, some officers had trouble with the hand controllers in VR and being able to teleport to move around the virtual environment with ease. This resulted in limiting the officers' path of movement throughout the scenario as compared to those in the live action scenario and could have prevented participants from picking up on certain important details within the scene. Additionally, officers may have accidentally gotten too close to the character and the baseball bat due to lack of familiarity navigating in VR, affecting how they

responded continuing through the scenario. Disabling teleportation and operating the scenario in room-scale could aid in this limitation.

Perhaps the scale used to measure state empathy (the CSES) was not an optimal choice for the type of training being evaluated, even though the reliability of the scale was good (Cronbach α = .87). For future research, potentially a different scale to measure state empathy with more sensitivity to change would be more suitable for the MHCRT program. On the topic of the state empathy scale used, the scores collected from the questionnaire referred specifically to one character in crisis. In future research, multiple characters in crisis could be included to obtain a wider range of different types of crisis situations that police officers encounter, such as using all three evaluation scenarios included in the MHCRT.

The testing locations included one at the Ontario Police College in Aylmer, ON for participants in the live action group and controls, and a second location at a VR studio in Toronto. Officers attended in uniforms at the OPC which was a familiar policing location, and in civilian clothes at the VR studio which was an unfamiliar professional location. Laboratory simulations created in both locations differed in some respects from the natural environments in which police officers engage in police practice in the field. Therefore, a limitation of this study is that these differing environments may not fully encompass how an officer would respond to the person in crisis as compared to their natural environments. It is worth noting that ecological validity is an aspect in all simulation studies, as participants are being placed in unfamiliar and fictive environments. However, officers do regularly undertake scenario-based training and thus are used to adapting to and accepting the training reality of the simulated scenario. Last, this study included police officers from Ontario, and so these findings would not necessarily be representative of the rest of the country.

Recommendations and Directions for Future Research

Some recommendations for future research are to include a more comprehensive measure of general empathy. While general empathy displayed significant results with both total DePICT^{TM} scores and DePICT^{TM} item scores (3-6 and 8) in this study, general empathy is not expected to change or improve. Therefore, general empathy is of little benefit to program evaluation.

As dialogue options were limited for the PIC in VR, perhaps future iterations of the MHCRT program in VR could improve upon responsivity of the characters in crisis. Some suggestions might include the ability to input more precise responses from characters through a text to voice feature. Additionally, the use of artificial intelligence to alleviate the need for an operator of the VR character to perform some or all controls could also be an option, however, that likely would be a larger undertaking for software development.

A direction for future research is to look at moderate to long-term effects of the MHCRT on different aspects of empathy to see if the results have lasting effects. The ability of greatest empathy formation would have been for officers to take the perspective of the person in crisis, which was encouraged in the Forum Scenario during curriculum delivery. Future research on empathy in police should include the ability to change perspectives rather than only seeing from the perspective of the officer responding to the scene.

Lastly, people with lived experiences of mental health crises were involved in the development of the MHCRT. This follows the recommendation from Iacobucci (2014), therefore, future research should continue to involve these individuals. Their involvement would provide further insight into the experiences of PMHC, ensure authenticity of training scenarios

and have a voice in dictating training objectives. Working with police organizations also assists in combatting against bias.

Conclusion

This study focused on empathy's role among police officers undergoing mental health crisis de-escalation training in live action and virtual reality training modalities. State empathy, general empathy, de-escalation strategies, efficacy of MHCRT, and differences between live action and virtual reality training modalities were examined. With the growing criticism of how police services respond to people experiencing mental health crises, a new perspective on police training must be considered. Key reports (e.g., Dubé, 2016; Iacobucci, 2014), academics (e.g., Lavoie et al., 2022; Coleman & Cotton, 2014b), clinicians (e.g., Usher & Trueman, 2015), researchers (e.g., Herrera et al., 2018; Soares & Pinto da Costa, 2019), mental health professionals (e.g., Lamanna et al., 2018), mental health advocates (e.g., Watson & Fulambarker, 2012), and people with lived experience of mental health crises (e.g., Brink et al., 2012; Wittmann, 2021) have claimed the need for an empathic approach to policing. This study showed a clear connect between general empathy and de-escalation competencies – perhaps empathy is a characteristic that police organizations can focus on hiring for. Given that mental health crises can happen to anyone, not just individuals with mental illness (Lavoie et al., 2022), police with greater general empathy capacity should be prioritized for specializing on mental health crisis response teams.

Presently, mental health crisis response training in police officers is not standardized across the province or country (Iacobucci, 2014; Coleman & Cotton, 2014a). The result of similar virtual reality outcomes to those of the widely used live action is thus extremely promising as virtual reality allows for wider scalability of this type of training. With greater

scalability of empathic relational policing and de-escalation training, consistency in quality of police service across jurisdictions is certainly a possibility. In conclusion, the main findings from this study present tremendous findings for technology, and training practices in police departments. With evidence demonstrating the benefits of focusing on empathy and de-escalation within policing, potentially fewer negative or tragic outcomes of police responding to mental health crisis situations will occur. As this type of training was developed with the inclusion of individuals with living experiences of mental health crisis, those that may be more likely to encounter police officers have added their voices to police training. These results suggest a progressive step forward for the future of policing training in Canada, and importantly, a step towards better care for those experiencing mental health crises.

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