The Relationship Between Attitudes Towards Violence and Violent Behaviour:

The use of Implicit and Self-report Measures

by

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Abstract

The current studies investigated the relationship between attitudes towards violence and violent behaviour. Violent attitudes have mostly been assessed with self-report measures. Within social psychology, implicit attitudes have also been assessed using response latency measures finding significance regarding these attitudes. The current studies examined implicit and self-report attitudes, as well as the relationship between attitudes and past/future violence, among three studies (one containing offenders). The effect of observing, or engaging in, violence on attitudes and whether this affects the relationship with violent behaviour was also examined. No significant results were found involving implicit attitudes; however self-report attitudes were positively related to measures of violent behaviour and more positive self-report attitudes were found after observing, or engaging in, the violent task, as was a positive relationship between these attitudes and future violence. These results extend previous research and provide valuable information regarding the role of attitudes in the commission of violence.

Keywords: implicit, explicit, self-report, attitudes, violence, violent behaviour, exposure to violence

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The Relationship Between Attitudes Towards Violence and Violent Behaviour:

The use of Implicit and Self-report Measures

In 2012, 415,000 violent crimes were reported to police in Canada, including 543 homicides (Statistics Canada, 2013). In an attempt to understand the causes of violent behaviour, research has focused on identifying the risk factors associated with behaving violently. Within psychology, attitudes have been focused on in research, as well as clinical settings, due to their practical and theoretical relevance in predicting and influencing a variety of behaviours. Many theories suggest that attitudes towards a behaviour can influence the likelihood of engaging in that behaviour (see General Aggression Model; Anderson & Bushman, 2002). Similarly, in the forensic psychology literature, criminal attitudes are considered an important risk factor in the perpetration of crime (Andrews & Bonta, 2010). In considering this, it is speculated in the current study that attitudes supportive of violence may influence the likelihood of engaging in violent behaviour. In addition, previous meta-analyses have shown that attitudes can be important predictors of behaviour in general (see Glasman & Albarracín, 2006; Kraus, 1995), with medium ($r = .38$, $k = 88$; Kraus, 1995) to large ($r = .52$, 95% CI [.49 to .54], $N = 4,598$; Glasman & Albarracín, 2006) associations found between attitudes and behaviour. Therefore, within psychology attitudes are considered important determinants of a variety of behaviours, including violent behaviour.

Two different approaches have been primarily used to assess attitudes towards violence within the literature. Previous research in social psychology has assessed attitudes with traditional methods such as self-report measures; however, within this literature attitudes have also been assessed with response latency measures, believed by some to assess more immediate associative evaluations referred to as *implicit attitudes* (see Gawronski & Bodenhausen, 2006).

In contrast, violent attitudes have most often been assessed using self-report measures within forensic psychology. Few studies to date have used implicit measures to assess attitudes towards violence, as has been done in the social psychology literature with the assessment of a variety of non-criminal attitudes. Although mixed results have been found regarding the use of these measures some promising results have emerged (see Eckhardt, Samper, Suhr, and Holtzworth-Munroe, 2012; Polaschek, Bell, Calvert, & Takarangi, 2010; Robertson & Murachver, 2007; Snowden, Gray, Smith, Moris, & MacCulloch, 2004). Conversely, self-report (or explicit) measures have not been as effective in assessing attitudes towards violence (e.g., Eckhardt et al., 2012; Robertson & Murachver, 2007; Snowden et al., 2004). In addition, past research has found mixed results regarding the relationship between scores on implicit and self-report measures when assessing attitudes towards violence (see Polaschek et al., 2010; Snowden et al., 2004). This may be due to the fact that within the self-report measures designed to assess attitudes, many cognitive constructs are used interchangeably when referring to the attitude construct. Little research has examined whether these cognitions are distinct constructs or are all encompassed within the attitude construct.

In considering these gaps in the literature pertaining to the assessment of attitudes towards violence, the current study will extend the findings of past research by administering both implicit and self-report measures to assess attitudes towards violence, across three different studies. The aim of this study is to achieve a more comprehensive understanding of the relationship between attitudes towards violence and violent behaviour.

Literature Review

Definition of the Attitude Construct

Within the social psychological literature attitudes have been typically defined as evaluations of psychological objects such as people, things, or behaviours (e.g., Ajzen, 2001; Eagly & Chaiken, 1993, 2007; Fazio, 2007). For instance, in one of the most cited definitions, Eagly and Chaiken (1993) defined attitudes as “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (p. 1). Similarly, Fazio (2007) defined attitudes as associations between a psychological object and an evaluation of that object (Fazio, 2007; see also Fazio, 1995; Fazio, Chen, McDonel, & Sherman, 1982). In addition, Ajzen (1991) defined attitudes towards behaviour as “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” (p. 188). Therefore, a common premise in many definitions of attitudes is the evaluative nature of the attitude construct. From this, attitudes towards violence can be considered evaluations of violence.

As stated above, the assessment of attitudes towards violence in the forensic psychological literature has used self-report measures. Although these measures have been designed to assess attitudes towards violence specifically, previous research has found self-report measures to be distinct from measures more closely assessing attitudes as evaluations (see Nunes, Hermann, Maimone, & Woods, 2014); thus, it is not clear whether items included in these measures require an evaluation of the behaviour in question (i.e., violent behaviour). Recent work published by my colleagues and I has examined the underlying constructs of some commonly used self-report measures (see Nunes, Hermann et al., 2014). Specifically, we examined whether items from the Violence attitude scale of the Measures of Criminal Attitudes

and Associates – Revised (MCAA-R-V; Mills, 2007) and the Criminal Attitudes to Violence Scale (CAVS; Polaschek, Colie, & Walkey, 2004) actually assess evaluations of violence. Two factor analyses were conducted to examine whether items from a scale assessing evaluations of violence formed a distinct factor from items in the MCAA-R-V and CAVS, which would suggest that these measures are assessing distinct cognitions. Hierarchical multiple regressions were also conducted to examine whether these measures were independently associated with self-reported violent behaviour. Participants consisted of 568 first and second year undergraduate students from Carleton University. Results indicated that items from the Evaluation of Violence scale formed a distinct factor from the MCAA-R-V items. Similarly for the factor analysis involving the CAVS items, evaluations of violence, once again, formed a distinct factor from the items in this self-report measure. Additionally, the MCAA-R-V and Evaluation of Violence scale were independently associated with violent behaviour and together accounted for a significantly greater amount of variance in violent behaviour than either one alone. These same results were found for the analysis involving the CAVS. As stated by my colleagues and I, the results of these analyses support the hypothesis that the MCAA-R-V and CAVS may be assessing cognitive constructs that are distinct from attitudes towards violence (or evaluations of violence); however, they also suggest that these measures appear to be associated with violent behaviour regardless of whether they are actually assessing attitudes. Therefore, these cognitive constructs may be important to examine alongside attitudes to fully understand what influences violent behaviour.

Implicit and explicit attitudes. According to Gawronski and Bodenhausen's (2006) associative propositional evaluation (APE) model there are two types of attitudes: implicit and explicit. Implicit attitudes are defined as immediately activated evaluations of psychological

objects often measured using response latency measures such as the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998); whereas explicit attitudes are defined as deliberative propositional reasoning about a psychological object often assessed using self-report measures such as the Measures of Criminal Attitudes and Associates (MCAA; Mills, Kroner, & Forth, 2002). Research has found that implicit and explicit attitudes are associated with relevant criterion variables (Greenwald, Poehlman, Uhlmann, & Banaji, 2009) and are intercorrelated (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005), but distinct constructs (e.g., Nosek & Smyth, 2007). Also, research has found that both implicit and explicit attitudes independently predict behaviour (Cameron, Brown-Iannuzzi, & Payne, 2012). In considering these findings, the assessment of both implicit and explicit attitudes may be required to fully understand the nature of the relationship between attitudes and behaviour, including the relationship between violent attitudes and violent behaviour.

Attitude Theories from the Social Psychology Literature

Theory of Planned Behaviour. The theory of planned behaviour was developed by Ajzen (1991) to predict people's behaviour in specific contexts. Ajzen (1991) stated that both peoples' intentions to perform a given behaviour and their perceived behavioural control determine whether they perform a behaviour. Intention to perform the behaviour is determined by one's attitude towards the behaviour, subjective norms concerning the behaviour, and belief in one's ability to perform the given behaviour (also referred to as behavioural control or self-efficacy). According to this theory, more favourable attitudes and subjective norms toward the behaviour, as well as more perceived behavioural control in ability to perform the behaviour, will result in stronger intention to perform the behaviour. It is believed that greater behavioural intention will result in greater likelihood of the behaviour occurring (see Figure 1 below).

Figure 1. Model of Ajzen's Theory of Planned Behaviour

Ajzen (1991) stated that attitudes are created from peoples' beliefs about objects that develop through linking outcomes to behaviours associated with these objects. Thus, the outcomes linked to behaviours are valued either positively or negatively and this predicts whether these behaviours will be performed. In considering this, violent behaviour is more likely to occur if it is believed to result in desirable outcomes.

Motivation and Opportunity as Determinants (MODE) model. According to the MODE model developed by Fazio (1990) attitudes were defined as object-evaluation associations that are stored in memory and may have an uncontrollable and spontaneous influence on behaviour. These object-evaluation associations (or attitudes) are formed through repeated exposure to an attitude object (such as people or behaviours) and become strengthened over time. This causes them to be immediately activated in the presence of the attitude object.

The MODE model also emphasized the different processing modes through which attitudes affect behaviour. These processing modes consist of automatic processing—associated with implicit attitude activation—or deliberative processing—associated with explicit attitude activation. Fazio (1990) proposed that motivation and opportunity determine whether automatic

or deliberative processing will influence behaviour. The automatic processing mode occurs when an attitude (which Fazio also called an object-evaluation association) is activated immediately in the presence of an attitude object. If this occurs, it will produce behavioural responses that are consistent with the activated attitude if the individual does not have the motivation or opportunity to deliberate on such attitudes (Fazio, 1990; 1995; see Figure 2 below). In addition, object-associations (or attitudes) become strengthened with repeated exposure to an attitude object. According to this model, immediate activation is more likely to occur with stronger attitudes. In contrast, deliberative processing occurs when there is no attitude towards the object or when motivation and opportunity to deliberate on the attitude is high. Therefore, if an attitude object (i.e., violence) has never been encountered, there may be no object-association already stored in memory and automatic activation will not occur. Additionally, if there is an object-association stored in memory but deliberation deems the attitude as invalid, or in opposition with norms of society or internally held beliefs and/or values, the initial attitude may be overridden and an inconsistent behavioural response will occur (see Figure 2 below). Thus, it is likely that the initial attitude will not have an immediate influence on behaviour if motivation and opportunity for deliberation is high and the resulting behaviour is evaluated as detrimental (Fazio, 1990).

Figure 2. Schematic diagram of Fazio's MODE model.

In considering this, immediate activation of positive implicit attitudes towards violence is more likely to occur in the future if prior violence has resulted in positive outcomes.

Additionally, measures designed to assess immediate (or implicit) attitudes, such as the IAT, may be inconsistent with measures assessing deliberative (or explicit) attitudes, such as self-report measures, because explicit attitude measures may allow for more opportunity to deliberate on immediate (or implicit) attitudes that are initially activated.

Associative-Propositional Evaluation (APE) model. Gawronski and Bodenhausen (2006) framed the associative –propositional evaluation (APE) model according to Eagly and Chaiken's (1993) definition of attitudes as evaluations. Consistent with the MODE model, Gawronski and Bodenhausen (2006) also suggested that two forms of mental processes underlie such attitudes (or evaluations). According to this model, associative processes underlie implicit attitudes and propositional processes underlie explicit attitudes. Associative processes are used when relevant attitude stimuli are encountered causing immediate activation of pre-existing associations in memory. When this occurs, affective reactions (or implicit attitudes) are activated. Immediate affective reactions can be activated and influence behaviour regardless of whether one believes them to be accurate (Gawronski & Bodenhausen, 2006).

Consistent with the MODE model, the APE model attempted to explain the potential discordance that can arise between implicit and explicit attitudes. Gawronski and Bodenhausen (2006) proposed that, unlike implicit attitudes, the basis for explicit attitudes is propositional processes that produce deliberative evaluative judgements (also called explicit attitudes). Therefore, explicit attitudes are referred to as evaluative judgements that are constructed from any information present and relevant when encountering the attitude stimulus. This results in an evaluative judgement (or explicit attitude) by transforming the initial affective reaction (or

implicit attitude) into a propositional form after evaluating whether it is valid and true.

Therefore, when implicit attitudes are evaluated as invalid, explicit attitudes may be inconsistent with implicit attitudes (or affective reactions).

Synthesis of theories. Inherent within all the theories above is the idea that attitudes are evaluations of psychological objects. Thus, attitudes towards violence are evaluations of violence. The above theories also propose that attitudes are formed through repeated evaluation of an object or behaviour over time. Immediate evaluations (or attitudes) are more likely to influence behaviour with repeated exposure to an attitude object. In addition, these theories suggest that implicit and self-report (or explicit) measures may be assessing different dimensions of the attitude construct (i.e., assessing implicit vs. explicit attitudes). Therefore, inconsistency between scores on these measures may occur because different processes may underlie the activation of implicit and explicit attitudes. Consequently, this suggests that it may be necessary to assess both implicit and explicit attitudes towards violence because they may be differentially related to violent behaviour.

Assessment of Violent Attitudes within Social Psychology

Within the social psychology literature, attitudes have been assessed with implicit attitude measures such as the Implicit Association Test (IAT; Greenwald et al., 1998). In IAT measures, implicit attitudes are inferred from the speed with which participants sort target words into the categories representing a target concept (i.e., violence vs. peace) and evaluative attributes (i.e., positive vs. negative). However, to the best of my knowledge, to date only four published studies have used IAT measures to assess attitudes towards violence specifically.

One such study, conducted by Snowden et al. (2004), used an IAT measure to assess implicit attitudes towards violence among a sample of violent offenders. The sample consisted

of 121 adult male offenders, all diagnosed with personality disorders. This sample was split up into two groups consisting of those who had received a prior conviction for murder (murderers; $n = 30$) and those who had received no prior conviction for murder (non-murderers; $n = 91$). The non-murderers served as the control group and their offences included sexual and violent offences. Offenders were also split up into low, medium, and high psychopathy groups based on their scores on the Psychopathy Checklist – Revised (PCL-R; Hare, 1991). Snowden et al. (2004) also administered explicit attitude measures consisting of a feeling thermometer that required participants to rate a target concept (i.e., *violence* or *peace* word) on a scale ranging from 0 (*cold/unfavourable*) to 99 (*warm/favourable*), and a semantic differential measure that required participants to rate a target concept word on six 7-point Likert scales. The average of the semantic differential scales assessing *violence* made up the index used. The IAT measure administered by Snowden et al. (2004) involved the presentation of a target word on a computer screen, related to violence, peace, pleasant, or unpleasant. Participants were required to sort these target words into categories pairing *violence* or *peace* with an evaluative scale (i.e., *unpleasant* or *pleasant*). As such, the categories in this IAT measure consisted of *Violence + Pleasant* and *Peace + Unpleasant* or *Violence + Unpleasant* and *Peace + Pleasant*. The speed with which the participants sorted the target words into these categories was recorded (i.e., response times) and the index used (i.e., IAT score) was the difference between the average response times for sorting words when *violence* was paired with *pleasant* and the average response times for sorting words when *violence* was paired with *unpleasant*. Lower IAT score indicated more positive implicit attitudes towards violence. In addition, faster response times were expected when sorting words for categories that are more strongly associated. For

example, if one views violence as being pleasant he/she would more quickly sort the target words when *Violence + Pleasant* share the same response key.

Snowden et al. (2004) found a significant three-way interaction between IAT condition (*violence* paired with *pleasant* or *violence* paired with *unpleasant*), offender group (murderers or non-murderers), and psychopathy (low, medium, or high PCL-R scores) on IAT scores. More specifically, in the high PCL-R group the IAT score was significantly lower for murderers than non-murderers (Cohen's $d = 1.0$), suggesting that murderers highest in psychopathy had more positive implicit attitudes towards violence in comparison to non-murderers. Additionally, no significant differences in IAT scores between murderers and non-murderers were found for those with medium PCL-R scores and murderers had a significantly higher IAT score in comparison to non-murderers in the low PCL-R group in (Cohen's $d = .86$). These results suggest that implicit attitudes may be involved in violent behaviour for some groups of offenders (i.e., murderers high in psychopathy) and that they may be important to consider in conjunction with explicit attitudes. Importantly, Snowden et al. (2004) found a non-significant relationship between participants' scores on the IAT measure and the explicit attitude measures ($r = -.05$ to $.06$). This result raises the possibility that implicit and explicit attitude measures may be assessing different dimensions of the attitude construct or entirely distinct constructs.

Polaschek et al. (2010) used two IAT measures to assess 30 imprisoned violent offenders' implicit attitudes towards violence. One IAT measure consisted of the following categories: *Violence + Good* and *Housework + Bad* or *Violence + Bad* and *Housework + Good*. The other included pictures related to weapons or entertainment and words related to *like* or *dislike*; thus the categories were as follows; *Weapons + Like* and *Entertainment + Dislike* or *Weapon + Dislike* and *Entertainment + Like*. They also administered two self-report measures consisting of

the Criminal Attitudes to Violence Scale (CAVS; Polaschek et al., 2004), to assess self-report attitudes towards violence, and the Aggression Questionnaire (AQ; Buss & Warren, 2000), to assess self-reported aggression. Measures were administered before and after an intensive rehabilitation program for violent offenders.

Specifically, these researchers assessed whether scores on implicit and self-report attitude measures were related, whether each measure showed the same pattern from pre- to post-treatment, and whether implicit and self-report attitude measures correlated with therapist violence risk ratings. An IAT score was computed such that lower scores indicated more positive implicit attitudes towards violence or weapons. No differences were found in IAT scores from pre- to post-treatment for the violence specific IAT measure; however, offenders' implicit attitudes towards weapons were significantly less favourable post-treatment ($\eta^2 = .10$). Results involving self-report measures found that offenders' reported being less aggressive and had more negative attitudes towards violence post-treatment (CAVS $\eta^2 = .44$; AQ $\eta^2 = .37$). Implicit attitudes towards violence were not significantly associated with offenders' violence risk; however implicit attitudes towards weapons were significantly related to the violence risk measure. Similarly, scores on the CAVS, assessing self-report attitudes towards violence, were not related to violence risk. In addition, scores on the IAT assessing attitudes towards weapons accounted for incremental variance in risk of future violence above the AQ alone (Adjusted $R^2 = .274$). Finally, just as in the study conducted by Snowden et al. (2004), no significant relationship was found between scores on the implicit and self-report measures of attitudes towards violence, with Pearson's r correlations ranging from $-.23$ to $.27$. Although no significant results involving the IAT assessing attitudes towards violence were found, these results suggest

that implicit measures may add incrementally to the prediction of behaviour in conjunction with self-report measures.

Robertson and Murachver (2007) examined offenders' attitudes towards violence using an IAT measure consisting of *Violence + Good* and *Non-violence + Bad* or *Violence + Bad* and *Non-violence + Good*. Their sample contained 39 participants (24 males, 15 females) incarcerated for intimate partner violence, as well as 133 non-incarcerated participants (students and community members) who served as the comparison group. These researchers examined whether participants' attitudes varied as a function of the sample. Thus, differences in scores on the IAT measure, assessing implicit attitudes towards violence, were compared between incarcerated and non-incarcerated samples using. Lower scores on the IAT trials reflected more positive implicit attitudes towards violence. A significant difference in implicit attitudes towards violence was examined between the incarcerated and the non-incarcerated samples. It was found that the incarcerated sample ($M = 1.09$) had significantly more positive implicit attitudes towards violence than the non-incarcerated sample ($M = 1.24$) as assessed by the IAT measure ($\eta^2 = .028$). However, self-report attitudes towards violence were not significantly different between samples. Once again, these findings suggest that implicit attitudes may be important to consider because a relationship with violent behaviour has been found across studies; however, it is difficult to draw any clear conclusions about the relationship between implicit attitudes towards violence and violent behaviour from the limited research that has been conducted to date.

Eckhardt et al. (2012) also used an IAT measure to examine attitudes towards violence in a sample of 50 men from an intimate partner violence intervention program and 40 nonviolent men from the community used as a comparison. Their IAT measure consisted of *Violence + Good* and *Peaceful + Bad* or *Violence + Bad* and *Peaceful + Good*. The index used (IAT D

score) was the difference between the average response times for blocks consisting of *violence* paired with *good* and the average response times for blocks consisting of *violence* paired with *bad*. Lower IAT scores indicated more positive implicit attitudes towards violence. It was found that men in treatment for intimate partner violence had a significantly lower IAT *D* score (i.e., more strongly associated *violence* with *good*) relative to the nonviolent men ($d = 0.45$). This result suggested that the violent men had significantly more positive implicit attitudes towards violence as compared to the nonviolent men, showing that more positive implicit attitudes towards violence could be related to more violent behaviour. In contrast, no significant differences were found between samples on the self-report attitude measures. These researchers also examined the relationship between implicit attitudes towards violence, as assessed by the IAT, and two self-report measures. Correlations between self-report and implicit attitudes towards violence were not significant in the intimate partner violence sample or in the community sample. These results are similar to what was found by Robertson and Murachver (2007) and suggest that implicit and self-report attitudes towards violence may be distinct constructs.

A recent manuscript by my colleagues and I used an IAT measure along with four measures of self-report attitudes towards violence including self-reported beliefs, evaluation, and outcome expectancies, to assess the relationship between attitudes towards violence, risk of violent recidivism, and psychopathy (Nunes, Ennis, Hermann, Maimone, & Choy, 2014). The categories in this IAT measure consisted of *Violence + Negative* and *Peace + Positive* or *Violence + Positive* and *Peace + Negative*. Average response times for sorting target words when *violence* was paired with *negative* was subtracted from the average response times for sorting target words when *violence* was paired with *positive*. Therefore, positive IAT scores

indicated more positive evaluations of violence. The sample consisted of 30 violent adult male forensic psychiatric patients. No significant results were found; however all attitude measures, with the exception of the implicit measure (i.e., IAT), showed small to moderate correlations with risk of violent recidivism and psychopathy, with Pearson's r correlations ranging from .09 to .28. Although also non-significant, small to moderate correlations were also found between the implicit and self-report attitude measures, with correlations ranging from .05 to .24.

Therefore, these results are somewhat inconsistent with the previous literature described above because the self-report attitude measures had stronger correlations than the implicit attitude measure with risk of violent recidivism. It could be the case that this sample of forensic psychiatric patients was less likely to respond in a socially desirable manner to the explicit attitude measures than non-psychiatric samples due to differences between the settings in which the measure were administered (i.e., prison vs. hospital settings). For instance, Gudjonsson and Moore (2001) hypothesized that forensic patients from a maximum security hospital would be less likely to respond in a socially desirable manner than patients from a medium security unit. This was hypothesized because those from the medium security unit were expected to perceive their stay as short and thus, be less likely to respond truthfully about undesirable behaviours and psychopathology for fear of delaying their discharge. These researchers found support for this claim, as scores on a deception questionnaire were significantly lower for the forensic psychiatric patients at the maximum security hospital than those at the medium security unit (Gudjonsson & Moore, 2001). Therefore, a lowered tendency to respond in a socially desirable manner among the violent forensic psychiatric patients in the Nunes, Ennis et al. (2014) study, in comparison to the other non-psychiatric samples mentioned above (i.e., those from an IPV program that presumably perceive their stay as short), may account for the discrepant findings between these

studies. Although the forensic psychiatric patients were not from a maximum security facility they may have been more willing to answer truthfully in comparison to those from an IPV program because perhaps patients from the psychiatric hospital were more likely to perceive their stay as long.

Nunes, Hermann, and Ratcliffe (2013) used an IAT measure, along with an explicit measure of evaluation of rape, to assess the relationship between attitudes towards rape (implicit and explicit), past sexual coercion, and future likelihood of rape. The categories of the IAT measure consisted of *Rape + Good* and *Not Rape + Bad* or *Rape + Bad* and *Not Rape + Good*. For the index used, average response times for sorting words when *rape* was paired with *good* was subtracted from the average response times for sorting words when *rape* was paired with *bad*. Thus, positive scores on the IAT measure indicated more positive implicit attitudes towards rape. The analyses found no significant relationship between implicit and explicit attitudes towards rape as in the previous studies mentioned above. In addition, those who reported the most past sexual coercion or likelihood to rape had significantly more positive implicit and explicit attitudes towards rape than those who reported no past sexual coercion or likelihood to rape. Implicit and explicit attitudes towards rape were also able to significantly differentiate participants who reported no past sexual coercion from those who reported the most past sexual coercion. The results were similar when assessing group differences on future likelihood to rape; however the IAT measure fell just short of statistical significance ($p = .051$). Finally, the IAT measures, as well as explicit measure assessing evaluations of rape were better able to differentiate groups together than either measure alone for both past sexual coercion and future likelihood to rape. These results suggest that implicit and explicit attitudes may be related to

violent (and sexually aggressive) behaviour and that assessing both may provide additional information.

The IAT was designed to assess the association between attributes (e.g., Good) and concept (e.g., violence) categories and therefore, is believed to reflect the definition of attitudes, outlined above by Fazio (1990), as object-evaluation associations in memory. However, previous research has questioned the ability of IAT measures to accurately assess individual attitudes. For instance, Olson and Fazio (2004) speculated that responses on IAT measures “may be contaminated by what [they] refer to as extrapersonal associations” (p. 655). They defined these associations as information stored in memory that does not contribute to one’s personal attitudes towards an object. In addition, they proposed that this information can be opposite in valence to one’s actual evaluation of the object that is also stored in memory and therefore, produce misleading or artificial IAT effects. For instance, beliefs about particular groups of individuals or behaviours that are considered the overarching norms of society can be considered *extrapersonal associations* and these may not be the same as the attitudes one holds towards those individuals or behaviours. Past research has found support for this assertion when assessing stereotypical attitudes held by society. For instance, Nosek, Banaji, and Greenwald (2002) assessed racial prejudice towards Black individuals using an IAT measure. They found that 80% of White participants showed negative attitudes towards Black individuals on the IAT. In addition, Nosek et al. (2002) found that Black individuals did not show an in-group preference on the IAT measure and thus, also showed negative evaluations of Black individuals. Olson and Fazio (2004) proposed that this is due to the negative portrayal of this racial group in the media and that even if one’s individual attitude is positive towards this group, the IAT could have activated from memory negative *extrapersonal associations* towards Black individuals. In

contrast, Banaji, Nosek, and Greenwald (2004) stated that numerous studies have found success when using the IAT to assess individual differences providing evidence that IAT measures likely assess something within the person.

Olson and Fazio (2004) stated that explicit attitude measures might not be subject to the same contamination as IAT measures and this could account for the discordance that has been found when comparing scores on IAT and explicit attitude measures. Along these same lines, Wilson, Lindsey, and Schooler (2000) argued that IAT and explicit attitude measures may be assessing two distinct attitudes or two different dimensions of the same attitude. There is some evidence within the literature to support this claim. For instance, prior research using an IAT measure to assess stereotypical gender roles found that women associated themselves with traditional gender roles to a greater extent on the IAT measure than on the explicit attitude measures (see Greenwald & Farnham, 2000). These results suggest that traditional gender roles of society may have been activated when responding to the IAT trials that are culturally shared but not necessarily individually held. Similar results were found in a study conducted by Karpinski and Hilton (2001) assessing implicit attitudes towards apples and candy bars using an IAT measure. These researchers found that participants had a greater implicit preference for apples over candy bars as reflected by scores on the IAT in comparison to scores on the explicit attitude measure. In addition, these researchers observed participants' actual behaviour by offering them either a candy bar or apple at the end of the survey. Participants' scores on the IAT did not correspond to their behaviour; however, their scores on the explicit attitude measure did.

Olson and Fazio (2004) conducted a study involving the use of a personalized version of the IAT in order to examine whether this IAT procedure reduced the influence of *extrapersonal*

associations. They compared results of a traditional IAT measure with the personalized version both designed to assess implicit racial prejudices. The personalized IAT version contained the categories of *I Like* and *I Dislike* instead of the traditional attribute categories because they argued that using normative attribute categories (i.e., *pleasant* and *unpleasant*) might increase the potential for participants to rely on normative beliefs about the attitude object that may be opposite to their personal attitudes. According to Olson and Fazio (2004), this may occur due to the fact that participants are trying to categorize the stimulus words as quickly as possible into the IAT categories and thus, there is greater potential for them to be influenced by whatever information is available in memory at the time, regardless of whether this information truly reflects their personal attitudes or culturally shared ones. Olson and Fazio (2004) found that the personalized IAT measure resulted in less preference for White individuals among White participants in comparison to the traditional IAT measure, which showed more racial prejudice. Last, in comparison to the traditional IAT measure, stronger correlations were found between the personalized IAT and the explicit attitude measures, as well as between the personalized IAT and behavioural intentions. In considering this literature, it appears as though discrepancy also exists in terms of whether traditional IAT measures assess actual personal evaluations (or attitudes) and caution must be taken when interpreting scores on these IAT measures.

History of Violent Attitudes within Forensic Psychology

Although not defined according to Eagley and Chaiken's (1993) definition of attitudes from the social psychology literature cited above, attitudes have also been a focus within the criminology/forensic psychology literature with the development of the risk – need – responsivity model (RNR; Andrews & Bonta, 2006). These authors developed the *big four* risk/need factors, found to be linked to the maintenance of criminal conduct. These factors

consist of antisocial attitudes, antisocial associates, antisocial personality factors, and antisocial behaviour (Andrews & Bonta, 2006). They also made a distinction between criminogenic and static risk factors. Static risk factors are defined as factors that are related to the perpetration of crime, but cannot be changed over time, such as past antisocial behaviour. In contrast, criminogenic (or dynamic) risk factors are defined as factors that can be changed over time, such as antisocial—including violent—attitudes. Thus, antisocial attitudes are considered to be a criminogenic factor because they can be changed. Andrews and Bonta (2006) argued that effective interventions should target known criminogenic risk/need factors because it is assumed that a reduction in these factors will correspond to a reduction in future criminal behaviour and thus, a reduction in attitudes supportive of violence is assumed to lead to a reduction in future violent behaviour. Therefore, according to this literature attitudes towards violence are seen as an important cause of violent behaviour.

Gendreau, Little, and Goggin (1996) found support for the correlation between these risk factors and criminal behaviour through their meta-analysis, involving 131 studies, producing 1,141 correlations with recidivism. The results of this analysis confirmed that criminogenic risk factors ($r = .71$), as well as having a criminal history and/or a history of antisocial behaviour ($r = .16$) were among the most strongly related to recidivism. In addition, they found that the predictive abilities of criminogenic needs and criminal history domains were significantly greater than the other predictor domains included in the analysis (i.e., family factors, intellectual functioning, personal distress, and socio-economic status). Specifically, Gendreau, Goggin, Chanteloupe, and Andrews (1992) found that the highest correlations existed between the *big four* risk/need factors and recidivism rates of offenders, with criminal attitudes having one of the highest correlations with recidivism ($r = .18$). Additionally, effect sizes in the $r = .25$ range have

been found for interventions adhering to the *big four* risk/need factors (see Andrews & Bonta, 2010).

In considering the findings above, as well as research on the risk factors of criminal behaviour (see Andrews & Bonta, 2006; Stattin & Magnusson, 1989), antisocial attitudes are regarded as one of the strongest dynamic predictors of antisocial behaviour and prior antisocial behaviour is considered to be the strongest static predictor of future antisocial behaviour. Therefore, it is assumed the more one has engaged in violent behaviour in the past, the more likely one is to engage in violent behaviour in the future. According to the social psychology literature, prior engagement in certain behaviours also has an impact on attitudes towards that behaviour in the future and can be considered a mechanism through which attitudes influence future behaviour. This can be applied to violent behaviour as well. For instance it can be assumed that stronger implicit attitudes towards violence (whether positive or negative) are formed through repeated exposure to violence (Fazio, 1990). The attitudes that are formed due to exposure to violence are consistent with the valence of the outcomes experienced as a result of engaging in such behaviours. For instance, if one engages in violence and experiences positive outcome as a result of this behaviour, this will likely establish more positive attitudes towards violence (Fishbein & Ajzen, 1975). Therefore, exposure to violence is expected to lead to the formation and increased strength of attitudes that correspond to the valence of the outcomes experienced as a result of behaving violently. It is assumed that this will occur regardless of whether the exposure to violence is associated with positive or negative outcomes, as more positive outcomes of violence are believed to establish more positive attitudes and more negative outcomes of violence are believed to establish less positive attitudes. In turn, it is believed that stronger implicit attitudes have an immediate effect on behaviour (Fazio, 1990). From this, prior

violent behaviour, or engaging in violence, is expected to result in a positive association (or increase consistency) between attitudes towards violence and future likelihood of violent behavior (i.e., more negative attitudes towards violence will be associated with less likelihood of future violence and more positive attitudes towards violence will be associated with greater likelihood of future violence). This is the case because according to Fazio (1990; 2000), attitudes direct behaviour in a way that increases the likelihood of experiencing positive outcomes in the future and minimizes the likelihood of experiencing future negative outcomes.

As stated above, antisocial attitudes are generally accepted as major criminogenic predictors of violent behaviour and they are commonly targeted in treatment aimed at reducing recidivism rates of high risk offenders (Andrews & Bonta, 2003). However, there exists a lack of clarity and precision in the conceptualization and terminology used when assessing attitudes towards violence within the psychological literature. Within the forensic psychological literature, self-report measures have been used to assess attitudes towards violence. Prior research conducted by my colleagues and I have found that items within these self-report measures may be assessing cognitive constructs that are distinct from attitudes (see Nunes, Hermann et al., 2014). To illustrate, consider the following items from the Violence scale of the Measures of Criminal Attitudes and Associates (MCAA-V; Mills et al., 2002): “Someone who makes you very angry deserves to be hit”, “There is nothing wrong with beating up someone who asks for it”, and “It’s understandable to hit someone who asks for it”, it appears that these items may not necessarily fit with Eagly and Chaiken’s (1993) definition of attitudes as evaluations. Instead, they may fit more with the assessment of rationalizations and justifications. As outlined above, my colleagues and I found that items from the MCAA-R-V and CAVS self-report measures formed distinct factors from a measure assessing evaluations of violence (or

attitudes) and the factors they formed were consistent with their original scales (see Nunes, Hermann et al., 2014). These results suggest that commonly used self-report measures designed to assess attitudes towards violence may not be assessing attitudes as evaluations. However, both the CAVS and MCAA-R-V were independently associated with violent behaviour and these self-report measures together with the scale assessing evaluations of violence accounted for significantly greater variance in violent behaviour than either one alone. According to these results, cognitive constructs assessed by self-report measures appear to be important in understanding violent behaviour regardless of whether they are assessing attitudes or not. Additionally, self-report measures may provide additional information above measures assessing evaluations of violence alone. Although this may be true, it is clear that some issues exist with solely relying on self-report measures to assess attitudes towards violence.

One such issue is the interchangeable use of many cognitive constructs when referring to attitudes. Therefore, *criminal* or *violent cognitions* will be used instead of *attitudes* within the following sections of this literature review in order to use a more inclusive term when describing material from the forensic psychology literature. In addition, socially desirable responding is a potential issue when administering these measures among offenders. Although Mills and Kroner (2006) have found validity in the use of self-report measures among offenders, this is still of concern. In contrast, Greenwald et al. (1998) proposed that the IAT method is resistant to self-presentation biases and thus, IAT measures designed to assess implicit attitudes may protect against socially desirable responding. In addition, Nunes and Babchishin (2008) found that an IAT measure designed to assess implicit attitudes towards rape was not significantly related to social desirability (BIDR-Impression management $r = .02$, BIDR- Self-deception $r = -.23$). Last, measures of explicit attitudes towards violence (including self-report measures) may provide an

incomplete assessment given that implicit and explicit attitude measures have been found to provide complementary information (see Nosek & Smyth, 2007). Therefore, although IAT measures may protect against social desirability and produce results that are free from presentation biases, implicit and explicit attitudes may assess distinct dimensions of the attitudes construct and, as stated previously, the assessment of both may be required in order to achieve a more comprehensive understanding of the relationship between attitudes towards violence and violent behaviour.

Attitude Theories from the Forensic Psychology Literature

Neutralization theory. In their neutralization theory, Sykes and Matza (1957) propose that delinquents engage in criminal behaviour by using justifications and excuses, which these authors refer to as neutralizations. Some examples of such neutralizations include “crime is necessary for me to survive”, or “the victim had it coming and got what they deserve”. These authors stated that offenders experience dissonance when engaging in behaviours that are in opposition to internally held values and beliefs; thus, they neutralize their criminal behaviour through the use of excuses and justifications. This is done to reduce feelings of dissonance (i.e., shame or guilt) that may come about due to committing such deviant acts. Therefore, neutralizations can be seen as criminal cognitions that perpetuate future criminal behaviour. This is thought to be the case because by accepting these neutralizations offenders believe that committing these acts was warranted and they are not going against any pro-social norms of society. It is believed that desistance from criminal behaviour will occur if offenders are able to reject these neutralizations (Maruna & Copes, 2004).

The neutralization theory has been applied to many forms of criminal and/or violent behaviour including sexual offending. For instance, Bohner, Reinhardd, Rutz, Sturm,

Kerschbaum, and Effler (1998) suggested that rapists endorse criminal cognitions referred to as rape myths (or cultural stereotypes about rape) that are used as neutralizations. They stated that these criminal cognitions lead to the commission of rape because they are conducive to such deviant behaviours. They also proposed that rape might be prevented among this population by showing rapists that these criminal cognitions are not realistic interpretations and by replacing them with cognitions that are more realistic and not conducive to crime.

In conclusion, according to the neutralization theory these criminal cognitions lead to persistence in a criminal lifestyle by minimizing the guilt felt due to committing violent acts. As such, it would be beneficial to examine the relationship between such neutralizations (i.e., justifications) and violent behaviour.

The General Aggression Model (GAM). The general aggression model (GAM; Anderson & Bushman, 2002) is a violence specific model that describes how violent cognitions influence the commission of aggressive and/or violent behaviour. The authors suggested that cognitive factors within the individual, referred to as person inputs, influence aggressive behaviour (DeWall & Anderson, 2011). These person inputs include enduring traits, as well as many cognitions, such as, motivations, attitudes, beliefs, and other knowledge structures. According to this model, situation inputs such as less enduring cognitive, affective, and arousal states that arise in certain situational contexts, also influence violent behaviour along with the above cognitions. This process occurs by person and situation inputs influencing people's internal states, which in turn, influence their outcomes (e.g., behaviour). Violent behaviour arises when person and situation inputs create internal states that are conducive to, and/or contribute to, the commission of violent behaviour. Therefore, person and situation inputs provide the most direct guiding force for aggressive and/or violent behaviour. According to

DeWall and Anderson (2011), affect, arousal, and cognition comprise the three most significant internal states influenced by these factors.

According to the GAM, appraisal and decision processes are also involved (DeWall & Anderson, 2011). These processes are believed to range from automatic—referred to as immediate appraisal—to heavily controlled—referred to as reappraisal. Immediate appraisal often occurs very rapidly and sometimes it may appear as though no appraisal has occurred because this process has happened so quickly. For instance, if people perceive a threat, this may lead to immediate appraisal of the situation or person as threatening and thus, prompt the individual to act in a violent manner almost immediately. However, if the immediate appraisal is deemed important and unsatisfactory and there are enough cognitive resources available reappraisal may occur (DeWall & Anderson, 2011). During reappraisal, the immediate appraisal may be seen as inappropriate for the situation and the individual may choose to act differently. For instance, if the immediate appraisal alerts the individual of a potential threat signifying that they should act violently, but the individual reappraises the immediate appraisal as not appropriate, then he/she may choose to act in a non-violent manner. Therefore, although a person may hold violent cognitions that are conducive to behaving in an aggressive/violent manner, the situation dictates whether the person responds with violence.

The GAM is similar to the attitude theories from the social psychology literature discussed above (i.e., APE and MODE models), in terms of its focus on immediate appraisal and reappraisal. These processes are comparable to the automatic versus controlled processes described in the APE and MODE models. These models propose that if there is enough time and cognitive resources available, immediate responses may be overridden and this may lead to acting inconsistently with one's initial violent cognitions (or attitudes as defined in social

psychology). However, the GAM focuses on many personal and situational factors that may contribute to influencing behaviour, whereas the MODE model solely focuses on attitudes as influencing behaviour.

Assessment of Violent Attitudes within Forensic Psychology

As stated above, in the forensic psychology literature attitudes towards violence have been assessed primarily with self-report (or explicit) measures. These measures were designed with the goal of assessing attitudes towards violence; however, they often include items that do not fit with the definition of attitudes (i.e., attitudes as evaluations). Consequently, these measures may assess criminal cognitions that are distinct from the attitude construct.

Nevertheless, self-report measures continue to be used to assess attitudes in this literature.

One such measure is the Measures of Criminal Attitudes and Associates (MCAA; Mills et al., 2002). The MCAA consists of two self-report measures; one designed to assess criminal associates (Part A) and the other designed to assess criminal attitudes (Part B). Thus, Part B is relevant for the current study and contains 46-items. This part consists of four attitude scales assessing criminal cognitions believed to contribute to the prediction of future violent and general criminal behaviour (Mills et al., 2002). These attitude scales include Violence, designed to measure attitudes and tolerance towards violence; Entitlement, designed to measure individuals' belief in their right to take whatever they think they are deserving of; Antisocial Intent, designed to measure beliefs concerning the commission of probable antisocial acts; and Associates, designed to measure attitudes towards antisocial friends (Mills et al., 2004).

Participants provide dichotomous responses to the various scales consisting of *agree* or *disagree*. It is believed that higher overall scores on the Violence attitude scale indicate more positive attitudes towards violence (Mills et al., 2002). For purposes of this study, the Violence subscale

will be focussed upon. The following are examples of the sort of questions asked within the Violence subscale: “It’s alright to fight someone if they stole from you” and “It’s understandable to hit someone who insults you” (Mills et al., 2002). As mentioned above, it appears as though these statements may not fit with the definition of attitudes, but rather appear to reflect neutralizations, such as justifications, for engaging in various violent behaviours.

Mills, Kroner, and Hemmati (2004) conducted a study assessing the predictive ability of the MCAA attitude scales to predict general and violent recidivism. The sample consisted of 144 incarcerated adult males sentenced to two years or more. In order to obtain their recidivism information, offenders were followed up after release using offender files and official police records. General recidivism included all new offences and violent recidivism included uttering threats, assault, sexual assault, armed robbery, and robbery with violence. Pearson’s r correlations and receiver operating characteristics (or AUC; area under the curve statistics) were used during analyses. Significant correlations ranging from .19 to .32 between the MCAA attitude scales and both general and violent recidivism were found for all attitude scales except the Violence scale with general recidivism. Most importantly for purposes of the current study, the Violence attitude scale was significantly correlated with violent recidivism ($r = .19$); showing that this measure is assessing some sort of construct, be it violent attitudes or not, that is related to violent reoffending (Mills et al., 2004). Additionally, the Violence attitude scale was found to have the lowest AUCs for both general (AUC = .58) and violent (AUC = .59) recidivism.

Purpose and Conclusions

The purpose of the current study was to assess the relationship between implicit and self-report (or explicit) attitudes towards violence and violent behaviour among three different samples, two of which contain male university students and one of which contains offenders

from the Ottawa Carleton Detention Centre (OCDC). Specifically, the following was examined: (a) whether scores on the implicit and self-report measures, designed to assess attitudes towards violence, will differentiate those who have engaged in violence from those who have not; (b) whether implicit and self-report attitudes towards violence are related and whether they are associated with past and future likelihood of violent behaviour; (c) whether self-report attitudes towards violence moderate the relationship between implicit attitudes towards violence and self-reported violent behaviour (past and future likelihood) and last; (d) whether observing or engaging in violence changes one's implicit and/or self-report attitudes towards violence, as well as changes the relationship between these attitudes and their relationship with future risk of violence.

Theory and research from the social psychology and forensic psychology literatures have demonstrated that attitudes towards violence are important correlates of violent behaviour. Traditionally, violent attitudes have been assessed using self-report measures, which require deliberative evaluation of the attitude under investigation and thus, have the potential for socially desirable responding. Past research has found inconsistent results regarding the relationship between these self-report measures and violent behaviour (see Eckhardt et al., 2012; Nunes, Hermann et al., 2014; Robertson & Murachver, 2007; Snowden et al., 2004). Previous research has also been inconclusive regarding the relationship between attitudes towards violence and violent behaviour when using implicit attitude measures, such as the IAT believed to reflect more immediate affective associations, to assess such attitudes (see Eckhardt et al., 2012; Robertson & Murachver, 2007; Snowden et al., 2004).

Many models from the social psychology literature focus on the evaluative nature of the attitude construct and suggest that attitudes towards violence can be considered evaluations of

violence. Conversely, the common self-report measures use many cognitive constructs synonymously with *attitudes*. These cognitive constructs may include attitudes, but may also be distinct from attitudes. Additionally, implicit and explicit attitude measures may assess distinct dimensions of the attitude construct and thus, both should be examined to aid in the understanding and interpretation of the relationship between attitudes towards violence and violent behaviour.

Research from the social psychology literature also suggests that more prior violent behaviour increases the strength of implicit attitudes towards violence, as well as the likelihood that they will immediately influence behaviour (see Fazio, 1990). In addition, according to the forensic psychology literature, prior violent behaviour is considered to be one of the strongest static predictors of future violence (see Gendreau et al., 1996). Therefore, it is expected that prior violent behaviour will strengthen the relationship between attitudes towards violence and violent behaviour. Also, if there are not enough cognitive resources available to deliberate on immediately activated attitudes, implicit and explicit attitudes will remain consistent with one another. However, if motivation and opportunity to deliberate is high, implicit and explicit attitudes may diverge (Fazio, 1990).

Overview of Method

Three separate studies were conducted to address the research hypotheses of the current study. These studies involved three different datasets that had already been collected. The current studies extend the research already conducted involving these datasets because the relationship between the attitude measures (implicit or self-report/explicit) and self-reported violent behaviour (past and future likelihood) is the main focus of investigation here. Two of these samples consist of male undergraduate students and one consists of offenders from OCDC.

Analyses were done examining the three samples separately in order to investigate the research questions in depth. Additionally, this provided the ability to replicate the findings in the hopes of achieving a better understanding of the relationship between attitudes towards violence and violent behaviour.

Study 1: Student Sample

This study examined the following research questions among a sample of first and second year male university students: (a) do implicit and self-report attitudes (and/or outcome expectancies of violence) differentiate those who have reported being violent from those who have not?; (b) are implicit attitudes towards violence associated with self-report attitudes towards violence (and/or outcome expectancies of violence)?; (c) are implicit/self-report attitudes towards violence (and/or outcome expectancies of violence) associated with self-reported prior violent behaviour?; (d) do implicit and self-report attitudes towards violence (and/or outcome expectancies of violence) together account for additional variance in self-reported prior violent behaviour above and beyond either one alone?; and (e) do self-report attitudes towards violence (and/or outcome expectancies of violence) moderate the relationship between implicit attitudes towards violence and self-reported prior violent behaviour?

Past research examining the use of implicit attitude measures in assessing attitudes towards violence has found mixed results regarding the use of such measures (specifically the IAT); however, some promising results have emerged. For instance, Snowden et al. (2004) found that murderers highest in psychopathy had significantly more positive attitudes towards violence as assessed by the IAT measure, in comparison to non-murderers in this psychopathy group; however, these differences did not emerge when using self-report measures to assess attitudes towards violence. Robertson and Murachver (2007) found that an incarcerated sample

had significantly more positive implicit attitudes towards violence in comparison to a non-incarcerated sample that included students and people from the community. Once again this difference between samples was not found when examining self-report attitudes towards violence. Eckhardt et al. (2012) found that offenders from an intimate partner violence intervention program had significantly more implicit attitudes towards violence in comparison to non-violent men and again, no differences were found on the self-report attitude measures. Finally, Nunes et al. (2013) found that both implicit and explicit (or self-report) attitudes towards rape were able to differentiate those who reported no past sexual coercion or likelihood to rape and those who reported the most past sexual coercion or likelihood to rape. In considering these results, it was hypothesized that implicit and self-report attitudes towards violence would differentiate those who reported engaging in violence from those who did not and there would be a significant positive relationship between attitudes towards violence and self-reported prior violent behaviour, such that more positive attitudes towards violence (implicit and self-report) would be related to more prior self-reported violent behaviour.

Prior research assessing the relationship between implicit and self-report attitudes towards violence has also found mixed results (i.e., Eckhardt et al., 2012; Nunes, Ennis et al., 2014; Polaschek et al., 2010; Snowden et al., 2004). Therefore, it was not known whether scores on these measures would be correlated in the current study.

Prior research has also found that implicit attitudes may increase the amount of variance explained in violent behaviour above and beyond self-report (or explicit) measures designed to assess attitudes towards violence. For instance, Polaschek et al. (2010) found that implicit and self-report attitude measures accounted for unique variance in risk of future violence and the inclusion of an IAT measure assessing attitudes towards weapons accounted for a significant

increase in the amount of variance explained in future risk of violence above and beyond what was explained by a self-report measure alone (Adjusted $R^2 = .274$). Additionally, Nunes et al. (2013) found that an IAT measure, assessing attitudes towards rape, along with an explicit (or self-report) measure of attitudes towards rape was better able to differentiate those who reported no sexual coercion or likelihood to rape from those who reported the most sexual coercion or likelihood to rape. From this, it was expected that implicit and self-report attitudes towards violence would be independently and positively associated with self-reported prior violence and together account for significantly more variance in prior violent behaviour than either one alone.

The nature and extent of the relationship between implicit attitudes towards violence and self-reported prior violent behaviour is expected to depend on the amount of agreement between implicit and self-report attitudes towards violence. Research suggests that implicit attitudes towards violence are more likely to influence behaviour when self-report (or explicit) attitudes are considered and consistent with implicit attitudes or when self-report attitudes are not considered (i.e., no motivation or opportunity to deliberate); however, self-report attitudes are more likely to influence behaviour when they are considered (i.e., there is motivation and opportunity to deliberate on these attitudes) and inconsistent with implicit attitudes (see Fazio, 1990; 2007; Gawronski & Bodenhausen, 2006). From this, it was hypothesized that the relationship between implicit attitudes towards violence and self-reported prior violent behaviour would depend on self-report attitudes. Therefore, self-report attitudes towards violence were expected to significantly moderate this relationship (see Figure 3 below).

Figure 3. An example of how self-report attitudes towards violence were expected to moderate the relationship between implicit attitudes towards violence and self-reported prior violent behaviour. The example shows the scenario in which one has positive implicit attitudes towards violence.

Self-reported outcome expectancies of violence were examined in conjunction with self-reported attitudes towards violence as past research has assessed self-report (or explicit) attitudes towards violence through outcome expectancies (e.g., Nunes et al., 2013; Slaby & Guerra, 1988). According to Fishbein and Ajzen's (1975) Expectancy-Value model of attitudes, attitudes towards a given behaviour are theoretically based on the aggregate valence (positive vs. negative) of the expected outcomes of that behavior. Thus, outcome expectancies can be viewed as precursors of attitudes. For example, if the expected costs for violent behavior outweigh the expected benefits, one should have a negative attitude towards violent behavior. Slaby and Guerra (1988) found that, compared to non-offenders, violent adolescent offenders more strongly

believed that violent behavior enhances one's reputation and self-esteem, and expected fewer negative consequences for violence. In research on sexual violence, expecting more positive (or fewer negative) outcomes for rape has been associated with more sexually aggressive behavior (e.g., Bouffard, 2002; Nunes et al., 2013; O'Donohue, McKay, & Schewe, 1996). From this it was expected that the above hypotheses involving self-report attitudes towards violence would also be found with regards to self-reported outcome expectancies of violence as the literature suggests that outcome expectancies of a behaviour and attitudes towards a behaviour will be consistent with one another. This is the case because if one expects negative outcomes to occur as a result of behaving violently, his or her attitudes towards violence will also be negative.

Methods

Participants. This dataset consisted of 132 male undergraduate students who were recruited through Carleton University's SONA systems website. Participants with scores less than 14 on the Clarke Vocabulary scale were excluded in order to eliminate those who could not adequately understand the items within the measures administered. In addition, those who received response times faster than 300 milliseconds on more than 10% of the IAT trials were excluded in order to remove those who did not sufficiently attend to the procedure and/or to lower the potential for guessing. Therefore, out of the original sample ($N = 132$), seven participants were excluded either due to insufficient English proficiency, missing data on variables of interest, a score of less than 14 on the Clarke Vocabulary Questionnaire, and/or response times faster than 300 milliseconds on more than 10% of the IAT trials. This left a final sample of 125 male participants. Out of this final sample, 33 (26.4%) reported that they were 16 to 18 years of age, 55 (44.0%) reported that they were 19 to 21 years of age, 26 (20.8%) reported that they were 22 to 25 years of age, 4 (3.2%) reported that they were 26 to 29 years to age, 3

(2.4%) reported that they were 30 to 35 years of age, and 3 (2.4%) reported that they were above 45. One participant chose not to disclose his age.

In order to assess how many participants had reported engaging in at least one of the violent acts contained in the Antisocial Behaviour Scale-Violent (ABS-Violent; a measure assessing prior violent behaviour), participants were split up into two groups according to their scores on the violent items of the ABS-Violent. Eighty-two participants reported that they had engaged in at least one prior violent incident at least once on the violent content questions and 43 participants reported that they had not engaged in any of the violent acts contained in these items.

Measures.

Demographic questionnaire. Participants were asked about their age, gender, and proficiency in English (see Appendix A).

Implicit attitudes towards violence.

Implicit Association Test (IAT). An adapted version of the Implicit Association Test (IAT; Greenwald et al., 1998) was administered to male university students. This version of the IAT was created to examine participants' implicit attitudes towards violence. During this procedure participants were required to categorize presented target words into binary categories that represent the association between violence (e.g., *violence* vs. *peace*) and an evaluative scale (e.g., *good* vs. *bad*). The strength of automatic associations between the categories of *violence* and *good* or *violence* and *bad*, as well as *peace* and *good* or *peace* and *bad*, is assessed by how quickly participants sort the target words into the categories of *Violence + Good* and *Peace + Bad*, or *Violence + Bad* and *Peace + Good*. Target words were sorted into these four categories by pressing one of two keys on a computer keyboard (*d* and *k*); with two of the categories

represented by one key and the other two categories represented by the other key (see Appendix B for an example of the IAT trials). The IAT data was collected and recorded by the E-prime 1.0 program (Schneider, Eschman, & Zuccolotto, 2002). The program recorded the response latency for each trial and the number of mistakes made for each participant. It is expected that response times will depend on the extent to which the categories sharing the same key are associated in memory.

The violent attitude IAT consisted of seven blocks, each categorizing either concept words (e.g., *violence* or *peace*), attribute words (e.g., *good* words or *bad* words), or both. Three of the trials within each block serve as practice trials, while four trials are used to score the IAT responses. Those who have more implicit attitudes supportive of violence (e.g., view violence as good) are expected to obtain faster response times when the response key shares the categories of *Violence + Good* and *Peace + Bad*, as this indicates a greater association in memory between the categories sharing the same key. Thus, the categorization of target words should be relatively easy when the response key shares these categories for those who hold implicit attitudes supportive of violence, with the opposite being the case for those who hold more pro-social implicit attitudes. The difference between the average response times for the two blocks that are compatible with viewing violence as bad (e.g., *Violence + Bad* and *Peace + Good*) and the two blocks that are compatible with viewing violence as good (e.g., *Violence + Good* and *Peace + Bad*) creates the index used (i.e., the IAT effect). This IAT effect value is created according to the *D* algorithm outlined by Greenwald, Nosek, and Banaji (2003) and it is used to transform raw data into the IAT effect value. Higher scores indicate more positive implicit attitudes towards violence or that *violence* and *good* are more strongly associated than *violence* and *bad*. Past studies using the IAT have reported relatively good internal consistency, with alphas ranging

from .63 (Hermann, 2010) to .73 (Hofmann et al., 2005; Nunes et al., 2013). The internal consistency was found to be .71 in the current study, which is considered extensive according to Robinson, Shaver, and Wrightsman (1991).

Self-report attitudes towards violence.

Measures of Criminal Attitudes and Associates – Revised (MCAA – R). The revised version of the Measures of Criminal Attitudes and Associates was administered as a measure of self-report attitudes towards violence (MCAA-R; Mills, 2007). The revised version was chosen because it is believed to contain items highly correlated with criminal recidivism that were excluded in the original scale due to their correlation with the Balanced Inventory of Desirable Responding, a scale assessing socially desirable responding (BIDR; Paulhus, 1988). Mills (2007) chose to include these items in the MCAA-R because the BIDR was highly correlated with criminal risk. In addition, the internal consistency of the Entitlement attitude scale was found to be higher for the MCAA-R in comparison to the internal consistency found using the Entitlement scale from the original MCAA (J. Mills, personal communication, January 30, 2009).

The MCAA-R consists of two parts (Appendix C). Part A quantifies offenders' criminal associates and requires participants to identify the four friends that they spend the most time with, as well as indicate how much of their free time is spent with these peers and the extent of criminal involvement of these peers (Mills, 2007). Part B assesses participants' general criminal attitudes and is of most importance for the purposes of the current study. This part contains 40 self-report items, split up into four attitudinal scales designed to assess different domains of the attitude construct. These scales include Violence (10 items), Entitlement (10 items), Antisocial Intent (10 items), and Associates (10 items; see Appendix C for a list of the items). The

Violence scale will be used in the current study to assess participants' self-report attitudes towards violence, as this scale was designed to assess violent attitudes specifically. Examples of items contained in this scale consist of, "sometimes you have to fight to keep your self-respect," and "someone who makes you angry deserved to be hit." Responses on all attitude scales range from 1 (*disagree*) to 4 (*agree*). Therefore, higher scores indicate more positive self-report attitudes towards violence on the Violence attitude scale.

The psychometric properties of the MCAA-R have not been investigated; however the original MCAA attitude scales have been found to have good temporal stability with analysis of their test-retest reliability finding the following coefficients for each attitude scale: Violence = .73, Entitlement = .74, Antisocial Intent = .79, and Associates = .65 (Mills et al., 2002). Analysis of the internal consistency of the MCAA attitude scales has found acceptable alphas for the Violence ($\alpha = .80$), Antisocial Intent ($\alpha = .84$), and Associates ($\alpha = .82$) attitude scales, with the Entitlement scale having the lowest internal consistency, with an alpha of .63, as mentioned above (Mills et al., 2002). In addition, adequate internal consistency for the violence scale of the original MCAA has also been found using student samples ($\alpha = .79$; Mills & Kroner, 2001). The internal consistency was found to be .75 for the Violence attitudes scale in the current study. This is considered to be extensive according to Robinson et al. (1991). Analysis of the factor structure of the MCAA attitude scales compared a four factor solution with a one factor solution (Mills et al., 2002). The results found support for the four factor structure finding four constructs matching the four attitude domains. The MCAA attitude scales have also demonstrated good convergent and discriminate validity finding correlations between the MCAA attitude scales and other criminal attitude measures (i.e., the CSS; Gendreau, Grant, Leipziger, & Collins, 1979 and the Pride in Delinquency Scale; Shields & Whitehall, 1994) ranging from .40 to .76 and

correlations between the MCAA attitude scales and measures of negative affect ranging from .04 to .36 (Mills et al., 2002).

Self-report outcome expectancies of violence.

Violence Outcome Expectancies (VOE) scale. The VOE scale was created for purposes of a previous study assessing implicit and explicit (or self-report) attitudes towards violence (see Appendix D). It is a self-report measure assessing self-reported outcome expectancies of violence and requires participants to come up with 5 outcomes that they believe are likely to occur as a result of committing violent acts. For each outcome, participants are then required to indicate how likely it is that the outcome would occur (i.e., likelihood ratings), on a scale ranging from 0 (*Never happen*) to 6 (*Guaranteed to happen*), and how positive or negative that outcome would be if it were to occur (i.e., valence ratings), on a scale ranging from -3 (*Very negative*) to 3 (*Very positive*). A VOE Evaluation scale total score is computed by summing the valence (i.e., positive or negative) ratings for each outcome. Last, a VOE scale total score is computed by multiplying the likelihood ratings by the valence ratings and summing these products, higher scores indicate more positive outcome expectancies of violence. The outcomes listed will vary for each participant and thus, the internal consistency of this measure cannot be determined.

Prior violent behaviour.

Antisocial Behaviour Scale-Violent (ABS-Violent). The Antisocial Behaviour Scale-Violent version was also created for purposes of a previous study assessing violent behaviour among students (see Appendix E). This scale assesses the extent of participants' prior commission of violent behaviour and includes items regarding a variety of criminal acts including previous fighting, mugging, robbing, threatening, weapon use, and similar aggressive behaviours. There are 17 self-report items that are responded to on a 3-point Likert scale

consisting of the following response options: 0 (*Never*), 1 (*Once*), or 2 (*Twice or more*). A total score on the ABS-Violent is computed by summing the responses to all items (1 through 17).

Therefore, scores can range from zero to 34, with higher scores indicating greater commission of prior violent behaviour. The internal consistency for this measure was found to be .86 in the current study, which is considered exemplary according to Robinson et al. (1991).

Control measure.

Clarke Vocabulary Scale. The Clarke Vocabulary Scale (Paitich, 1977) was used in this dataset to assess and control for participants' reading ability (see Appendix F). Assessing participants' reading comprehension was particularly important for the IAT procedure used in this study. As outlined above, the IAT requires participants' to sort stimulus words into categories representing the association between a target concept (i.e., violence or peace) and an attribute category (i.e., good or bad). If participants are not able to read or understand the words presented, then this procedure would not be effective in assessing their implicit attitudes towards violence as these attitudes are inferred by the speed with which participants' are able to sort the words into these categories. Items on the Clarke Vocabulary Scale consist of 40 individually presented terms. Participants' are required to pair these terms with one of four presented synonyms, with one point being assigned for every correct pairing. Therefore, scores can range from 0 to 40. A cutoff score of 14 is recommended, meaning that those who receive scores below 14 are considered to have poor reading comprehension (Paitich, 1977).

Few studies have assessed the psychometric properties of the Clarke Vocabulary Scale; however, Paitich (1977) found this scale to be highly correlated with the Wechsler Adult Intelligence Scale vocabulary test ($r = .90$). Additionally, past research has successfully made use of the Clarke Vocabulary Scale amongst a variety of populations (see Hanson & Scott, 1995;

Price & Hanson, 2007). Higher scores on this scale (i.e., greater reading ability) have also been found to correlate with fewer errors on a reading task (Hanson & Scott, 1995).

Procedure. Male undergraduate students signed up to participate in this study through Carleton University's online SONA system. Participation was voluntary and participants received a 1% bonus in their course grade for either PSYC 1001, 1002, 2001, or 2002. Upon arrival, participants were presented with the consent form (Appendix G), which was verbally explained to them. The consent form outlined, to the participants, their involvement in the study. After the participants read and signed the consent form, they completed the measures. Students completed the Clarke Vocabulary Scale first on a PC laptop computer. The demographic questionnaire, the IAT, the MCAA-R, the VOE scale, and the ABS-Violent were then also completed on the laptop computer. In order to protect against potential confounding variables, the order of these measures was counterbalanced. Upon completion of these measures, participants were instructed to notify the researcher and they were then given the ABS-Violent to complete by hand. Following data collection, participants were thanked and given the debriefing form (Appendix H).

Results

Research questions and statistical analyses. The research questions and analyses ran for Study 1, are outlined in Table 1 below. The analyses are described in more detail when explaining the results.

Table 1

Student sample assessing implicit and self-report attitudes towards violence, as well as outcome expectancies of violence, and prior violent behaviour

Research Question	Analysis
1) Are implicit (IAT) and self-report (MCAA-V-R) attitudes towards violence or outcome expectancies of violence (VOE	Correlations

Evaluation scale total scores and total scores on VOE scale) related to one another?	
2) Are implicit (IAT) and self-report (MCAA-V-R) attitudes towards violence or outcome expectancies of violence (and VOE Evaluation scale total scores and total scores on VOE scale) associated with self-reported prior violent behaviour (ABS-Violent)?	Correlations
3) Are implicit (IAT) and self-report (MCAA-V-R) attitudes towards violence or outcome expectancies of violence (VOE Evaluation scale total scores and total scores on VOE scale) independently associated with self-reported prior violent behaviour (ABS-Violent) and together do they account for incremental variance in prior violent behaviour above and beyond either one alone? Do implicit and self-report attitude or outcome expectancy measures differ in their correlations with the ABS-Violent?	Hierarchical multiple regression, and Fisher's r to z
4) How well do implicit and self-report attitudes towards violence or outcome expectancies of violence differentiate those who have reported being violent from those who have not?	Logistic regression
5) Are the interactions between implicit and self-report attitudes towards violence or outcome expectancies of violence significantly related to amount of self-reported prior violent behaviour?	Moderated regression

Note. IAT = Implicit Association Test, MCAA-V-R = the Violence scale of the Measures of Criminal Attitudes and Associates – Revised, VOE scale = Violence Outcome Expectancies scale, ABS-Violent = Antisocial Behaviour Scale-Violent version.

Data screening. Only one participant was missing a value on total ABS-Violent scores. Therefore, missing value analysis was not applied here because this analysis is used to examine the pattern of missing data for variables that have more than 5.00% missing data. In addition, because less than 5% of the data were missing listwise deletion was used. Prior to running analyses the scores on all variables (i.e., IAT effect value scores, total scores on MCAA-V-R, VOE Evaluation scale total scores, total scores on the VOE scale, and total scores on the ABS-Violent) were screened for out of range values, univariate outliers, and bivariate outliers. In addition, the assumptions that underlie the various tests that were run were checked to make sure

that they were upheld and any violations were noted. All scores appeared to be within the range of possible scores for each variable.

Z-scores were created and examined for each variable and any scores with z -scores exceeding ± 3.29 were changed to the next lowest or highest value for that variable. Once transformed, z -scores for each new variable were examined again to make sure that no outlying values remained. No univariate outliers were found for all variables except for total scores on the ABS-Violent, which had two outlying values with z -scores greater than 3.29. These values were changed to the next highest value in the dataset for that variable (i.e., a score of 17). Z-scores were examined again for total scores on the ABS-Violent and no outlying values remained, thus the transformation eliminated all univariate outliers.

Mahalanobis distance values were examined to check for bivariate and multivariate outliers. For correlational analyses, no Mahalanobis distance values exceeded the cutoff of 13.82 for two predictors when examining the correlations between implicit and self-report attitudes or outcome expectancies of violence. However, one bivariate outlier was found for the correlation between total scores on the MCAA-V-R and total ABS-Violent scores. All other correlations between implicit/self-report attitudes towards violence and prior violent behaviour had no Mahalanobis distance values that exceeded 13.82. Analyses were run with and without this participant for analyses involving the correlation between total scores on the MCAA-V-R and total ABS-Violent scores; however, excluding this participant did not make a difference, thus results were reported for the full sample of participants ($N = 125$). Skew and kurtosis ratios were examined to check for normality of each variable in order to fulfill the assumptions of Pearson's r correlations. Z-scores exceeding ± 3.29 were considered significantly skewed and/or kurtotic. All variables were normally distributed except the distribution of total scores on the ABS-

Violent, which had a significant positive skew (z -score = 6.64) and kurtosis (z -score = 4.27). However, because the sample was large ($N = 125$) and correlational analysis is robust to violations of normality when sample sizes exceed 30 (i.e., Central Limit Theorem), no further attempts were made to uphold normality for this variable. Linearity and homoscedasticity were visually examined using scatterplots. The relationship between all variables appeared to be linear and homoscedastic.

Mahalanobis distance values were also checked for the regression analyses that were run. Any data points with Mahalanobis distance values greater than 16.27 were considered multivariate outliers, which is the cutoff value used for three predictors. For the regression including IAT effect value scores, as well as total scores on the MCAA-V-R as predictors and total ABS-Violent scores as the outcome, the combination of scores for one participant was found to be a multivariate outlier. Therefore, analyses were run with and without this participant. However, excluding this multivariate outlier did not change the results of this analysis, thus results using the total sample were reported ($N = 125$). The assumptions of regression analyses were also checked to make sure that they were upheld for the hierarchical multiple regressions and moderated regressions that were run. Multicollinearity between predictors was assessed using bivariate correlations between variables. None of the bivariate correlations exceeded .70, thus collinearity between predictors was not problematic. Homoscedasticity and linearity of the relationship between independent variables (i.e., IAT effect value with total scores on the MCAA-V-R, VOE Evaluation scale total scores, or VOE scale total scores) and the outcome (total scores on the ABS-Violent) was assessed using scatterplots of the standardized residuals on the y-axis and standardized predicted values on the x-axis. Visual inspection of the scatterplots showed that the relationship between the set of

predictors and the outcome (total scores on the ABS-Violent) appeared linear for all regressions that were conducted. Homoscedasticity appeared to be upheld for all regression analyses including implicit attitudes towards violence and self-report attitudes or expectancies of violence as predictors and total scores on the ABS-Violent as the outcome. Independence of residuals was examined using Durbin-Watson values after sorting the data according to participant number. A score of close to 2 is assumed to signify independence of residuals over time. All values ranged from 2.14 to 2.20 for the hierarchical multiple regressions and from 2.14 to 2.21 for the moderated regressions, thus independence of residuals was upheld as all of these values were close to 2. Last, normality of residuals was examined using histograms, P-P plots, and Q-Q plots of the standardized residuals for the three regressions including IAT effect value scores, as well as total scores on the MCAA-V-R, VOE Evaluation scale total scores, or VOE scale total scores, as the predictors, and total scores on the ABS-Violent as the outcome. The plots for all three regressions appeared to slightly deviate from normality suggesting that normality of residuals was not upheld. Therefore, because normality of residuals was not upheld, this may have lowered power to find significance in the regression analyses that were run.

Additional data screening and assumption checking were conducted for the binary logistic regressions that were run. Dichotomous groups consisting of violent participants (received a score of 1 or more on violent content items of the ABS-Violent; $n = 82$) and non-violent participants (received a 0 on violent content items of the ABS-Violent; $n = 43$) were created on the ABS-Violent. Univariate and bivariate outliers were checked for each ABS-Violent group. No univariate or bivariate outliers were found for either violent or non-violent ABS-Violent groups. Normality of variables was also checked for each ABS-Violent group. None of the variables had significantly skewed or kurtotic distributions for either group (cutoff

was greater than or less than ± 3.29). Last, linearity of the logit was assessed by examining whether the interactions between each predictor with its natural log was significantly related the dichotomous outcome (i.e., ABS-Violent groups). Interactions between the IAT effect value and its log was not significant, and neither was the interaction between VOE Evaluation scale total scores and its log; however, the interaction between total VOE scale scores and its log was significantly related to the dichotomized ABS-Violent outcome ($p = .041$). This violation may have lowered power to find significance when running logistic regressions involving this predictor.

Results of analyses.

Relationship between implicit and self-report attitudes towards violence. To assess the relationship between implicit and self-report attitudes towards violence, Pearson's r correlations between the IAT effect value and self-report attitude measures, consisting of total scores on the Violence attitude scale of the MCAA-R, were conducted. These analyses were exploratory in nature, as prior research examining the relationship between implicit and self-report (or explicit) attitudes towards violence has found mixed results. The correlation between the IAT effect value and VOE Evaluation scale total scores, as well as VOE scale total scores, were also conducted to examine the relationship between implicit attitudes towards violence and self-report outcome expectancies of violence. The results of these analyses are displayed in Table 2. As seen in Table 2, no significant relationships were found between implicit and self-report attitude measures or between implicit attitudes and outcome expectancies.

Additional analyses assessing the relationship between self-report attitude measures, as well as the relationship between self-report attitude measures and outcome expectancies of violence, were also conducted. A positive and small relationship was found between VOE

Evaluation scale total scores and total scores on the Violence attitude scale of the MCAA-R, $r(123) = .34, p < .001$. A positive and small relationship was also found between total scores on the Violence scale of the MCAA-R and total outcome expectancy scores on the VOE scale, $r(123) = .28, p = .002$.

Relationship between attitudes towards violence and prior violent behaviour. To examine the relationship between attitudes (implicit and self-report) and participants' self-reported prior violent behaviour, Pearson's r correlations were conducted between IAT effect value scores and total scores on the Violence scale of the MCAA-R, with total scores on the ABS-Violent. Correlations between VOE Evaluation scale total scores, as well as total outcome expectancy scores on the VOE scale, with scores on the ABS-Violent were also conducted to assess the relationship between outcome expectancies of violence and prior violent behaviour. Results of these analyses are also displayed in Table 2. As seen in Table 2, no significant correlation was found between implicit attitudes towards violence, as assessed by IAT effect value scores, and prior violent behaviour, as assessed by total ABS-Violent scores. However, significant small and positive correlations were found between outcome expectancies of violence, as assessed VOE Evaluation scale total scores, and ABS-Violent total scores, $r(123) = .22, p = .013$, as well as between MCAA-R total scores on the Violence attitude scale and total scores on the ABS-Violent, $r(123) = .22, p = .012$. A significant small and positive correlation was also found between outcome expectancies, as assessed by total scores on the VOE scale, and ABS-Violent total scores, $r(123) = .28, p = .002$. Due to violations of the assumption of normality for total scores on the ABS-Violent, Spearman's rho correlations were also conducted (see Table 2). Similar results were found when running these nonparametric tests, thus violation of this assumption did not appear to affect the results of the Pearson's r correlations.

Table 2

Correlations between IAT effect value, total MCAA-V-R scores, sum of VOE Evaluation scale total scores, VOE scale total scores, and total scores on ABS-Violent

Measure	VEIATD	VOEEVAL	VOETOTAL	MCAA-V-R	ABS-Viol.
VEIATD	-	.10	.07	.01	.02
VOEEVAL	.14	-	.78***	.34***	.22*
VOETOTAL	.06	.74***	-	.28**	.28**
MCAA-V-R	.04	.34***	.27**	-	.22*
ABS-Viol.	-.02	.24**	.30**	.31***	-

Note. Pearson's r correlations are above the diagonal line. Spearman's Rho correlations are below the diagonal line. VEIATD = effect value scores on the Implicit Association Test. VOEEVAL = VOE Evaluation scale total scores on the Violence Outcome Expectancies Evaluation scale. VOETOTAL = total scores on the Violence Outcome Expectancies scale. MCAA-V-R = total scores on the Violence attitudes scale of the Measures of Criminal Attitudes and Associates- Revised. ABS-Viol. = total scores on the Antisocial Behaviour Scale-Violent version.

*** $p < .001$

** $p < .01$

* $p < .05$

Hierarchical multiple regressions were also conducted with self-reported attitudes towards violence (i.e., the MCAA-V-R total score) entered in Step 1 and implicit attitudes towards violence (i.e., the IAT effect value) entered in Step 2, as well as the interaction term between IAT effect values scores and MCAA-V-R total scores entered in Step 3. This was conducted to assess whether implicit attitudes towards violence add incrementally to the prediction of prior violent behaviour. Hierarchical multiple regressions were also conducted with self-reported outcome expectancies of violence, as assessed by total scores on the VOE scale or VOE Evaluation scale total scores, entered in Step 1 and IAT effect value scores entered in Step 2, as well as the interaction term between implicit attitudes towards violence and outcome expectancies of violence entered in Step 3. Total scores on the ABS-Violent were the outcome of interest, assessing participants' self-reported prior violent behaviour. Results of

these analyses found that implicit attitudes towards violence (i.e., IAT effect value scores) did not add incrementally to the prediction of self-reported prior violence above and beyond self-report attitudes towards violence (i.e., total scores on the MCAA-R Violence attitude scale) or outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) alone.

More specifically, for the regression in which total scores on the Violence scale of the MCAA-R was entered in block 1 and IAT effect value scores were entered in block 2, there was no significant increase in the amount of variance explained in prior violent behaviour, as assessed by total ABS-Violent scores, between block 1, with only self-report attitudes included (Adjusted $R^2 = .042$), and block 2 (Adjusted $R^2 = .035$). Thus, 3.5% of the variance in prior violent behaviour was accounted for when implicit attitudes towards violence were included in the model, $F(2, 122) = 3.24, p = .04$, however, implicit attitudes towards violence did not add incrementally to the prediction of prior violence above and beyond self-reported (i.e., total scores on the MCAA-V-R) attitudes towards violence alone and the inclusion of IAT effect value scores in fact decreased the amount of variance accounted for. In blocks 1 and 2, total scores on the Violence scale of the MCAA-R were significantly and positively associated with total scores on the ABS-Violent, $B = .18, SE = .07, \beta = .22, t(122) = 2.54, p = .01, 95\% CI = [.04, .33], sr^2 = .05$. In contrast, in block 2, IAT effect value scores were not significantly related to participants' self-reported prior violent behaviour.

Similar results were found for the regression in which VOE Evaluation scale total scores were entered in block 1 and IAT effect value scores were entered in block 2. In block 2, the inclusion of implicit attitudes towards violence resulted in an Adjusted R^2 equal to .033 which suggests that this model accounted for 3.3% of the variance in prior violent behaviour, $F(2, 122)$

= 3.12, $p = .048$. However, there was no significant difference in the amount of variance accounted for between block 1, with just self-report outcome expectancies of violence included (Adjusted $R^2 = .041$), and block 2 (Adjusted $R^2 = .033$); showing that implicit attitudes towards violence did not add incrementally to the prediction of prior violent behaviour above and beyond self-report outcome expectancies of violence alone (i.e., VOE Evaluation scale total scores). In block 2, outcome expectancies of violence were significantly and positively associated with participants' self-reported prior violent behaviour, as assessed by total scores on the ABS-Violent, $B = .18$, $SE = .07$, $\beta = .22$, $t(122) = 2.49$, $p = .014$, 95% CI = [.04, .33], $sr^2 = .05$, and similar to the first regression, IAT effect value scores were not significantly related to participants' self-reported prior violent behaviour in block 2.

Last, similar results were once again found for the regression in which total scores on the VOE scale were entered in block 1 and IAT effect value scores were entered in block 2. In block 2, the inclusion of implicit attitudes towards violence resulted in an Adjusted R^2 equal to .064 which suggests that 6.4% of the variance in self-reported prior violent behaviour was accounted for by this model, $F(2, 122) = 5.22$, $p = .007$. However, once again, there was no significant increase in the amount of variance accounted for between blocks 1, with just outcome expectancies of violence included (Adjusted $R^2 = .071$), and block 2 (Adjusted $R^2 = .064$). Therefore, implicit attitudes towards violence once again did not add incrementally to the prediction of self-reported prior violent behaviour above and beyond self-reported outcome expectancies of violence (i.e., total VE sale scores) alone. In block 2, outcome expectancies of violence were significantly and positively associated with total scores on the ABS-Violent, $B = .04$, $SE = .01$, $\beta = .28$, $t(122) = 3.23$, $p = .002$, 95% CI = [.02, .07], $sr^2 = .08$. Finally, IAT effect value scores were not significantly related to total scores on the ABS-Violent as was found in the

other two regression analyses (see Tables 6, 7, and 8 below for the overall results of the hierarchical regression analyse with interaction terms included in the third step).

Comparisons between the correlation of the IAT effect value with ABS-Violent total scores, as well as the correlation between total scores on the MCAA-V-R with ABS-Violent total scores, were done to examine whether implicit and self-report attitudes differ in their relationships with self-reported prior violent behaviour (i.e., ABS-Violent total scores). In addition, the correlations between outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) with ABS-Violent total scores were also compared to the correlations between implicit or self-report attitudes towards violence with prior violent behaviour. A significant difference was found when comparing the correlation between implicit attitudes towards violence (i.e., IAT effect value scores) with self-reported prior violent behaviour [i.e., total scores on the ABS-Violent; $r(123) = .02, p = .84$] and the correlation between outcome expectancies of violence (i.e., total VOE scale scores) with self-reported prior violent behaviour [$r(123) = .28, p = .002$], $z\text{-score} = -2.12, p = .03$, two-tailed. This was the only significant difference found in the magnitude of correlations when comparing the relationship between the implicit attitude measure with ABS-Violent total scores and the relationship between the self-report measures (both outcome expectancies and attitudes towards violence) with ABS-Violent total scores.

Group differences on implicit and self-report attitudes towards violence. A new variable was created in which those students who reported engaging in violent acts, according to the ABS-Violent, were coded as 1 and those students who reported not having engaged in violent acts, according to the ABS-Violent, were coded as 0. Those who reported a score of 1 or more on the violent content items of the ABS-Violent were placed in the violent group, which

consisted of 82 participants. Those who reported a score of 0 on the violent content items were placed in the non-violent group, which consisted of 43 participants. This was done to assess whether scores on the implicit and self-report attitude measures are able to differentiate those who reported being violent from those who did not. Binary logistic regressions including IAT effect value scores, the MCAA-V-R total score, VOE Evaluation scale total scores, or VOE scale total scores, entered as predictors and the new grouping variable entered as the outcome, were conducted to examine these group differences on the implicit and self-reported violent attitude or outcome expectancy measures.

Results of these analyses are displayed in Tables 3, 4, and 5. As can be seen in these Tables, implicit attitudes towards violence, as assessed by IAT effect value scores, did not significantly differentiate violent participants from non-violent participants in any of the models. However, self-reported attitudes towards violence, as assessed by total scores on the MCAA-V-R, significantly differentiate groups, as did self-reported outcome expectancies of violence, as assessed by total scores on the VOE scale. In addition, self-reported outcome expectancies of violence, as assessed by VOE Evaluation scale total scores, showed marginal significance in differentiating violent and non-violent ABS-Violent groups. Specifically, more positive self-report attitudes towards violence and outcome expectancies of violence were associated with reporting having engaged in prior violent behaviour and more negative self-report attitudes towards violence or outcome expectancies of violence were associated with reporting having engaged in no prior violent behaviour.

Table 3

Results of binary logistic regression with IAT effect value scores and total scores on the MCAA-V-R entered as predictors and dichotomous groups on the ABS-Violent (violent vs. non-violent groups) entered as the outcome

Measure	<i>B</i>	<i>SE</i>	Wald	Odds Ratio	95% CI	<i>p</i>
VEIATD	-.14	.42	.12	.87	[.38, 1.95]	.728
MCAA-V-R	.14	.04	10.52	1.15	[1.06, 1.25]	.001

Note. $\chi^2(1, N = 125) = 8.689, p = .369$. Nagelkerke's $R^2 = .13$. VEIATD = effect value scores on the Implicit Association Test. MCAA-V-R = total scores on the Violence attitude scale of the Measures of Criminal Attitudes and Associates-Revised.

Table 4

Results of binary logistic regression with IAT effect value scores and VOE Evaluation scale total scores entered as predictors and dichotomous groups on the ABS-Violent (violent vs. non-violent groups) entered as the outcome

Measure	<i>B</i>	<i>SE</i>	Wald	Odds Ratio	95% CI	<i>p</i>
VEIATD	-.21	.41	.28	.81	[.365, 1.790]	.60
VOEEVAL	.08	.04	3.60	1.08	[.997, 1.172]	.058 ^a

Note. $\chi^2(1, N = 125) = 8.46, p = .39$. Nagelkerke's $R^2 = .04$. VEIATD = effect value scores on the Implicit Association Test. VOEEVAL = sum of the VOE Evaluation scale total scores on the Violence Outcome Expectancies Evaluation scale.

^aMarginally significant.

Table 5

Results of binary logistic regression with IAT effect value scores and total scores on the VOE scale entered as predictors and dichotomous groups on the ABS-Violent (violent vs. non-violent groups) entered as the outcome

Measure	<i>B</i>	<i>SE</i>	Wald	Odds Ratio	95% CI	<i>p</i>
VEIATD	-.22	.41	.29	.80	[.36, 1.79]	.59
VOETOTAL	.02	.01	6.29	1.02	[1.00, 1.04]	.01

Note. $\chi^2(1, N = 125) = 6.53, p = .59$. Nagelkerke's $R^2 = .07$. VEIATD = effect value scores on the Implicit Association Test. VOETOTAL = total scores on the Violence Outcome Expectancies scale.

Moderation of self-report attitudes towards violence. To assess whether self-report attitudes towards violence moderate the relationship between implicit attitudes towards violence and self-reported prior violent behaviour, the interaction between IAT effect value scores and total scores on the MCAA-V-R was examined using moderated regression with the ABS-Violent total score entered as the outcome of interest. The results of this moderated regression analysis are displayed in Table 6. As seen in this table, the interaction between implicit and self-report attitudes towards violence was not significantly related to participants' self-reported prior violent behaviour. Only the self-report attitudes towards violence were significantly and positively related to total scores on the ABS-Violent, suggesting that self-report attitudes towards violence (i.e., total scores on MCAA-V-R) do not moderate the relationship between implicit attitudes towards violence and self-reported prior violent behaviour.

Table 6

Results of moderated regression with IAT effect value scores and total scores on MCAA-V-R entered in Step1, IAT effect value scores entered in Step 2, and interaction between implicit and self-report attitudes entered in Step 3. Total scores on ABS-Violent is the outcome.

Variables Entered	R^2	Adjusted R^2	F	ΔR^2	B	SE	sr^2
Step 1:	.050	.042	6.50*	.050			
MCAA-V-R					.18*	.07	.05
Step 2:	.050	.035	3.24*	.000			
VEIATD					.14	.76	.00
Step 3:	.054	.030	2.30	.003			
VEIATD $\times$ MCAA-V-R					-.10	.15	.00

Note. VEIATD = effect value scores on the Implicit Association Test. MCAA-V-R = total scores on the Violence attitudes scale of the Measures of Criminal Attitudes and Associates-Revised.

* $p < .05$

Moderated regressions were also conducted assessing the interaction between IAT effect value scores and outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) to assess whether outcome expectancies of violence moderate the

relationship between implicit attitudes towards violence and self-reported prior violent behaviour. The results of these analyses are displayed in Tables 7 and 8. As can be seen in these tables, the interactions between outcome expectancies of violence and implicit attitudes towards violence were not significantly related to participants' self-reported prior violent behaviour, suggesting that self-reported outcome expectancies of violence do not moderate the relationship between implicit attitudes towards violence and self-reported prior violent behaviour. Only outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) were significantly and positively related to total scores on the ABS-Violent.

Table 7

Results of moderated regression with IAT effect value scores and VOE Evaluation scale total scores entered in Step 1, IAT effect value scores entered in Step 2, and interaction between implicit and self-report attitudes entered in Step 3. Total scores on ABS-Violent is the outcome.

Variables Entered	R^2	Adjusted R^2	F	ΔR^2	B	SE	sr^2
Step 1:	.049	.041	6.29*	.049			
VOEEVAL					.18*	.07	.05
Step 2:	.049	.033	3.12*	.000			
VEIATD					-.03	.77	.00
Step 3:	.049	.025	2.07	.000			
VEIATD $\times$ VOEEVAL					.02	.16	.00

Note. VEIATD = effect value scores on the Implicit Association Test. VOEEVAL = sum of the VOE Evaluation scale total scores on the Violence Outcome Expectancies Evaluation scale.

* $p < .05$

Table 8

Results of moderated regression with IAT effect value scores and total scores on the VOE scale entered in Step 1, IAT effect value scores entered in Step 2, and interaction between implicit and self-report attitudes entered in Step 3. Total scores on ABS-Violent is the outcome.

Variables Entered	R^2	Adjusted R^2	F	ΔR^2	B	SE	sr^2
Step 1:	.079	.071	10.53**	.079			
VOETOTAL					.04**	.01	.08
Step 2:	.079	.064	5.22**	.000			
VEIATD					-.02	.75	.00
Step 3:	.079	.056	3.46*	.000			
VEIATD $\times$ VEETOTAL					-.00	.03	.00

Note. VEIATD = effect value scores on the Implicit Association Test. VOETOTAL = total scores on the Violence Outcome Expectancies scale.

* $p < .05$

** $p < .01$

Discussion

Implicit attitudes towards violence did not differentiate those that reported engaging in prior violent behaviour. However, self-reported attitudes towards violence and outcome expectancies of violence differentiated those who reported having engaged in violence from those who had not, such that those who self-reported more prior violent behaviour had more positive attitudes and/or outcome expectancies of violence than those who reported no prior violent behaviour. Therefore, the hypothesis that attitudes towards violence would differentiate violent participants from non-violent participants was only partially supported because only self-reported attitudes and outcome expectancies of violence significantly differentiated groups of participants. It was also found that implicit and self-report attitudes towards violence or outcome expectancies of violence were not significantly related to one another. These analyses were exploratory, as past research has found mixed results regarding the nature of this relationship. However, more positive self-report attitudes towards violence were related to more positive self-report outcome expectancies of violence. This was hypothesized to be the case because outcome

expectancies of violence are considered precursors of attitudes and they are expected to be consistent with one another. In addition, prior research has used outcome expectancies of violence as a way of assessing attitudes towards violence (see Nunes et al., 2013; Slaby & Guerra, 1988). It was also found that implicit attitudes towards violence were not related to self-reported prior violent behaviour; however, both more positive self-reported attitudes towards violence and outcome expectancies of violence were related to more prior self-reported violent behaviour. Therefore, once again, this hypothesis was only partially supported because it was expected that more positive implicit and self-report attitudes (or expectancies of violence) would be related to more self-reported prior violent behaviour. It was found that the non-significant relationship between implicit attitudes towards violence and self-reported prior violent behaviour only significantly differed from the relationship between self-report attitudes towards violence and self-report prior violent behaviour.

In terms of the hypothesis regarding whether implicit attitudes towards violence would account for incremental variance in self-reported prior violent behaviour, it was expected that together implicit and self-report attitudes towards violence (or outcome expectancies of violence) would account for a greater amount of variance than either one alone. However, this was not found to be the case; implicit attitudes towards violence did not account for additional variance in prior violent behaviour. Only positive self-report attitudes towards violence and outcome expectancies of violence were significantly related to more self-reported prior violent behaviour, which was expected when considering the results of the correlational analyses discussed above. Last, it was expected that the relationship between implicit attitudes towards violence and self-reported prior violent behaviour would depend on participants' self-report attitudes towards violence (or outcome expectancies of violence); however, once again, this hypothesis was not

supported. Only self-report attitudes towards violence or outcome expectancies of violence were related to self-reported prior violent behaviour such that more positive self-reported attitudes or outcome expectancies of violence were associated with more self-reported prior violence.

In considering the results of this study, it appears as though implicit attitudes may not play a role in violent behaviour because none of the analyses involving the implicit attitude measure found significance. Implicit attitudes towards violence were neither related to self-report attitudes towards violence, outcome expectancies of violence, or self-reported prior violent behaviour. It was also hypothesized that the relationship between implicit attitudes towards violence and prior violent behaviour would depend on the amount of agreement between implicit and self-report violent attitudes (or outcome expectancies of violence). In this case a relationship between implicit attitudes towards violence and self-reported prior violent behaviour would not necessarily be expected if implicit attitudes towards violence were inconsistent with self-reported attitudes towards violence (see Fazio, 1990; Gawronski & Bodenhausen, 2006). However, the relationship between implicit attitudes towards violence and prior violent behaviour was not found to differ depending on participants' self-reported attitudes towards violence. Therefore, it appears as though implicit attitudes towards violence are not a correlate of violent behaviour. Although this could be the case, issues with the measurement of implicit attitudes towards violence within this study may have affected the ability to actually assess this construct. Some issues must be considered when administering an IAT measure to assess attitudes. For instance, because the IAT requires participants to evaluate an attitude concept (i.e., *violence*) relative to some opposite concept category (i.e., *peace*) the categories that are chosen may alter the IAT effect. Prior research has found the largest effect sizes when using contrasting categories (Lane, Banaji, Nosek, & Greenwald, 2007). Therefore, if the opposite attitude

category to *violence*, which in this case was *peace*, was not considered to be the true opposite of violence by most of the participants, this may have resulted in ambiguity when sorting the stimulus words into the attitude categories (i.e., *violence* or *peace*), which may have produced a diminished IAT effect. Also, the stimulus words that are used can affect the results of IAT measures. Research has found that stimulus words that are easily classified produce more accurate results because it reduces the error in the design. However, if ambiguity occurs when classifying stimuli this results in slower reaction times, producing increased error variance. In addition, the stimuli used can affect IAT results by producing effects that do not necessarily reflect one's implicit attitudes. For instance, prior research assessing implicit racial prejudices using an IAT measure found that when liked White individuals and disliked Black individuals were used as stimuli, a significant positive preference for White individuals was found; however when liked Black individuals and disliked White individuals were used as stimuli, the preference for White individuals was no longer significant (see Mitchell, Nosek, & Banaji, 2003). Therefore, this study may have benefitted from running pilot testing when deciding on the attitude/attribute categories and stimuli to use, as there is no way of knowing whether the IAT procedure used in this study adequately assessed implicit attitudes towards violence.

Another potential issue that should be considered when interpreting scores on an IAT measure is whether the scores actually reflect the participants' personal attitudes towards an object or culturally accepted beliefs about the phenomenon under investigation. As stated in the literature review above, Olson and Fazio (2004) proposed that traditional IAT measures containing attribute (i.e., *Good* and *Bad*) and concept (i.e., *Violence* and *Peace*) categories might reflect more societal attitudes (or as they call them *extrapersonal associations*) than one's own personal attitudes. Therefore, the IAT measure used within this study may have assessed

society's beliefs regarding violence rather than the participants' attitudes towards violence.

Olson and Fazio (2004) stated that personalized IAT measures should be used in which the categories of *I Like* and *I Dislike* are used instead of the traditional attribute categories usually used, such as *Good* and *Bad* or *Pleasant* and *Unpleasant*, because the attribute categories have greater potential for activating normative beliefs about the attitude under investigation.

Therefore, future research should administer personalized versions of the IAT along with the traditional IAT when assessing implicit attitudes towards violence.

As discussed above, the results involving self-report attitudes towards violence and self-report outcome expectancies of violence did find a significant relationship between these self-report constructs and violent behaviour such that more positive attitudes towards violence and outcome expectancies of violence were related to more self-reported prior violent behaviour.

Although these results are promising as many of the analyses revealed similar results regarding the relationship between these measures and violent behaviour, the correlational nature of these analyses prevents one from making any causal conclusions. Therefore, many interpretations can be gleaned from these results; more positive attitudes towards violence or outcome expectancies of violence may cause more violent behaviour, more violent behaviour may cause more positive attitudes towards violence or outcome expectancies of violence, or a reciprocal causal relationship may exist in which more positive self-report attitudes towards violence or outcome expectancies of violence increases violent behaviour and in turn, more violent behaviour leads to more positive self-report attitudes towards violence or outcome expectancies of violence. In addition, because all of these measures were self-report in nature, socially desirable responding may have been an issue when responding to the items contained within these measures.

However, participants were told that their responses would be completely anonymous and this

hopefully reduced the chance of responding in a socially desirable manner on these measures. Also, there is evidence that supports the use of self-report measures and states that they can be accurate, valid (Kendall & Norton-Ford, 1982), and equivalent to traditional methods of predicting violent recidivism (Kuriychuk, 1990) and general recidivism (Huizinga & Elliot, 1986; Jones & Miller, 2012; Kroner, Mills, & Morgan, 2007; Motiuk, Motiuk, & Bonta, 1992; Thornberry & Krohn, 2000; Woods, Hermann, Nunes, McPhail, & Sewell, 2011). More specifically, Thornberry and Krohn (2000) have found that similar self-report measures of antisocial behaviour are generally associated with official criminal justice indicators of antisocial behavior. In addition, research conducted by my colleagues have found that a self-report version of the Static-99 (Hanson & Thornton, 1999; 2000), used to predict sexual recidivism, had relatively high agreement with official file-based information among a sample of 21 adult male sex offenders (Woods et al., 2011). Prior research conducted by O'Connor, Archer, and Wu (2001) assessed whether participants' scores on the Aggression Questionnaire (AQ; Buss & Perry, 1992), a self-report questionnaire of aggressive behavior, correlated with scores on the Aggression Questionnaire-Partner Version (AQ-P was adapted from original AQ scale; Buss & Perry, 1992) to examine whether participants' self-reported aggressive behaviour was related to their partners' reports of their aggression. These researchers found moderate to high correlations between the AQ and AQ-P showing that participants were likely truthful in their responses to this self-report questionnaire (O'Connor et al., 2001). Finally, the fact that self-report attitudes towards violence and outcome expectancies of violence were significantly correlated with one another in the current study provides support that these measures may be assessing similar constructs. The significant relationship between scores on these self-report measures indicates that participants were most likely truthful in their answers to these measures because a

relationship was detected. Although this seems to be the likely case, it should also be noted that individual differences in socially desirable responding on the self-report measures could have inflated the correlation between the two measures. This could have occurred due to participants not being truthful on the violent attitude (or outcome expectancies of violence) and violent behaviour self-report measures.

Although past research making use of implicit attitude measures in conjunction with self-report measures to assess the relationship between attitudes towards violence and violent behaviour has been scant and inconclusive, the results of this study appear to be somewhat inconsistent with what has been found. For instance, prior research assessing attitudes towards violence with the use of self-report measures, as well as IAT measures, has found that implicit attitude measures significantly differentiate incarcerated participants from non-incarcerated participants (Robertson & Murachver, 2007) and men from an intimate partner violence intervention program from community men (Eckhardt et al., 2012), such that the incarcerated and IPV samples had more positive implicit attitudes towards violence in comparison to the non-incarcerated or community samples. However violent participants did not differ from non-violent participants on the self-report attitude measures in these studies. These results are in opposition to the results found in the current study.

Previous research has assessed attitudes towards violence with self-report measures that more closely assess attitudes as evaluations of violence, such as semantic differential measures and feeling thermometers, along with IAT measures. As outlined above, these measures are believed to assess constructs more consistent with explicit attitudes towards violence (Gawronski and Bodenhausen (2006); however, mixed results have also been found when assessing explicit attitudes towards violence. For instance, Snowden et al. (2004) found that murderers had

significantly more positive implicit attitudes towards violence, as assessed by an IAT measure, in comparison to non-murderers among those in the highest psychopathy group, and no differences were found among scores on the explicit violent attitude measures. In contrast, research conducted by my colleagues has found that those who reported the highest future risk of rape had significantly more positive explicit attitudes towards rape in comparison to those who reported no risk; however, scores on the IAT measure fell just short of significance when differentiating these groups (see Nunes et al., 2013). Those who reported the most past sexual coercion had significantly more positive implicit and explicit attitudes towards rape in comparison to those who reported no past sexual coercion; thus, both implicit and explicit attitude measures differentiated these groups (Nunes et al., 2013). In addition, Nunes et al. (2013) found that implicit and explicit attitude measures together were better able to differentiate groups than either one alone. Last, a recent manuscript by my colleagues and I found small to moderate positive relationships between explicit attitudes towards violence and risk of violent recidivism, but these relationships were not significant. Additionally, the relationship between implicit attitudes towards violence and risk of future violence was not promising (see Nunes, Ennis et al., 2014).

In considering the results discussed above the literature concerning the use of implicit attitude measures to assess attitudes towards violence has been mixed and inconclusive. The results of the current study support the use of self-report measures that have been designed to assess such attitudes, as significant relationships were found between these measures and self-reported prior violent behaviour. Also important to note is that many, if not all, of the IAT measures used within the studies described above differ in terms of the categories and/or stimulus words used in the procedure. This may account for some of the discrepancy in results

that has been found when using this measure to assess attitudes towards violence because, as described above, if ambiguous stimulus words and categories are used this may mask the IAT effect. Therefore, the IAT used in the current study may have not adequately assessed implicit attitudes towards violence resulting in failure to accurately assess the relationship between implicit attitudes towards violence and prior violent behaviour.

The lack of significant findings when assessing scores on the IAT measure shows lack of support for the attitudinal theories described above from the social psychology literature. For instance, the Associative Propositional Evaluation model (APE Gawronski & Bodenhausen, 2006) discussed above makes a distinction between two types of attitudes, implicit and explicit. Also, Fazio (1990), in the Motivation and Opportunity as Determinants model (MODE; Fazio, 1990), stated that attitudes are defined as object-evaluation associations and they can be activated through an automatic processing mode, which underlies implicit attitudes, or a deliberative processing mode, which underlies explicit attitudes. Therefore, because the IAT measure is a reaction time based procedure that assesses immediate associations between an attitude object and an evaluative scale, one would expect the IAT to have activated the automatic processing mode thus activating participants' implicit attitudes towards violence. However, according to the MODE model, if an attitude object has never been encountered before (i.e., violence), then an individual may have no implicit attitude towards that object already stored in memory. In this case there would be no implicit attitude present to be activated immediately from memory. In considering this, it could be the case that the IAT measure used in the current study did not accurately assess implicit attitudes towards violence because the current sample did not have any implicit attitudes towards that behaviour; however, the fact that some participants self-reported prior violent behaviour and a positive relationship was found between self-reported attitudes

towards violence and prior violent behaviour suggests that some participants would have encountered violence before and therefore, would have created an implicit attitude towards violence.

Several limitations should be considered when interpreting the results of the current study. One such limitation is the use of a student sample that presumably reported fewer instances of violence than an offender sample would have reported. Therefore, this limits the ability of these results to generalize to an offender sample because there is no way of knowing whether the same relationship, or lack of relationship, would be found among offenders when assessing the relationship between attitudes towards violence (implicit and self-report) and violent behaviour. Many of the studies described above use offender samples and therefore, this could account for the discrepancy found especially regarding implicit attitudes towards violence. Perhaps offenders have more immediate attitudes regarding violence in comparison to students who may not possess implicit attitudes regarding violence. In addition, the MCAA-V-R was designed for use among offender samples and therefore, most research using this measure to assess attitudes towards violence has been done with more violent/criminal samples. However, prior research conducted by Mills et al. (2001) assessing the psychometric properties of the original MCAA attitude scales, has found comparable results between offender and student samples supporting the validity of this measure when used with students. Also, the fact that significant relationships were found between scores on this measure and self-reported prior violent behaviour in the current study further supports the use of the MCAA-V-R among students.

Another limitation of the current study is that many of the measures used were created for purposes of this study, such as the VOE scale and ABS-Violent, and therefore the psychometric

properties of these scales have not been replicated among other samples and studies. In addition, internal consistency of the VOE scale could not be assessed because the outcomes listed vary between participants. As a result, there is no way of knowing whether someone who has more positive outcome expectancies of violence would score consistently as such on this measure; however the fact that positive relationships were found between scores on the VOE scale and scores on the MCAA-V-R, as well as between these measures and self-reported prior violent behaviour, provides some evidence that the items within these measures are consistently assessing similar constructs because, for the most part, participants with more prior violent behaviour scored consistently similar on these measures.

Another limitation is that the lack of significant findings when assessing scores on the IAT may be attributed to that fact that only the IAT measure was used to assess implicit attitudes towards violence. As a result, this prevented the assessment of whether scores on this implicit attitude measure converged with any other measures designed to assess implicit attitudes towards violence. Therefore, perhaps the IAT measure used in this study did not accurately assess implicit attitudes towards violence, whereas other implicit attitude measures, such as the Affect Misattribution Procedure (AMP; Payne, Cheng, Govorun, & Stewart, 2005), would have better assessed these attitudes.

When assessing the assumptions of the various statistical tests that were conducted, non-normal distributions were found for several of the variables of interest. Although the sample size was large which insured the robustness of the tests, non-parametric tests were run in conjunction with the parametric tests proposed. Similar results were found between the parametric and non-parametric tests, suggesting that violation of the assumption of normality was likely not an issue. Last, as mentioned above, the cross-sectional nature of the design used in the current study

prevents one from making any causal conclusions. Therefore, it is not known whether more positive self-report attitudes towards violence lead to more violent behaviour or the other way around and there is not way of knowing which variable precedes the other.

In considering the limitations discussed above, future research should extend the research conducted thus far by continuing to assess the relationship between attitudes towards violence, using implicit and self-report/explicit attitude measures, and violent behaviour among offender samples. Future research should also attempt to confirm whether *peace* is considered by most to be the opposite of violence in order to validate that the categories contained within the IAT procedure used in the current study actually assess implicit evaluations of violence relative to the opposite of violence. This could be done by running a pilot study prior to administering the violent evaluation IAT measure in the study proper to ensure that the categories and stimuli used result in an IAT effect that accurately reflects implicit evaluations of violence. Additional implicit attitude measures should also be used in future research in order to cross-validate the scores on this IAT measure with scores on other measures designed to assess implicit attitudes towards violence. Also, future research should assess the underlying construct that is being assessed by implicit attitude measures (the IAT in particular) as has been done by my colleagues and I (see Nunes, Hermann et al., 2014) with self-report violent attitude measures such as the MCAA-V-R. This could be done using factor analysis by assessing whether this IAT measure loads onto the same factor as other measures known to assess explicit evaluations of violence, such as a semantic differential measure. If these measures load onto the same factor then this would help to confirm that the IAT measure used in the current study is assessing a construct similar to evaluations of violence. Additional self-report attitude measures that are thought to more closely reflect explicit evaluations of violence should also be included in future research

along with the more traditional self-report attitude measures such as the violence scale of the MCAA-R. This would allow one to assess whether scores on these measures are related to scores on the more frequently used self-report attitude measures and whether similar relationships are observed between these measures and violent behaviour.

Future research should also make use of official file information in order to assess prior instances of violent behaviour among offenders rather than relying on self-reported instances of violent behaviour. Last, future studies should conduct true experiments in which violence and/or attitudes towards violence are manipulated in order to extend the findings from the cross-sectional studies that have been conducted thus far. This would allow for the examination of whether more positive attitudes towards violence causes violent behaviour or if acting more violently causes one to have more positive attitudes towards violence. Future research could extend the study conducted by Polaschek et al. (2010) by assessing whether scores on implicit and self-report attitude measures differ from one another before and after offenders receive treatment; however future studies should provide a control group of offenders that received no treatment in order to compare scores on these violent attitude measures between treated and untreated offender groups.

In conclusion, the results of this study support the use of self-report measures of attitudes towards violence and outcome expectancies of violence. However, research on this topic is still inconclusive. Future studies should further refine the measures, as well as procedures, used to assess implicit and self-report attitudes towards violence in order to better inform treatment, as well as screening procedures about the risk factors that should be assessed and targeted. Study 2 extends the results of the current study by assessing the relationship between attitudes towards

violence, using the same implicit and self-report violent attitude measures, and violent behaviour among a male offender sample.

Study 2: Offender Sample

This study assessed the following research questions among a sample of male offenders:

(a) do implicit and self-report attitudes towards violence (and/or outcome expectancies of violence) differentiate violent offenders from non-violent offenders?; (b) are implicit attitudes towards violence associated with self-report attitudes towards violence (and/or outcome expectancies of violence)?; (c) are implicit/self-report attitudes towards violence (and/or outcome expectancies of violence) associated future risk of violence?; (d) do implicit and self-report attitudes towards violence (and/or outcome expectancies of violence) together account for additional variance in future risk of violent behaviour above and beyond either one alone?; and (e) do self-report attitudes towards violence (and/or outcome expectancies of violence) moderate the relationship between implicit attitudes towards violence and future risk of violence?

As mentioned above, past research using implicit measures (the IAT specifically) to assess attitudes towards violence has found that implicit measures significantly differentiated murderers from non-murderers among those low and high in psychopathy (see Snowden et al., 2004), incarcerated participants from and non-incarcerated participants (see Robertson & Murachver, 2007), men from an intimate partner violence intervention program from non-violent men (see Eckhardt et al., 2012), and participants who reported no past sexual coercion or likelihood to rape from those who reported the most past sexual coercion or likelihood to rape (see Nunes et al., 2013). Among these studies, two studies found significant results regarding self-report (or explicit) attitude measures; one found that self-report (or explicit) attitude measures significantly differentiate groups of participants (see Nunes et al., 2013) and the other

found a significant relationship between scores on a self-report measure of attitudes towards violence and future violence risk (see Nunes, Hermann et al., 2014). In addition, Poaschek et al. (2010) found that implicit attitudes towards violence were not significantly associated with future risk of violence and neither were scores on a self-report measure of attitudes towards violence. From these results, implicit and self-report attitudes were expected to differentiate violent offenders from non-violent offenders and significant relationships between implicit/self-report attitudes towards violence and future risk of violence was expected, such that more positive attitudes towards violence (implicit and self-report) would be related to greater future risk of violent behaviour; however the strength of these relationships may differ in magnitude. As outlined above, prior research regarding the relationship between implicit and self-report (or explicit) attitudes towards violence has been inconclusive; thus conclusions about the nature of this relationship cannot be drawn. In addition, prior research has found that implicit and self-report attitudes account for unique variance in risk of future violence (see Polaschek et al., 2010) and sexually aggressive behaviour (see Nunes et al., 2013) and together they account for significantly greater variance in these behaviours than either one alone. Therefore, it was expected that implicit and self-report attitudes towards violence would be independently and positively associated with future risk of violence and together they would account for additional variance. Last, research suggests that the extent to which implicit attitudes towards violence will correlate with violent behaviour depends on the agreement between implicit and self-report attitudes towards violence and whether self-report attitudes are considered (i.e., there are enough cognitive resources available and/or high motivation to deliberate; see Fazio, 1990; 2007; Gawronski & Bodenhausen, 2006). From this, it was expected that the relationship between

implicit attitudes towards violence and future risk of violent behaviour would depend on self-report attitudes towards violence.

In past research more positive outcome expectancies of violence have been associated with violent offending (see Slaby & Guerra, 1988) and past research has assessed self-report (or explicit) attitudes towards violence through outcome expectancies (e.g., Nunes et al., 2013; Slaby & Guerra, 1988). Therefore, as in the previous study, self-reported outcome expectancies of violence were examined in conjunction with self-reported attitudes towards violence because, according to the literature, it is expected that outcome expectancies of a behaviour and attitudes towards a behaviour will be consistent with one another. For example, if one expects negative outcomes to occur as a result of behaving violently, his or her attitudes towards violence will also be negative (see Expectancy-Value model of attitudes; Fishbein & Ajzen, 1975). Therefore, as in Study 1, it was expected that the above hypotheses involving self-report attitudes towards violence would also be found with regards to self-reported outcome expectancies of violence.

In conclusion, one of the goals of this study was to examine the relationship between implicit and self-report attitudes towards violence (or outcome expectancies of violence) among an offender sample and thus, replicate the findings of Study 1 among offenders. Another goal was to achieve an understanding of the relationship between these attitudes and future risk of violence, as well as test the moderating effect of self-report attitudes towards violence (or outcome expectancies of violence) on the relationship between implicit attitudes towards violence and future risk of violence.

Methods

Participants. This sample consisted of 31 adult male inmates incarcerated at the Ottawa Carleton Detention Center (OCDC). Offenders were selected from a nominal roll of incarcerated

inmates and were sampled from either minimum security, the general population of offenders, segregation, or protective custody in order to achieve a more representative sample of offenders. These offenders consisted of those who had been charged with both violent and non-violent offences and they were either convicted or awaiting trial. Therefore, not all offenders had been sentenced. Information on the offenders' current charge or offence (if they had been convicted) was taken from official provincial institutional records.

Participants with scores less than 14 on the Clarke Vocabulary scale were considered to have inadequate reading comprehension and were therefore excluded in order to eliminate those who could not adequately understand the items within the measures administered. In addition, those who received response times faster than 300 milliseconds on more than 10% of the IAT trials were eliminated in order to exclude those who did not sufficiently attend to the procedure and/or to lower the potential for guessing. Therefore, out of these 31 offenders, five were excluded either due to missing data on the variables of interest, insufficient English proficiency, inadequate reading comprehension, and/or response times faster than 300 milliseconds on more than 10% of the IAT trials. This left a sample of 26 offenders. A further 7 participants had missing data on the Self-Appraisal Questionnaire (a measure assessing future likelihood of violent reoffending). Thus, the final sample consisted of 19 male offenders. Out of this sample, the following ages were reported: 1 (5.3%) was 16 to 18 years old, 2 (10.5%) were 19 to 21 years old, 5 (26.3%) were 22 to 25 years of age, 2 (10.5%) were 26 to 29 years old, 4 (21.1%) were 30 to 35 years old, 4 (21.1%) were 36 to 45 years old, 1 (5.3%) was older than 45 years. When asked about their current and/or prior violent convictions, four reported none and 15 reported having current and/or prior violent convictions. When assessing the offenders' official current

violent charges and/or convictions, 12 offenders had current violent charges and/or convictions and 7 did not.

Measures.

Demographic questionnaire. Participants were asked about their age, proficiency in English, whether they were at OCDC because of a charge or conviction for a violent offence, and whether they had ever been charged or convicted for a violent offence before (see Appendix I).

Implicit attitudes towards violence. The same IAT procedure used in the student sample above was used among this sample of offenders (see Appendix B). The internal consistency was found to be .50 in the current study, which is considered to be minimal according to Robinson et al. (1991).

Self-report attitudes towards violence. The MCAA-R (Mills, 2007), as outlined above, was used once again among this offender sample (see Appendix C). The internal consistency was found to be .84 in the current study, which is considered to be exemplary according to Robinson et al. (1991).

Self-report outcome expectancies of violence. The VOE scale was used once again among this offender sample (see Appendix D).

Future risk of violent behaviour.

Self-Appraisal Questionnaire (SAQ). The Self-Appraisal Questionnaire (SAQ; Loza, 2005) is a self-report measure designed to predict violent and non-violent recidivism among offenders. This measure contains 72 items overall, assessing criminogenic risk-need areas. The first 6 subscales are used to assess recidivism specifically. These subscales consist of criminal tendencies, antisocial personality problems, conduct problems, criminal history, alcohol/drug abuse, and antisocial associates. The two other subscales consist of the Anger and Validity scales. The Anger subscale (5 items) is not included in the SAQ total score; however, the

Validity items are. Therefore, the SAQ total score is made up of 67 items. These items, assessing risk of future reoffending, were used to predict future likelihood of violent reoffending among this sample of offenders. Scores on these items consist of dichotomous *yes/no* responses. The SAQ has not been appended to this document because it is a copyrighted measure.

Canbell, French, & Gendreau (2009) found that third-generation risk assessment instruments, such as the SAQ that predict risk of recidivism but also identify criminogenic needs that can be targeted for change to reduce future risk, are most predictive of violent recidivism over first- and second-generation risk assessment instruments. More specifically, the SAQ has been found to have good predictive validity, with a correlation of .32 found between the SAQ total score and violent recidivism as the outcome, as well as Relative Improvement of Predictions Over Chance (RIOC) statistics ranging from 38.8% to 66.6% for the predictive outcomes of any parole violation, general recidivism, violent recidivism, and any failure (Loza & Loza-Fanous, 2000). Loza and Loza-Fanous (2003) also examined the predictive validity of the SAQ for predicting violent and non-violent recidivism after a five year follow-up period. Once again, the SAQ total score was found to correlate with all recidivism outcomes, with the most important being the correlation between the SAQ total score and violent recidivism ($r = .34$). In addition, an RIOC of 69% was found for the prediction of violent acts, which is well beyond chance. The SAQ has also been found to have good test-retest reliability among a sample of 303 male offenders, with a reliability coefficient for the SAQ total score of .95 and reliability coefficients ranging from .69 to .93 for the SAQ subscales (Loza, Dhaliwal, Kroner, & Loza-Fanous, 2000). Sound internal consistency was also found with coefficient alphas ranging from .42 to .87 (Loza et al., 2000). The internal consistency was found to be .88 in the current study, which is considered to be exemplary according to Robinson et al. (1991).

Control measure. The Clarke Vocabulary Scale (Paitich, 1977) was used in this dataset to assess and control for offenders' reading ability (see Appendix F), as was done in Study 1 above. Once again, a cutoff score of 14 on the Clarke was used, meaning that those who receive scores below 14 were considered to have poor reading comprehension (Paitich, 1977).

Procedure. Offenders were selected from a nominal roll of eligible participants provided by OCDC and they were randomly selected from this list. After being selected, offenders were escorted to an interview room in the institution where they completed the study. The researchers then explained the study to the offender and gave them the consent form (Appendix J). The experimenters were blind to whether the offender was violent or non-violent during data collection. The consent form outlined, to the offenders, their involvement in the study. After the offenders read and signed the consent form, they completed the measures. Offenders completed the Clarke Vocabulary Scale first on a PC laptop computer. Then, the demographic questionnaire, the IAT, the MCAA-R, and the VOE scale were also completed on the PC laptop and the order of these measures was counterbalanced in order to protect against potential confounding variables. Upon completion of these measures, offenders were instructed to notify the experimenters and they were then given the SAQ to complete by hand. The experimenters remained in the room while the offenders completed all the measures.

Following data collection, offenders were thanked and given the debriefing form (Appendix H). The correctional officer responsible for the interview rooms then escorted them back to their living units. After all data had been collected, the experimenters reviewed the offenders' current charges and convictions and the offenders were then grouped as violent or non-violent accordingly.

Results

Research questions and statistical analyses. The research questions and analyses ran for Study 2, are outlined in Table 9 below. The analyses are described in more detail when explaining the results.

Table 9

Offender sample assessing implicit and self-report attitudes towards violence, as well as outcome expectancies of violence, and risk of violent behaviour

Research Question	Analysis
1) Are implicit (IAT) and self-report (MCAA-V-R) attitudes towards violence or outcome expectancies of violence (VOE Evaluation scale total scores and total scores on VOE scale) related to one another?	Correlations
2) Are implicit (IAT) and self-report (MCAA-V-R) attitudes towards violence or outcome expectancies of violence (VOE Evaluation scale total scores and total scores on VOE scale) associated with future risk of violent behaviour (SAQ)?	Correlations,
3) Are implicit (IAT) and self-report (MCAA-V-R) attitudes towards violence or outcome expectancies of violence (VOE Evaluation scale total scores and total scores on VOE scale) independently associated with future risk of violent behaviour (SAQ) and together do they account for incremental variance in future risk of violent behaviour above and beyond either one alone? Do implicit and self-report attitude or outcome expectancy measures differ in their correlations with the SAQ?	Hierarchical multiple regression, and Fisher's r to z
4) How well do implicit and self-report attitudes towards violence or outcome expectancies of violence differentiate violent offenders from non-violent offenders?	Logistic regression
5) Are the interactions between implicit and self-report attitudes towards violence or outcome expectancies of violence significantly related to offenders' future risk of violent behaviour?	Moderated regression

Note. IAT = Implicit Association Test, MCAA-V-R = the Violence scale of the Measures of Criminal Attitudes and Associates – Revised, VOE scale = Violence Outcome Expectancies scale, SAQ = Self-Appraisal Questionnaire.

Data screening. First missing data were examined on each of the variables of interest (i.e., IAT effect value scores, VOE Evaluation scale total scores, total scores on VOE scale, total scores on MCAA-V-R, total scores on SAQ, and total scores on the Clarke Vocabulary Scale). One participant was found to have a missing value on the Clarke Vocabulary scale, thus they were excluded, as there was no way of knowing what his reading comprehension was. Eight participants were missing total scores on the SAQ. Therefore, missing values analysis was conducted to assess whether these values were missing at random. *T*-tests were conducted comparing participants with missing and non-missing values on age, IAT effect values scores, VOE Evaluation scale total scores, and total scores on the MCAA-V-R and VOE scale. None of the *t*-tests were significant, thus participants with and without missing data did not differ significantly from one another on the continuous variables of interest. A chi-square test was conducted to assess whether those with and without missing values on the total score of the SAQ differed significantly on English proficiency (whether they understood written and/or spoken English). Participants with and without missing values on the total score of the SAQ did not differ significantly from one another on whether they understood written English; however no participants reported that they could not understand spoken English and so missing values analysis could not be done for that demographic variable. The results of the missing values analysis suggested that the eight participants with missing values on the total score of the SAQ were missing completely at random and as a result listwise deletion was used.

Prior to running analyses the scores on all variables (i.e., IAT effect value scores, total scores on MCAA-V-R, VOE Evaluation scale total scores, VOE scale total scores, and total scores on the SAQ) were screened for out of range values, univariate outliers, and bivariate outliers. In addition, the assumptions that underlie the various tests that were run were checked

to make sure that they were upheld and any violations were noted. All scores appeared to be within the range of possible scores for each variable.

Z-scores were created and examined for each variable and any scores with z -scores exceeding ± 3.29 were changed to the next lowest or highest value for that variable. Once transformed, z -scores for each new variable were examined again to make sure that no outlying values remained. No univariate outliers were found for all variables of interest.

Mahalanobis distance values were examined to check for bivariate and multivariate outliers. For correlational analyses, no Mahalanobis distance values exceeding the cutoff of 13.82 for two predictors were found when examining the correlations between implicit and self-report attitudes or outcome expectancies of violence. In addition, no bivariate outliers were found for the correlation between SAQ total scores and implicit attitudes towards violence, self-report attitudes towards violence, or outcome expectancies of violence. Skew and kurtosis ratios were examined to check for normality of each variable in order to fulfill the assumptions of Pearson's r correlations. Z-scores exceeding ± 3.29 were considered significantly skewed and/or kurtotic. The distributions for all variables were neither significantly skewed nor kurtotic and thus, they could be considered normally distributed. Linearity and homoscedasticity were visually examined using scatterplots. The relationship between all variables appeared to be linear and homoscedastic.

Mahalanobis distance values were also checked for the regression analyses that were run. Any data points with Mahalanobis distance values greater than 16.27 were considered multivariate outliers, which is the cutoff value used for three predictors. No Mahalanobis values were found that exceeded 16.27 for any of the regression analyses, thus no multivariate outliers were found. The assumptions of regression analyses were also checked to make sure that they

were upheld for the hierarchical multiple regressions and moderated regressions that were run. Multicollinearity between predictors was assessed using bivariate correlations between variables. None of the bivariate correlations exceeded .70, thus collinearity between predictors was not problematic. Homoscedasticity and linearity of the relationship between independent variables (i.e., IAT effect value with total scores on the MCAA-V-R, VOE Evaluation scale total scores, or total VOE scale total scores) and the outcome (total scores on the SAQ) was assessed using scatterplots of the standardized residuals on the y-axis and standardized predicted values on the x-axis. Visual inspection of the scatterplots showed that the relationship between the set of predictors and the outcome (total scores on the SAQ) appeared linear for all regressions that were conducted. The errors for each regression, including implicit attitudes towards violence and self-report attitudes or expectancies of violence as predictors and total scores on the SAQ as the outcome, appeared to have an even spread across all values of the predictor variables thus, suggesting that homoscedasticity was upheld. Independence of residuals was examined using Durbin-Watson values after sorting the data according to participant number. A score of close to 2 is assumed to signify independence of residuals. Independence of residuals was found for the hierarchical regression including IAT effect values scores and total scores on the MCAA-V-R as predictors and total scores on the SAQ as the outcome (Durbin-Watson = 2.05); however independence of residuals was not found for the regressions including IAT effect value scores and VOE Evaluation scale total scores or VOE scale total scores (i.e., Durbin-Watson values were 1.51 and 1.44 respectively). Once again, independence of residuals was found for the moderated regression including the interaction between IAT effect values scores and total scores on the MCAA-V-R (Durbin-Watson = 2.22); however independence of residuals was not found for the other two moderated regressions including the interactions between IAT effect value

scores and VOE Evaluation scale total scores or VOE scale total scores (i.e., Durbin-Watson values were 1.52 and 1.48 respectively). Last, normality of residuals was examined using histograms, P-P plots, and Q-Q plots of the standardized residuals for the three regressions including IAT effect value scores, as well as total scores on the MCAA-V-R, VOE Evaluation scale total scores, or VOE scale total scores, as the predictors, and totals scores on the SAQ as the outcome. The plots for all three regressions appeared normally distributed suggesting that normality of residuals was upheld. Therefore, because independence of residuals was not upheld, this may have lowered power to find significance in the regression analyses that were run.

Additional data screening and assumption checking were conducted for the binary logistic regressions that were run. Dichotomous groups were created by separating offenders into violent and non-violent groups based on the offenders' official file information for current violent charges and convictions. Therefore, those who had a current violent charge or conviction (i.e., violent group) were coded as 1 ($n = 12$) and those who had a current non-violent charge or conviction (i.e., non-violent group) were coded as 0 ($n = 7$). Univariate and bivariate outliers were checked for each group. No univariate or bivariate outliers were found for either violent or non-violent groups. Normality of variables was also checked for either offender group. None of the variables had significantly skewed or kurtotic distributions for either group (cutoff was greater than or less than ± 3.29), except for the distribution of total scores on the MCAA-V-R for the non-violent offender group that was found to be significantly kurtotic ($z\text{-score} = 3.480$), but not significantly skewed. Last, linearity of the logit was assessed by examining whether the interactions between each predictor with its natural log was significantly related the dichotomous

outcome (i.e., offender groups). None of the interactions were significant thus; the assumption of linearity of the logit was upheld.

Results of analyses.

Relationship between implicit and self-report attitudes towards violence. To examine the relationship between implicit attitudes towards violence and self-report attitudes towards violence or outcome expectancies of violence the same procedure conducted in the previous study was done here. Therefore, to assess the relationship between implicit and self-report attitudes towards violence, Pearson's r correlations between the IAT effect value and self-report attitude measure, consisting of total scores on the Violence attitude scale of the MCAA-R, were conducted. These analyses were exploratory in nature, as prior research examining the relationship between implicit and self-report attitudes towards violence has found mixed results. The correlation between the IAT effect value and outcome expectancies of violence, consisting of VOE Evaluation scale total scores and VOE scale total scores, were also conducted to examine the relationship between implicit attitudes towards violence and self-report outcome expectancies of violence. The results of these analyses are displayed in Table 10. As seen in Table 10, no significant relationships were found between implicit and self-report attitude measures or between implicit attitudes and outcome expectancies of violence.

Additional analyses assessing the relationship between self-report attitude measures, as well as the relationship between self-report attitude measures and outcome expectancies of violence, were also conducted. No significant correlations were found when examining these relationships between self-report measures as can be seen in Table 10.

Relationship between attitudes towards violence and future risk of violent behaviour.

To examine the relationship between attitudes towards violence (implicit and self-report) and

participants' future risk of violent behaviour, Pearson's r correlations were conducted. Correlations between the IAT effect value and the SAQ total score were done for each participant to examine the relationship between implicit attitudes towards violence and future risk of violent behaviour. In addition, correlations between the MCAA-V-R total score and the SAQ total score were done for each participant to examine the relationship between self-report attitudes towards violence and future risk of violent behaviour. Correlations between outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) and total scores on the SAQ were also conducted to assess the relationship between outcome expectancies of violence and future risk of violent behaviour. Results of these analyses are also displayed in Table 10. As seen in Table 10, no significant correlation was found between implicit attitudes towards violence, as assessed by IAT effect value scores, and future risk of violent behaviour, as assessed by total SAQ scores. No significant correlation was found between self-reported outcome expectancies of violence, as assessed by VOE Evaluation scale total scores on, and SAQ total scores. Also, no significant correlation was found between total VOE scale scores and total SAQ scores. However, a significant and positive correlation was found between total scores on the MCAA-V-R and total scores on the SAQ, $r(17) = .47, p = .04$.

Table 10

Pearson's r correlations between IAT effect value, total MCAA-V-R scores, VOE Evaluation scale total scores, VOE scale total scores, and total scores on SAQ

Measure	VEIATD	MCAA-V-R	VOEEVAL	VOETOTAL	SAQ
VEIATD	-	.21	.17	.10	-.16
MCAA-V-R	.21	-	.11	-.09	.47*
VOEEVAL	.17	.11	-	.86**	-.18
VOETOTAL	.10	-.09	.86**	-	-.37
SAQ	-.16	.47*	-.18	-.37	-

Note. VEIATD = effect value scores on the Implicit Association Test. MCAA-V-R = total scores on the Violence attitudes scale of the Measures of Criminal Attitudes and Associates- Revised. VOEEVAL = VOE Evaluation scale total scores on the Violence Outcome Expectancies Evaluation scale. VOETOTAL = total scores on the Violence Outcome Expectancies scale. SAQ = total scores on the Self-Appraisal Questionnaire.

** $p < .001$

* $p < .05$

Hierarchical multiple regressions were also conducted with self-report attitudes towards violence (i.e., the MCAA-V-R total score) entered in Step 1, implicit attitudes towards violence (i.e., the IAT effect value) entered in Step 2, and the interaction term between scores on the MCAA-V-R and IAT effect value scores entered in Step 3. This was conducted to assess whether implicit attitudes towards violence add incrementally to the prediction of future risk of violent behaviour beyond just self-report or implicit attitudes alone. Hierarchical multiple regressions were also conducted with self-reported outcome expectancies of violence, as assessed by VOE Evaluation scale total scores or VOE scale total scores, entered in Step 1, IAT effect value scores entered in Step 2, and the interaction between outcome expectancies and IAT effect value scores entered in Step 3. This was conducted to assess whether implicit attitudes towards violence add incrementally to the prediction of future risk of violent behaviour beyond just implicit attitudes towards violence or self-reported outcome expectancies of violence alone.

Total scores on the SAQ was the outcome of interest, assessing participants' future risk of violent behaviour. Results of these analyses found that implicit attitudes towards violence (i.e., IAT effect value scores) did not add incrementally to the prediction of future risk of violence above and beyond self-report attitudes towards violence (i.e., total scores on the MCAA-R Violence attitude scale) or outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) alone. As was expected when considering the results of the bivariate correlations above, nothing was significant for the regression including IAT effect value scores and VOE Evaluation scale total scores as predictors and total SAQ scores as the outcome or for the regression including IAT effect value scores and total scores on the VOE scale as predictors and total scores on the SAQ as the outcome.

For the regression in which total scores on the Violence scale of the MCAA-R was entered in block 1 and IAT effect value scores were entered in block 2, total scores on the MCAA-V-R were significantly and positively related to SAQ total scores in blocks 1 and 2; however, there was no significant increase in the amount of variance explained in self-reported future likelihood of violent behaviour, as assessed by total SAQ scores, between block 1, with only self-report attitudes included (Adjusted $R^2 = .18$), and block 2 (Adjusted $R^2 = .21$). Thus, 21% of the variance in prior violent behaviour was accounted for when implicit attitudes towards violence were included in the model, $F(2, 16) = 3.37, p = .06$, however, implicit attitudes towards violence did not add incrementally to the prediction of future risk of violence above and beyond self-reported (i.e., total scores on the MCAA-V-R) attitudes towards violence alone. In block 2, total scores on the Violence scale of the MCAA-R were significantly and positively associated with total scores on the SAQ, $B = .79, SE = .32, \beta = .53, t(16) = 2.47, p = .03, 95\% \text{ CI}$

$= [.14, 1.48]$, $sr^2 = .27$. In contrast, in block 2, IAT effect value scores were not significantly related to participants' future risk of violent behaviour.

As in Study 1, comparisons between the correlations of the SAQ total scores with IAT effect values scores, and the correlations between SAQ total scores and self-report attitudes towards violence (i.e., total scores on the MCAA-V-R) or outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) were done to examine whether implicit attitudes towards violence differ in their relationship with future risk of violent behaviour (i.e., SAQ total scores) in comparison to self-report attitudes towards violence (i.e., total scores on MCAA-V-R) or outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores). None of the comparisons were significant; however, when comparing the correlation between IAT effect value scores and total scores on the SAQ with the correlation between total scores on the MCAA-V-R and total scores on the SAQ, a marginally significant difference was found, $z\text{-score} = -1.92$, $p = .055$, 2-tailed.

Group differences on implicit and self-report attitudes towards violence. Offenders were split up into two groups; those that have been charged or convicted of a violent offence ($N = 12$) and those that have not ($N = 7$), in order to assess whether scores on the implicit and self-report attitude, as well as violent outcome expectancy, measures are able to differentiate violent offenders from non-violent offenders. Binary logistic regressions including IAT effect value scores with the MCAA-V-R total score, VOE Evaluation scale total scores, or total scores on the VOE scale entered as predictors and the grouping variable (i.e., violent offenders vs. non-violent offenders) entered as the outcome were conducted to examine these group differences on the implicit and self-report violent attitude or outcome expectancy measures. No significant results were found when running these logistic regressions, suggesting that neither implicit attitudes

towards violence (i.e., IAT effect value scores), self-report attitudes towards violence (i.e., total scores on MAA-V-R), or self-report outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) were able to significantly differentiate violent offenders from non-violent offenders (groups based on current violent charges and convictions from official file information).

Moderation of self-report attitudes towards violence. To assess whether self-report attitudes towards violence moderate the relationship between implicit attitudes towards violence and future risk of violent behaviour, the interaction between IAT effect value scores and total scores on the MCAA-V-R was examined using moderated regression with the SAQ total score entered as the outcome of interest. This interaction was not significantly related to participants' future risk of violent behaviour, suggesting that self-report attitudes towards violence do not moderate the relationship between implicit attitudes towards violence and future risk of violence. Only the total scores on the MCAA-V-R were significantly and positively related to total scores on the SAQ, $B = .83$, $SE = .32$, $t(15) = 2.54$, $p = .02$, 95% CI = [.13, 1.52], $sr^2 = .29$.

Two moderated regressions were also conducted assessing the interaction between IAT effect value scores and total scores on the VOE scale, as well as the interaction between IAT effect value scores and VOE Evaluation scale total scores, to assess whether outcome expectancies of violence moderate the relationship between implicit attitudes towards violence and future risk of violence. Nothing was significant when running these analyses. Therefore, the interactions between outcome expectancies of violence and implicit attitudes towards violence were not significantly related to participants' future risk of violent behaviour, suggesting that self-reported outcome expectancies of violent behaviour may not moderate the relationship between implicit attitudes towards violence and future risk of violent behaviour.

Discussion

Neither implicit attitudes towards violence or self-report attitudes towards violence (and/or outcome expectancies of violence) differentiated violent offenders from non-violent offenders. Therefore, the hypothesis that violent offender would have more positive attitudes towards violence and outcome expectancies of violence, relative to non-violent offenders, was not supported. In addition, implicit and self-report attitudes towards violence were not significantly related to one another and neither were implicit attitudes towards violence and self-report outcome expectancies of violence. These analyses were exploratory in nature, as prior research assessing the relationship between these constructs has found mixed results.

It was also hypothesized that more positive attitudes towards violence and outcome expectancies of violence would be related to greater future risk of violent behaviour. However, implicit attitudes towards violence were not significantly related to future risk of violent behaviour and neither were outcome expectancies of violence. In contrast, more positive self-report attitudes towards violence were related to greater future risk of violent behaviour. Therefore, this hypothesis was only partially supported. In addition, self-report attitudes towards violence were not significantly related to self-report outcome expectancies of violence, which is inconsistent with what was found in Study 1 when using a male student sample. It was expected that these constructs would also be consistent with one another among a male offender sample because past research has assessed attitudes towards violence through self-report outcome expectancies of violence (see Nunes et al., 2013; Slaby & Guerra, 1988).

It was also hypothesized that implicit attitudes towards violence and self-report attitudes towards violence (and/or outcome expectancies of violence) together would account for additional variance in future risk of violence above and beyond just self-report attitudes or

outcome expectancies of violence alone. However, implicit attitudes towards violence did not add incremental variance in the prediction of future risk of violent behaviour and only positive self-report attitudes towards violence were related to greater future risk of violent behaviour as was expected when considering the results above. A marginally significant difference when comparing the relationship between implicit attitudes towards violence and future risk of violence with the relationship between self-report attitudes towards violence and future risk of violence; however, no other difference were found between correlations.

Last, it was hypothesized that self-report attitudes towards violence and/or outcome expectancies of violence would moderate the relationship between implicit attitudes towards violence and future risk of violent behaviour. It was expected that if one's implicit and self-report attitudes towards violence (or outcome expectancies of violence) were consistent with one another then a positive relationship between implicit attitudes towards violence and future risk of violence would be observed; however, this was not found to be the case. Once again, only more positive self-report attitudes towards violence were related to greater future risk of violence. Therefore, this hypothesis was not supported and these results suggest that the relationship between implicit attitudes towards violence and future risk of violence may not depend on the amount of agreement between one's implicit attitudes towards violence and self-report attitudes towards violence or outcome expectancies of violence.

The results of the current study regarding implicit and self-report attitudes towards violence are fairly consistent with what was found in Study 1 when using a male student sample; self-report attitudes towards violence, as assessed by total scores on the Violence attitude scale of the MCAA-R, were related to future risk of violence and none of the analyses involving implicit attitudes towards violence, as assessed by IAT effect value scores, were significant.

Therefore, once again these results suggest that implicit attitudes towards violence may not play a role in violent behaviour. However, some issues may have arisen when administering this IAT procedure that may account for the lack of significant findings with regards to IAT effect value scores. As stated when discussing the results of Study 1, the categories and stimuli used in IAT measures can affect response times when sorting stimulus words into attitude/attribute categories and may produce a diminished IAT effect. If ambiguity arises when sorting stimulus words then this may result in slower response times and more error (Lane et al., 2007). In considering this, the IAT categories of *Violence* and *Peace* may have not been seen as opposite which could have resulted in the IAT measure failing to accurately assess implicit attitudes towards violence. In addition, the traditional IAT consisting of attribute (e.g., *Good*) and concept (e.g., *Violence*) categories may assess more societal beliefs about the concept under investigation rather than individual attitudes towards violence (see Olson & Fazio, 2004). In considering this the IAT measure used in the current study may have assessed culturally accepted normative beliefs about violence rather than the offenders' attitudes towards violence.

Challenges also arise when administering IAT measures among participants. For instance, the procedure is quite lengthy and requires more attention than traditional self-report questionnaires assessing attitudes towards violence. Therefore, the intended IAT effect may have not been detected among the offender sample used in the current study because of failure, on the part of this sample, to properly attend to the task. In addition, only this measure was used to assess implicit attitudes towards violence; thus, there is no way of knowing whether the IAT measure used in studies 1 and 2 actually assessed implicit attitudes towards violence. If additional response latency measures were included to assess implicit attitudes towards violence, along with the IAT measure, this would have allowed for comparisons to be made between the

scores on the measures. If scores converged, this would have provided evidence to suggest that the IAT procedure accurately assessed implicit attitudes towards violence. Regardless of whether the non-significant findings regarding IAT effect value scores was due to a lack of relationship between these attitudes and violent behaviour or due to failure in detecting an IAT effect because of the procedure employed, the results from studies 1 and 2 involving implicit attitudes towards violence converge suggesting that this construct is not a correlate of violent behaviour either among male students or offenders.

Inconsistent results were found between studies 1 and 2 when assessing the relationship between self-reported outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) and violent behaviour (i.e., self-reported past and future risk). This discrepancy in results may be attributed to the fact that non-equivalent measures of violent behaviour were used between Studies 1 and 2 (i.e., the ABS-Violent vs. the SAQ). The results of Study 1 found a significant relationship between outcome expectancies of violence and self-reported prior violent behaviour such that more positive outcome expectancies of violence were related to more self-reported prior violent behaviour among the student sample. In addition, positive relationships were found between participants' self-reported outcome expectancies of violence and self-report attitudes towards violence (total scores on MCAA-V-R). However, as stated above, no significant relationship was found between outcome expectancies of violence and future risk of violent behaviour among offenders in Study 2. Also, offenders' self-report attitudes towards violence or outcome expectancies of violence were not related to one another. In considering these results it appears as though outcome expectancies of violence are not a correlate of violent behaviour among offenders. However, some issues must be considered when administering the VOE scale among an offender sample. Perhaps this scale was unsuccessful in

assessing outcome expectancies among offenders, as this measure requires participants to list three outcomes that they believe would be likely to occur as a result of committing violent acts. Offenders may have had more difficulty in reflecting on potential consequences of behaving in a violent manner and thus, were less able to come up with these outcomes in comparison to the student sample. As a result, this measure may have failed to accurately assess offenders' outcome expectancies of violence, which may account for the inconsistency found between offenders' outcome expectancies of violence and self-report attitudes towards violence, as well as the non-significant relationship found between their outcome expectancies of violence and future risk of violence.

As noted above when discussing the results of Study 1, it is not possible to assess the psychometric properties, including internal consistency, of the VOE scale because the outcomes listed vary between participants and from one time to the other. Therefore, it is not known whether offenders who are considered violent scored consistently on this measure. Therefore, this also prevents the assessment of whether the VOE scale actually assessed offenders' expected outcomes of behaving violently. Also, the lack of relationship found between offenders' self-report attitudes towards violence and outcome expectancies of violence suggests that these measures may have been assessing distinct constructs, but this cannot be concluded directly from these results. Last, it should also be noted that the sample size for the current study was very small ($n = 19$) and this likely lowered power to find significant results. However, when examining the results of the correlational analyses, the relationships between outcome expectancies of violence and self-report attitudes towards violence or future risk of violence were either small or not in the expected direction.

The results involving self-report attitudes towards violence, as assessed by total scores on the Violence attitude scale of the MCAA-R, were consistent between studies 1 and 2. For instance, more positive self-reported attitudes towards violence were related to more self-reported prior violent behaviour (e.g., total scores on the ABS-Violent) among male students in Study 1 and similarly, more positive self-reported attitudes towards violence were related to greater future risk of violent behaviour (e.g., total scores on the SAQ) among male offenders in Study 2. The results of these studies combined suggest that self-report attitudes towards violence are an important correlate of violent behaviour. However, caution should be taken when interpreting the results of these analyses because, as described above in the literature review, it is not known whether self-report measures, such as the Violence scale of the MCAA-V-R, designed to assess attitudes towards violence actually assess this construct or some other cognition that is related to violent behaviour. For instance, past research conducted by my colleagues and I have found that the items contained within the Violence attitude scale of the MCAA formed distinct factors from a measure more closely assessing self-report (or explicit) attitudes towards violence (e.g., semantic differential measure assessing evaluations of violence). However, these measures were found to be independently associated with violent behaviour and together provided complementary information in predicting such behaviour (see Nunes, Hermann et al., 2014). Therefore, from these results it is clear that whatever construct the MCAA-R Violence scale is assessing it seems to be important in the commission of violent behaviour; however, it remains unclear whether these findings show that self-report *attitudes towards violence*, specifically, are important in understanding violence.

The results of the current study appear to be inconsistent with what has been found in previous research using IAT measures along with self-report attitude measures to assess attitudes

towards violence. As discussed previously, more positive implicit attitudes towards violence were found among more violent samples of participants relative to non-violent participants who had more negative implicit attitudes towards violence (see Eckhardt et al., 2012; Robertson & Murachver, 2007; Snowden et al., 2004). Among all of these studies no differences between violent and non-violent samples were found on the self-report measures of attitudes towards violence. In addition, the results of the current study do not support the attitudinal theories from the social psychology literature presented above in the literature review. This is the case because the APE (Gawronski & Bodenhausen, 2006) and MODE (Fazio, 1990) theories suggest that people hold both implicit and explicit attitudes towards an object/behaviour. These theories also suggest that if one repeatedly encounters an attitude object (i.e., violent behaviour) in the environment, then this strengthens one's implicit attitudes towards that object resulting in greater saliency of these attitudes. It is expected that stronger implicit attitudes towards violence are activated more readily from memory and have a more immediate effect on behaviour. From this one would expect that violent offenders' implicit attitudes towards violence would be activated more immediately when encountering stimuli related to violent behaviour because these individuals would have repeatedly encountered situations in the past in which violence was used. However, no relationship between offenders' implicit attitudes towards violence and future risk of violence was found in the current study and implicit attitudes towards violence did not differentiate violent offenders from non-violent offenders when creating groups according to the nature of their current charges and convictions. These results show lack of support for the APE and MODE models and question the importance of implicit attitudes in influencing violent behaviour.

As in Study 1, several limitations are inherent within the current study that may have affected the results. For instance, this study made use of self-report measures to assess various constructs of interest such as attitudes towards violence, future risk of violent behaviour, and outcome expectancies of violence. These measures have a tendency towards self-presentation biases; however, past research has found these measures to be accurate in predicting actual behaviour (see Huizinga & Elliot, 1986; Jones & Miller, 2012; Kendall & Norton-Ford, 1982; Kroner et al., 2007; Kuriychik, 1990; Motiuk et al., 1992; Thornberry & Krohn, 2000; O'Connor et al., 2001; Woods et al., 2011). Another limitation to this study is that only the MCAA-V-R was used to assess self-report attitudes towards violence and no other measure was administered that more closely assesses evaluations of violence (i.e., semantic differential measure or feeling thermometer). Including a measure that assesses attitudes as defined by Eagley and Chaiken (1993), would have allowed for the comparison of scores between these measures providing evidence as to whether the scores on the MCAA-V-R converge with scores on explicit attitude measures. Therefore, future research should make use of official file information in order to assess violent behaviour, as well as employ self-report measures that more closely assess evaluations of violence along with the more widely used self-report attitude measures such as the MCAA. As noted above, only the IAT measure was used to assess implicit attitudes towards violence, which prevented comparisons between the scores on this measure and other response latency measures designed to assess implicit attitudes. Therefore, future research should employ additional response latency measures to allow for these comparisons.

As mentioned above, the sample size of the current study was very small and this likely reduced power in finding significance. Therefore, many of the non-significant findings may have been attributable to too little power in the design. However, as stated above, many of the

correlation coefficients found when examining the relationships of interest were small in size and some were in the opposite direction to what was expected. This was especially true for the correlations between self-report attitudes and outcome expectancies of violence, as well as the correlations between future risk of violence and all measures except for the MCAA-R Violence scale. Therefore, future research should make use of larger samples of offenders in order to extend the findings from previous research because although this study made use of an offender sample, much of what was found was in opposition to previous findings.

Another limitation inherent within the current study is the correlational nature of the design. As in Study 1, this prevents one from making any causal conclusions because it is not known whether self-report attitudes towards violence causes more violent behaviour in the future or the other way around and there is no way of knowing which variable precedes the other. Future research should employ true experimental designs in which attitudes towards violence and/or violent behaviour are manipulated in order to assess whether a change in one or more of these constructs corresponds to a change in violent behaviour (self-reported or otherwise), or the other way around.

In conclusion, the results of the current study extend the findings of Study 1 due to the fact that significant relationships were found between self-report attitudes towards violence, as assessed by the MCAA-V-R, and future risk of violence. In addition, these results supported the use of this measure among student and offender samples and extends the findings from Mills and colleagues (2001; 2002; 2004), regarding the relationship between the MCAA-V and violent behaviour. The following study further extends the findings from studies 1 and 2 by conducting a true experiment in which violent behaviour is manipulated by having participants engage in either a violent or non-violent video game task. This allows for the assessment of attitudes

towards violence (both implicit and self-report), as well as self-report outcome expectancies of violence, before and after the manipulation and also allows for the examination of whether the relationship between these constructs and violent behaviour differs from pre- to post-manipulation. Additionally, a semantic differential measure was employed in Study 3 instead of the MCAA-V-R in order to assess a construct that more closely resembles explicit evaluations of violence.

Study 3: Student Sample Assessing Exposure to Violence

The following research questions were assessed among male undergraduate students before and after a manipulation consisting of engaging in or observing someone engaging in a violent or peaceful task: (a) are implicit and explicit attitudes towards violence (and/or outcome expectancies of violence) associated both before and after the manipulation and does the magnitude of these relationships significantly differ?; (b) are implicit and explicit attitudes towards violence (and/or outcome expectancies of violence) associated with self-reported prior violent behaviour before and after the manipulation?; (c) do implicit and explicit attitudes towards violence (and/or outcome expectancies of violence) together account for incremental variance in self-reported prior violent behaviour above either one alone before and after the manipulation?; (d) do explicit attitude (and/or outcome expectancy) measures moderate the relationship between implicit attitudes towards violence and self-reported prior violent behaviour before and after the manipulation?; (e) is there a significant difference between pre-manipulation scores and post-manipulation scores on implicit and explicit attitude (and/or outcome expectancy) measures and does this difference differ by experimental condition (i.e., those who engaged in or observed someone engaging in a violent task versus peaceful task)?; and (f) does engaging in and/or observing someone engaging in violence increase the positive relationship

between implicit/explicit attitudes towards violence (and/or outcome expectancies of violence) and future risk of violent behaviour?

As stated in Studies 1 and 2, past research has found that implicit attitudes towards violence significantly differentiate violent individuals from non-violent individuals (see Eckhardt et al., 2012; Nunes et al., 2013; Robertson & Murachver, 2007). Some research has also found that explicit attitudes are able to significantly differentiate groups (see Nunes et al., 2013). Also, implicit attitudes together with explicit attitudes have been found to account for significantly greater variance in risk of future violent behaviour above either one alone (see Polaschek et al., 2010). In addition, theory suggests that the relationship between implicit attitudes towards violence and violent behaviour will depend on the consistency between implicit and explicit attitudes and/or whether explicit attitudes are considered (see Fazio, 1990; 2007; Gawronski & Bodenhausen, 2006). Therefore, the hypotheses proposed in Study 1 were expected here in terms of the relationship between implicit/explicit attitudes towards violence and prior violence, the incremental validity accounted for in prior violence when implicit and explicit attitudes measures are both included, and the moderating effect of explicit attitudes towards violence on the relationship between implicit attitudes towards violence and prior violent behaviour. As such, it was hypothesized that more positive implicit and explicit attitudes towards violence would be associated with greater self-reported prior violent behaviour, implicit and explicit attitudes together would account for incremental variance in self-reported prior violent behaviour, and that the relationship between implicit attitudes towards violence and self-reported prior violent behaviour would depend on one's explicit attitudes towards violence.

According to the MODE and APE models from the social psychology literature, repeated exposure to an attitude object (i.e., violence) strengthens one's attitudes towards that attitude

object. Additionally, engaging in or observing one engage in a violent task is expected to increase the positive association (or consistency) between attitudes towards violence and future likelihood of violent behaviour. More specifically, it can be inferred from the APE and MODE models that the more one has engaged in violent behaviour (or observed those around him/her engaging in violence) the stronger one's implicit attitudes towards violence will be. In turn, stronger attitudes are more likely to have an immediate influence on behaviour in the future (see Fazio, 1990; Gawronski & Bodenhausen, 2006). In addition, a history of violent behaviour is considered to be one of the strongest static predictors of future violence in the forensic psychology literature (Andrews & Bonta, 2010). Consequently, prior violent behaviour can be considered the mechanism through which the association between attitudes towards violence and future likelihood of violence is formed. From this, it was expected that engaging in and/or observing one engage in violence would strengthen participants' attitudes towards violence (both implicit and explicit), as well as strengthen the positive relationship between these attitudes and future risk of violent behaviour, relative to those that have not engaged in or observed someone engaging in violence. As such, it was hypothesized that those who engaged in the violent task would have the most positive attitudes towards violence (both implicit and explicit) and those who engaged in the peaceful task would have the most negative attitudes towards violence. It was also hypothesized that those who engaged in or observed someone engaging in the violent task would have a stronger positive relationship between their attitudes towards violence (both implicit and explicit) and future risk of violence in comparison to those who engaged in or observed someone engaging in the peaceful task.

Finally, as expected in studies 1 and 2, it was hypothesized that self-reported outcome expectancies of violence and explicit attitudes towards violence would be consistent with one

another and that the above hypotheses involving explicit attitudes towards violence would also be found with regards to self-reported outcome expectancies of violence. For example, if one expects negative outcomes to occur as a result of behaving violently, his or her attitudes towards violence will also be negative (see Expectancy-Value model of attitudes; Fishbein & Ajzen, 1975). This is expected because past research has assessed self-report (or explicit) attitudes towards violence through outcome expectancies (e.g., Nunes et al., 2013; Slaby & Guerra, 1988) and has found that more positive outcome expectancies of violence are associated with violent offending (see Slaby & Guerra, 1988). Therefore, as in the previous studies, self-reported outcome expectancies of violence were examined in conjunction with explicit attitudes towards violence in the current study.

Methods

Participants. This dataset consisted of 132 male undergraduate students recruited through Carleton University's SONA system website. Participants who received response times faster than 300 milliseconds on more than 10% of the IAT trials were eliminated in order to exclude those who did not sufficiently attend to the procedure and/or to lower the potential for guessing. No missing values were found on the variables of interest; however, six participants were excluded either due to insufficient English proficiency and/or response times faster than 300 milliseconds on more than 10% of the IAT trials (including response times both pre- and post-manipulation). Therefore, this left a final sample of 126 male participants. Out of this final sample, 1 (.8%) reported that he was under the age of 17, 78 (61.9%) reported they were 18 to 19 years of age, 26 (20.6%) reported that they were 20 to 21 years of age, 13 (10.3%) reported that they were 22 to 23 years of age, 5 (4.0%) reported that they were 26 to 29 years of age, and 3 (2.4%) reported that they were 30 to 39 years of age.

Measures.

Demographic questionnaire. Participants were asked about their age, English proficiency, and previous experience with playing video games (see Appendix K).

Implicit attitudes towards violence. The same IAT procedure used in the student and offender samples above was used among this sample (see Appendix B). The internal consistency was found to be .62 in the current study pre-manipulation and post-manipulation, which is considered moderate according to Robinson et al. (1991).

Explicit attitudes towards violence.

Semantic Differential scales. A series of seven-point semantic differential scales were used to assess explicit evaluations of violence and peace on six bipolar scales consisting of *negative to positive, not fun to fun, bad to good, wrong to right, immoral to moral, and not enjoyable to enjoyable* (see Appendix L). Violence and peace mean scores are computed by averaging the scales evaluating violence and peace. Higher scores indicate more positive evaluations of violence and/or peace. A difference score is created by subtracting the average ratings for the peace scales from the average ratings for the violence scales with higher scores reflecting more positive explicit evaluations of violence and lower scores reflecting more positive explicit evaluations of peace. The internal consistency was found to be .85 in the current study pre-manipulation and .84 post-manipulation, which is considered to be exemplary according to Robinson et al. (1991).

Self-report outcome expectancies of violence. The VOE scale, as outlined in the student and offender samples above, was also used among this sample (see Appendix D).

Prior violent behaviour.

Violent Behaviour Questionnaire (VBQ). The VBQ was administered to assess participants' prior violent behaviour. Students were asked about how many times since the age

of 16 they have engaged in a variety of aggressive acts, such as threatening and fighting (see Appendix M). Responses range from 0 (*never*) to 9 (*nine times or more*). Therefore, higher scores indicate that the participant has engaged in a greater frequency of violent behaviour in the past. The internal consistency was found to be .70 in the current study, which is considered extensive according to Robinson et al. (1991).

Future violent behaviour.

Violence Analogue. This analogue measure of violent behaviour was created for this study in order to assess the effects of exposure to violence (i.e., engaging in simulated violence or observing simulated violence) on participants' future likelihood of violent behaviour. This measure requires participants to read a hypothetical scenario depicting an argument over a parking spot (see Appendix N). At several stages throughout the script, participants are asked to choose a violent or non-violent option. Selecting the non-violent option terminates the script and selecting the violent option causes the script to continue, getting progressively more violent every time the violent option is selected. The number of times that each participant chooses to persist in using violent behaviour is summed in order to compute a total Violence Analogue score for each participant, with higher scores indicating a greater likelihood of engaging in future violent behaviour.

Procedure. Male undergraduate students signed up to participate in this study through Carleton University's online SONA system. Participation was voluntary and students received a 1% bonus in their course grade for either PSYC 1001, 1002, 2001, or 2002. Two participants completed the study at a time in an office on campus (see Figure 4 for an overview of the procedure). Upon arrival, participants were told about the study and were presented with the consent form (Appendix O). They were told to read the consent form and to sign two copies if

they agreed to participate; one for them and one for the experimenters' records. Participants were given verbal instructions and they then completed the demographic questionnaire, Violent Behaviour Questionnaire, the IAT, the violent Semantic Differential scales, and the VOE scale on a PC laptop computer. Upon completion of this phase, participants were assigned to one of four conditions. These conditions consisted of 1) playing a boxing video game, 2) watching the other participant play a boxing video game, 3) playing a tennis video game, or 4) watching the other participant play a tennis video game. Those involved in the boxing video game made up the exposure to violence conditions (i.e., conditions 1 or 2) and those involved in the tennis video game made up the exposure to peace conditions (i.e., conditions 3 or 4). Figures 5 and 6 provide examples of the Wii boxing and tennis video games. Participants were required to play, or watch these games being played, for 15 minutes. They then completed the IAT, the violent Semantic Differential scales, and the VOE scale on a PC laptop computer again, along with the Violence Analogue measure (assessing future likelihood of violent behaviour). Following data collection, participants were thanked and given the debriefing form on the laptop computer (Appendix P).

Figure 4. Overview of procedure.

Figure 5. Wii boxing.

Figure 6. Wii tennis.

Results

Research questions and statistical analyses. The research questions and analyses ran for Study 3, are outlined in Table 11 below. The analyses are described in more detail when explaining the results.

Table 11

Student sample assessing implicit attitudes towards violence, explicit attitudes towards violence, self-reported outcome expectancies of violence, and prior violent behaviour, as well as the effect of observing or engaging in violence on attitudes, outcome expectancies, and future risk of violent behaviour

Research Question	Analysis
1) Are implicit (IAT) and explicit (SD scales) attitudes towards violence or outcome expectancies of violence (VOE Evaluation scale total scores and total scores on VOE scale) related to one another both before and after the manipulation (i.e., observing or engaging in a violent or peaceful task)?	Correlations
2) Do the correlations between implicit and explicit attitude or outcome expectancy measures before and after the manipulation (observing or engaging in a violent or peaceful task) significantly differ from one another?	Fisher's r to z
3) Are implicit and explicit attitudes towards violence or outcome expectancies of violence associated with prior violent behaviour (VBQ)?	Correlations (before and after manipulation)
4) Are implicit and explicit attitudes towards violence or outcome expectancies of violence independently associated with prior violent behaviour (VBQ) and together do they account for incremental variance in prior violent behaviour above and beyond either one alone? Do implicit and explicit attitude or outcome expectancy measures differ in their correlations with the VBQ?	Hierarchical multiple regression, and Fisher's r to z (before and after manipulation)
5) Are the interactions between implicit and explicit attitudes towards violence or outcome expectancy of violence significantly related to amount of prior violent behaviour?	Moderated regression (before and after manipulation)
6) Is the difference between pre-manipulation implicit and explicit attitudes towards violence or outcome expectancies of violence and post-manipulation implicit and explicit attitudes or outcome	Mixed design ANOVA

expectancies of violence significantly different by experimental condition (i.e., engaging in or observing someone engage in a violent versus peaceful task)?

7) Do those that observe or engage in violence, show a stronger positive relationship between their implicit/explicit attitudes towards violence or outcome expectancies of violence and future risk of violent behaviour (Violence Analogue measure), in comparison to those who did not play or observe someone play a violent video game (in tennis manipulation task). In another words, does doing and/or observing violence increase the positive relationship between implicit/explicit attitudes towards violence or outcome expectancies of violence and future risk of violent behaviour?	<p>Pearson's <i>r</i> correlations
(after manipulation)</p> |
|--|---|

Note. IAT = Implicit Association Test, SD scales = Semantic Differential scales assessing explicit evaluations of violence, VOE scale = Violence Outcome Expectancies scale, VBQ = Violent Behaviour Questionnaire.

Data screening. No missing values were found on any of the variables of interest (i.e., pre- and post-manipulation scores on the IAT effect value, VOE Evaluation scale total scores, SD scales, and VOE scale total scores, as well as total scores on VBQ and total scores on the VA). Therefore, missing values analysis was not assessed as no data were missing.

Prior to running analyses scores on all variables (i.e., pre- and post-manipulation scores on the IAT effect value, VOE Evaluation scale total scores, sum of scales assessing violence on SD scales, and total scores on the VOE scale, as well as total scores on the VBQ and total scores on the VA) were screened for out of range values, univariate outliers, and bivariate outliers. In addition, the assumptions that underlie the various tests that were run were checked to make sure that they were upheld and any violations were noted. All scores appeared to be within the range of possible scores for each variable.

Z-scores were created and examined for each variable and any scores with z-scores exceeding ± 3.29 were changed to the next lowest or highest value for that variable. Once transformed, z-scores for each new variable were examined again to make sure that no outlying

values remained. No univariate outliers were found for IAT effect value scores pre- and post-manipulation, sum of violence scales on the SD for pre-manipulation scores, or total scores on the VA; however, univariate outliers were found for VOE Evaluation scale total scores pre- and post-manipulation, total scores on the VOE scale pre- and post-manipulation, sum of violence scales on the SD post-manipulation, and total scores on the VBQ as all of these variables had at least one z -score that exceeded the cutoff of 3.29. Scores that were found to be univariate outliers were changed to the next highest values in the dataset for each variable and z -scores for the fixed variables were examined once again. The transformations eliminated all univariate outliers for total scores on the VOE scale pre-manipulation, post-manipulation sum of violence scales on the SD, and total scores on the VBQ. However, univariate outliers still remained for pre- and post-manipulation VOE Evaluation scale total scores and VOE scale total scores post-manipulation. Therefore, the outlying values were changed to equal the highest values for those variables in the dataset and z -scores were once again examined for the fixed variables. No z -scores were found to exceed 3.29 thus; this transformation eliminated all univariate outliers.

Mahalanobis distance values were examined to check for bivariate and multivariate outliers. For correlational analyses, Mahalanobis distance values exceeding the cutoff of 13.82 for two predictors were considered bivariate outliers. When examining the correlations between implicit and explicit attitudes or outcome expectancies of violence, combination of IAT effect value scores and scores on the Semantic Differential measure pre-manipulation, one bivariate outlier was found. For correlations between implicit/explicit attitudes towards violence or outcome expectancies of violence and total scores on the VBQ, bivariate outliers were found for the correlations between IAT effect value scores and VBQ total scores, as well as between scores on the SD measures and total VBQ scores, pre-manipulation, and IAT effect value scores and

total scores on the VBQ post-manipulation, for one participant. Analyses were conducted with this participant included and excluded. If the exclusion of this bivariate outlier did not affect the results of the analyses, then results using the full sample of participants ($N = 126$) were recorded. Skew and kurtosis ratios were examined to check for normality of each variable in order to fulfill the assumptions of Pearson's r correlations. Z -scores exceeding ± 3.29 were considered significantly skewed and/or kurtotic. The distributions of pre- and post-manipulation VOE Evaluation scale total scores, and VOE scale total scores, as well as total scores on the VBQ and VA were all significantly positively skewed (i.e., $z_{\text{skew}} > 3.29$). Only the distribution of pre-manipulation VOE Evaluation scale total scores was found to be significantly positively kurtotic (i.e., $z_{\text{kurtosis}} > 3.29$). No additional attempts were made to satisfy the assumption of normality for these variables because the sample size was quite large (i.e., $N = 125$) and regression analyses are robust to violations of this assumption when sample sizes are greater than 30. The Central Limit Theorem (Fidell & Tabachnick, 2003) states that when sample sizes are large the sampling distribution can be considered normal even if the sample is not. Linearity and homoscedasticity of the relationship between variables pre- and post-manipulation were visually examined using scatterplots. The relationship between all variables appeared to be linear and homoscedastic both pre- and post-manipulation.

Mahalanobis distance values were also checked for the regression analyses that were run. Any data points with Mahalanobis distance values greater than 16.27 were considered multivariate outliers, which is the cutoff value used for three predictors. One participant was found to have a multivariate outlier (i.e., Mahalanobis value was greater than 16.27) for all regression analyses including implicit/explicit attitudes towards violence or outcome expectancies of violence as predictors and totals scores on the VBQ as the outcome for both pre-

and post-manipulation scores on these variables. Therefore, this participant was excluded in all regression analyses ($N = 125$). The assumptions of regression analyses were also checked to make sure that they were upheld for the hierarchical multiple regressions and moderated regressions that were run. Multicollinearity between predictors was assessed using bivariate correlations between variables. None of the bivariate correlations exceeded .70, thus collinearity between predictors was not an issue. Homoscedasticity and linearity of the relationship between independent variables (i.e., IAT effect value with VOE Evaluation scale total scores and Semantic Differential, or total scores on the VOE scale) and the outcome (total scores on the VBQ) was assessed using scatterplots of the standardized residuals on the y-axis and standardized predicted values on the x-axis for both pre- and post-manipulation scores on these variables. Visual inspection of the scatterplots showed that the relationship between the set of predictors and the outcome (VBQ total scores) appeared linear for each regression (both pre- and post-manipulation). The errors for each regression, using both pre- and post-manipulation scores, including implicit attitudes towards violence and explicit attitudes or expectancies of violence as predictors and total scores on the VBQ as the outcome, appeared to have an even spread across all values of the predictor variables, suggesting that homoscedasticity was upheld. Independence of residuals was examined using Durbin-Watson values. A score of close to 2 is assumed to signify normality of residuals. All values ranged from 1.72 to 1.83 for the hierarchical multiple regressions using pre-manipulation scores and from 1.76 to 1.83 for the hierarchical multiple regressions using post-manipulation scores. For the moderated regressions that were run (e.g., implicit attitudes towards violence as the predictor, explicit attitudes towards violence or outcome expectancies of violence as the moderator, and VBQ total scores as the outcome), Durbin-Watson values ranged from 1.71 to 1.77 using pre-manipulation scores and

from 1.72 to 1.78 using post-manipulation scores. Although these values are not equal to 2, they are fairly close thus; independence of residuals does not appear to have been an issue for the regression analyses. Last, normality of residuals was examined using pre- and post-manipulation scores with histograms, P-P plots, and Q-Q plots of the standardized residuals for the regressions including IAT effect value scores, as well as VOE Evaluation scale total scores and Semantic Differential, or total VOE scale scores, as the predictors, and totals scores on the VBQ as the outcome. The plots for all six regressions appeared non-normally distributed suggesting that normality of residuals was not upheld. Therefore, because normality of residuals was not upheld, this may have lowered power to find significance in the regression analyses that were run.

Additional data screening and assumption checking was also done for the Pearson's r correlations, examining whether observing or engaging in the violence task (i.e., playing or watching someone play Wii boxing) strengthen the relationship between participants' attitudes towards violence (i.e., IAT effect value scores, as well as VOE Evaluation scale total scores and SD) and/or outcome expectancies of violence (total scores on the VOE scale) and future risk of violence (i.e., total scores on the VA). Participants' were split into two groups: those who played or watched someone playing Wii boxing ($n = 68$) and those who played or watched someone playing Wii tennis ($n = 58$). Univariate and multivariate outliers were checked for both groups on all variables of interest using post-manipulation scores, as were the assumptions of multiple linear regression analyses. Once again, univariate outliers were examined by converting raw scores to z -scores for each variable and any scores that had z -scores exceeding the cutoff of ± 3.29 were considered outlying values. Univariate outliers were changed to the next highest or lowest value in the dataset for that variable and z -scores were examined again on the fixed

variables to confirm that no outlying values remained. For the Wii boxing group, univariate outliers were found for VOE Evaluation scale total scores and total scores (e.g., z -scores were greater than 3.29). These values were changed to the next highest value in the data set for those variables. No univariate outliers remained. For the Wii tennis group, no univariate outliers were found. Mahalanobis distance values were examined to identify multivariate outliers. Any data points with Mahalanobis distance values greater than 13.82 were considered multivariate outliers. No multivariate outliers were found for either the Wii boxing or Wii tennis groups. Skew and kurtosis ratios were computed for each group to examine normality of the variables used. For the Wii boxing group, the distributions of all variables were neither significantly skewed nor kurtotic except for the distribution of VOE Evaluation scale total scores that was significantly positively skewed ($z > 3.29$). For the Wii tennis group, the distributions of all variables were neither significantly skewed nor kurtotic except for the distribution of total scores on the VA that was significantly positively skewed ($z > 3.29$). Last, homoscedasticity and linearity of the relationships between attitude and outcome expectancy variables with the VA was assessed by visually examining scatterplots of the relationships between IAT effect value scores, VOE Evaluation scale total scores, VOE scale total scores, or total scores on the SD, with total scores on the VA. All scatterplots appeared to be heteroscedastic and thus, homoscedasticity was not upheld. However, the relationships between variables appeared linear. Due to the fact that the assumption of homoscedasticity was not upheld, this may have lowered power to find significance when running these correlational analyses.

Last, additional data screening and assumption checking were also conducted for the mixed design ANOVAs that were run, assessing whether the difference between pre-manipulation implicit attitudes towards violence and explicit attitudes or outcome expectancies

of violence, and post-manipulation implicit attitudes towards violence and explicit attitudes or outcome expectancies of violence, is significantly different by experimental condition. Four experimental conditions were examined: playing Wii boxing, playing Wii tennis, watching someone play Wii boxing, or watching someone play Wii tennis. Therefore, the presence of outlying values and the assumptions of mixed design ANOVA were examined for each experimental condition on all variables of interest (i.e., pre- and post-manipulation IAT effect value scores, VOE Evaluation scale total scores and SD, as well as total scores on the VOE scale). For those who played Wii tennis ($n = 39$), univariate outliers were found for pre-manipulation VOE Evaluation scale total scores and total scores on the VOE scale (z -scores > 3.29). These scores were changed to the next highest value for that variable in the dataset and z -scores were once again examined for the outlier-reduced variables. No outliers remained. For those who played Wii boxing ($n = 41$), univariate outliers were found for pre- and post-manipulation VOE Evaluation scale total scores, as well as pre- and post-manipulation total scores on the VOE scale (i.e., z -scores > 3.29). After changing these values to the next highest value for that variable in the dataset, no outliers remained. No univariate outliers were found for those who either watched someone playing Wii tennis ($n = 19$) or Wii boxing ($n = 27$). Skew and kurtosis ratios were examined to assess normality of the distributions for the variables used in this analysis for all four experimental conditions. The distribution of pre-manipulation VOE Evaluation scale total scores were found to be significantly and positively skewed ($z_{\text{skew}} > 3.29$) for both those who played Wii tennis and those who played Wii boxing. Once again, no further attempts were made to satisfy the assumption of normality for these variables, as the sample size was quite large ($N > 30$). For the other two experimental conditions (i.e., watching someone play

Wii tennis or Wii boxing), none of the distributions for the variables of interest were significantly skewed or kurtotic.

Results of analyses.

Effect of observing or engaging in violence on the relationship between implicit and explicit attitudes towards violence. To examine the relationship between implicit attitudes towards violence and explicit attitudes towards violence, Pearson's r correlations were computed between IAT effect values scores and violence outcome evaluation ratings on the Semantic Differential measure. Pearson's r correlations were also computed between IAT effect value scores and VOE Evaluation scale total scores, as well as total scores on the VOE scale, in order to assess the relationship between implicit attitudes towards violence and outcome expectancies of violence. These correlations were computed using pre-manipulation scores to assess whether participants' scores on the implicit and explicit attitudes towards violence or violence outcome expectancy measures correlate before observing or engaging in violence (see Table 12). As can be seen from Table 12, none of the correlations between implicit attitudes towards violence and explicit violent attitudes or violent outcome expectancy measures were significant when assessing pre-manipulation scores. Correlations between measures were also computed using post-manipulation scores to examine whether engaging in or observing someone engaging in a violent or peaceful video game affects the relationship between participants' implicit and explicit attitudes towards violence or outcome expectancies of violence (see Table 13). As seen in Table 13, similar results were found when using post-manipulation scores: none of the correlations between implicit attitudes towards violence and explicit violent attitude measures or violent outcome expectancy measures were significant when assessing post-manipulation scores.

Due to the fact that the assumption of normality, for Pearson's r correlations, was not upheld, Spearman's Rho correlations were also conducted to assess the relationship between implicit attitudes towards violence and explicit violent attitudes and violent outcome expectancy measures using both pre- (see Table 12) and post-manipulation (see Table 13) scores. As can be seen in Tables 12 and 13, similar results were obtained when using a non-parametric test to assess these relationships.

Additional analyses were conducted to assess the relationship between explicit attitudes towards violence (i.e., Semantic Differential scale) and outcome expectancies of violence (i.e., VOE Evaluation scale total scores and total scores on the VOE scale). Pearson's r and Spearman's Rho correlations were conducted to assess these relationships pre- (see Table 12) and post-manipulation (see Table 13). As can be seen in Table 12, none of the Pearson's r correlations between explicit attitudes towards violence and outcome expectancies of violence were significant pre-manipulation; however, the relationship between explicit attitudes towards violence (i.e., SD scale) and VOE Evaluation scale total scores was significant, $r(124) = .24, p = .007$, as was the relationship between violence ratings on the SD scale and total violence outcome expectancy scores on the VOE scale, $r(124) = .20, p = .024$ pre-manipulation when using Spearman's Rho correlations to assess these relationships. As seen in Table 13, Pearson's r correlations revealed a significant relationship between violence ratings on the SD scale and VOE Evaluation scale total scores, $r(124) = .29, p = .001$, as well as a significant relationship between the SD scale and total scores on the VOE scale, $r(124) = .25, p = .005$, when using post-manipulation scores. These relationships post-manipulation were also significant when using Spearman's Rho correlations as seen in Table 13.

In order to further examine the effect that observing or engaging in a peaceful or violent task has on the relationship between implicit and explicit attitudes towards violence or outcome expectancies of violence, analyses were conducted to assess whether the relationships between implicit attitudes towards violence and explicit attitudes towards violence, as well as implicit attitudes towards violence and outcome expectancies of violence, differ before and after the manipulation. Therefore, the correlations between the IAT effect value and the VOE scale total score and VOE Evaluation scale total scores, as well as between the IAT effect value and the Semantic Differential scale were compared before and after the manipulation in this analysis. No significant results were found when comparing these correlations; thus, none of these correlations significantly differed from one another.

Table 12

Correlations between IAT effect value, explicit attitudes towards violence, outcome expectancies of violence, and total scores on VBQ pre-manipulation

Measure	VEIATD	VOEEVAL	VOETOTAL	SD	VBQ
VEIATD	-	.10	.15	.01	-.00
VOEEVAL	.11	-	.93***	.13	.09
VOETOTAL	.16	.89***	-	.13	.01
SD	-.06	.24**	.20*	-	.05
VBQ	-.08	.08	.01	.03	-

Note. Pearson's r correlations are above the diagonal line. Spearman's Rho correlations are below the diagonal line. VEIATD = effect value scores on the Implicit Association Test. VOEEVAL = VOE Evaluation scale total scores on the Violence Outcome Expectancies Evaluation scale. VOETOTAL = total scores on the Violence Outcome Expectancies scale. SD = sum of scores for the violence scales of the Semantic Differential measure. VBQ = total scores on the Violent Behaviour Questionnaire.

*** $p < .001$

** $p < .01$

* $p < .05$

Table 13

Correlations between IAT effect value, explicit attitudes towards violence, outcome expectancies of violence, and total scores on VBQ post-manipulation

Measure	VEIATD	VOEEVAL	VOETOTAL	SD	VBQ
VEIATD	-	.10	.11	.13	.14
VOEEVAL	.04	-	.92***	.29**	.15
VOETOTAL	.04	.89***	-	.25**	.08
SD	.09	.31***	.27**	-	.01
VBQ	.07	.21*	.09	.03	-

Note. Pearson's r correlations are above the diagonal line. Spearman's Rho correlations are below the diagonal line. VEIATD = effect value scores on the Implicit Association Test. VOEEVAL = VOE Evaluation scale total scores on the Violence Outcome Expectancies Evaluation scale. VOETOTAL = total scores on the Violence Outcome Expectancies scale. SD = sum of scores for the violence scales of the Semantic Differential measure. VBQ = total scores on the Violent Behaviour Questionnaire.

*** $p < .001$

** $p < .01$

* $p < .05$

Relationship between attitudes towards violence and prior violent behaviour. To

examine the relationship between scores on the implicit and explicit attitude, or violent outcome expectancy, measures with participants' self-reported prior violent behaviour, Pearson's r correlations were conducted. Correlations between the IAT effect value and the VBQ total score were done for each participant using pre- and post-manipulation scores in order to examine the relationship between implicit attitudes towards violence and prior violent behaviour. In addition, correlations between the Semantic Differential total score and the VBQ total score, as well as VOE Evaluation scale total scores and total scores on the VOE scale with the VBQ total score were done for each participant using pre- and post-manipulation scores to examine the relationship between explicit attitudes towards violence, or outcome expectancies of violence, and prior violent behaviour. These analyses were conducted in order to replicate and extend the

findings from Study 1. The results are displayed in Tables 12 (pre-manipulation scores) and 13 (post-manipulation scores). As can be seen in Table 12, total scores on the VBQ were not significantly related to implicit attitudes towards violence, explicit attitudes towards violence, or outcome expectancies of violence pre-manipulation. Comparable results were found when using Spearman's Rho correlations. In addition, no significant correlations were found between total scores on the VBQ and attitudes towards violence or outcome expectancies of violence post-manipulation (see Table 13). However, when using Spearman's Rho correlations a significant correlation was found between total scores on the VBQ and VOE Evaluation scale total scores, $r(124) = .21, p = .021$ post-manipulation (see Table 13).

Hierarchical multiple regressions were conducted using pre-manipulation scores with explicit attitudes towards violence (i.e., the Semantic Differential total score) or outcome expectancies of violence (VOE Evaluation scale total scores and total scores on the VOE scale) entered in Step 1, implicit attitudes towards violence (i.e., the IAT effect value) entered in Step 2, and the interaction between explicit attitudes or outcome expectancy measures and IAT effect value scores entered in Step 3. This was conducted to assess whether implicit attitudes towards violence add incrementally to the prediction of prior violent behaviour beyond just explicit attitudes or outcome expectancies of violence alone. Total scores on the VBQ was the outcome of interest, assessing participants' self-reported prior violent behaviour. None of the hierarchical multiple regressions were statistically significant using pre-manipulation scores, suggesting that implicit attitudes towards violence do not explain incremental variance in self-reported prior violent behaviour above and beyond explicit attitudes towards violence or outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) alone. When assessing post-manipulation scores, once again implicit attitudes towards violence did not

account for incremental variance in self-reported prior violent behaviour above and beyond explicit attitudes towards violence or outcome expectancies of violence alone. As seen in Table 14 below, only VOE Evaluation scale total scores were found to be significantly and positively associated with self-reported prior violent behaviour in block 1 (total scores on the VBQ), $B = .43$, $SE = .22$, $\beta = .18$, $t(123) = 2.00$, $p = .05$, 95% CI = [.003, .865], $sr^2 = .03$. Thus, there was no significant increase in the amount of variance explained in self-reported prior violent behaviour with the inclusion of implicit attitudes towards violence [block 1 Adjusted $R^2 = .023$; block 2 Adjusted $R^2 = .017$, $F(2, 122) = 2.05$, $p = .13$].

Comparisons between the correlations of the IAT effect with VBQ total scores and the Semantic Differential, as well as the VOE Evaluation scale total scores or VOE scale total scores, with VBQ total scores were done (with pre- and post-manipulation scores) to examine whether implicit and explicit attitudes or outcome expectancies of violence differ in their relationships with self-reported prior violent behaviour (i.e., VBQ total scores). Again, this was done to further replicate the findings from Study 1. None of the comparisons between correlations were significantly different when comparing correlations either before or after the manipulation.

Moderation of explicit attitudes towards violence. To assess whether explicit attitudes towards violence moderate the relationship between implicit attitudes towards violence and self-reported prior violent behaviour, the interaction between IAT effect value scores and scores on the Semantic Differential scale was examined using moderated regression with the VBQ total score entered as the outcome of interest. This analysis was conducted with scores collected on measures prior to manipulation in order to further replicate the findings from Study 1, as well as with scores collected after the manipulation to examine whether engaging in the video game task

affected the association between these interactions and self-reported prior violent behaviour. None of the interactions between implicit and explicit attitudes towards violence were significantly related to participants' self-reported prior violent behaviour pre- or post-manipulation.

Moderated regressions were also conducted to assess whether the interactions between implicit attitudes towards violence and self-reported outcome expectancies of violence were significantly related to participants' self-reported prior violent behaviour. Interactions between IAT effect value scores and VOE Evaluation scale total scores, as well as between IAT effect value scores and total scores on the VOE scale, were examined pre- and post-manipulation with total scores on the VBQ entered as the outcome. None of the interactions between implicit attitudes towards violence and outcome expectancies of violence were significantly related to participants' self-reported prior violent behaviour when using pre-manipulation scores. In addition, the interaction between IAT effect value scores and total scores on the VOE scale was not significantly related to total scores on the VBQ post-manipulation; however, for the moderated regression in which VOE Evaluation scale total scores and implicit attitudes towards violence were entered in block 1 and the interaction between these variables was entered in block 2 (outcome was total VBQ scores), a moderately significant interaction between IAT effect value and VOE Evaluation scale total scores was found post-manipulation (see Table 14). Therefore, VOE Evaluation scale total scores may moderate the relationship between implicit attitudes towards violence and self-reported prior violent behaviour; however, non-significant simple slopes were found upon further inspection of this interaction.

Table 14

Results of moderated regression using post-manipulation scores with IAT effect value scores entered in step 1, VOE Evaluation scale total scores entered in Step 2, and interaction between implicit and outcome expectancies of violence entered in Step 3. Total scores on VBQ is the outcome.

Variables Entered	R^2	Adjusted R^2	F	ΔR^2	B	SE	sr^2
Step 1:	.031	.023	3.98	.031			
VOEEVAL					.43	.22	.03
Step 2:	.033	.017	2.05	.001			
VEIATD					.71	1.79	.00
Step 3:	.060	.037	2.58	.028			
VEIATD $\times$ VOEEVAL					-1.06 ^a	.56	.03

Note. VEIATD = effect value scores on the Implicit Association Test. VOEEVAL = VOE Evaluation scale total scores on the Violence Outcome Expectancies Evaluation scale.

^aMarginally significant $p = .062$

Effect of observing or engaging in violence on implicit attitudes towards violence, explicit attitudes towards violence, and outcome expectancies of violence. Mixed design ANOVAs were conducted to examine whether there is a difference between pre-manipulation implicit attitudes towards violence, explicit attitudes towards violence, and outcome expectancies of violence, and post-manipulation implicit attitudes towards violence, explicit attitudes towards violence, and outcome expectancies of violence, as well as to examine if this difference differs depending on whether one engaged in or observed someone engaging in the violent video game or peaceful video game task. This was done by examining whether the interaction between time (i.e., pre- or post-manipulation) and condition (engaging in or observing someone engage in a violent versus peaceful video game) on implicit attitudes towards violence (i.e., IAT effect value), explicit attitudes towards violence (i.e., Semantic Differential), or outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores) was statistically significant.

For the mixed design ANOVA assessing the effects of Time and Condition on implicit attitudes towards violence (i.e., IAT effect value scores), a significant main effect of Time on implicit attitudes towards violence was found such that participants' pre-manipulation scores on the IAT measure were significantly less positive towards violence (i.e., lower in value) than their post-manipulation scores regardless of experimental condition (i.e., whether they played or watched Wii boxing or tennis), $F(1, 122) = 134.53, p < .001, MSE = .07$ (see Figure 7). No significant results were found for the mixed design ANOVAs assessing the effects of Time and Condition on outcome expectancies of violence (i.e., VOE Evaluation scale total scores and VOE scale total scores; see Figures 8 and 9). Therefore, there were no significant main effects of Time or Condition or a significant interaction on either the sum of VOE Evaluation scale total scores or VOE scale total scores. However, examination of the simple effects was still conducted. When assessing the simple effects of Time (e.g., pre- and post-manipulation) on outcome expectancies of violence at each level of condition (e.g., playing or watching Wii boxing or tennis), using paired samples *t*-tests, a marginally significant difference between pre-manipulation ($M = 5.73$) and post-manipulation ($M = 6.41$) total scores on the VOE Evaluation scale was found for those who played Wii boxing, $t(40) = -2.08, p = .04, 95\% CI = [-1.35, -.02]$, such that more positive evaluations of the expected outcomes of violence were found post-manipulation. In addition, a marginally significant difference between pre-manipulation ($M = 26.39$) and post-manipulation ($M = 31.29$) total scores on the VOE scale was also found for those who played Wii boxing, $t(40) = -2.39, p = .02, 95\% CI = [-9.04, -.76]$, such that more positive outcome expectancies of violence were found post-manipulation. Although these differences appear to be significant, they fail to approach significance due to the fact that the per-comparison error rate is much lower than the standard alpha of .05.

Figure 7. Interaction plot showing the results of the mixed design ANOVA assessing Time and Condition on implicit attitudes towards violence. The dotted line represents IAT effect value scores post-manipulation and the solid line represents IAT effect value scores pre-manipulation.

Figure 8. Interaction plot showing the results of the mixed design ANOVA assessing Time and Condition on VOE Evaluation scale total scores. The dotted line represents VOE Evaluation

scale total scores post-manipulation and the solid line represents VOE Evaluation scale total scores pre-manipulation.

Figure 9. Interaction plot showing the results of the mixed design ANOVA assessing Time and Condition on outcome expectancies of violence. The dotted line represents total scores on the VOE scale post-manipulation and the solid line represents total scores on the VOE scale pre-manipulation.

Last, for the mixed design ANOVA assessing the effects of Time and Condition on Semantic Differential measure scores, a significant main effect of Time on Semantic Differential scores was found, $F(1, 122) = 5.24, p = .02, MSE = .27$, such that more positive explicit attitudes towards violence were found post-manipulation, as well as a significant main effect of Condition on Semantic Differential scores, $F(3, 122) = 2.97, p = .035, MSE = 1.52$, with those who played Wii boxing having the most positive explicit attitudes towards violence and those who watched someone playing Wii tennis having the most negative attitudes towards violence. A marginally

significant interaction was also found between Time and Condition on SD scores (see Figure 10). The simple effects of Time on SD scores at each level of Condition were conducted using paired samples t -tests, along with the simple effects of Condition on SD scores at each level of Time using two one-way ANOVAs; the first assessing pre-manipulation SD scores among the four experimental conditions and the second assessing post-manipulation SD scores among the four experimental conditions.

Figure 10. Interaction plot showing the results of the mixed design ANOVA assessing Time and Condition on explicit attitudes towards violence. The dotted line represents scores on the semantic differential scale post-manipulation and the solid line represents scores on the semantic differential scale pre-manipulation.

For the simple effects of Time on SD scores at each level of Condition, a paired samples t -test found a significant difference between pre-manipulation ($M = 2.24$) and post-manipulation ($M = 2.56$) scores on the SD scale for those who played Wii boxing such that more positive

explicit attitudes towards violence were found after engaging in the manipulation, $t(40) = -2.57$, $p = .01$, 95% CI = $[-.57, -.07]$. Similarly, a significant difference was also found between pre-manipulation ($M = 1.83$) and post-manipulation ($M = 2.20$) scores on the SD scale for those who watched someone playing Wii boxing such that more positive explicit attitudes towards violence were found after watching someone play Wii boxing, $t(26) = -2.36$, $p = .03$, 95% CI = $[-.69, -.05]$. No significant differences were found between pre- and post-manipulation scores on the SD scale for those who either played Wii tennis or watched someone playing Wii tennis.

For the simple effects of Condition on SD scores at each level of Time, no significant differences were found between the four experimental conditions for the one-way ANOVA assessing the simple effect of Condition for pre-manipulation scores on the SD scale. However, a significant difference was found for the one-way ANOVA assessing the simple effect of Condition for post-manipulation scores on the SD, $F(3, 122) = 3.58$, $p = .02$, $MSE = .98$, between those who played Wii boxing and those who watched someone playing Wii tennis (Mean Difference = .894, $SE = .27$, $p = .008$, 95% CI = $[.18, 1.61]$). It can be seen from these results that those who played Wii boxing had significantly more positive explicit attitudes towards violence (e.g., higher scores on the SD scale) than those who watched someone playing Wii tennis (see Figure 10). No other significant differences in post-manipulation scores on the SD were found between the experimental conditions.

Effects of observing or engaging in violence on the relationship between attitudes towards violence, as well as outcome expectancies of violence, and future risk of violent behaviour. Pearson's r correlations were conducted to examine whether those who either played a violent video game or observed someone playing a violent video game (i.e., Wii boxing) show a different relationship between their implicit and/or explicit attitudes towards violence, as well

self-reported outcome expectancies of violence, with future risk of violent behaviour in comparison to those who played or observed someone playing a peaceful video game (i.e., Wii tennis). Correlations between IAT effect value scores, total scores on the Semantic Differential scale, VOE Evaluation scale total scores, VOE scale total scores, and Violence Analogue total scores were computed separately for those who played/watched someone playing Wii boxing ($n = 68$) and those who played/watched someone playing Wii tennis ($n = 58$).

No significant relationships were found between attitude and outcome expectancy measures with the VA for those who played or watched someone playing Wii Tennis ($n = 58$). Therefore, implicit attitudes towards violence, explicit attitudes towards violence, or outcome expectancies of violence were not significantly related to participants' future risk of violence for those who played or watched someone playing the peaceful video game. In contrast, for those who played or watched someone playing Wii boxing ($n = 68$), total scores on the Semantic Differential measure were significantly and positively associated with future risk of violence such that more positive explicit attitudes towards violence were associated with greater future risk of violent behaviour, $r(66) = .31, p = .01$. In addition, total scores on the VOE scale were significantly and positively associated with total scores on the VA measure such that more positive outcome expectancies of violence were associated with greater future risk of violent behaviour, $r(66) = .25, p = .04$. However, VOE Evaluation scale total scores were not significantly related to future risk of violence and neither were implicit attitudes towards violence (i.e., IAT effect value scores). These results suggest that engaging in the violent video game task may increase the positive association between participants' attitudes towards violence and future risk of violent behaviour in terms of their explicit attitudes towards violence, but not for their implicit attitudes towards violence. In addition, it appears as though engaging in the

violent video game task may have also increased the positive association between participants' outcome expectancies of violence and future risk of violent behaviour.

Discussion

No significant relationships were found between implicit and explicit attitudes towards violence or between implicit attitudes towards violence and outcome expectancies of violence either before or after the manipulation was conducted. Once again these analyses were exploratory because past research has found mixed results regarding the nature of these relationships. In addition, no significant relationships were found between explicit attitudes towards violence and self-reported outcome expectancies of violence prior to the manipulation when using Pearson's r correlations; however more positive explicit attitudes towards violence were related to more positive self-reported outcome expectancies of violence prior to manipulation when using Spearman's Rho correlations. When assessing the relationship between these measures using post-manipulation scores, both Pearson's r and Spearman's Rho correlations found significant relationships between explicit attitudes towards violence and self-reported outcome expectancies of violence such that more positive explicit attitudes towards violence were related to more positive outcome expectancies of violence. No significant relationships (using either Pearson's r or Spearman's Rho correlations) were found between attitudes towards violence (implicit and explicit) and self-reported prior violent behaviour, or between self-reported outcome expectancies of violence and prior violent behaviour when assessing scores on these measures prior to the manipulation. When assessing scores on these measures following the manipulation, once again nothing was significant when assessing relationships using Pearson's r correlations, but a significant relationship between VOE Evaluation scale total scores and self-reported prior violent behaviour was found using

Spearman's Rho correlations, such that more positive outcome expectancies of violence were related to greater self-reported prior violent behaviour. Therefore, the hypothesis regarding these relationships was only partially supported because it was expected that both implicit and explicit attitudes towards violence, as well as outcome expectancies of violence, would be positively related to prior violent behaviour. No significant differences between these relationships were found when comparing correlations using pre-manipulation scores to correlations using post-manipulation scores.

The results of the correlational analyses above are consistent with studies 1 and 2 in terms of the non-significant relationships found when assessing scores on the IAT measure. Similarly for studies 1 and 2 no significant relationships were found between implicit attitudes towards violence and the self-report or explicit attitude and outcome expectancy measures and neither were there significant relationships found between IAT effect value scores and self-reported violent behaviour (both past and future likelihood). When considered in combination, these results suggest that implicit attitudes towards violence are not a correlate of violent behaviour and that they may be distinct constructs from explicit or self-report attitudes towards violence. However, as stated when discussing the results of studies 1 and 2, many issues must be considered when administering an IAT measure. The categories and stimuli used may produce artificial IAT effects if ambiguity exists when classifying the stimulus words into the IAT categories (see Lane et al., 2007). In addition, as stated above when discussing the results of studies 1 and 2, the IAT measure used in the current studies may have assessed attitudes that reflect society's views of violence rather than participants' own attitudes towards violence because the attribute categories of *Good* and *Bad* may have activated normative beliefs about violence instead of personal attitudes (see Olson & Fazio, 2004). Due to the fact that the same

IAT procedure was used in all three studies and no significant results were found when assessing scores on this measure, it could be that this particular IAT measure did not accurately assess implicit attitudes towards violence. Promising results have emerged when using IAT measures to assess implicit attitudes towards violence in previous studies. For instance, it was found that incarcerated participants and men from an IPV intervention program had significantly more positive implicit attitudes towards violence, as assessed by IAT measures, in comparison to non-incarcerated or community male samples (see Eckhardt et al., 2012; Robertson & Murachver, 2007). In addition, Snowden et al. (2004) found that murderers high in psychopathy had more positive implicit attitudes towards violence in comparison to non-murderers that were also high in psychopathy. Additionally, research conducted by my colleagues have found that an IAT measure assessing implicit attitudes towards rape differentiated those who reported the most past sexual coercion from those who reported the least, finding that those who reported the most prior instances of rape had more positive implicit attitudes towards rape (see Nunes et al., 2013). Therefore, it is clear that the results of the current study are inconsistent with previous research using varied IAT measures to assess implicit attitudes towards violence. In addition, the current studies only made use of the IAT to assess implicit attitudes; however, perhaps other response latency measures would more accurately assess implicit attitudes towards violence. Therefore, continued research is needed to assess which IAT measures best capture the construct of implicit attitudes towards violence and future studies should make use of various response latency measures when assessing these attitudes.

The results regarding the relationships between explicit attitudes towards violence, self-report outcome expectancies of violence, and self-reported prior violent behaviour were mixed. Many of the Pearson's r correlations that were run were not significant. This could have been

due to the fact that the normality assumption was violated when assessing the distributions of the variables of interest. Specifically, non-normal distributions were found for outcome expectancies of violence, self-report prior violent behaviour, and future risk of violence when assessing pre- and post-manipulation scores on these variables. However, no attempt was made to satisfy this assumption because correlational analyses (i.e., Pearson's r) are robust to violations of this assumption with large enough sample sizes ($N > 30$). When sample sizes are large, the sampling distribution for the skewed variable can be considered normal even if the sample drawn is not. However, nonparametric tests were run consisting of Spearman's Rho correlations in case the violation of this assumption masked the true relationships between the variables of interest. As can be seen when comparing the results of the parametric and nonparametric tests, some of these relationships may not have been linear in nature, as the Pearson's r correlations did not approach significance. For instance, the correlation between explicit attitudes towards violence and outcome expectancies of violence using pre-manipulation scores was only significant when examining the results of Spearman's Rho. Similarly, a significant relationship between outcome expectancies of violence and self-reported prior violent behaviour using post-manipulation scores was only found when assessing these relationships using Spearman's Rho correlations once again. Therefore, the violation of the assumption of normality for many of the variables used in these analyses may have affected the ability for the Pearson's r correlations to detect significant relationships among these constructs.

According to the MODE model by Fazio (1990), implicit and explicit attitudes towards violence are expected to be inconsistent with one another when there are enough cognitive resources available and deliberation deems the immediate (or implicit) attitude as invalid. However, when there are not enough cognitive resources available to deliberate on attitudes

towards violence, implicit and explicit attitudes are expected to be consistent with one another. In addition, Hofmann et al. (2005) proposed that correspondence between implicit and explicit attitude measures is expected to increase as the spontaneity of responses to explicit measures increases. Although no significant differences were found when comparing the relationships between variables pre- and post-manipulation, a significant relationship was found between outcome expectancies of violence and self-reported prior violent behaviour post-manipulation (using Spearman's Rho) and this relationship was not found when assessing pre-manipulation scores. Therefore, perhaps engaging in the Wii video games, as well as having already responded to the attitudinal measures pre-manipulation, may have resulted in the availability of less cognitive resources. This could have limited the ability for participants to deliberate on their responses to the VOE scale (i.e., when listing the three outcomes that they believe would be likely to occur as a result of committing violent acts). Therefore, by responding to this self-report measure more impulsively and regulating their responses less, this may have resulted in participants being more truthful on this measure; thus allowing for a significant and positive relationship between outcome expectancies of violence and self-reported prior violent behaviour to emerge. In contrast, no significant differences were found when comparing the relationships between implicit and explicit attitudes towards violence (or outcome expectancies of violence) pre- and post-manipulation. However, it should be noted that no significant results were observed when assessing scores on the IAT measure; thus, the lack of significance could be due to the fact that the IAT was unable to properly assess implicit attitudes towards violence as described above.

When considering the results regarding explicit attitudes towards violence, no significant relationships were found between this construct and implicit attitudes towards violence or self-

reported prior violent behaviour. The semantic differential measure was used in the current study, rather than the MCAA-V-R, because it is believed to more closely assess attitudes as evaluations of violence due to the fact that participants evaluate the word *violence* on a series of six seven-point Likert scales. Therefore, it is believed to be a more pure measure of explicit attitudes towards violence. However, when comparing the results of the current study with those of Study 2 (i.e., the student sample), the MCAA-V-R was more strongly related to self-reported prior violent behaviour in comparison to the SD. This suggests that perhaps whatever construct the MCAA-V-R is measuring may be more important in understanding violent behaviour. Future research should replicate the research conducted by my colleagues and I that assessed the underlying constructs of the MCAA-R-V in comparison to a semantic differential measure assessing evaluations of violence as this research found that scores on the MCAA-V-R and SD scale provided complementary information in predicting violent behaviour.

Caution must be taken when interpreting the results of the current study because the semantic differential measure is a self-report measure that is subject to presentation biases. However, the fact that significant results involving scores on the SD were found for the mixed design ANOVAs and multiple regressions below, assessing the relationship between attitudes towards violence (or outcome expectancies of violence) and future risk of violence, shows that perhaps the correlational analyses were not able to pick up on the relationship between explicit attitudes towards violence and self-reported prior violent behaviour. In addition, perhaps participants were not truthful in their responses on the VBQ (measure assessing prior violent behaviour), preventing a relationship between these variables to emerge. Future research should assess these relationships making use of official file information (or true instances of prior behaviour) rather than self-report measures.

It was hypothesized that implicit and explicit attitudes towards violence or outcome expectancies of violence would account for greater variance in self-reported prior violent behaviour together than just explicit attitudes or outcome expectancies of violence alone. This was examined both before and after the manipulation was conducted. Implicit attitudes towards violence did not explain incremental variance in self-reported prior violent behaviour and only VOE Evaluation scale total scores were significantly related to prior violent behaviour post-manipulation such that more positive expected outcomes of violence were related to more self-reported prior violent behaviour. This was expected when considering the results of the bivariate correlations above. In considering these results, the expected hypothesis was not supported.

These results are inconsistent with previous research using IAT measures to assess implicit attitudes. For instance, previous research conducted by my colleagues found that implicit and explicit measures of attitudes towards rape provided complimentary information and together accounted for a greater amount of variance in self-reported prior sexual coercion, as well as self-reported future likelihood of rape (see Nunes et al., 2013). In addition, Polaschek et al. (2010) found that an IAT measure assessing implicit evaluation of aggression provided complimentary information to self-report measures of aggressive behaviour and together accounted for greater variance in risk of future violence. Once again, the results of the current study are not surprising given the fact that implicit attitudes towards violence were not related to self-reported prior violent behaviour either before or after the manipulation was conducted. These results suggest that implicit attitudes towards violence do not play a role in violent behaviour.

It was also hypothesized that explicit attitudes towards violence and/or self-reported outcome expectancies of violence would moderate the relationships between implicit attitudes

towards violence and self-reported prior violent behaviour. Results involving pre-manipulation scores found that the relationship between implicit attitudes towards violence and self-reported prior violent behaviour did not depend on participants' explicit attitudes or outcome expectancies of violence. However, a marginally significant interaction between implicit attitudes towards violence and VOE Evaluation scale total scores on self-reported prior violent behaviour was found when using post-manipulation scores suggesting that self-reported outcome expectancies of violence may moderate the relationship between implicit attitudes towards violence and self-report prior violent behaviour. However, assessment of the simple slopes found non-significant relationships between implicit attitudes towards violence and prior violent behaviour for those with low and high violent outcome evaluation ratings on the VOE scale. It should be noted that when running these moderated regression analyses, the assumption of normality of residuals was not upheld. This could have lowered power in finding significance and could have accounted for the marginally significant interaction between outcome expectancies of violence and implicit attitudes towards violence, as well as the non-significant simple slopes that were found. Had this assumption not been violated, perhaps these results would have approached significance.

Participants who played Wii boxing were expected to have the most positive attitudes towards violence or outcome expectancies of violence followed by those who watched someone playing Wii boxing and last, those who played or watched someone playing Wii tennis were expected to have the most negative attitudes towards violence or outcome expectancies of violence. Therefore, it was hypothesized that engaging in a violent task would increase participants' positive attitudes towards violence or outcome expectancies of violence, relative to those who engaged in a peaceful task.

More positive implicit attitudes towards violence were found following the manipulation for all experimental conditions and implicit attitudes were not found to differ depending on experimental condition. From these results it appears as though, on average, participants' had more violent implicit attitudes following the manipulation regardless of what condition they were in (i.e., whether they played or watched someone playing Wii boxing or tennis). Therefore, it appears that engaging in the manipulation task led to more violent implicit attitudes. It is not known what caused this effect to occur, as it was expected that only those who engaged in the violent video game task would have more positive implicit attitudes towards violence following the manipulation. Perhaps participants became frustrated with the lengthy procedure or it was a result of some carryover or practice effects that occurred as a result of already having completed the IAT procedure once before.

Outcome expectancies did not differ significantly before and after the manipulation or between experimental conditions. However, when conducting post-hoc tests of the simple effects, marginally significant differences between pre- and post-manipulation scores on outcome expectancies of violence were found for those who played Wii boxing. In considering these results, the mixed design ANOVA that was conducted did not find a significant main effect of Time or Condition on outcome expectancies of violence or a significant Time $\times$ Condition interaction, meaning that outcome expectancies did not differ significantly before and after the manipulation and neither did they differ between experimental conditions. However, examination of the simple effect was done anyway and more positive outcome expectancies of violence were found post-manipulation for those who played Wii boxing, but this effect was only marginally significant. Perhaps the lack of significance could be attributed to low power in the design because when assessing the assumptions of this test, a non-normal distribution was found

for VOE Evaluation scale total scores. Violation of this assumption could have lowered power in finding significance and no further attempts were made to satisfy this assumption because the sample size was greater than 30 and as a result, it was assumed that this test would be robust.

Significantly more positive explicit attitudes towards violence were found post-manipulation for those who played Wii boxing, as well as for those who watched someone playing Wii boxing. Explicit attitudes towards violence did not differ pre- and post-manipulation for those who either played Wii tennis or watched someone playing Wii tennis. In addition, no significant differences were found pre-manipulation on explicit attitudes towards violence between experimental conditions; however significant differences were found post-manipulation on explicit attitudes towards violence between those who played Wii boxing and those who watched someone playing Wii tennis. More specifically, those who played Wii boxing had significantly more positive explicit attitudes towards violence (higher scores on the SD) in comparison to those who watched someone playing Wii tennis (had more negative explicit attitudes towards violence or lower scores on the SD).

In considering the above results, the expected hypothesis was found when examining explicit attitudes towards violence because engaging in the violent video game task resulted in more positive explicit attitudes towards violence post-manipulation for these participants in comparison to those who engaged in the peaceful video game task. These results support the APE and MODE models, which suggest that the more one engages in a behaviour the stronger one's attitudes towards that behaviour become (see Fazio, 1990; Gawronski & Bodenhausen, 2006). From these theories it is also suggested that the more one engages in prior violence and experiences positive outcomes as a result of that behaviour (i.e., perhaps they won the Wii boxing game or had fun engaging in the task), the more positive one's attitudes towards violence

will become. These results have implications for the real world in terms of violent video game playing and are consistent with previous research assessing the effects of violent video games on attitudes and behaviour. For instance, a meta-analysis conducted by Anderson and Bushman (2001) found support for a causal link between exposure to violence in video games and aggressive behaviour, aggressive cognitions (or attitudes) and emotion, and reduced helping behaviours. More specifically, Anderson and Bushman (2001) stated that there is a unique ability for violent video games to directly increase aggressive cognitions and have a long-term affect on behaviour. In their meta-analysis they found that short-term exposure to violent video games also resulted in at least a temporary increase in aggression and that greater violent video-game exposure was related to more aggressive cognitions. From these results they concluded that violent video games might increase aggression in the short term by increasing aggressive thoughts (Anderson & Bushman, 2001). However, this could also lead to more long-term effects because Anderson and Bushman (2001) state that the main mechanism underlying the development of aggressive personality is aggressive cognitions. Additionally, if Wii boxing, which presumably is not that violent of a video game, was able to create more violent attitudes among participants then one would expect video games that engage the player in first person shooting scenarios, and other situations of a more violent and interactive nature, would have much greater consequences for future violence. For instance, Lin (2013) examined whether the effect of interactivity on aggressive affect occurred through identification with the character in the video game, *Grand Theft Auto*. Lin (2013) found that the more interactive the violent video game was, the more participants identified with the character they were playing in the game. This, in turn, led to more aggressive affect among those in the violent video game condition (Lin, 2013).

Last, it was hypothesized in the current study that those who played or watched someone playing Wii boxing would have a stronger and more positive relationship between their attitudes towards violence or outcome expectancies of violence and future risk of violent behaviour in comparison to those who played or watched someone playing Wii tennis. This was expected because the literature suggests that engaging in violence increases the saliency and strength of one's attitudes towards violence and stronger attitudes are believed to have a greater influence on future behaviour (see MODE model; Fazio, 1990). No significant relationships were found between these constructs when examining the scores of those who played or watched someone playing Wii tennis. However, for those who played or watched someone playing Wii boxing, a significant and positive relationship was found between explicit attitudes towards violence and future risk of violence such that more positive explicit attitudes towards violence were related to greater future risk of violence. Also, a significant and positive relationship was found between outcome expectancies of violence (i.e., total scores on the VOE scale) and future risk of violence such that more positive outcome expectancies of violence were related to greater future risk of violence. Therefore, once again this hypothesis was supported when examining explicit attitudes towards violence, as well as outcome expectancies of violence, because engaging in the violent video game task resulted in a positive relationship between explicit attitudes towards violence (or outcome expectancies of violence) and future risk of violent behaviour post-manipulation; however, the results involving scores on the IAT measure were not significant.

Once again, these results provide implications in terms of the detrimental effects of exposure to violence in video games and the effect of engaging in prior violence on attitudes and future behaviour. The violent video game task can be seen as a way of artificially creating a history of violence among some participants and examining whether this causes participants in

the violent condition to form more positive attitudes towards violence; thus leading to greater likelihood of future violent behaviour, relative to those in the peaceful condition. Therefore, these results provide evidence that a history of violence is an important risk factor in future violent behaviour and that it can also lead to more positive attitudes towards violence. Although it is clear from these analyses that exposure to violence causes more violent attitudes, as well as greater likelihood of violent behaviour in the future, because a history of violence was manipulated in the current study, there is no way of knowing whether engaging in more violence leads to more future violence that results in more positive attitudes towards, or whether engaging in violence causes more positive attitudes towards violence that results in greater future violence. Therefore, future research should attempt to establish causation between attitudes and behaviour by using causal experimental designs. It should also be noted that these results may not generalize to the real world (or a non-experimental setting) as playing Wii boxing may not be analogous to actually having a history of violent behaviour. Specifically, there is no way of knowing whether the same results would be found when examining scores on these attitude measures before and after real instances of violent behaviour.

Another factor that could have limited ability to find significant results when examining post-manipulation scores on the implicit attitude and outcome expectancy measures is that the manipulation was not violent enough to detect a real effect. Therefore, the Wii boxing manipulation did not increase participants' positive implicit attitudes towards violence and/or future risk of violence enough, relative to those who engaged in Wii tennis, to detect an increased positive relationship between these constructs. Therefore, future research should replicate this design using more violent video games. In addition, when assessing the assumptions of regression analysis it was found that the distribution of violent outcome

evaluation scores was skewed; therefore, the assumption of normality was not upheld for this variable. Once again, no further attempts were made to satisfy this assumption because the sample size was greater than 30 participants. Additionally, heteroscedasticity and non-normality of residuals was found for all regression analyses ran. Therefore, violation of these assumptions could have also lowered power to find significance. Regardless of these non-significant results, a significant positive relationship between explicit attitudes towards violence, as well as total outcome expectancies of violence, and future risk of violence were found for those who engaged in Wii boxing post-manipulation and, as stated when discussing the results of the mixed design ANOVAs, explicit attitudes towards violence were found to be more positive following the manipulation for those in the Wii boxing conditions. This suggests that the Wii boxing manipulation was successful in creating more positive explicit attitudes towards violence among those who engaged in the violent task. Therefore, these results support the MODE model, which states that greater prior exposure to violence strengthens one's attitudes towards violence. This results in one's attitudes having a greater influence on future violence because, according to this theory, stronger attitudes are more influential for future behaviour (see Fazio, 1990).

Summary and Conclusions

The purpose of the current thesis was to administer an implicit attitude measure along with the commonly used explicit (or self-report) measures, designed to assess attitudes towards violence, to gain a more comprehensive understanding of the relationship between attitudes towards violence and violent behaviour. Analyses were conducted in an attempt to replicate and further extend findings from previous studies assessing implicit and self-report (or explicit) attitudes towards violence and their relationship with violent behaviour, as well as to investigate how these variables may interact to influence one's violent behaviour. It was expected that

implicit attitude measures would provide complementary information in explaining past and future likelihood of violent behaviour in conjunction with self-report measures. The current thesis also examined the effects of observing and/or engaging in violence on implicit and explicit attitudes towards violence and future risk of violent behaviour as research suggests that engaging in more violence will strengthen such attitudes, resulting in a stronger influence on behaviour.

When combining the results of the current studies, implicit attitudes towards violence did not differentiate those who reported being violent from those who had not and neither did they differentiate violent offenders from non-violent offenders. In addition, implicit attitudes towards violence were not related to self-reported (or explicit) attitudes towards violence, self-reported outcome expectancies of violence, self-reported prior violent behaviour, or future risk of violent behaviour among the student or offender samples. Also, implicit attitudes towards violence did not account for incremental variance in self-reported prior violent behaviour or future risk of violent behaviour above and beyond self-report (or explicit) attitudes towards violence or outcome expectancies of violence alone. Self-report (or explicit) attitudes or outcome expectancies of violence were also not found to moderate the relationship between implicit attitudes towards violence and self-reported prior or future risk of violence. Last, engaging in a violent task (i.e., playing or watching someone play Wii boxing) did not result in more violent implicit attitudes or greater correspondence between these attitudes and future risk of violence.

In contrast, self-report attitudes towards violence, as assessed by the MCAA-V-R, differentiated male students who reported having engaged in prior violent behaviour from those who reported having not engaged in prior violence. Also, more positive self-report attitudes towards violence were related to greater self-reported prior violent behaviour amongst the student sample, as well as greater future risk of violence among offenders. More positive self-

reported outcome expectancies of violence were also related to self-reported prior violence. In terms of the experimental manipulation that was conducted in which participants either engaged in a violent (i.e., played or watched someone playing Wii boxing) or peaceful (i.e., played or watched someone playing Wii tennis) video game task, positive relationships between explicit attitudes towards violence, as well as outcome expectancies of violence, and future risk of violence were found for those who engaged in violence, whereas no relationship was found between these constructs for those who engaged in the peaceful task. In addition, engaging in the violent video game seemed to cause an increase in violent explicit attitudes and the most positive explicit attitudes towards violence were found among those who played Wii boxing, whereas the most negative explicit attitudes towards violence were found among those who watched someone playing Wii tennis.

This research provides insight into the role that attitudes play in the commission of violent behaviour and suggests that implicit attitudes towards violence may not be important in understanding such behaviours. However, future research should extend these findings by making use of more diverse IAT measures (e.g., personalized vs. traditional IAT measures), as well as several response latency measures, in order to confirm these results. In addition, self-report attitudes towards violence, as assessed by scores on the MCAA-V-R, appear to be important in the commission of violence; however it cannot be concluded from these results whether the construct that is being assessed by this scale is actually *attitudes towards violence*. As mentioned previously, prior research has found the MCAA-V-R items to be distinct from a semantic differential scale assessing explicit evaluations of violence suggesting that the MCAA-V-R may be assessing a cognitive construct that is distinct from attitudes (see Nunes, Hermann et al., 2014). Thus, future research assessing the relationship between attitudes and violent

behaviour should extend these findings by incorporating semantic differential measures believed to more closely assess evaluations of violence, along with self-report measures designed to assess attitudes towards violence, in order to examine whether similar results emerge between the two.

A unique feature of the current thesis is the use of a manipulation in which a history of violence was artificially created among some participants. By doing this, change on the attitude and outcome expectancy measures was observed before and after the manipulation and between experimental conditions. This allowed one to examine the causal effect of exposure to violence on attitudes towards violence, outcome expectancies of violence, and future risk of violence. This analysis found a causal link between playing a violent video game and increased violent explicit attitudes, outcome expectancies of violence, and risk of future violence. More specifically, it was established that engaging in violence (i.e., through playing a violent video game) produced greater correspondence between one's explicit attitudes towards violence (and outcome expectancies of violence) and future risk of violence such that those with more positive explicit attitudes towards violence (and outcome expectancies of violence) had reported greater future risk of violence. Interestingly, no relationship was found between explicit attitudes towards violence (or outcome expectancies of violence) and future risk of violence for those who engaged in Wii tennis. In considering this, explicit attitudes towards violence, as assessed by semantic differential measures, appear to be an important correlate of future violence; therefore, future studies should employ more sophisticated experimental techniques to establish causation between these variables. For example, if it is established that engaging in violence increases violent attitudes which causes greater instances of future violence, this would inform treatment about the risk factors that should be targeted when attempting to reduce future risk of violence

among offenders. In conclusion, the current study contributes to the existing literature by extending the sparse research conducted thus far on the relationship between implicit attitudes towards violence and violent behaviour. In addition, this study establishes a causal link between engaging in violence on attitudes towards violence and future behaviour.

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Appendix A**Demographic Questionnaire**

1. Do you speak English fluently?	No	Yes
2. Do you understand written English?	No	Yes
3. Do you understand spoken English?	No	Yes
4. Is English your first language?	No	Yes
5. Did you attend an English grade school (grades 1 to 8)?	No	Yes
6. Did you attend an English high school?	No	Yes
7. What is your gender?	Male	Female
8. How old are you?	_____ years-old	

Appendix B

Violent Attitudes Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998)

An Example of an IAT Measure Adapted to Assess Attitudes Towards Violence

Violence Evaluation Implicit Association Test (VE-IAT) Categories and Stimulus Words

Violence: Attack, hit, hurt, kill, murder, stab, strangle, threaten.

Peace: calm, dove, peace, quiet, rest, sleep, tranquil, whisper.

Good: Vacation, rainbow, smile, sunshine, paradise, freedom.

Bad: Rotten, poison, sickness, vomit, cancer, evil.

Appendix C

Measures of Criminal Attitudes and Associates – Revised (MCAA-R; Mills, 2007)

This questionnaire has two parts (Part A and Part B). The first part asks some questions about your friends and acquaintances. The second part is a series of statements for which you can respond by showing whether you agree or disagree with the statement. There are no right or wrong answers. Please answer all the questions.

Part A

Consider the 4 adults you spend the most time with in the community, when you answer Part I. **No names please of the people you are referring to.** Then answer the questions to the best of your knowledge.

1.

A. How much of your free time do you spend with person #1? (Please Circle Your Answer)

less than 25% 25% - 50% 50% - 75% 75% - 100%

B. Has person #1 ever committed a crime? Yes No

C. Does person #1 have a criminal record? Yes No

D. Has person #1 ever been to jail? Yes No

E. Has person #1 tried to involve you in a crime? Yes No

2.

A. How much of your free time do you spend with person #2? (Please Circle Your Answer)

less than 25% 25% - 50% 50% - 75% 75% - 100%

B. Has person #2 ever committed a crime? Yes No

C. Does person #2 have a criminal record? Yes No

D. Has person #2 ever been to jail? Yes No

E. Has person #2 tried to involve you in a crime? Yes No

3.

A. How much of your free time do you spend with person #3? (Please Circle Your Answer)

less than 25% 25% - 50% 50% - 75% 75% - 100%

B. Has person #3 ever committed a crime? Yes No

C. Does person #3 have a criminal record? Yes No

D. Has person #3 ever been to jail? Yes No

E. Has person #3 tried to involve you in a crime? Yes No

4.

A. How much of your free time do you spend with person #4? (Please Circle Your Answer)

less than 25% 25% - 50% 50% - 75% 75% - 100%

B. Has person #4 ever committed a crime? Yes No

C. Does person #4 have a criminal record? Yes No

D. Has person #4 ever been to jail? Yes No

E. Has person #4 tried to involve you in a crime? Yes No

Part B

Please Answer All The Questions - Choose One Answer Only

	Disagree	Somewhat Disagree	Somewhat Agree	Agree
	1	2	3	4
1. It's none of my business if I saw a someone being robbed.	1	2	3	4
2. Any money I find in a wallet rightfully belongs to me.	1	2	3	4

3. I could see myself lying to the police.	1	2	3	4
4. I have a lot in common with people who break the law.	1	2	3	4
5. It's understandable to hit someone who insults you.	1	2	3	4
6. If you can't get a job, then you have to do crime to get by.	1	2	3	4
7. I could not see myself buying stolen goods.	1	2	3	4
8. None of my family have committed crimes.	1	2	3	4
9. Sometimes a person may have to carry a weapon to protect themselves.	1	2	3	4
10. A hungry man has the right to steal.	1	2	3	4
11. I would keep any amount of money I found.	1	2	3	4
12. I know several people who have committed crimes.	1	2	3	4
13. Sometimes you have to fight to keep your self-respect.	1	2	3	4
14. It's not wrong to steal if it lets you keep your self-respect.	1	2	3	4
15. In certain situations I would try to outrun the police.	1	2	3	4
16. I would not steal and I would hold it against anyone who does.	1	2	3	4
17. It is reasonable to expect a fight from someone you cheated.	1	2	3	4
18. Only I should decide what I deserve.	1	2	3	4
19. I would be open to cheating certain people.	1	2	3	4
20. I am most comfortable around people who obey the law.	1	2	3	4
21. Ignoring a store being robbed is not wrong.	1	2	3	4

22. Sometimes you have to break the law to survive.	1	2	3	4
23. I would not enjoy getting away with something wrong.	1	2	3	4
24. Most of my friends don't have criminal records.	1	2	3	4
25. There is nothing wrong with beating up a child molester.	1	2	3	4
26. Stealing to survive is understandable.	1	2	3	4
27. I would run a scam if I could get away with it.	1	2	3	4
28. I have friends who have been to jail.	1	2	3	4
29. It's not wrong to fight to save face.	1	2	3	4
30. Anyone with self-respect would rather steal than have to live off of charity.	1	2	3	4
31. For a good reason, I would commit a crime.	1	2	3	4
32. None of my friends has ever wanted to commit a crime.	1	2	3	4
33. Someone who makes you very angry deserves to be hit.	1	2	3	4
34. Taking what is owed you is not really stealing.	1	2	3	4
35. If it put money in my pocket, I would take advantage of someone.	1	2	3	4
36. I have committed a crime with friends.	1	2	3	4
37. It's all right to fight someone if they stole from you.	1	2	3	4
38. A lack of money should not stop you from getting what you want.	1	2	3	4
39. I will not break the law again.	1	2	3	4
40. I have friends who are well known to the police.	1	2	3	4

Appendix D

Violence Outcome Expectancies (VOE) Scale

A person's behaviour can result in a number possible outcomes - some positive and some negative. For example, watching a movie instead of studying for an important exam could result in many outcomes. Some positive outcomes might be that you would (a) enjoy a good movie, (b) have fun with friends, (c) avoid studying, and (d) relax. Some negative outcomes might be that you would (a) worry about the fact that you're not studying, (b) do poorly on the exam, (c) do poorly in the course, and (d) disappoint your parents.

Some of these outcomes may seem more or less likely to you. For example, you may believe that it is very likely that you are going to enjoy the movie because you've heard that it is excellent from a lot of people. Relatedly, these outcomes may be viewed as positive or negative by you. For example, enjoying yourself would probably be a positive outcome for you.

Committing a violent act could also result in a number of possible outcomes. "Violent act" refers to physical aggression towards another person with the intention of hurting that person; some examples of violent acts are punching someone, hitting someone with a baseball bat, stabbing someone, intentionally hitting someone with your car). List five things that you think could happen if you were to commit a violent act. For each outcome, (a) indicate how likely you think that outcome is and (b) indicate how positive or negative that outcome would be for you if it did happen.

Outcome #1 _____

How likely is it that this outcome would happen?

Never happen			Might happen			Guaranteed to happen	
0	1	2	3	4	5	6	

How positive or negative would this outcome be for you if it did happen?

Very negative			Neutral			Very positive	
-3	-2	-1	0	1	2	3	

Outcome #2 _____

How likely is it that this outcome would happen?

Never happen			Might happen			Guaranteed to happen	
0	1	2	3	4	5	6	

How positive or negative would this outcome be for you if it did happen?

Very negative			Neutral			Very positive	
-3	-2	-1	0	1	2	3	

Outcome #3 _____

How likely is it that this outcome would happen?

Never happen			Might happen			Guaranteed to happen	
0	1	2	3	4	5	6	

How positive or negative would this outcome be for you if it did happen?

Very negative			Neutral			Very positive	
-3	-2	-1	0	1	2	3	

Outcome #4 _____

How likely is it that this outcome would happen?

Never happen			Might happen			Guaranteed to happen	
0	1	2	3	4	5	6	

How positive or negative would this outcome be for you if it did happen?

Very negative			Neutral			Very positive	

-3 -2 -1 0 1 2 3

Outcome #5 _____

How likely is it that this outcome would happen?

Never happen				Might happen			Guaranteed to happen
0	1	2	3	4	5	6	

How positive or negative would this outcome be for you if it did happen?

Very negative				Neutral			Very positive
-3	-2	-1	0	1	2	3	

Appendix E

Antisocial Behaviour Scale

From when you were 16-years old to today, have you ever:	Never	Once	Twice or more
1. Started a fight with someone?	0	1	2+
2. Assaulted (e.g., beat up) anyone?	0	1	2+
3. Threatened to hurt someone?	0	1	2+
4. Committed arson (e.g., set a building on fire)?	0	1	2+
5. Engaged in 'purse snatching'?	0	1	2+
6. Mugged (i.e., robbed) someone <u>without</u> using a weapon?	0	1	2+
7. Mugged (i.e., robbed) someone <u>with</u> a weapon?	0	1	2+
8. Robbed a store, gas station, bank or any other 'business' <u>without using a weapon</u> ?	0	1	2+
9. Robbed a store, gas station, bank or any other 'business' <u>using a weapon</u> ?	0	1	2+
10. Threatened someone with a gun, knife, or any other weapon?	0	1	2+
11. Been in possession of a weapon (e.g., gun or knife [excluding pocketknife]), which you were not licensed to carry?	0	1	2+
12. Injured someone using a weapon (e.g. knife, gun, rock, baseball bat, etc.)?	0	1	2+
13. Injured someone badly (e.g., left bruises, caused visible bleeding or broken bones, etc.)?	0	1	2+
14. Hit a girl or woman?	0	1	2+
15. Ever been arrested for a violent offence (e.g., assault)?	0	1	2+
16. Ever been convicted of a violent offence (e.g., assault)?	0	1	2+
17. Resisted arrest?	0	1	2+

Appendix F

Clarke Vocabulary Scale

INSTRUCTIONS: Please circle the response that has the most similar meaning to the underlined word.

1. a book A. is to read B. is a ball C. is blue D. is to run
2. a car A. is a dance B. is to drive C. is black D. is to eat
3. a horse A. has four legs B. is small C. lives in a house D. flies
4. a clock A. keeps you dry B. is deep C. tells time D. is for cats
5. a hammer A. grows on a tree B. is a tool C. is for you leg D. has a shell
6. a pillow A. is an animal B. is hard C. is to open jars D. is to sleep on
7. a glove A. goes on your hand B. goes on your head C. is to work with D. is a tree
8. a saw A. is to cut with B. is to sit on C. is to point with D. is a page
9. Fur A. is blue B. is animal hair C. is sweet D. is on birds
10. Jewel A. round B. sky C. flower D. diamond
11. Connect A. spill B. part C. join D. feel
12. Shovel A. farm B. spade C. cry D. ace
13. Weapon A. sword B. correct C. lip D. pecan
14. Nuisance A. baby B. help C. worse D. bother

15.	<u>ridiculous</u>	A. silly	B. ruined	C. poor	D. defenceless
16.	<u>nimble</u>	A. fat	B. active	C. brave	D. sick
17.	<u>wager</u>	A. court	B. dice	C. gamble	D. strike
18.	<u>magnify</u>	A. make smaller	B. distant	C. make bigger	D. handle
19.	<u>fable</u>	A. fur	B. watch	C. rhyme	D. story
20.	<u>facetious</u>	A. hungry	B. witty	C. weighty	D. ugly
21.	<u>blemish</u>	A. flaw	B. abuse	C. vaunt	D. clean
22.	<u>strife</u>	A. try	B. verse	C. battle	D. wine
23.	<u>seclude</u>	A. ensure	B. dream	C. isolate	D. obtain
24.	<u>recede</u>	A. withdraw	B. deny	C. repeat	D. dine
25.	<u>profusion</u>	A. glitter	B. plenty	C. noise	D. glory
26.	<u>adversary</u>	A. opponent	B. explosive	C. light	D. grammar
27.	<u>effrontery</u>	A. bombing	B. boldness	C. triviality	D. belief
28.	<u>impending</u>	A. valuable	B. prominent	C. imminent	D. obese
29.	<u>abyss</u>	A. confusion	B. suicide	C. monastery	D. chasm
30.	<u>diverge</u>	A. asset	B. vacation	C. distress	D. wander
31.	<u>devoid</u>	A. planet	B. vacuum	C. missing	D. insect
32.	<u>arduous</u>	A. laborious	B. shapeless	C. sterile	D. proud

33.	<u>vigilant</u>	A. watchful	B. careful	C. literal	D. winning
34.	<u>relinquish</u>	A. food	B. plague	C. distress	D. surrender
35.	<u>catacomb</u>	A. deep valley	B. Japanese garden	C. ruined city	D. underground cemetery
36.	<u>indemnity</u>	A. penalty	B. subsidy	C. amity	D. ordinance
37.	<u>reprobation</u>	A. approval	B. censure	C. slander	D. verification
38.	<u>dilatory</u>	A. slow	B. expanded	C. selfish	D. uncertain
39.	<u>requite</u>	A. admonish	B. love	C. repay	D. commend
40.	<u>imprecation</u>	A. inaccuracy	B. scruple	C. curse	D. rarity

Appendix G

Consent Form for Student Participants

An informed consent form outlines the procedure, identifies any potential negative consequences, and provides contact information should you have any questions or concerns about the research that cannot be addressed by the experimenter. The main purpose of a consent form is to INFORM you of what you will be required to do so that you have adequate information to decide whether or not you wish to participate.

This research is being conducted by Samantha Balemba (Undergraduate Student, Department of Criminology, Carleton University, 613-520-2600, ext. 2649, sbalemba@connect.carleton.ca) under the supervision of Dr. Kevin Nunes (Assistant Professor, Department of Psychology, Carleton University, 613-520-2600, ext 1545; kevin_nunes@carleton.ca). For questions or concerns about this study please contact Samantha Balemba or Kevin Nunes. Should you have any ethical or any other concerns about this study, please contact Dr. Avi Parush, Chair of the Carleton University Ethics Committee for Psychological Research (613-520-2600, ext. 6026; avi_parush@carleton.ca) or Dr. Anne Bowker, Chair of the Psychology Department (613-520-2600, ext. 2648; psychchair@carleton.ca).

Participation in this study consists of one session of about 1 hour in a private room at Carleton University. You will be asked to complete some categorization tasks and questionnaires. The categorization tasks and questionnaires are designed to measure how people think about violence and crime.

The information you provide will be used only for research purposes and your confidentiality will be respected and protected. You will not be identified as a participant in the publication or presentation of the results from this research project. Your name and other personal information will **not** be written on the information you provide to protect your confidentiality.

Because some of the activities deal with sensitive information, they may be embarrassing or offensive. You are free to withdraw from the project at any time, refuse to participate, and refuse to answer questions.

The information collected will be kept in a secure manner at Carleton University for a period of 5 years in a locked filing cabinet and password-protected computer, with any identifying information removed, and will be accessible only to the researchers working on this research.

I have read and understood the information above. My signature indicates that I agree to participate in this study. There are two copies of the consent form, one of which I may keep.

Participant Signature: _____ Date: _____

Experimenter Signature: _____ Date: _____

Appendix H

Debriefing

Thank you very much for participating in my study. Without your participation, this research would not have been possible. I hope the following information addresses any questions and concerns you may have.

What Are We Trying to Learn in this Research?

The categorization task, which is called the Implicit Association Test (IAT), and some of the questionnaires you completed were designed to measure how positively or negatively one views violence. We are trying to find out if men who have been violent view violence more positively than men who have not been violent. We are also interested in seeing if the IAT measure is related to the questionnaire measures of evaluation of violence.

Why Is This Important to Scientists or the General Public?

Violent behaviour has many negative consequences for victims and the community in general. It has been suggested that what people think influences their behaviour. As such, finding out more about how men think about violence can help us to better understand why men behave violently and, ultimately, how to reduce this harmful behaviour. In most of the research conducted to date, attitudes have been measured with self-report scales. Self-report scales have many strengths, but they are often quite vulnerable to deceptive responding. Most of us want to present ourselves in a positive light and may be reluctant to report negative attitudes (e.g., viewing violence as a good thing). It is usually quite easy to answer a self-report scale in a way that makes us look better but does not accurately reflect our true feelings. In contrast to self-report scales, the IAT is less susceptible to this kind of deceptive responding.

What are our Hypotheses and Predictions?

We expect that men who have been violent will view violence more positively than men who have not been violent.

Where Can I Learn More?

To learn more about the IAT, visit Anthony Greenwald's (the creator of the procedure) website at <http://faculty.washington.edu/agg/> or read:

- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology*, 74, 1464-1480.

What if I Have Questions Later?

Please direct any questions or concerns about this research to Samantha Balemba (Student, Department of Criminology, Carleton University; 613-520-2600, ext. 2649; sbalemba@connect.carleton.ca) or Dr. Kevin Nunes (Assistant Professor, Department of Psychology, Carleton University; 613-520-2600, ext 1545; kevin_nunes@carleton.ca). Should you have any ethical or any other concerns about this study, please contact Dr. Avi Parush, Chair of the Carleton University Ethics Committee for Psychological Research (613-520-2600, ext. 6026; avi_parush@carleton.ca) or Dr. Anne Bowker, Chair of the Psychology Department (613-520-2600, ext. 2648; anne_bowker@carleton.ca).

Is There Anything I Can Do if I Found This Experiment to be Emotionally Draining?

If you experience any distress as a result of this study, please seek help from (*for offenders: health services or the psychology department of the institution*) one of the following sources as soon as possible.

University Health and Counselling Services	613-520-6674
Distress Centre of Ottawa and Region	613-238-3311

Ottawa Police Service Victim Crisis Unit

613- 236-1222, ext. 5822

Thank you very for making this research possible.

Appendix I

Demographic Questionnaire for Offender Sample

1. Do you speak English fluently?	No	Yes
2. Do you understand written English?	No	Yes
3. Do you understand spoken English?	No	Yes
4. Is English your first language?	No	Yes
5. Did you attend an English grade school (grades 1 to 8)?	No	Yes
6. Did you attend an English high school?	No	Yes
7. How old are you?		
Under 16		
16 to 18		
19 to 21		
22 to 25		
26 to 29		
30 to 35		
36 to 45		
45 +		
8. Are you at OCDC now because of a charge or conviction for a violent offence?	No	Yes
9. Before your current charges or convictions, were you ever charged or convicted for a violent offence?	No	Yes

Appendix J

Consent Form for Offender Participants

An informed consent form outlines the procedure, identifies any potential negative consequences, and provides contact information should you have any questions or concerns about the research that cannot be addressed by the experimenter. The main purpose of a consent form is to INFORM you of what you will be required to do so that you have adequate information to decide whether or not you wish to participate.

This research is being conducted by Samantha Balemba (Undergraduate Student, Department of Criminology, Carleton University, 613-520-2600, ext. 2649, sbalemba@connect.carleton.ca) under the supervision of Dr. Kevin Nunes (Assistant Professor, Department of Psychology, Carleton University, 613-520-2600, ext 1545; kevin_nunes@carleton.ca). For questions or concerns about this study please contact Samantha Balemba or Kevin Nunes. Should you have any ethical or any other concerns about this study, please contact Dr. Avi Parush, Chair of the Carleton University Ethics Committee for Psychological Research (613-520-2600, ext. 6026; avi_parush@carleton.ca) or Dr. Anne Bowker, Chair of the Psychology Department (613-520-2600, ext. 2648; psychchair@carleton.ca).

Participation in this study consists of one session of about 1 hour in a room at the Ottawa-Carleton Detention Centre (OCDC). You will be asked to complete some categorization tasks and questionnaires. The categorization tasks and questionnaires are designed to measure how people think about violence and crime.

You are also being asked to consent to the disclosure of your criminal record to the researchers. This information will be used by the researcher to see if there is a relationship between the measures completed today and the number and type of offences on record. Your file information will be accessed for the current study and for follow-up studies.

The information you provide will be used only for research purposes and your confidentiality will be respected and protected. Your information will **NOT** be shared with correctional staff or put on any institutional file. You will not be identified as a participant in the publication or presentation of the results. Your name, FPS number, and other personal information will **NOT** be written on the information you provide to protect your confidentiality.

Because some of the activities deal with sensitive information, they may be embarrassing or offensive. You are free to withdraw from the project at any time, refuse to participate, and refuse to answer questions. Refusal to participate will **NOT** affect your treatment by OCDC or the Courts in any way. Participation in this study will **NOT** affect any decisions concerning you, such as your sentence, security-level, institutional placement, parole, or the outcome of your case.

The information collected will be kept in a secure manner at Carleton University for a period of 5 years in a locked filing cabinet and password-protected computer, with any identifying information removed, and will be accessible only to the researchers working on this research.

I have read and understood the information above. My signature indicates that I agree to participate in this study. There are two copies of the consent form, one of which I may keep.

Participant Signature: _____ Date: _____

Experimenter Signature: _____ Date: _____

Appendix K**Demographic Questionnaire for Wii study**

How old are you? (16-17, 18-19, 20-24, 25-29, 30-34, 35-39, 40-49, 50-59, 60 or older)

Do you speak English fluently? (yes/no)

Do you understand written English? (yes/no)

Do you understand spoken English? (yes/no)

Is English your first language? (yes/no)

Did you attend an English grade school (grades 1 to 8)? (yes/no)

Did you attend an English high school? (yes/no)

How often do you usually play Wii Boxing? (once a day, once a week, once a month, once every two months, once every three months, once every four months, once every five months, once every six months, once every seven months or less)

How often do you usually play Wii Tennis? (once a day, once a week, once a month, once every two months, once every three months, once every four months, once every five months, once every six months or less, never)

How often do you usually play any Wii games? (once a day, once a week, once a month, once every two months, once every three months, once every four months, once every five months, once every six months or less, never)

How often do you play violent video games of any kind (Wii, X-Box, etc.)? (once a day, once a week, once a month, once every two months, once every three months, once every four months, once every five months, once every six months or less, never)

Appendix L

Semantic Differential Measures of Evaluation of Violence and Peace

Violence is:

Negative			Neutral			Positive
-3	-2	-1	0	1	2	3
Not Fun			Neutral			Fun
-3	-2	-1	0	1	2	3
Bad			Neutral			Good
-3	-2	-1	0	1	2	3
Wrong			Neutral			Right
-3	-2	-1	0	1	2	3
Immoral			Neutral			Moral
-3	-2	-1	0	1	2	3
Not Enjoyable			Neutral			Enjoyable
-3	-2	-1	0	1	2	3

Peace is:

Negative			Neutral			Positive
-3	-2	-1	0	1	2	3
Not Fun			Neutral			Fun
-3	-2	-1	0	1	2	3
Bad			Neutral			Good
-3	-2	-1	0	1	2	3
Wrong			Neutral			Right
-3	-2	-1	0	1	2	3
Immoral			Neutral			Moral
-3	-2	-1	0	1	2	3
Not Enjoyable			Neutral			Enjoyable
-3	-2	-1	0	1	2	3

Appendix M**Violent Behaviour Questionnaire****Response Scale****1=Once****2=Twice****3=Three times****4=Four times****5=Five times****6=Six times****7=Seven times****8=Eight times****9=Nine times or more****0=Never**

From when you were 16-years old to today, how many times have you:

18. Started a physical fight with someone?

19. Threatened to physically hurt someone?

20. Hit someone with the intention of hurting them?

21. Thrown objects such as rocks or bottles at someone with the intention of hurting them?

22. Used a weapon or force to make someone give you money or items?

23. Injured someone on purpose (e.g., left bruises, caused visible bleeding or broken bones, etc.)?

24. Ever been arrested for a violent offence (e.g., assault)?

25. Ever been convicted of a violent offence (e.g., assault)?

Appendix N

Violence Analogue

You're driving around looking for a parking space at the mall. It's really busy and there aren't many spaces. You've already been driving around for 20 minutes looking for a parking spot. Whenever you've seen a car leaving, there were already people waiting for the spot before you got there. You need to be somewhere in about 20 minutes, so if you don't find a space very soon you're not going to have time to get what you need from the mall. Suddenly, you see someone starting to back out of a spot just ahead of you. You pull up a bit closer and put on your turn signal to show that you're going to pull into that spot once it's empty. There is nobody else waiting for it but you. While you're waiting for the person who is leaving to pull out around you, another car approaches from the other side and pulls into the space before you can. You honk your horn. The person who took your spot looks at you, laughs, and gives you the finger.

1. Do you:

- A) Give him the finger
- B) Drive away and look for another parking spot

If B, end.

If A, then:

You give him the finger back. He gets out of his car and walks up to yours. He says, "What are you going to do about it, you fucking pussy? Nothing. That's what you're going to do. Nothing."

He dares you to get out of your car.

2. Do you:

A) Get out of your car and tell him to get out of your parking space

B) Drive away

If B, end.

If A, then:

You get out of your car. You tell him he stole your parking space and that he needs give it back and go find his own space. He starts laughing at you. He laughs and laughs for quite a while. He asks, "Who's going to make me move? You? I don't think so."

3. Do you:

A) Tell him that if he doesn't get out of your parking space, you're going to kick his ass.

B) Get back in your car and drive away

If B, end.

If A, then:

You tell him that you're going to kick his ass if he doesn't get out of your parking space.

Sarcastically, he says, "Oh, I'm scared. Stop scaring me." He pours his can of Pepsi on the hood of your car, smashes the empty can on your hood, and throws it at you. It hits you in the face, the jagged edges scratch you and the few remaining drops of Pepsi splash your face and shirt.

3. Do you:

C) Throw the can back at him

D) Get back in your car and drive away

If B, end.

If A, then:

You throw the can back at him and it hits him in the chest. He marches right up to you and challenges you to fight. He says, "Come on, pussy. You gonna fight or you gonna cry and run away? Let's go chickenshit."

4. Do you:

- A) Push him
- B) Get in your car and leave

If B, end.

If A, then:

You push him and he stumbles backwards a few steps. He steps forward and gives you a hard shove that sends you back a few steps. Then he spits on you.

5. Do you:

- A) Hit him
- B) Get in your car and leave

If B, end.

If A, then:

You step forward and punch him in the stomach. As he bends forward from the blow, you punch him in the side of his head. He kicks you hard in the ribs. You both step away from each other.

He says, "That's all you got, tough guy? Your mother has bigger balls than you."

6. Do you:

- A) Lunge at him and hit him harder

B) Get in your car and leave

If B, end.

If A, then:

You throw yourself towards him and knock him to the ground. You punch and elbow him in the head and neck several times. He blocks some of your punches and gets some of his own punches in on your face, stomach and ribs. He eventually throws you off of him. He stands up, calls you a pussy again, and spits on your car. He then kicks the side of your car, denting it.

7. Do you:

A) Attack him

B) Get in your car and leave

You charge towards him. He lands some good shots to your head and upper body. You get in a few shots of your own and finally land a punch that breaks his nose and sends blood gushing down his face. He crouches forward holding his nose. He screams, “You broke my fucking nose, asshole!”

8. Do you:

A) Hit him again

B) Get back in your car and leave

If B, end.

If A, then:

While he is crouched forward, you kick him hard in the face. It knocks his head up and he falls backwards holding his face and moaning. You walk around to his side and give him a hard kick

to the ribs. He screams, “Stop fucking hitting me! Enough already.” You kick him in the ribs and head a few more times. He’s moaning and seems like he might be crying. You sit on his chest and punch him in the face a few times. His nose is smashed, his lip is split, some of his teeth are broken, and he is bleeding from his mouth and nose. He says, “Get the fuck off me man. What’s your problem? Leave me alone.”

9. Do you:

- A) Smash his head against the ground
- B) Get off him, get in your car, and leave

If B, end.

If A, then:

You grab him by his ears and smash his head against the pavement. You do this once, twice, and a third time. He was begging you to stop after the first two times. After the third smash, he loses consciousness. He’s bleeding from his ears.

10. Do you:

- A) Stomp on his head
- B) Get off him, get in your car, and leave

END

Appendix O

Consent Form

An informed consent form informs you of what is expected from you as a participant to allow you to make an informed decision about whether you want to participate. Consent forms also details the procedure, lists any potential negative consequences, and provides contact information should any questions or concerns arise after the research, which cannot be answered by the researcher.

The present study is being conducted under the supervision of Dr. Kevin Nunes (Assistant Professor, Department of Psychology, Carleton University, 613-520-2600, ext 1545; kevin_nunes@carleton.ca). If you have any questions or concerns about this study please contact Kevin Nunes. If you are concerned about ethics or have any other concerns about this study, please contact Dr. Monique Sénéchal, Chair of the Carleton University Ethics Committee for Psychological Research (613-520-2600, Ext. 1155, monique_senechal@carleton.ca) or Dr. Janet Mantler, Chair of the Psychology Department (613-520-2600, ext. 4173; psychchair@carleton.ca).

Participation in this study consists of one session of about 45 minutes in an office at Carleton University. You will be asked to complete some categorization tasks and questionnaires and play or watch someone play a Wii game. The categorization tasks and questionnaires are designed to measure violent behaviour and how people think about violence.

Your responses will be anonymous; that is, nobody will know how you responded to the questions because your name will not be connected with your responses. The information you provide will be used only for research purposes and your confidentiality will be respected and

protected. In the publication or presentation of study results, you will **NOT** be identified as a participant.

Because some of the questions ask about your violent behaviour and some contain foul language, they may be embarrassing, offensive, or otherwise upsetting. Wii games can also be physically demanding and you should not participate if you are unable to sustain 15 minutes of physical activity. You are free to withdraw from the project at any time or refuse to participate altogether.

The information collected will be kept in a secure manner at Carleton University for a period of 5 years in a locked filing cabinet and password-protected computer and will be accessible only to the researchers working on this research.

This study has been approved by the Carleton University Ethics Committee for Psychological Research.

I have read and understood the information above. My signature indicates that I agree to participate in this study. There are two copies of the consent form, one of which I may keep.

Participant Signature: _____ Date: _____

Experimenter Signature: _____ Date: _____

Appendix P

Debriefing

Thank you very much for participating in this study. Without your participation, this research would not have been possible. I hope the following information addresses any questions and concerns you may have.

What Are We Trying to Learn in this Research?

The categorization task, which is called the Implicit Association Test (IAT), and some of the questionnaires you completed were designed to measure how positively or negatively one views violence. Some participants in this study are exposed to a violent video game – they either play Wii Boxing or watch someone else play it. Other participants are exposed to a non-violent video game – they either play Wii Tennis or watch someone else play it. We are trying to find out if exposure to violent video games makes violence seem more positive and makes one more likely to be violent.

Why Is This Important to Scientists or the General Public?

Violent behaviour has many negative consequences both for victims and perpetrators. Victims obviously suffer, but people who behave aggressively can also face negative outcomes, such as arrest and prison time. It is important to explore whether there is a causal link between violent behaviour, evaluation of violence, and likelihood of future violence. It is also important to examine whether exposure to violent peers has a similar effect on evaluation of violence and likelihood of violence. Although there is good evidence that past violent behaviour and violent peers predict future violence, little research has been done to explore the role evaluation of violence may play.

What are our Hypotheses and Predictions?

We expect that men exposed to the violent video game will view violence more positively and will choose more violent responses in the parking lot story.

What if I Have Questions Later?

Please direct any questions or concerns about this research to Dr. Kevin Nunes. If you are concerned about ethics or have any other concerns about this study, please contact Dr. Monique Sénéchal, Chair of the Carleton University Ethics Committee for Psychological Research or Dr. Janet Mantler, Chair of the Psychology Department. The contact information for these people is provided in your copy of the consent form.

Is There Anything I Can Do if I Found This Experiment to be Emotionally Draining?

If you experience any distress as a result of this study, please seek help from one of the following sources as soon as possible.

Carleton University Health and Counselling Services	613-520-6674
Distress Centre of Ottawa and Region	613-238-3311
Ottawa Police Service Victim Crisis Unit	613- 236-1222, ext. 5822

Thank you very for making this research possible.