

**AN EXPLORATION OF THE RELATIONSHIP BETWEEN
EXPOSURE TO VIOLENT VIDEO GAMES AND MORAL
REASONING ABOUT VIOLENCE**

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Thesis Abstract

The overarching aim of this thesis was to explore the relationships between violent video games (VVGs), moral reasoning about violence, empathy and aggression. This was achieved through a systematic review, psychometric critique, empirical study and a single case study. A systematic review of the association between violent video games exposure (VVGE) and moral development suggested a knowledge gap in the relationship between VVGs and moral reasoning. It also highlighted potential difficulties in measuring moral reasoning as a global construct. Hence, a more specific aspect of moral reasoning was examined in this thesis - moral reasoning about justified and unjustified violence. A critique of the Moral Interpretations of Interpersonal Violence (MIIV) was conducted to review its suitability as a measure of moral reasoning about violence. Results of the systematic review and psychometric critique informed the design of the empirical study which found that VVGE was positively associated with perceptions of justified violence as being acceptable in males. VVGE also predicted moral reasoning about justified violence in males, even after controlling for empathy, childhood exposure to and experience of violence. There was no evidence that moral reasoning about violence mediated the relationship between VVGE and aggression. As the empirical study focused on a non-offending sample using a quantitative design, a qualitative approach was taken to explore the relationships between

the variables of interest in a female offender with a violent offence. Findings from the four pieces of work culminated in a proposed integrated model reflecting the associations between media violence, moral reasoning, empathy and aggression/offending.

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Chapter 1 : Introduction

Research on the impact of violent video games (VVGs) continues to be an area of interest despite decades of extensive research. This, in part, driven by the lack of consensus amongst researchers in the field. While several reviews and meta-analyses showed support that playing VVGs could impact on aggressive affect, cognitions and behaviour (e.g., Anderson et al., 2010; Calvert et al., 2017; Prescott, Sargent, & Hull, 2018), others reported no evidence of the link between VVGs and aggressive behaviour or minimal effects of VVGs on adverse outcomes (e.g., Ferguson, 2015; Furuya-Kanamori & Doi, 2016; Przybylski & Weinstein, 2019). Further, there were concerns that the increased popularity of video games as a leisure activity (Király et al., 2018; Przybylski & Weinstein, 2019), as well as the increased accessibility and enhanced realism of violence portrayal in VVGs (Lin, 2013; Sestir & Bartholow, 2010) could aggravate the impact of VVGs on players' aggressive behaviours.

Incidents of mass shootings, violent crimes or reports of young persons being groomed online and falling prey to online offences while engaging in VVGs with other online players have also sparked public concerns regarding the impact of VVGs. Attention was also drawn to the possibility that VVGs could impact on children's moral development and moral values (Yang, 2013), which in turn would lead to adverse outcomes, as lower levels of moral reasoning has been

found to be related to higher levels of aggressive and antisocial behaviours (Palmer, 2005). Despite concerns about the impact of video gameplay on the development of moral reasoning, Yang (2013) noted that there has been relatively few research examining the impact of media violence on moral development. The current thesis thus aimed to add to the existing literature by examining the relationship between engagement in VVGs and moral development.

Theories of Moral Reasoning

Jean Piaget's (1932) work on the cognitive development of children has been an early influence in the development of moral reasoning theories, and it was based on this work that Lawrence Kohlberg (1958, 1969) subsequently developed his theory of moral reasoning (Palmer, 2003). John Gibbs (1979) in turn revised the work of Kohlberg and developed his theory of sociomoral reasoning. It was not the intent of this thesis to critically evaluate each of these theories. A summary of each theory would instead be discussed to provide a brief background of the key moral reasoning theories.

Piaget's Theory of Moral Reasoning

Piaget's theory of moral reasoning stemmed from his research into children's development of logical reasoning abilities. He identified four stages through which children progress in this development process: (i) the sensorimotor stage (from birth to 18 months); (ii) the preoperational stage (18 months to 6 years); (iii)

the concrete operational stage (6 years to early adolescence); (iv) and the formal operational stage (from early adolescence onwards) (Piaget, 1952 in Palmer, 2003).

As children move through these stages, the ways in which they make sense of the world increase and become more complex, shifting from relying on physical attributes perceived through their sensory and motor skills (such as taste or touch), to forming mental categories, and employing more general, abstract, and complex rules and strategies. Similar to the development of logical reasoning abilities, Piaget (1932) considered the acquisition of moral reasoning to be a developmental process occurring in phases, where moral judgements are formed and developed based on one's social experiences over time. He was also of the view that the development of moral reasoning was contingent on the development of logical reasoning. Hence, one could possibly be of a higher logical reasoning stage than moral reasoning stage, but not vice versa (Palmer, 2003).

Kohlberg's Theory of Moral Reasoning

Riding on Piaget's work, Kohlberg (1958) subsequently developed his moral reasoning theory which extended beyond childhood into adolescence (Palmer, 2003). Similar to Piaget's theory, Kohlberg's theory of moral reasoning also consisted of stages and he considered these stages to be related to one's general cognitive development just as Piaget did. One difference between the two was that instead of four stages, Kohlberg categorised moral reasoning into

six stages which mapped onto three levels of moral reasoning – preconventional (Stages 1 and 2), conventional (Stages 3 and 4) and postconventional (Stages 5 and 6). Moral development is reflected by the progression from the lower stages to the higher stages, with the type of reasoning becoming more complex and more abstract at each stage.

While largely taking a cognitive-developmental perspective, Kohlberg also saw the importance of social perspective-taking in moral reasoning (Palmer, 2003); individuals would take into account the perspective of others (e.g., others' points of view, thoughts, feelings, wishes, etc.) in deciding if an action is morally right or wrong. He conceptualised the development of moral reasoning as one that begins from a more self-centred view at the preconventional level (Stages 1 and 2), where individuals demonstrate little or no understanding of social rules and conventions. The social perspective adopted at this level is thus more concrete and individualistic. How 'right' and how 'wrong' a behaviour is would be judged by whether the behaviour in question would result in punishment from authority figures (Stage 1). In Stage 2, moral judgement is based on "concrete moral reciprocity" – pragmatic deals where behaviour is justified on the basis of what other people have done or would do (Gibbs, 2014).

Progressing to the conventional level of moral reasoning (Stages 3 and 4), individuals start to incorporate an understanding of society's conventions and the need to maintain them. This is first

focused on the social perspectives of those within their personal network, i.e., meeting the needs and maintaining the relationships with family and friends (Stage 3), before expanding to include the wider societal system where behaviours are judged based on what is fair and just to everyone within the social system (Stage 4).

At postconventional level of moral reasoning (Stages 5 and 6), individuals start to make a distinction between their own values and the societal rules and conventions. They adopt the perspective that individuals have rights despite the presence of societal contracts and law, and that the latter could be broken under certain circumstances (Stage 5). Ultimately, moral reasoning would be based on individuals' own values, moral and ethical principles and these might override that of the society's when the two are in conflict in order for the individual to maintain a consistent set of moral principles (Stage 6). Nonetheless, Kohlberg acknowledged that not everyone would reach the postconventional stage.

Gibbs' Theory of Sociomoral Reasoning

Gibbs subsequently revised Kohlberg's model and named the revised model the theory of "*sociomoral* reasoning" instead of *moral* reasoning to reflect the emphasis placed on social perspective-taking, and being able to understand the nature and importance of the relations between people (Gibbs, Basinger, & Fuller, 1992/2015). Further, considering the lack of strong evidence for Kohlberg's postconventional level of reasoning, Gibbs proposed that moral

development consisted of two overlapping phases – immature and mature, with two stages within each phase which essentially were the first four stages in Kohlberg’s theory of moral reasoning (Gibbs, 1979).

The first two stages were deemed to be ‘immature’ as moral reasoning at these stages tended to be egocentric, concrete, and superficial, and were typical of younger children. Stages 3 and 4, typically noted in late childhood and adolescence, were considered to be at the ‘mature’ level as moral reasoning at these stages demonstrated an understanding of interpersonal relationships and took into consideration societal norms and values. Gibbs’ model also gave greater emphasis to the role of empathy in moral reasoning, stating that social perspective-taking and decentration (adopting a less superficial, more-balanced, wider and more comprehensive perspective) would likely result in emotions such as empathy and sympathy for others, which in turn would serve to influence and motivate one’s moral judgements and behaviours (Palmer, 2003).

Definition and Measurement of Moral Reasoning

In investigating the impact of VVGs on moral reasoning, some researchers (e.g. Bajovic, 2013; Hodge, Taylor, & McAlaney, 2019) have adopted Gibbs’ theory of sociomoral reasoning to examine how violent video games exposure (VVGGE) was related to one’s level of moral maturity as reflected by the four stages of moral reasoning (Gibbs, 1979). In these studies, the Sociomoral Reflection Measure-

Short Form (SRM-SF) (Gibbs et al., 1992/2015), a validated tool developed based on Gibbs' theory of sociomoral reasoning, was utilised for the assessment of participants' moral stage reasoning.

Other researchers, however, were more concerned with how VVGE related to one's attitudes towards the use of violence and have conceptualised moral reasoning in terms of constructs associated with the use of violence and aggression. For instance, in investigating the effects of VVGs on moral evaluation (i.e., how individuals evaluated the appropriateness of aggressive behaviours), Funk, Buchman, Jenks, and Bechtoldt (2003) defined moral evaluation as involving the processes of affective (empathy) and cognitive (attitudes) desensitisation. Funk et al. (2003) thus utilised measures of empathy and attitudes towards violence as indicators of moral evaluation.

There were also studies examining the influence of media violence on moral reasoning that focused specifically on moral reasoning about violence (i.e., how acceptable an individual considered an act of violence to be) rather than the development of moral reasoning as a whole (e.g. Krcmar & Valkenburg, 1999; Vieira & Krcmar, 2011). A distinction was also made between the contexts of 'justified' versus 'unjustified' violence. From a social learning perspective, it was hypothesised that an exposure to justified violence (i.e., violence used to solve problems or to protect others) without corresponding punishment or consequences would likely influence

viewers to see violence as a right or acceptable way of resolving interpersonal conflicts.

The primary focus of this thesis centred on how exposure to violence in video games relate to individuals' perception of the rightfulness or wrongfulness of violence acts, and consequently the engagement in aggressive behaviours. Hence, the more specific definition of moral reasoning about justified and unjustified violence was adopted, rather than to examine the stage of moral development as a whole.

Taking reference from the work of Krcmar and Valkenburg (1999) and Vieira and Krcmar (2011), the Moral Interpretations of Interpersonal Violence (MIIV) (Krcmar & Valkenburg, 1999) was adopted in this thesis as the outcome measure for moral reasoning about violence. In gist, the MIIV comprised four vignettes depicting scenarios where the main characters had used physical violence as a means of resolving problems (see Chapter 3 for a more detailed description of the MIIV). Respondents would have to rate how right or wrong they felt the main characters were to use violence. The MIIV appeared apt for use in the current research as it covered scenarios depicting both justified and unjustified violence. In addition, violence described in the vignettes encompassed the key elements reflected in the definition of 'violence' – used in the context of an interpersonal conflict and used with the intent to inflict harm. This is further discussed in the subsequent section.

Definition and Measurement of Violence

From a risk assessment and management perspective, the criterion of concern is general interpersonal violence, and violence is defined as “any actual, attempted or threatened infliction of bodily harm on another person” (Douglas et al., 2014, p. 100). Bodily harm would include both physical and serious psychological harm.

This definition of violence was also reflected in how VVGs have been defined. VVGs would generally involve some form of physical violence and/or verbal violence (Yao, Zhou, Li, & Gao, 2019). These would be games that portrayed, or showed a simulation of, interpersonal violence where a player would intentionally attempt to inflict harm on others e.g., kills or causes serious physical harm to another (Anderson & Bushman, 2001; Bajovic, 2013). Examples of serious physical harm included death, dismemberment, decapitation, maiming, mutilation of body parts, etc to name a few (Bajovic, 2013).

Applying these definitions to the current research, VVGs were taken to be those that were rated by the Entertainment Software Rating Board (ESRB) as Mature 17+ and above, or by the Pan European Game Information (PEGI) as PEGI 16+ and above as these games would have been described as containing realistic and/or intense violence (i.e. graphic and realistic portrayal of physical conflict, depictions of human injury and death), as well as blood and gore (realistic depictions of blood or mutilation of body parts). Video games that might contain aggressive acts in the context of a

competitive sports were excluded from the current research as the use of violence in such circumstances might not be to intentionally inflict harm on the other party. Further, taking into account the definitions of violence, outcome measure of acts of aggression focused on both physical and psychological (including verbal aggression) violence that have taken place in the context of interpersonal interactions.

Organisation of the Thesis: Introducing Chapters 2 through 6

In this thesis, after the Introduction in **Chapter 1**, **Chapter 2** presents the results of a systematic review conducted to synthesise findings from existing literature investigating the relationship between VVGE and moral reasoning. The literature search for the systematic review included several related terminologies typically seen in literature relating to moral development, such as moral reasoning, moral judgement, moral justification, moral evaluation, moral disengagement, to name a few. The systematic review attested to the dearth of research in this area and the need to plug the knowledge gap.

From the systematic review, it was also evident that there were very few measures of moral reasoning specifically developed or applied to studies examining the relationship between VVGE and moral reasoning about violence. Searching for the appropriate moral reasoning measure was thus a challenge. While the MIIV (Krcmar &

Valkenburg, 1999) was reportedly developed for use in examining moral reasoning about violence, it has not been as widely used as other measures. A psychometric critique of the MIIV and an evaluation of its suitability for use in the current research was carried out and reported in **Chapter 3**.

Taking in findings from Chapters 2 and 3, an empirical study was designed and conducted to examine the relationship between VVGE, moral reasoning about violence, empathy and aggression. Considerations of the definitions and measurement of moral reasoning and violence were also factored into the conceptualisation of the study. The study examined the relationship between empathy and moral reasoning about violence, as well as that between VVGE and moral reasoning about violence. With childhood exposure and experiences of violence as a covariate, the study also investigated if moral reasoning about violence mediated the relationship between VVGE and aggression. Details and results of the empirical study are reported in **Chapter 4**.

Chapter 4 also included an exploratory analysis of differences between a non-offending and an offending sample. Nonetheless, the small sample size of the offending sample limited the quantitative analyses that could be conducted. The relationship between violent media, moral reasoning, empathy and aggression in an offending sample was thus investigated through qualitative means by employing a single case study design as presented in **Chapter 5**.

Finally, **Chapter 6** of this thesis provided a summary of the various pieces of work at Chapters 2 to 5 and attempts to integrate the findings across the thesis into a coherent model. Implications and applicability of the findings, as well as possible future directions were also discussed in the concluding chapter.

Chapter 2 : A Systematic Review of the Relationship Between Violent Video Games and Moral Development or Related Moral Components

Abstract

Concerns have been raised about the impact of VVGs on moral development though research in this area has been relatively sparse and no systematic review has been conducted. This systematic review thus aims to plug the gap and explore if a relationship exists between VVGE and moral development or related components such as moral reasoning, moral evaluation and moral disengagement. Fifteen bibliographic databases, gateways and grey literature sources were comprehensively searched to identify all relevant literature. Studies were also identified through hand-searching. The search yielded a total of 2596 citations, of which 301 were duplicates, 2271 were assessed to be irrelevant, and 14 did not meet inclusion criteria. This resulted in a total of ten citations for the review. All ten studies were quality-assessed based on pre-defined criteria and 50% of the studies were quality-assessed by a second independent reviewer. Inter-rater reliability was high ($Kappa=1.00$, $p=.002$). All ten studies were included for data extraction and synthesis. The review indicated that VVGE was positively related to moral disengagement and moral disengagement mediated the impact of VVGE on aggression. The relationship between VVGE and moral reasoning was less clear due to

inconsistent findings. Only one study examined VVGE and moral evaluation so no firm conclusions could be drawn. Age and gender were found to be possible covariates. The review also highlighted the need for greater clarity in the concept and construct of the various moral components in future research.

Background

In the last two decades, technological advances have increased the accessibility to video games and enhanced the interactivity and realism of violence portrayal in games. Consequently, this has generated much attention and research interest in the impact of VVGs as some believed that such advances in violence portrayal in games could potentially worsen the impact of VVGs on aggressiveness (Lin, 2013; Sestir & Bartholow, 2010). While some researchers suggested that the concerns surrounding the negative impact of VVGs could be a wave of moral panic (Markey & Ferguson, 2017), there were also concerns raised about the impact of VVGs on children's moral development and moral values (e.g., Yang, 2013) given that lower levels of moral reasoning has been found to be associated with aggressive and antisocial behaviours (Palmer, 2005).

Despite the interest and concerns raised, there has been relatively few research examining the impact of media violence on moral development (Yang, 2013). A scoping exercise also showed that there was no existing systematic review or meta-analysis of this topic, suggesting that a systematic review of the relationship between VVGE and moral development would be a useful addition to the existing literature. The preliminary search for the scoping exercise was done on the following databases in December 2019: Campbell Collaboration, Cochrane Library, Database of Abstracts of Reviews of Effects (DARE), Evidence for Policy and Practice Information and Co-

ordinating Centre (EPPI Centre) Evidence Library, Joanna Briggs Institute (JBI), Medline, PsycINFO, and the University of Birmingham and University of Nottingham e-thesis portals.

Although the preliminary search did not find any systematic review or meta-analyses, it yielded a number of reports and articles related to moral development. A scan of these papers revealed that various terms related to 'moral development' were often used in the literature, such as 'moral reasoning', 'moral judgement', 'moral evaluation' and 'moral disengagement'. This reflected the need to include these various moral components in the systematic review.

Aims & Objectives

The aim of this systematic review was thus to determine the relationship between exposure to VVGs and moral development, or related moral components, based on existing literature. Having clarity on this would serve as a first step for subsequent research examining the role of VVGE on moral development and consequently implications for prevention and intervention. The objective of the review was to address the key questions:

- (i) Is there a relationship between engagement in VVGs and moral development, moral disengagement, moral evaluation, moral judgement and moral reasoning?
- (ii) What is the nature of this relationship, if any?
- (iii) What are the research gaps to be addressed in future?

Method

Inclusion and Exclusion Criteria

Studies were eligible for inclusion if they met the following criteria based on the PICO elements (Population, Intervention, Comparator, and Outcome) recommended in the Cochrane Handbook for Systematic Reviews of Interventions (McKenzie et al., 2019):

- (i) *Population*: A general or non-offending population with no limits on gender and age to include as many relevant articles as possible. A non-offending population was chosen as an offending population might present with other risk factors that could mask the impact of VVGs on their moral development and delinquent behaviours. Including both groups in this review and for separate data synthesis was not feasible as the scoping exercise did not find any relevant studies examining VVGE and moral components in the offending population.
- (ii) *Intervention/Exposure*: An exposure to VVGs, where the violence is not in the context of a competitive sport.
- (iii) *Comparator*: Individuals who were either exposed to a non-VVG, or not exposed to any video game.
- (iv) *Outcome*: Studies were included if they measured moral development or related moral components such as moral evaluation, moral judgement, moral reasoning, and moral disengagement as the outcome variable of interest.

The review included studies published between 2000 and 2019. This would have captured a large proportion of the relevant research given that Anderson et al. (2010) had noted a proliferation of studies investigating the effects of VVGs after 2004. Further, with the advancement in technology, studies in the last two decades would have examined VVGs that were more interactive, more graphic and more realistic than those before the 2000s. Hence, the selected time span was deemed appropriate.

Studies that were correlational, cross-sectional, experimental or longitudinal were included in the review. Reviews (e.g. book reviews, narrative reviews, or other systematic reviews and meta-analyses), opinion papers (e.g. editorials, commentaries, news), qualitative studies, case-series, and single-case experimental designs were excluded. To avoid publication bias and ensure that all relevant studies would be included, no limitation was set on the language. A copy of the Inclusion Criteria Form is provided in Appendix A.

Sources of Literature

Articles for the systematic review were located through comprehensive searches of the following electronic bibliographic databases: ASSIA via PROQUEST (2000-2019), EBSCO (2000 - 2019), OVID Embase (1974 to 6 December 2019), Ovid MEDLINE(R) (ALL 1946 to 04 December 2019), OVID PsycINFO (1806 to December Week 1 2019), PubMed (2000 to 23 December 2019), Scopus (2000-2019), and Web of Science (core collection) (2000-2019). Gateways

and grey literature sources were also searched. This included: Cochrane Library (publication date not limited as the search yielded no returns), National Criminal Justice Reference Service (NCJRS) (2000–2019), OpenGrey (2000 to 9 December 2019), Google Scholar (2000–2019), NICE Evidence Search (2000 to 11 December 2019), DART-Europe E-theses Portal (2000 to 11 December 2019) and PROQUEST Dissertations & Theses A&I (2000–2019). Due to the high number of returns for some of the searches conducted on Google Scholar, only the first 200 entries were imported when the search yielded more than this number as visual examination of those beyond 200 revealed that the articles were irrelevant. Three articles were identified through hand-searching.

Search strategy

The following terms were used for the search:

videogam* OR (video (game* OR gaming)) OR (online (game* OR gaming)) OR (computer (game* OR gaming)) OR (arcade (game* OR gaming))

AND

"moral reasoning" OR "moral development" OR "moral judgment" OR "moral evaluation" OR "moral disengagement"

The specific search strategies for ASSIA, NCJRS, OVID Embase, OVID MEDLINE, OVID PsycINFO, PubMed, and Web of Science are provided in Appendix B. Similar search strategies were adopted for

the other search sources, with slight amendments to fit the syntax unique to the respective databases.

Study Selection

Study selection was done through a two-stage process. Titles and abstracts of the records generated from the search were first screened for relevance based on the pre-defined inclusion/exclusion criteria set out in Appendix A. Studies that were clearly unrelated to this review were excluded. Full text was next extracted for the remaining records and reviewed again using the Inclusion Criteria Form. Only those that met all inclusion criteria were retained for quality assessment and data synthesis.

Quality Assessment

Each selected study was assessed for its risk of bias using a Quality Assessment Pro Forma (Appendix C), adapted from the National Heart, Lung, and Blood Institute Study Quality Assessment Tools (NHLB, undated) and the Newcastle-Ottawa Quality Assessment Scale (adapted for cross-sectional studies) (Modesti et al., 2016). The quality assessment checklist assessed the risk of bias in six domains: (A) Sampling and selection bias; (B) Measurement bias for exposure; (C) Measurement bias for outcome; (D) Attrition bias; (E) Statistical bias; and (F) Reporting bias and other bias. Taking guidance from the Cochrane Handbook for Systematic Reviews of Interventions (Higgins, Savović, Page, Elbers, & Sterne, 2019), signalling questions were included in each domain to ensure that the

relevant information would be consistently extracted across all studies. The response options for each signalling question were 'Yes' - if there was evidence to support the statement, 'Partial' - if evidence supported the statement to some degree, 'No' - if the evidence did not support the statement, and 'Unclear' - if there was insufficient information for the assessment.

Based on the ratings on all signalling questions, each domain is assigned a risk-of-bias judgement of either 'Low', 'High' or 'Unclear'. An overall quality rating of 'Poor', 'Fair', or 'Good' was then assigned taking into consideration the risk of bias in each of the domains.

All studies were quality assessed by the primary researcher. A second reviewer (a Doctorate in Forensic Psychology trainee familiar with the systematic review process) also independently assessed 50% of the articles (i.e., $n=5$). For items and domains where ratings differed, the two reviewers discussed each other's justifications and adjustments were made independently after the discussion. Most of the differences in ratings were easily resolved as they arose out of a misinterpretation of the signalling question, an oversight of evidence presented in the study or inconsistency within the reviewer in how ratings were assigned. An inter-rater reliability analysis using the Kappa statistic was performed to determine consistency between the two raters. The inter-rater reliability for a single measure (overall quality rating) was found to be in almost perfect agreement with $\text{Kappa}=1.00$ ($p=.002$).

Data Extraction

Following the quality assessment, all studies were put through the data extraction process. Data was extracted using a pre-defined Data Extraction Pro Forma included in Appendix D. For each study, information relating to the following was extracted: (i) Confirmation of eligibility for inclusion; (ii) Participant characteristics (e.g. target population, sample size, demographics); (iii) Study characteristics (e.g. study design, recruitment procedure, variables collected, comparison group, exclusion criteria if any); (iv) Exposure (e.g. definition of exposure variable, type of variable, exposure measure, reliability and validity of exposure measure); (v) outcome (e.g. outcome variable, definition of outcome variable, type of variable, outcome measure, reliability and validity of outcome measure, number of follow-up measurements); (vi) statistical analysis (e.g. statistical tests conducted, covariates, handling of missing data, power analysis); (vii) results of statistical tests; and (viii) summary and other information (e.g., key conclusions, limitations).

Results

Description of Studies

A total of 2593 citations were identified through a comprehensive search of databases, gateways and grey literature. From this, 301 duplicates were removed, leaving 2292 citations to be screened for selection. In the process of screening the records, an

additional three articles were hand-searched and added to the pool as these were cited in some of the studies but not identified through the database searches. In all, 2295 citations were screened.

After screening through titles and abstracts, 2271 citations were excluded as these were found to be irrelevant to the review topic. For the remaining 24 citations, full text was extracted to assess for eligibility. Of these 24 citations, 14 did not meet inclusion criteria. Two of these 14 articles extracted were not in English (both in Portuguese). Nonetheless, one of them contained an English translation of the abstract which provided sufficient information to assess eligibility for inclusion. For the other, the abstract was translated to English using three different online translation tools. The translated versions were largely consistent across the three online translation tools and this provided adequate information to assess for inclusion eligibility. A graphical representation of the study selection process is provided in the PRISMA Flowchart (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009) shown in Figure 2.1. Reasons for the exclusion of the 14 references were also indicated in the flowchart. Ultimately, ten citations were assessed to have met the inclusion criteria and were retained for the final analysis.

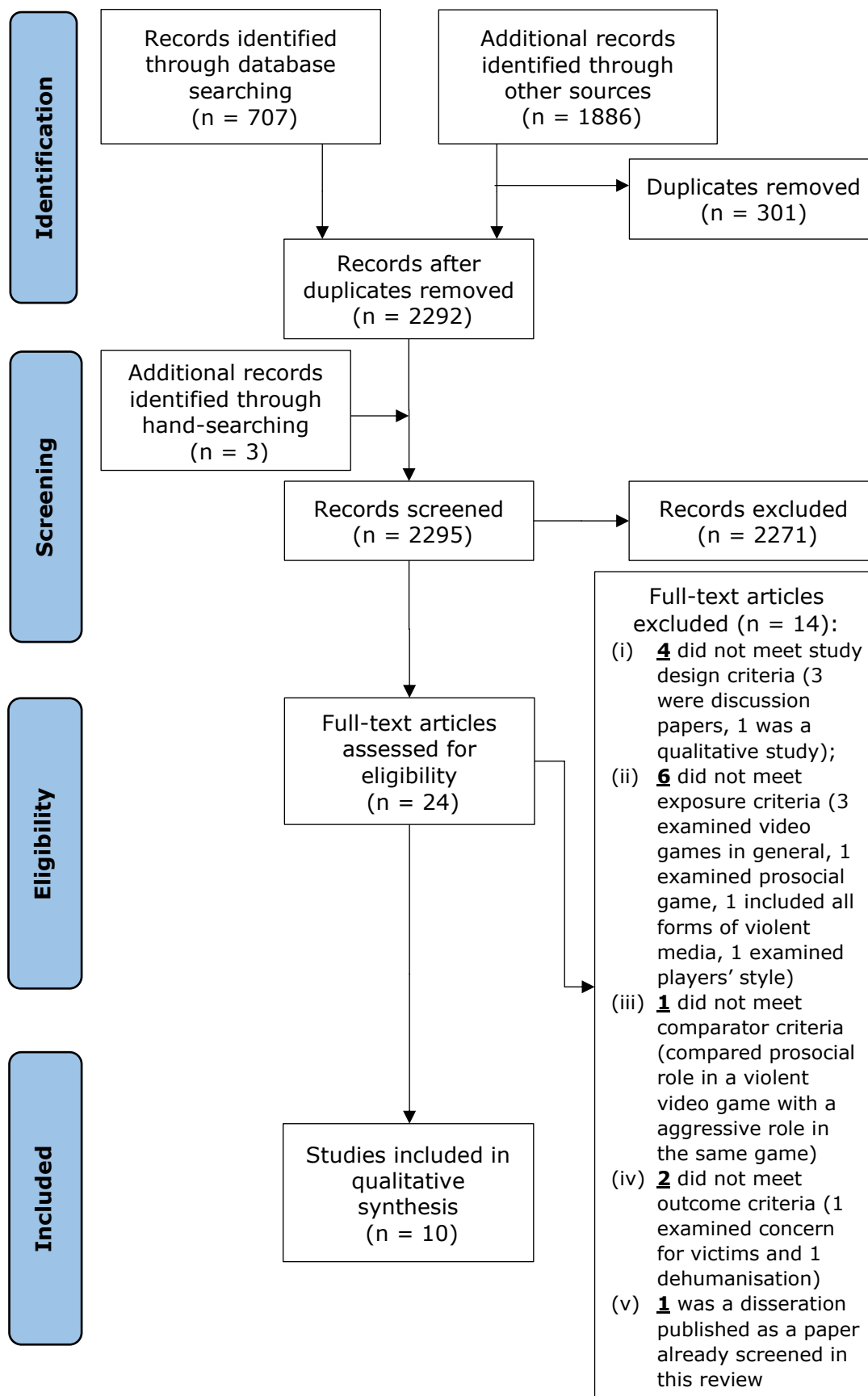


Figure 2.1. Study Selection Flowchart

Characteristics of Included Studies

A summary of the characteristics of the ten studies selected for the review is presented in Table 2.1. The overall number of participants included in the review was 5529 (49.38% male; 50.48% female; 0.14% gender unknown). Majority of the selected studies (80%) targeted children and adolescents (between 5 and 20 years old). Only two studies had an adult sample (between 16 and 60 years old). Participants were from both Western (six studies) and Eastern cultures (four studies). In terms of study design, 80% of the studies reviewed were cross-sectional. One of these studies also included an experimental component to investigate short-term effects of VVGE. The remaining two were longitudinal studies, with a follow-up period of 12 months and 10 months respectively.

To measure VVGE, all studies used some form of self-report questionnaire on gameplay habits to assess engagement in VVGs. There were however variations in how VVGE was determined. Half of the studies measured VVGE as a continuous variable by means of a VVGE index. While the algorithm to calculate VVGE index differed slightly across the studies, it generally took into consideration both the violent content of the game(s) played and the play frequency. Three of the included articles measured VVGE as a categorical variable, using information from the gameplay questionnaire to determine if a participant has engaged in VVG or non-VVG. The remaining two articles measured VVGE as both a categorical (Yes/No)

and continuous (extent of VVGE) variable. Of the ten studies, only two studies used specific VVGs as the exposure – one study identified Grand Theft Auto (GTA) as the target VVGE and another assigned participants to either a VVG or a non-VVG as part of the experimental manipulation. All other remaining eight studies did not specify any particular VVGs as the exposure criteria.

In terms of measurement of outcome, all the selected studies measured the outcome as a continuous variable. Three of the studies investigated relationship between VVGE and moral reasoning, one study looked at moral evaluation and the remaining six studies examined moral disengagement.

Results across the ten studies were mixed. The three studies examining relationship between VVGE and moral reasoning all showed different results – one study concluded that there was a negative relationship between VVGE and moral reasoning, one found no relationship, and the other found partial support for a positive relationship between VVGE and perceptions of justified violence as acceptable. For moral evaluation, the study revealed no relationship between VVGE and moral evaluation in the short-term, but partial support for a negative relationship in the longer-term. Results were more consistent in terms of the relationship between VVGE and moral disengagement. Three of the six studies found a positive relationship while the remaining three found a positive relationship between VVGE and moral disengagement under specific circumstances.

Table 2.1.
Summary of the Characteristics of Studies Included (N=10)

	1. Bajovic (2013)	2. Funk et al. (2003)	3. Gabbiadini, Andrighetto, and Volpato (2012)	4. Hodge et al. (2019)	5. McLean and Griffiths (2018)	6. Teng et al. (2019)	7. Teng, Nie, Guo, and Liu (2017)	8. Teng, Nie, Pan, Liu, and Guo (2017)	9. Vieira and Krcmar (2011)	10. Yao et al. (2019)
Participants' Characteristics										
Target population (Total sample size; Male, Female)	Adolescents (109; 61M, 48F)	Younger & older children (Younger:31; 14M, 17F) (Older:35; 25M, 10F)	Adolescents (385; 199M, 186F)	Adolescents (166; 78M, 88F)	Adults (605; 300M, 305F)	Chinese adolescents (Time 1 (T1): 1340; 604M, 736F) (T2: 1208; 560M, 648F) (T3: 1086; 469M, 617F)	Chinese adolescents (761; 404M, 357F)	Chinese adolescents (1384; 670M, 706F, 8 unknown gender)	Children (166; 110M, 56F)	Adult college students (547; 265M, 282F)
Age range (Mean; SD)	13–14 yrs old (Mean and SD not reported)	Younger: 5–7 yrs old (5.61; .62) Older: 8 - 12 yrs old (10.14; .97)	14–20 yrs old (16.20; 1.43)	11–18 yrs old (13.08; 1.91)	17–60 yrs old (23.6, 8.1)	12–19 yrs old (T1: 14.86, 1.50) (T2: 15.30, 1.48) (T3: 16.12, 1.49)	12–15 yrs old (13.17, .65)	12–18 yrs old (14.54, 1.54)	7–15 yrs old (11.58, SD not reported)	16–26 yrs old (19.34, 1.01)
Coun- try	Canada	United States	Italy	United Kingdom	Ireland	China	China	China	United States	China
Study Characteristics										
Study design	Cross- sectional	Experimental (short-term effects) Cross-sectional (long-term effects)	Cross- sectional	Cross- sectional	Cross- sectional	Longitudinal, 18-mths, 3 waves (T1, T2 & T3), each wave 6 mths apart	Cross- sectional	Longitudinal, two waves of data collection, 5 mths apart	Cross- sectional	Cross- sectional

	1. Bajovic (2013)	2. Funk et al. (2003)	3. Gabbiadini, Andrighetto, and Volpato (2012)	4. Hodge et al. (2019)	5. McLean and Griffiths (2018)	6. Teng et al. (2019)	7. Teng, Nie, Guo, and Liu (2017)	8. Teng, Nie, Pan, Liu, and Guo (2017)	9. Vieira and Krcmar (2011)	10. Yao et al. (2019)
Exposure group (sample size)	Violent video game (VVG) players (45)	Short-term effects: Younger (16) & older (18) children who played a given VVG	Grand Theft Auto (GTA) players (209)	VVG players (71)	VVG players (192)	VG players (1086)	VG players (761)	VG players (1393: 694 middle school & 699 high school)	VG players (166)	VG players (547)
Comparison group (sample size)	Non-VVG players (51)	Long-term effects: VVG players Short-term effects: 15 mins of non-VVG play Long-term effects; compared various levels of VVG exposure (VVGE)	Non-GTA players (169)	Non-VVG players (32)	Competitive sports players (185) & Non regular VG players (228)	NA Comparing varying levels of VVGE within the sample	NA Comparing varying levels of VVGE within the sample	NA Comparing varying levels of VVGE within the sample	NA Comparing varying levels of VVGE within the sample	NA Comparing varying levels of VVGE within the sample
Exposure										
Exposure variable	VVGE	VVGE	Exposure to GTA	VVGE	VVGE	VVGE	VVGE	VVGE	VVGE	VVGE
Categorical/Continuous	Categorical and continuous	Categorical and continuous (extent of VVGE)	Categorical	Categorical	Categorical	Continuous (extent of VVGE)	Continuous (extent of VVGE)	Continuous (extent of VVGE)	Continuous (extent of VVGE)	Continuous (extent of VVGE)

	1. Bajovic (2013)	2. Funk et al. (2003)	3. Gabbiadini, Andrighetto, and Volpato (2012)	4. Hodge et al. (2019)	5. McLean and Griffiths (2018)	6. Teng et al. (2019)	7. Teng, Nie, Guo, and Liu (2017)	8. Teng, Nie, Pan, Liu, and Guo (2017)	9. Vieira and Krcmar (2011)	10. Yao et al. (2019)
Measure used	Self-report questionnaire on game-play habits adapted from Media Self-report Questionnaire (Elliot, 2006) VVG play - Y/N, time playing VVG (continuous & categorical -1, 2, 3/more hrs a day)	Short-term effects: A VVG & a non-VVG Long-term effects: self-report questionnaire on game-play habits VVGE = proportion of video game choices child categorised as violent x weekly play time x length of time playing in mths	Self-report questionnaire on game-play habits on GTA exposure, how often game played and last played GTA	Self-report questionnaire on game-play habits VVG play - Y/N and length of time playing/week	Self-report questionnaire on game-play habits and engagement in competitive sports VVG play - Y/N; Competitive sports - Y/N	Self-report questionnaire on game-play habits (used in previous studies e.g., Anderson and Dill, 2000) VVGE = sum of violent content scores (ave ratings of same game across participants in each wave) x play frequency	Self-report questionnaire on game-play habits (used in previous studies e.g., Anderson and Dill, 2000) VVGE = sum of violent content scores (ave rating for the 3 VGs listed by each participant) x play frequency	Self-report questionnaire on game-play habits (used in previous studies e.g., Anderson and Dill, 2000) VVGE calculated by summing violent content scores & multiplying the total by play frequency	Self-report questionnaire on game-play habits. VVGE measured by dangerous play score = mean ESRB rating of 1 st & 2nd second choice VGs x ave no. of hrs of game play/week	Self-report questionnaire on video game play adapted by Gentile et al. (2004) from Anderson and Dill (2000) VVGE = (sum of content and graphics ratings x sum of weekday play freq and weekend play freq in a week) ÷ no. of games
Outcome										
Outcome variable	Moral reasoning (MR)	Moral evaluation (ME) (defined as empathy & pro-violence attitudes)	Moral disengagement (MD)	Moral reasoning (MR)	Moral disengagement (MD)	Moral disengagement (MD)	Moral disengagement (MD)	Moral disengagement (MD)	Moral reasoning (MR) (of justified and unjustified violence)	Moral Disengagement (MD)
Categorical / Continuous	Continuous	Continuous	Continuous	Categorical (stage of moral development) & Continuous (MR scores)	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous

	1. Bajovic (2013)	2. Funk et al. (2003)	3. Gabbiadini, Andrighetto, and Volpato (2012)	4. Hodge et al. (2019)	5. McLean and Griffiths (2018)	6. Teng et al. (2019)	7. Teng, Nie, Guo, and Liu (2017)	8. Teng, Nie, Pan, Liu, and Guo (2017)	9. Vieira and Krcmar (2011)	10. Yao et al. (2019)
Measure used	Sociomoral Reflection Measure – Short form (SRM-SF)	(i) Empathy: Children’s Empathy Questionnaire (CEQ) & Index of Empathy for Children and Adolescents (IECA) for younger and older children respectively	Adapted Moral Disengagement Scale (MDS)	Sociomoral Reflection Measure – Short form (SRM-SF)	Adapted Moral Disengagement Scale (MDS)	Chinese version of the Moral Disengagement Scale (MDS)	Chinese version of the Moral Disengagement Scale (MDS)	Chinese version of the Moral Disengagement Scale (MDS)	Moral Interpretations of Interpersonal Violence (MIIV)	Chinese version of the Moral Disengagement Scale (MDS)
		(ii) Attitudes: Revised Attitudes Towards Violence Scale Child Version (ATVC) for younger & ATVC for older children (iii) Vignettes (measure empathetic/aggressive response)								
Statistical Analysis										
Main Statistical Test(s)	Compare means (t-test)	Compare means (MANOVA)	Compare means (ANCOVA)	Correlation Regression	Compare means (ANOVA)	Correlation Mediation analysis	Correlation Moderation analysis	Correlation Structured Equation Modelling	Structured Equation Modelling	Correlation Mediation analysis
	Correlation	Correlation Hierarchical multiple regression	Multiple regression							

	1. Bajovic (2013)	2. Funk et al. (2003)	3. Gabbiadini, Andrighetto, and Volpato (2012)	4. Hodge et al. (2019)	5. McLean and Griffiths (2018)	6. Teng et al. (2019)	7. Teng, Nie, Guo, and Liu (2017)	8. Teng, Nie, Pan, Liu, and Guo (2017)	9. Vieira and Krcmar (2011)	10. Yao et al. (2019)
Key Findings	R/ship between VVGE & MR:	R/ship between VVGE & ME:	R/ship between VVGE & MD:	R/ship between VVGE & MR:	R/ship between VVGE & MD:	R/ship between VVGE & MD:	R/ship between VVGE & MD:	R/ship between VVGE & MD:	R/ship between VVGE & MR:	R/ship between VVGE & MD:
	☐ None	☐ None	☐ None	☒ None	☐ None	☐ None	☐ None	☐ None	☐ None	☐ None
	☒ Negative	☐ Negative	☐ Negative	☐ Negative	☐ Negative	☐ Negative	☐ Negative	☐ Negative	☐ Negative	☐ Negative
	☐ Positive	☐ Positive	☐ Positive	☐ Positive	☒ Positive	☐ Positive	☒ Positive	☐ Positive	☐ Positive	☒ Positive
	☐ Mixed	☒ Mixed	☒ Mixed	☐ Mixed	☐ Mixed	☒ Mixed	☐ Mixed	☒ Mixed	☒ Mixed	☐ Mixed

Quality of Included Studies

The quality assessment revealed that the ten studies were of varying quality (see Figure 2.2). Even though three studies were rated as 'poor quality', these were included in the data synthesis so as not to bias the review.

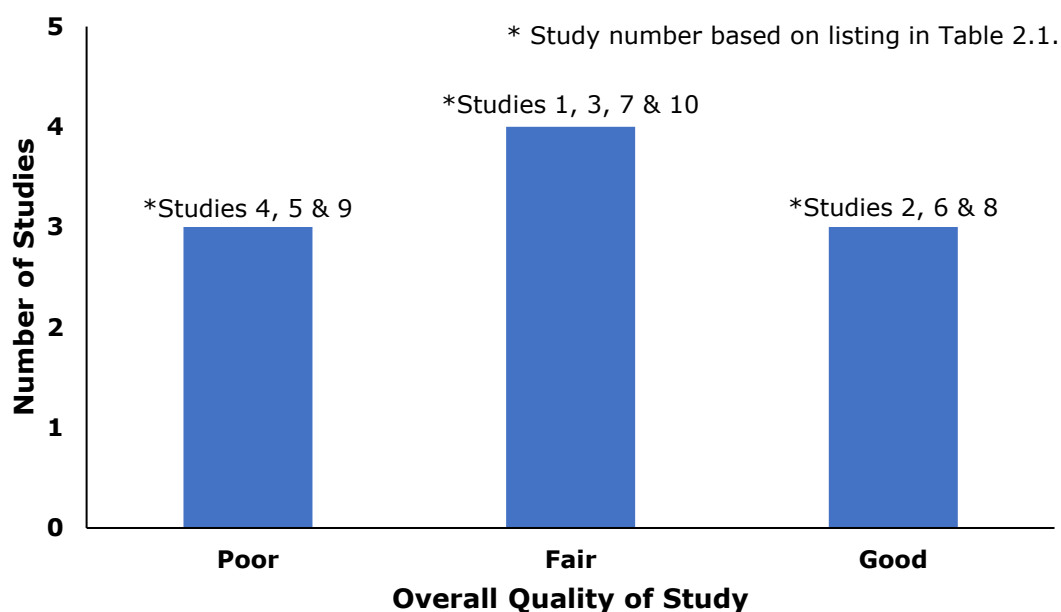


Figure 2.2. Breakdown of Number of Studies by Overall Quality (N=10)

Table 2.2 shows a breakdown of the number of studies rated as 'Low', 'High' or 'Unclear' risk of bias in each of the risk domains A to F. On the whole, Domains C (Measurement bias for outcome) and F (Reporting bias and other bias) appeared to be areas of strength across the ten studies as all the studies were assessed to be low risk on Domain C, and nine of the ten studies were assessed to be low risk on Domain F. Of the remaining domains, Domain B (Measurement bias for exposure) appeared to be a better-performing

area. Six of the studies were assessed to be low risk on Domain B, with only one study (Hodge et al., 2019) rated as high risk. Unfortunately, three of the studies did not present with sufficient information to assess the risk of bias and were rated as 'Unclear' risk.

Domains A (Sampling and selection bias) and E (Statistical bias) were comparatively weaker areas. Less than half of the studies reviewed were deemed to be of low risk in Domain A. Four studies presented with a high risk of sampling and selection bias while three studies were rated as "Unclear" risk due to a lack of information. In terms of statistical bias, four of the studies presented with a low risk of bias and two were assessed to be high risk. The remaining four studies were rated as "Unclear" risk due to insufficient information.

The lack of information for the assessment of risk of bias was a particularly salient problem when evaluating the studies on Domain D (Attrition bias). 80% of the studies reviewed did not contain sufficient information for a conclusive assessment of the risk of attrition bias. A more detailed discussion of the quality assessment within each risk domain is expended in the subsequent sections.

Table 2.2.

Breakdown of Number of Studies Rated by Risk Domain and Signalling Questions (N=10)

Domain	Signalling Question	No. of studies rated 'No', 'Partial', 'Yes' or 'Unclear' on each signalling question				No. of studies rated 'Low', 'High', or 'Unclear' risk for each risk domain		
		No	Partial	Yes	Unclear	Low	High	Unclear
(A) Sampling and selection bias	Participants randomly selected	4	0	4	2			
	Sample representative of target population	4	4	1	1	3	4	3
	Participants blind to specific aim	1	0	0	9			
(B) Measurement bias for exposure	VVG defined	1	6	3	0			
	Exposure measure described	0	1	9	0			
	Exposure measure reliable and valid	0	1	5	4	6	1	3
	Examined different levels of exposure	0	0	10	0			
	Exposure measure adapted to meet needs of participants	0	0	3	7			
(C) Measurement bias for outcome	Outcome defined	0	0	10	0			
	Outcome measure reliable and valid	0	1	9	0			
	Same outcome measure consistently applied	0	1	9	0	10	0	0
	If not, scores standardised	0	0	1	0			
	Outcome measure appropriate for target population	0	0	10	0			
	Outcome measure adapted to meet needs of participants	0	0	3	7			
(D) Attrition bias	Participation rate at least 50%	0	0	2	8	2	0	8
	Reported loss at $\leq 20\%$	2	0	0	8			
(E) Statistical bias	Statistical methods appropriate	0	0	10	0			
	Assumptions tested	0	2	1	7			
	Sample sufficiently large with 80% power	7	1	1	1	4	2	4
	Incomplete/ missing information appropriately handled	0	0	5	5			
	Confounding factors considered and adjusted for	1	1	8	0			
(F) Reporting bias and other bias	Reported all findings	0	0	10	0			
	Measurement of association presented	1	0	9	0	9	1	0
	Acknowledged potential biases	0	0	10	0			
	Results generalisable	10	0	0	0			

(A) Sampling and selection bias

None of the studies were assessed to have met criteria on all three signalling questions within Domain A. Only 40% of the studies reviewed were deemed to have selected participants at random (see Table 2.2). Two studies did not provide sufficient information to be assessed while the remaining four studies used convenience samples. In addition, the lack of a representative sample was a concern across several of the studies as data collection was concentrated in one location or region. Only one study (Funk et al., 2003) was assessed to have recruited a representative sample. 90% of the studies reviewed did not provide sufficient information on what participants were briefed on prior to the data collection. Hence, no conclusive assessment could be made on whether participants were blind to the specific aims of the study. Fully disclosing the objectives of investigating impact of violent video games could bias participants' responses and contribute to sampling and selection bias.

(B) Measurement bias for exposure

Within Domain B, a common strength across all ten studies was that they had all examined different levels of exposure to VVGs (whether as a categorical or continuous variable) so appropriate analyses could be made by comparing individuals with varying extent of VVGE or comparing those exposed to VVGs to those not exposed to it. As presented in Table 2.2, it was noteworthy that 90% of the

studies reviewed had described the exposure measure clearly; this would ensure that studies could be replicated if necessary.

Studies could however be more conscientious in providing an objective and standard definition of VVGs given that self-report questionnaires on gameplay habits were commonly used in VVGs studies. While some researchers have found self-report measures of violent media exposure to be both reliable and valid (Fikkers, Piotrowski, & Valkenburg, 2017), a clear definition would help to minimise subjectivity in what researchers and/or participants consider as a VVG. Only three studies were noted to have provided an objective definition of VVG (Bajovic, 2013; Funk et al., 2003; Yao et al., 2019) though it was not clear if this was communicated to participants when administering the self-report questionnaire. Most of the studies (60%) reviewed were assessed to have partially defined VVG; these studies did not provide an objective or standard definition of VVG though offered operational definitions of how a VVG was determined e.g., via participants' self-ratings of the violent content of the games or using ESRB game classification.

A number of studies did not provide information on the reliability and validity of the exposure measure. Furthermore, information was frequently unavailable on whether adaptations were made to the exposure measures to meet the specific needs of the participants. Consequently, the overall risk of measurement bias for exposure could not be conclusively assessed for three of the studies.

(C) Measurement bias for outcome

All the included studies fared well in addressing the risk of measurement bias for outcome and were rated as low risk of bias in this domain. While the studies examined different outcome variables (moral reasoning, moral evaluation, or moral disengagement), they have all included a clear definition of the outcome variable within the context of their respective studies and selected outcome measures appropriate for the target population.

In addition, measurement bias for outcome was also minimised as studies ensured that the same outcome measure was consistently applied to the entire sample within the study. Where this was not adhered to – as in the case of Funk et al. (2003), the authors took steps to standardise the scores for comparisons. The use of different outcome measures within the study was also deemed reasonable as the age groups of the participants required different measures.

In terms of validity and reliability of the outcome measures, 90% of the studies were assessed to have employed valid and reliable instruments. Only one study was rated as 'Partial' (Vieira & Krcmar, 2011) as the internal reliability coefficients of the outcome measure used (MIIV) seemed relatively lower (in the range of .51 to .77) than figures reported in previous studies using the same measure.

Three studies were found to have considered the need to adapt the outcome measures for their target populations. The remaining seven did not present with adequate information for this to be

assessed. Nonetheless, considering that the studies have adopted reliable and valid measures that were appropriate for the target population, it was unlikely that major adaptations would be needed for the participants. Even in the event that slight adjustments might have been necessary, failing to do so probably would not significantly increase the risk of measurement bias. Hence, the ten studies were still assessed to be of low risk of bias in this domain.

(D) Attrition bias

No conclusions could be drawn about the risk of attrition bias as 80% of the studies reviewed did not provide information on participation rate and loss of participants. It was unclear if participants who dropped out (if any) or chose not to engage in the study shared a similar profile with those who remained in the study.

(E) Statistical bias

All the included studies were assessed to have used appropriate statistical methods and majority of them (80%) considered possible confounding variables and/or covariates in the statistical analyses. These were essential in addressing possible statistical bias.

The quality assessment showed that most studies did not report the power of their selected sample sizes or justify the sample sizes. Insufficient power would contribute to statistical bias particularly when effect sizes are likely to be small. Most studies (70%) also did not report if assumptions were tested when conducting the statistical analyses. Notwithstanding the above, some of the included studies

(e.g. McLean & Griffiths, 2018; Teng et al., 2019; Yao et al., 2019) had very large sample sizes in the range of 500 – 1000+ and issues of normality or power would be less of a concern compared to studies with smaller sample sizes.

(F) Reporting bias and other bias

As previously highlighted, Domain F was assessed to be a strength across the ten studies. All studies reported both significant and non-significant findings and acknowledged potential biases. Furthermore, all except one study duly reported measurement of association such as probability levels, confidence intervals, and/or effect sizes. These were positive indicators that the studies have minimised the risk of reporting bias.

One other bias was that the results of all the included studies were likely not generalisable. This could be expected given that representativeness of the sample was a potential bias for several of the studies reviewed. Moreover, as these studies targeted specific age groups, results would not be generalisable to other age groups beyond those examined.

Descriptive Data Synthesis

A summary of the key findings across the ten studies is provided in Table 2.3. Only the key statistical analyses and results relating to the exposure measure and moral component outcome measure were presented.

Table 2.3.
Summary of Results Across All Studies Included (N=10)

Relation -ship with VVG	Study	Outcome variable	Statistical tests and key findings relating to VVG and outcome variable					
			(a)Correlation /comparing means	Results	Effect size	(b) Predicting effect	Results	β ; SE; R^2 / ΔR^2
NONE	Hodge et al. (2019)	Moral Reasoning	Correlation	Non-significant (n.s) correlation between MR scores & VVG, GTA, and Call of Duty (COD)	<u>VVG</u> $r=.11$ (n.s) <u>GTA</u> $r= -.02$ (n.s) <u>COD</u> $r= -.12$ (n.s)	Regression	VVG, GTA and COD did not predict MR scores	<u>VVG</u> (n.s) $\beta= -.72$, SE=.45 <u>GTA</u> (n.s) $\beta=.10$, SE=.11 <u>COD</u> (n.s) $\beta=.32$, SE=.13
	Bajovic (2013)	Moral Reasoning	t-test Correlation	Playing VVG ≥ 3 hrs/day significantly lower MR scores than 1hr/day Significant negative correlation between time spent on VVG & MR scores	Effect size not reported ($p=.021$) $r= -.324$ ($p=.04$)			
POSITIVE	McLean & Griffiths (2018)	Moral Disengage-ment	ANOVA	VVG players and sports players higher on total MD and cognitive restructuring subscale than control. VVG players lower than sports players on minimising one's role subscale.	Effect sizes not reported (Total MD $p=.032$; cognitive restructuring $p<.0001$; minimising one's role $p=0.008$)			
	Teng, Nie, Guo, et al. (2017)	Moral Disengage-ment	Correlation	Significant positive correlation with MD Positive association for all but two MD subscales	$r=.219$ r range from .097-.0304 ($p<.01$ for all)	Moderation analysis	Interaction of VVGE and moral identity significantly predicted MD, i.e., VVGE predicted MD more strongly for people with higher levels of moral identity. Age, gender controlled for	$\beta=.02$, SE=.01, $t=3.26$, $p=.001$, $\Delta R^2=.013$

Relation -ship with VVG	Study	Outcome variable	Statistical tests and key findings relating to VVG and outcome variable					
			(a)Correlation /comparing means	Results	Effect size	(b) Predicting effect	Results	β ; SE; R^2 / ΔR^2
POSITIVE	Yao et al. (2019)	Moral Disengage- ment	Correlation	Significant positive correlation with MD	$r=.29$ ($p<.001$)	Mediation	Mediation effects of MD, anger ($ab=.10$) and hostility ($ab=.02$) significant. Total indirect effect .15.	For MD: $ab=.03$, $SE=.01$, 95% CI= [0.01, 0.06] $R^2=14.29\%$
							Direct effect of VVGE on aggression not significant after controlling for MD, anger and hostility.	$\beta=.06$, $SE=.03$, 95% CI= [-0.001, 0.12] (n.s)
MIXED FINDINGS	Funk et al. (2003)	Moral Evaluation (<i>measured by empathy and pro- violence attitudes</i>)	Correlation	No significant correlation between type of game and empathy or aggression vignette and questionnaire scores	r range from .00 - .11 (n.s for all)	Hierar- chical multiple regression	<u>Longer-term:</u> VVGE negatively related to empathetic vignette scores, even after age & empathy questionnaire scores controlled for. VVGE accounted for additional 2% variance	$\beta=.15$, $SE=.01$, $p<.05$, $\Delta R^2=.02$
			MANOVA	<u>Short-term:</u> No r/ship between type of game played and aggression or empathy vignette scores	$\eta^2=.01$ ($p>.05$) Observed power =.10		No r/ship between VVGE & aggressive vignette scores ($F(1, 62)= 0.12$, $p>.05$)	$\beta=.04$, $SE=.00$, n.s, $\Delta R^2=.001$
	Gabbiadini et al. (2012)	Moral Disengage- ment	ANCOVA	After controlling for covariates (age and overall exposure to VG) effect of GTA exposure on MD still significant. Those exposed to GTA higher levels of MD than those not exposed	$\eta_p^2=.01$ ($p=.03$)	Multiple Regression	Recency of exposure to GTA significantly predicted three of five MD mechanisms even after controlling for age, gender and overall exposure to video games	$\beta=.16$, $p=.03$, $R^2=.10$ $\beta=.21$, $p=.004$, $R^2=.06$ $\beta=.20$, $p=.003$ $R^2=.11$
				[Gender found to be significant covariate, age and overall exposure to VGs were not]			Effect of frequency of exposure significant only for one MD dimension	$\beta=.17$, $p=.02$ $R^2=.08$ SE not reported

Relation -ship with VVG	Study	Outcome variable	Statistical tests and key findings relating to VVG and outcome variable					
			(a)Correlation /comparing means	Results	Effect size	(b) Predicting effect	Results	β ; SE; $R^2/\Delta R^2$
MIXED FINDINGS	Teng et al. (2019)	Moral Disengage- ment	Correlation	Significant positive correlation at three time points, T1 – T3.	T1: $r=.18$ T2: $r=.21$ T3: $r=.19$ ($p<.01$ for all)	Mediation	T1 VVGE predicted T2 MD T2 MD predicted T3 aggression Significant indirect effect of T1 VVGE on T3 aggression at T3, through T2 MD MD mediated longitudinal relationship between VVGE & aggression for between- person, not within-person effects. Age might moderate effects - stronger for early than late adolescents, esp between persons. Gender did not moderate effects	$\beta=.08$, SE=.03, $p=.003$ $\beta=.19$, SE =.06, $p=.001$ ab=.017, SE=.01, 95% CI= [0.007, 0.033]
	Teng, Nie, Pan, et al. (2017)	Moral Disengage- ment	Correlation	VVGE positively correlated with MD at both time points, T1 & T2, for both middle school (MS) and high school (HS) students.	<u>MS</u> : T1: $r=.22$ T2: $r=.29$ <u>HS</u> : T1: $r=.22$ T2: $r=.26$ ($p<.01$ for all)	Structured Equation Modelling (SEM) [Age, gender, parents' ed level, trait aggression controlled for]	T1 VVGE predicted T2 MD in all participants. T1 MD did not predict T2 VVGE Multiple-group analysis: T1 VVGE predicted T2 MD in MS students but not HS T1 MD did not predict T2 VVGE T2 for middle sch but did for high sch	$\beta=.11$, SE=.05, $p=.017$ $\beta=.04$, SE=.04, $p=.271$ <u>MS</u> : $\beta=.15$, SE=.06, $p=.003$ <u>HS</u> : $\beta=.01$, SE=.06 $p=.824$ <u>MS</u> : $\beta=-.04$, SE=.05 $p=.454$ <u>HS</u> : $\beta=.15$, SE=.06, $p=.010$

Relation -ship with VVG	Study	Outcome variable	Statistical tests and key findings relating to VVG and outcome variable					
			(a)Correlation /comparing means	Results	Effect size	(b) Predicting effect	Results	β ; SE; R^2 / ΔR^2
MIXED FINDINGS	Vieira & Krcmar (2011)	Moral Reasoning				SEM	Significant positive effect between VVGE and perception of justified violence as acceptable. No relationship with perceptions of unjustified violence as acceptable.	$\beta=.14, p<.05$ (SE not reported)

On the whole, findings across the ten studies suggested that a relationship existed between exposure to VVGs and the various moral components examined - all but one study reported evidence of this relationship (see Table 2.3). One study found a negative relationship between VVGE and the moral component assessed while three studies found a positive relationship. The remaining four studies yielded mixed findings. As previously noted under "Characteristics of Included Studies", three different moral components were examined across the ten studies – moral reasoning, moral evaluation and moral disengagement. Findings pertaining to each of these would be discussed in turn.

Moral reasoning

Findings were inconsistent across the three studies examining VVGE and moral reasoning. One study found no significant correlation between the two (Hodge et al., 2019) while another concluded that there was a significant negative correlation between time spent on VVG and moral reasoning scores (Bajovic, 2013). On the other hand, Vieira and Krcmar (2011) reported mixed findings. Specifically, VVGE was found to have a positive effect on moral reasoning about justified violence with children perceiving justified violence as being acceptable, but no relationship was found between VVGE and children's moral reasoning about unjustified violence.

No firm conclusions could thus be drawn about the relationship between VVGE and moral reasoning given the inconsistent findings.

Moreover, findings across the studies were not comparable as the target participants were of different age groups and age was said to moderate the effects of VVGE on moral reasoning (Teng et al., 2019; Vieira & Krcmar, 2011). The quality assessment also revealed potential biases within each of the studies and this could have affected the results. Overall, none of the studies were assessed to be of good quality. The studies presented with possible sampling and statistical biases - participants were not randomly selected, unlikely to be representative of the target population, and it was unclear if the sample sizes in the studies had sufficient power to detect an effect, if any.

Moral evaluation

Of the ten studies reviewed, only one study (Funk et al., 2003) investigated the relationship between VVGE and moral evaluation. Funk and colleagues (2003) conceptualised moral evaluation in terms of empathy and attitudes towards violence. Using measures of empathy and pro-violence attitudes based on self-report questionnaires and vignettes, the authors found that in the short-term, there was no relationship between the type of game played (violent vs non-violent) and children's aggressive or empathetic vignette responses.

In the longer-term, VVGE was found to negatively predict empathetic vignette responses. The effect, while significant, was small as VVGE accounted for just 2% of variance in empathetic

vignette responses, after controlling for other factors such as age (accounted for 65% of variance) and scores on an empathy questionnaire (accounted for additional 5% of variance). In contrast, VVGE did not predict aggressive vignette responses.

While the study was assessed to be of overall good quality with minimal risk of bias in most domains, it had only targeted children between the ages of 5 and 12 years old. Hence, findings could not be generalised to populations beyond the age range. It was also possible that the findings, or lack of, could have been affected by low power. The observed power for short-term effect of type of game played on aggression or empathy vignette scores was reported to be .10, while that for the effect of longer-term VVGE on aggressive vignette responses was .06.

Moral disengagement

Six studies examined the relationship between VVGE and moral disengagement. Findings across these studies were more consistent than that of VVGE and moral reasoning. All studies reported a positive relationship between VVGE and moral disengagement in adolescents from both a western and eastern culture. Although three studies were categorised as having mixed findings, these studies had essentially demonstrated a positive relationship as well, albeit this being limited to specific subgroups or conditions.

In gist, studies reported a significant positive correlation between VVGE and moral disengagement (r ranging from .18 to .29)

(Teng, Nie, Guo, et al., 2017; Teng et al., 2019; Teng, Nie, Pan, et al., 2017; Yao et al., 2019). Compared to non-VVG players, VVG players presented with higher levels of moral disengagement at a .05 level of significance (Gabbiadini et al., 2012; McLean & Griffiths, 2018). Further, moral disengagement was found to have mediated the relationship between VVGE and aggression ($ab=.03$, $SE=.01$, 95% $CI=[.01, .06]$) (Yao et al., 2019). Nonetheless, these studies were of a cross-sectional design which would have limited the inference of causal relationships. A more robust finding was reported in a longitudinal study by Teng et al. (2019). Data collected six months apart at three time points found that moral disengagement at Time 2 significantly mediated the effect of VVGE at Time 1 on aggression at Time 3 ($ab=.17$, $SE=.01$, 95% $CI=[.007, .033]$).

Five of the six studies were assessed to be of fair or good quality and included large sample sizes (ranging from 385 to 1384) although most did not explicitly report if their sample sizes achieved at least 80% power to detect an effect. Taking the above into consideration, it seemed likely that there is consensus on the presence of a relationship between VVGE and moral disengagement.

It should however be noted that whilst significant findings were reported in these studies, effect sizes and mediating effects were small (see Table 2.3). Additional analyses reported in some of the studies also revealed that effects of VVGE on moral disengagement was not homogenous across the participants but possibly moderated

by age (Teng et al., 2019; Teng, Nie, Pan, et al., 2017). Moreover, when moral disengagement was examined in terms of its eight mechanisms rather than as a single construct, VVGE did not exert an effect on all mechanisms. This was demonstrated in a study by Gabbiadini et al. (2012) where after controlling for age, gender and overall exposure to video games, recency of exposure to GTA significantly predicted only three of the five moral disengagement mechanisms and frequency of exposure significantly predicted only one of the mechanisms. Nevertheless, this specific study presented with possible measurement bias for exposure. There was no report of the exposure measure being reliable and valid. Furthermore, when classifying individuals who engaged in GTA as the exposure group and non-GTA players as the comparison group, it was not clear if the comparison group could have been contaminated by individuals who were also exposed to other VVGs even if not GTA.

Moderators and controlling for other variables

Age and gender were two variables commonly controlled for in the analyses. One study found that gender, and not age, was a significant covariate while another reported that age might moderate the effects of VVG. Other variables controlled for included overall exposure to video games, parents' educational level and trait aggression.

Discussion

The aim of this review was to investigate if a relationship existed between VVGE and various moral components, and to identify the nature of this relationship, if any. In all, ten studies were included for the review, with three different moral components examined as the outcome variable of interest - moral reasoning (three studies), moral evaluation (one study) and moral disengagement (six studies).

An examination of the findings across the studies showed evidence of a relationship between VVGE and moral disengagement. In line with the hypotheses of the studies reviewed, a positive correlation was found between VVGE and moral disengagement, and VVGE was reported to positively predict moral disengagement even though effect sizes were generally small. These findings were likely credible given that the quality of most of the studies investigating VVGE and moral disengagement were fair or good, with one of the studies assessed to be of low risk of bias in all domains. The pool of evidence also included findings from two longitudinal studies which would have allowed for an interpretation of causality.

Nonetheless, these studies were not entirely free from potential biases. None of the six studies were assessed to have a representative sample and one should be mindful not to generalise the findings to populations beyond that sampled in the studies. Further, of the six studies, four presented with unclear risk of attrition bias owing to a lack of information. Three of the studies also

presented with a high or unclear risk of statistical bias, largely arising from concerns in relation to whether assumptions were tested prior to the statistical analyses, and whether the sample size had sufficient power to detect the potentially small effects. Notwithstanding the above, these potential biases might not substantially impact on the validity of the findings as the studies involving VVGE and moral disengagement had large sample sizes.

In contrast, evidence for a relationship between VVGE and moral reasoning or moral evaluation was less clear given the inconsistent findings across the four studies. Two of the four studies were assessed to be of poor quality and all four studies had relatively small sample sizes. Consequently, low power might have affected the ability of these studies to detect an effect, particularly since effects could be expected to be small, as seen from existing findings. As with studies on VVGE and moral disengagement, the studies on VVGE and moral reasoning and moral evaluation were similarly affected by concerns surrounding unclear attrition bias and possible sampling and statistical biases.

A more significant concern was the lack of consistency in the construct of moral reasoning across the studies. Studies examining VVGE and moral disengagement adopted a standard and consistent definition of moral disengagement as put forth in Bandura, Barbaranelli, Caprara, and Pastorelli (1996) and Bandura (2002), and had all utilised the Moral Disengagement Scale (MDS) (Bandura et al.,

1996) as the outcome measure. Such consistency in definition and choice of outcome measure would facilitate comparison of results across studies. Unlike the concept of moral disengagement, there was variability in how moral reasoning was defined and measured. In the study by Vieira and Krcmar (2011), the authors had specifically explored moral reasoning *about violence*, making a distinction between justified violence and unjustified violence, and examining how VVGE would be associated with children's perceptions of justified and unjustified violence as being acceptable. Bajovic (2013) and Hodge et al. (2019) however explored moral reasoning as a global concept in terms of one's stages of moral development from immature to mature and the choice of outcome measure was the SRM-SF (Gibbs et al., 1992/2015). Taken together, the conceptual difference of moral reasoning as well as the difference in choice of outcome measure between the latter two studies and that by Vieira and Krcmar (2011) meant that the studies were not truly comparable, and conclusions should not be drawn based on findings of these three studies alone.

Conceptual differences aside, it was noted that results were contradictory even between Bajovic (2013) and Hodge et al. (2019). This could have been a function of the quality of the studies, suggesting the need for further research in the area of VVGE and moral reasoning before conclusions could be drawn. Similarly, no conclusions could be drawn from a single study on VVGE and moral

evaluation. The concept of moral evaluation would require further clarification and exploration with corresponding outcome measures considered.

Conclusions and Recommendations

This systematic review is the first conducted to examine the relationship between VVGE and moral development. The search strategy made use of the MESH terms within each database and included several alternative terms to moral development. Hence, it is believed that this would have been a sufficiently comprehensive search. One limitation was that the review covered largely cross-sectional studies, with only two longitudinal studies. Hence, causal interpretations could not be conclusively made. Nonetheless, the intent of this review was to establish the association between VVGE and moral development as a first step.

The fact that only ten articles were eventually found to be relevant was an indication of the paucity of research in this area. Given that most reviews and meta-analyses have consistently shown a link between VVGE and increased aggressive cognitions and aggressive behaviours (e.g., Anderson, 2004; Anderson & Bushman, 2001; Anderson et al., 2010; Barlett, Anderson, & Swing, 2009; Calvert et al., 2017; Greitemeyer & Mugge, 2014; Huesmann & Taylor, 2006), and that lower levels of moral reasoning were associated with aggressive and antisocial behaviours (Palmer, 2005), it would be

useful to examine the association between VVGE and moral development. This could advance our understanding of the mechanisms through which VVGE impact on aggression and offer practical implications in terms of prevention and intervention strategies to mitigate the impact of VVGE. As existing studies targeted only the general population, it would also be useful for future research to include an offending population for comparison.

More importantly, greater clarity in the concept and construct of the various moral components would be needed to ensure that appropriate outcome measures could be selected and findings between studies would be comparable. Moral development, moral reasoning, moral judgement, and moral evaluation, etc. are complex concepts applicable to a range of behaviours and contexts, and perhaps too broad to be measured with a single measure. If the intent was to investigate how various moral components relate to VVGE and aggression-related outcomes, there might be utility in being more focused and intentional in selecting moral components of direct relevance to violence and aggression. To this end, the approach taken by Vieira and Krcmar (2011) could be a refreshing alternative – to examine moral reasoning specifically in relation to perceptions of violence. As little is known about the MIIV reported in Vieira and Krcmar (2011), it would be of interest to review this tool. A critique of the MIIV is presented in the following chapter.

Chapter 3 : Critique of the Moral Interpretations of Interpersonal Violence Scale

Abstract

A number of measures have been developed to assess moral development and moral reasoning. Most of these were designed to measure moral development as a whole construct, using moral dilemmas or items that cut across various themes. Krcmar and Valkenburg (1999) developed the Moral Interpretations of Interpersonal Violence scale (MIIV) as a measure of children's moral reasoning specifically in relation to violent situations. This paper examined the psychometric properties of the MIIV and provided a critique of the measure. On the whole, there were positive indications of acceptable internal reliability though this was not consistently replicated across studies. In terms of validity, the MIIV items were assessed to be face valid and there was evidence of construct (both convergent and divergent) validity. Criterion validity was demonstrated in part, with concurrent validity established between the SRM-SF and the unjustified violence scenarios of the MIIV but not the justified violence portion. More research would be needed to provide stronger support for its internal reliability and predictive validity. Nonetheless, the MIIV could still be a potentially useful measure as it allowed for a more specific measure of moral reasoning in relation to the use of violence.

Introduction

A number of measures have been developed to assess moral development and moral reasoning. These can be broadly categorised into two types: production measures and recognition measures (Palmer, 2003). Production measures require respondents to explain how they would resolve a moral dilemma presented and provide moral justifications for their decisions, typically through an interview. These include measures such as the Moral Judgement Interview (MJI) (Colby and Kohlberg, 1987 in Palmer, 2003) and the Sociomoral Reflection Measure - Short Form (SRM-SF) (Gibbs et al., 1992/2015). On the other hand, recognition measures such as the Defining Issues Test (DIT) (Rest, Cooper, Coder, Masanz, & Anderson, 1974; Rest, 1973), Sociomoral Reflection Objective Measure (SROM) (Gibbs et al., 1984), SROM-Short Form (SROM-SF) (Basinger & Gibbs, 1987), and Normative Beliefs About Aggression Scale (Huesmann & Guerra, 1997), took a close-ended, multiple-choice format where respondents evaluate a list of statements relating to moral reasoning after reading a given situation or moral dilemma.

While these measures have been relatively well-established, Krcmar and Valkenburg (1999) were of the view that they were not well-suited for assessing children's moral development and moral reasoning about violent situations. Specifically, they felt that the moral dilemmas or situations presented in some of these measures were too difficult for children to understand. Even when dilemmas

were crafted to be easily understood and interpreted by children (e.g., Eisenberg-Berg, 1979; Eisenberg-Berg & Roth, 1980), these tended to reflect situations that required prosocial moral reasoning (e.g., dealing with the conflict between meeting one's own needs and that of others), reasoning about minor wrongdoings, or perceptions of truth and honesty rather than situations involving aggressive behaviours (Krcmar & Valkenburg, 1999). Krcmar and Valkenburg (1999) thus doubted that such measures of moral reasoning would adequately capture the effects of media violence on moral reasoning given that the dilemmas do not mirror situations of violence, particularly those that children might be exposed to on television. This was of interest as earlier researchers had postulated that television violence was a causal factor in the breakdown of children's moral reasoning (e.g., Rust & Wagner, 1998 in Krcmar & Valkenburg, 1999), yet little research has been conducted to establish this.

To further their work on examining the relationship between media violence and children's moral reasoning, Krcmar and Valkenburg (1999) developed MIIV as a measure of children's moral development and moral reasoning in relation to violent situations. This critique served to provide a summary of the background information driving the development of the MIIV, review its psychometric properties, and consider its applicability to research on the impact of media violence on moral reasoning about violence.

Overview of the MIIV

The MIIV was initially designed with 12 stories, each depicting a scenario where the main character used violence to solve a problem in an interpersonal context. Three categories of violence were represented in the 12 stories (four stories in each category) – stealing¹, hurting someone (e.g., kicking, beating someone up), and killing someone. Within each of the categories, two stories were designed to show justified violence, defined as “violence used to protect another person or as a restitution for harm done” (Krcmar & Valkenburg, 1999, p. 616), and two stories showed unjustified violence. The severity of violence and harm inflicted were matched between the two justified and two unjustified violence scenarios. For instance, if the victim of a justified violence story was kicked and required a visit to the hospital, an unjustified violence story was similarly designed to reflect the victim being kicked and requiring a visit to the hospital.

To ensure that the MIIV could be easily administered to children, Krcmar and Valkenburg (1999) conducted a principle components analysis (PCA) to reduce the number of stories to a smaller set, while maintaining satisfactory levels of internal reliability. By progressively eliminating items that loaded lowest on the justified and unjustified violence scales, the authors eventually retained four stories for the

¹ It was not clear why the authors considered ‘stealing’ as a form of ‘violence’ and the scenarios were not provided in Krcmar and Valkenburg (1999) for review.

final version of the MIIV - two justified violence stories and two unjustified violence stories (see Appendix E). All four stories involved hurting someone, which the authors felt was more ideal for young children than scenarios that involved killing. The severity of harm inflicted was similarly matched between each pair of justified-unjustified violence scenarios.

Scoring

The MIIV is scored based on a 7-point scale ranging from 1 (*very, very wrong*) to 7 (*very, very right*). When administering to children, the authors also used a scale with schematic faces to accompany each of the seven responses (see Appendix E). Looking at the scale, the child was first asked if the main character was right, wrong, or in the middle, for harming the victim. Based on the response, the child's attention would then be directed to the appropriate end of the scale and asked how right or wrong the character was. This was done to ensure that the children would utilise the entire 7-point scale.

Normative Data

There was no normative sample available and thus far, the MIIV has only been administered to children although the factor structure of the MIIV has been validated with an adult sample of college students. Hence, the MIIV would only be appropriate for assessing perceptions of justified and unjustified violence within the individual and not to determine how an individual fared compared to others.

Psychometric Properties of the MIIV

The psychometric properties of the MIIV was examined in relation to its reliability and validity. This was based on six published papers that were found to have administered the MIIV, including the original validation study by the authors.

Reliability

Reliability of a measure includes (i) test-retest reliability, i.e., how consistent the measure is over time in measuring the construct it was meant to measure (Kline, 2000) and (ii) internal consistency, i.e., how consistent the results of individual items (or sets of items) are with the results of the overall questionnaire (Field, 2014). As none of the six studies provided test-retest reliability information, only internal consistency would be discussed here.

Internal consistency

The Cronbach's alpha is a commonly reported measure of internal consistency. Table 3.1 shows the Cronbach's alpha values for the two justified violence and two unjustified violence items of the MIIV as reported in the studies reviewed. In the initial validation of the MIIV, Krcmar and Valkenburg (1999) reported alpha values of .81 and .75 for the justified and unjustified violence scales respectively. Subsequent studies reported lower alpha values ranging from .56 to .73 for the justified violence scale and .54 to .60 for the unjustified violence scale (Krcmar & Curtis, 2003; Krcmar & Vieira, 2005; Vieira

& Krcmar, 2011). Internal reliability estimates were not available for two of the studies, though the author shared that from experience, the Cronbach's alpha values for the justified and unjustified violence scales have not been higher than .60 (E. T. Vieira, Jr, personal communication, November 16, 2019).

Table 3.1.
Cronbach's alpha of MIIV

Study	Participants	Cronbach's alpha	
		Justified Violence	Unjustified Violence
Krcmar & Valkenburg (1999)	156 children (45% boys; 55% girls)	.81	.75
Krcmar & Curtis (2003)	121 children (45% boys; 55% girls)	.73	.60
Krcmar & Vieira (2005)	177 parent-child dyads (47% boys; 53% girls)	.56	.55
Vieira & Krcmar (2011)	166 children (66% boys; 34% girls)	.61	.54
Vieira (2014)	145 girls	Unavailable	
Vieira (2015)	253 girls	Unavailable	

Cronbach's alpha values of .70 to .80 would generally be considered 'acceptable' and substantially lower values suggested an unreliable scale (Field, 2014). Some researchers however have suggested that for developmental scales, a score of .60 or higher would be acceptable (Vieira & Krcmar, 2011). Alpha values of .50 to .60 is regarded as 'poor' and less than .50 'unacceptable'. At first glance, it thus seemed like the MIIV did not consistently show

acceptable levels of internal consistency. Nonetheless, caution should be exercised in interpreting Cronbach's alpha based on these general guidelines.

Firstly, Cronbach's alpha is sensitive to the number of items in the scale. Increasing the number of items can make a scale more reliable (Marsh, Hau, Balla, & Grayson, 1998) though large alpha values do not necessarily reflect the true reliability as this could be a function of the number of items included (Field, 2014). Secondly, Cronbach's alpha is said to be an underestimate of true reliability particularly for a two-item scale (Eisinga, Grotenhuis, & Pelzer, 2013), as was the case for the MIIV justified and unjustified violence scales. Finally, it is essential to consider how the MIIV data was collected. The MIIV required children to listen/read the given scenarios, think about the stories, decide if the action of the main character was acceptable and to what degree it was acceptable. This could be a rather complex process for children in view of their developing mental efficiency and susceptibility to distractions (Vieira & Krcmar, 2011). The developing nature of children and the relative complexity of the MIIV could thus have contributed to poor reliability estimates (E. T. Vieira, Jr, personal communication, November 16, 2019).

Considering the above, while internal consistency estimates did not show clear and consistent support for internal reliability based on general guidelines, they can be considered to have shown some positive indications.

Validity

The concept of validity refers to whether a test actually measures what it is meant to. Various types of validity would be discussed in this section, namely face validity, criterion validity, construct validity, and content validity.

Face validity

Face validity refers to whether the test 'looks' valid, i.e., if it *appears* to measure what it claims to measure, rather than whether it meets specific statistical properties. On the whole, the MIIV appeared to be a face valid scale. It was designed to assess children's moral reasoning regarding interpersonal violence exhibited in a justifiable and unjustifiable context. The four scenarios of the MIIV clearly showed these two pertinent variables - interpersonal violence and justified or unjustified violence. Including pertinent variables of interest was considered to be an element of good vignette content design (Evans et al., 2015). In addition, the scenarios were assessed to have met a number of other requirements of good vignette design. This included being clear, not being longer than necessary, followed a story-like progression, written as a third-person character, and having scenarios that were relatable and plausible to the respondent with no misleading details or bizarre content (Evans et al., 2015).

Criterion validity

Criterion validity refers to the extent to which scores on a test correlates with a concrete outcome. It encompasses two aspects –

(i) concurrent validity, i.e., if scores from the test correlate with an established test that measures the same construct of interest; and (ii) predictive validity, i.e., if scores from the test correlate with a future outcome. Predictive validity of the MIIV has not been examined in the studies reviewed and hence would not be discussed here.

To assess for concurrent validity, Krcmar and Valkenburg (1999) administered both the MIIV and SRM-SF to a group of 156 children (between six and twelve years old) and correlated their responses on these two scales. Results showed that children's responses on the SRM-SF correlated significantly with that on the MIIV unjustified violence scale ($r=.34, p<.001$), but not the justified violence scale ($r=.00, p$ value not reported). To ascertain if the low correlation on the latter was due to MIIV and SRM-SF having different types of moral judgement situations, correlations were calculated between children's SRM-SF responses and their responses to the MIIV justified and unjustified *stealing* scenarios (which were part of the initial 12 MIIV scenarios) as stealing was said to be better represented in the SRM-SF. The same pattern of correlation emerged; with SRM-SF correlating significantly with unjustified stealing ($r=.33, p<.001$) but not justified stealing ($r=.10, p=.21$).

Taken together, there was no strong evidence for concurrent validity of the MIIV. Only the unjustified portion of the MIIV was found to be correlated with the SRM-SF, possibly due to the MIIV unjustified violence items being more conceptually similar to the

SRM-SF items as both were relatively unambiguous ethical dilemmas (Krcmar & Valkenburg, 1999). In contrast, the MIIV justified scenarios likely created ambiguity, eliciting a greater range of responses amongst respondents and consequently a weaker correlation with the SRM-SF.

Construct validity

When a scale is indeed measuring what it claims to be measuring, it would have demonstrated construct validity. Construct validity encompasses convergent and divergent validity. Convergent validity is supported when measures that should be related and are meant to reflect the same or similar construct are indeed related. Divergent validity on the other hand, is demonstrated when measures that should not be related are indeed not related.

Factor analysis is said to be one approach to assessing convergent and divergent validity (Lehmann, 1988). In the development of the MIIV, Krcmar and Valkenburg (1999) conducted a PCA to explore the factor structure of the responses to the initial 12 stories of the MIIV. The PCA found only two factors which together, explained 47.5% of the variance. Six of the justified violence scenarios defined one factor ($\alpha=.80$) and the remaining six unjustified violence stories defined the second factor ($\alpha=.70$). There was no difference between the three categories of violence (stealing, hurting, or killing). This supported the authors' initial design of the justified violence versus unjustified violence contexts. A validation check of

the factor structure using an adult sample of 43 college students yielded similar results with the six unjustified violence stories loading on one factor (eigenvalue=3.02) and five of the justified violence stories loading on another factor (eigenvalue=2.45).

Further support of convergent validity was provided in Vieira and Krcmar (2011). A confirmatory factor analysis (CFA) indicated that the four MIIIV items loaded meaningfully on two factors, with factor loadings of .77 and .58 for the justified violence stories, and .73 and .51 for the unjustified violence stories. Fit indices were good: $p=.10$, root mean square residual=.03; comparative fit index=.96.

Some researchers postulated that moral reasoning comprised both a cognitive component requiring a process of logical reasoning, and an affective component via empathy. Measures of perspective-taking and sympathy were thus included in some studies (e.g., Krcmar & Vieira, 2005; Vieira, 2014, 2015; Vieira & Krcmar, 2011). Zero-order correlations between measures of justified violence, unjustified violence, perspective-taking and sympathy were small to moderate (r ranged from .03 to .58) (Table 3.2), indicating that these concepts were related but also distinctly different, lending support to discriminant validity.

Table 3.2.
Zero-order Correlations Between Measures

Measure	Correlation, <i>r</i>		Study
	Justified Violence	Unjustified Violence	
Perspective-taking	.17	.24	Krcmar & Vieira (2005)
	.22	-.32	Vieira & Krcmar (2011)
	.02 (less severe violence)	.07 (less severe violence)	Vieira (2014)
	.14 (severe violence)	.28 (severe violence)	
Sympathy	-.24	-.33	Vieira & Krcmar (2011)
	.19 (less severe violence)	.12 (less severe violence)	Vieira (2014)
	.37 (severe violence)	.04 (severe violence)	
Justified Violence	--	.20	Krcmar & Vieira (2005)
	--	.34	Vieira & Krcmar (2011)
	--	.03 (less severe violence)	Vieira (2014)
	.58 (severe violence)	.07 (severe violence)	
	--	.03 (less severe violence)	
	--	.19 (severe violence)	
Unjustified Violence	--	--	
	--	.17 (severe violence)	Vieira (2014)
	--	--	

Content validity

Content validity refers to the extent to which a measure has captured all aspects of a construct it was designed to assess. There was no information on how the authors designed and decided on the first set of 12 MIIV scenarios prior to reducing them to a smaller set of four. For instance, scenarios of stealing were initially included as part of the stories, but it was not apparent why 'stealing' was considered an act of interpersonal violence. There was also no information on whether the design process included an evaluation of items by subject matter experts (SMEs), which is a common method for reviewing content validity (Markus & Smith, 2012).

Notwithstanding the above, MIIV appeared to have some degree of content validity based on the minimal information available. Specifically, the PCA has shown that the four items did cluster into the two justified and unjustified violence scales, and that together, they accounted for 47.5% of the variance. Nonetheless, this also meant that more than 50% of the variance is left unaccounted for, suggesting that there were aspects not captured by the MIIV.

Practical Applications and Limitations

Comparison Between MIIV and Other Measures

The MIIV demonstrated poorer internal reliability (Cronbach's $\alpha = .54$ to $.81$) than other more commonly used moral reasoning measures such as the MJT (Cronbach's $\alpha = .92$ to $.96$) and the

SRM-SF (Cronbach's $\alpha=.93$) (Palmer, 2003). Its internal reliability however was comparable to that of the SROM (Cronbach's $\alpha=.52$ to $.84$) and SROM-SF (Cronbach's $\alpha=.58$ to $.70$) (Palmer, 2003).

In terms of concurrent validity, MIIV did not fare as well as the SRM-SF, SROM and SROM-SF (all with correlations in the range of $.69$ to $.77$). Nonetheless, of the latter three measures, only the SRM-SF was able to discriminate between adolescent male offenders and adolescent male non-offenders (Gavaghan, Arnold, & Gibbs, 1983). Psychometric properties of MIIV in the adolescent population and offending population has not been examined.

Based on psychometric properties alone, it thus seemed like measures such as the MJT or SRM-SF have an edge over the MIIV. Nevertheless, these measures, while psychometrically stronger, presented with practical limitations. Specifically, production measures like the MJT and SRM-SF would not be appropriate for group administration and generally required a longer time to complete. Further, scoring tended to be time-consuming and could be complex (Palmer, 2003). On the other hand, even though recognition measures like the SROM and SROM-SF could be group-administered and might be easier to score, they also appeared to have limited psychometric properties when used with younger respondents or respondents with low levels of literacy and short attention spans (Palmer, 2003).

Advantages and Applications of the MIIV

The MIIV would address the challenges associated with test administration. With just four items in a close-ended format, the MIIV had the advantage of ease of administration and short duration of time needed to complete. This would be beneficial in settings involving younger children or large-scale administration.

Furthermore, given that no existing moral reasoning measures specifically explored one's perception of how right or wrong violence is, the MIIV could potentially plug this gap. The scenarios presented in the MIIV were crafted to reflect situations involving interpersonal violence, rather than moral dilemmas in general which might not match the construct of interest when examining the impact of media violence (e.g., VVGE) on one's perception of violence.

Of interest was how the MIIV allowed for a distinction between two different contexts in which violence took place - 'justified' or 'unjustified'. Such consideration of context was important as Krcmar and Vieira (2005) found that children's exposure to fantasy violence programmes affected only their perceptions of justified violence, but not unjustified violence. While more research would be needed to support this finding and determine the processes through which this occurred, being able to distinguish between justified and unjustified violence would ensure that any potential effects on one would not be masked by null effects of the other.

Limitations of the MIIV

The lack of a normative data was a limitation of the MIIV as it did not allow for comparison of scores between individuals or comparison to age- and gender- appropriate groups. The brevity of the MIIV was also as much a limitation as it was an advantage. As discussed earlier, this could have adversely impacted on the internal reliability of the scale.

To address the limitations posed by the brevity of the measure and relatively weaker psychometric properties, the MIIV could perhaps be administered alongside one of the more established moral reasoning measures. In doing so, the inadequacies of one measure could possibly be addressed by the other, thereby allowing the strengths of the various measures to be tapped on. Such potential benefits would however need to be carefully weighed against the costs of doing so. Using multiple measures would inevitably increase the time taken for administration of the study measures, consequently increasing the risk of test fatigue and the risk of respondents withdrawing prematurely from the study.

Conclusion

The MIIV has not been as widely used as some of the more established measures of moral reasoning such as the MIT, SRM-SF, or SROM. Hence, only a few papers could be found for examination

of its psychometric properties and the MIIV could certainly benefit from more research to lend stronger support in this aspect.

Notwithstanding the above, the MIIV was not without merits as it has presented with some positive indications of internal reliability; efforts to obtain stronger evidence of internal reliability could have been hindered by the small number of items and the inherent difficulties in obtaining reliable responses from young children. Further, the MIIV items presented with face validity, and studies provided support for construct (both convergent and divergent) validity. Criterion validity was demonstrated in part, with concurrent validity established between the SRM-SF and the unjustified violence portion of the MIIV.

Undeniably, the MIIV might not have psychometric properties as strong as some of the more established measures. Nonetheless, considering how MIIV fared against other measures, as well as its potential advantages - ease of administration for large-scale settings, inclusion of scenarios specifically designed to reflect interpersonal violence instead of general moral dilemmas, as well as consideration of context (justified versus unjustified), the MIIV could still be a potentially useful measure to adopt in studies exploring the impact of VVGE on one's moral reasoning about violence. This thus made MIIV an appropriate choice for use in the empirical study presented in Chapter 4.

Future Directions

Further studies on the MIIV's reliability should be undertaken, perhaps by increasing the number of items, investigating test-retest reliability, or using other reliability statistics such as the Spearman-Brown coefficient which is reportedly less biased and better than the Cronbach's alpha for two-item scales (Eisinga et al., 2013). Obtaining more support for concurrent validity would likely be challenging given the lack of an established tool that purportedly measures the same construct as the MIIV.

In future, the MIIV could perhaps be developed to include a wider range of moral dilemmas and to ensure that the gender of victims is balanced across the items. In the current MIIV, the victims of the unjustified violence scenarios were both male, while the victims of the justified violence stories were female. Respondents could possibly be influenced by gender of the victims, rather than focus only on the parameter of justified versus unjustified violence.

To address the inherent difficulties in obtaining reliable responses from children, studies could also look into using the MIIV for young adults given that the factor structure has been found to be valid for college students. As none of the studies reviewed have looked into the predictive validity of the MIIV in relation to actual display of aggressive/violent behaviours, there could be value in investigating how moral reasoning about justified and unjustified violence might impact on use of aggression.

Chapter 4 : An Empirical Study of the Relationship Between Violent Video Games, Moral Reasoning About Violence, Empathy and Aggression

Abstract

An online questionnaire was designed to examine the relationship between VVGE, moral reasoning about violence, empathy and aggression. After screening out ineligible participants, the final sample comprised 291 adolescents (16-25 years old; 195 males, 96 females) from a general population and 16 young offenders (16-21 years old; 14 males, 2 females). Correlation, multiple regression and mediation analyses were conducted to test the hypotheses that: (1) empathy would be negatively correlated with and (2) VVGE would be positively correlated with moral reasoning about violence, and (3) moral reasoning about violence would mediate the relationship between VVGE and aggression. Results provided partial support for the first two hypotheses. In male participants, lower levels of cognitive and affective empathy were significantly related to perceptions of justified violence as being more acceptable. Cognitive empathy was negatively correlated with moral reasoning about unjustified violence. In females, significant negative associations were found between empathy (both cognitive and affective) and moral reasoning about unjustified violence. In male participants only, VVGE was positively correlated with moral reasoning about justified

violence and significantly predicted the latter even after controlling for empathy, childhood exposure to and experience of violence. VVGE did not predict moral reasoning about justified or unjustified violence in female participants. Meditation analysis showed that moral reasoning did not predict aggression and did not mediate the relationship between VVGE and aggression.

Introduction

Research on the effects of VVGs has gained much traction in the last two decades, spanning across a wide range of issues from examining the impact of VVGs on aggression-related constructs, physiological arousal, and desensitisation (e.g., Anderson et al., 2010; Calvert et al., 2017; Prescott et al., 2018), to real-world violence and crime (e.g., Cunningham, Engelstätter, & Ward, 2016; Ferguson, 2011; Vieira & Krcmar, 2011), weapon- or gun-carrying behaviours (e.g., Chang & Bushman, 2019; Ybarra, Huesmann, Korchmaros, & Reisner, 2014), and brain activity (e.g., Engelhardt, Bartholow, Kerr, & Bushman, 2011; Montag et al., 2012).

The relationship between VVGs and moral development has also been an area of interest (Yang, 2013) though few studies have examined this, as evidenced by the systematic review (Chapter 2). Relevant studies in this area have examined various moral components such as 'moral reasoning', 'moral evaluation', and 'moral disengagement'. The recent systematic review found some evidence of a positive association between VVGE and moral disengagement but the relationship between VVGE and moral reasoning was less clear. Hodge et al. (2019) found no relationship between VVGE and moral reasoning while Vieira and Krcmar (2011) found partial evidence, and Bajovic (2013) reported that the amount of time spent playing VVGs was negatively correlated with the sociomoral maturity of adolescents. The lack of a conclusive finding across these studies signified a gap

in the existing literature and was thus the impetus for this empirical research.

Moral Reasoning About Justified and Unjustified Violence

As discussed in Chapter 2, the use of different conceptual and operational definitions of moral reasoning could have contributed to the different findings across the studies. Bajovic (2013) and Hodge et al. (2019) adopted Gibbs' theory of sociomoral reasoning (Gibbs, 1979) (see Chapter 1 for brief description of the model), measuring moral reasoning in terms of the level and stage of development. On the other hand, Vieira and Krcmar (2011) made a distinction between justified violence and unjustified violence in moral reasoning as earlier studies have found that children distinguished between the two (Krcmar & Valkenburg, 1999).

From a social learning perspective, moral development of a child could be influenced by his/her social interactions with others and observations of moral choices made by people within the social environment of the child (Krcmar & Valkenburg, 1999). For instance, when violence seen on television was portrayed as justified and unpunished, the exposure to such justified violence could lead children to believe that the use of violence was appropriate and beneficial, thereby increasing the child's acceptance of justified violence. Krcmar and Valkenburg (1999) found that children who watched more fantasy violence (where violence was perpetrated by the superhero and presented as justifiable) perceived justified

violence as being 'less wrong'. Similarly, Vieira and Krcmar (2011) found that VVGE was positively associated with acceptance of justified violence though no such association was found between VVGE and perceptions of unjustified violence.

Given that the focus of VVGE studies centred on how violence portrayal in games could affect aggressive behaviours, it would seem appropriate to adopt a more targeted and intentional measurement of moral reasoning in relation to the use of violence, rather than a more global moral reasoning measure. Making the distinction between justified and unjustified violence would also allow for a more fine-grained exploration of how moral reasoning might differ in different contexts of violence.

Moral Reasoning and Empathy

Researchers generally agreed that empathy was an important component of moral reasoning (Funk et al., 2003; Jolliffe & Farrington, 2006; Palmer, 2003; Vieira & Krcmar, 2011). Gibbs (1995, in Palmer, 2003) stated that empathy and sympathy could serve to motivate moral behaviour and Vieira and Krcmar (2011) were of the view that children who experienced less empathy or sympathy for victims would probably see violence as less harmful. Indeed, Vieira and Krcmar (2011) found that lower levels of sympathy predicted perceptions of unjustified violence as being acceptable though not perceptions of justified violence. It was unclear why this would be so and thus, the

relationship between empathy and moral reasoning would also be examined in this study.

Moral Reasoning and Aggression

Several reviews and meta-analyses have shown that VVGE was associated with higher levels of aggression (e.g., Anderson et al., 2010; Calvert et al., 2017; Prescott et al., 2018). Lower levels of moral reasoning was also found to be associated with aggressive and antisocial behaviours (Palmer, 2005) thereby driving concerns that VVGE could impact on moral development and that delayed moral development would in turn contribute to higher levels of aggression. By this account, moral reasoning could possibly mediate the relationship between VVGE and aggression – this would also be explored in this study.

The Role of Family Environment and Parenting Practices in Moral Development

Social perspective-taking played an important role in the development of moral reasoning (Gibbs, 1979; Palmer, 2003) and it is through social interactions with others that one develops social perspective-taking. While peer interactions have traditionally been found to facilitate such development, Palmer (2005) argued that research has also lent support for the role of families and parents in the acquisition of social perspective-taking and moral reasoning.

Just as how early abuse and neglect in childhood have been found to be risk factors for the subsequent development of antisocial

and criminal behaviour (Kerig & Becker, 2015), similar factors have also been found to be associated with the development of moral reasoning. For instance, harsh disciplinary practices involving the use of physical discipline (particularly in the context of a cold and rejecting parenting style), early physical abuse, poor parental supervision, high levels of parental conflict and other sociocultural factors such as poverty and exposure to aggressive adult models were found to be associated with high levels of aggression (Palmer, 2005). It was believed that these factors impacted on subsequent behaviour through the mediating effects of social information processing, social cognitions and moral reasoning. Hence, children exposed to such childhood experiences and practices were said to be at risk of moral developmental delays (Palmer, 2005).

Taking the above into consideration, it would be crucial to factor in the impact of childhood exposure to violence and exposure to aggressive adult models (e.g., witnessing violence between parents) as well as childhood experiences of abuse in examining the relationship between VVGE, moral reasoning and aggression. This has been factored into the present study as a covariate.

Present Study

The present study aimed to explore the relationship between VVGE, moral reasoning about violence, empathy and aggression. The objectives of the study were to address the following:

- (i) What is the relationship between empathy and moral reasoning about violence?

Hypothesis 1: Empathy would be negatively associated with moral reasoning about violence.

- (ii) What is the relationship between VVGE and moral reasoning about violence?

Hypothesis 2: VVGE would be positively associated with perceptions of violence as being acceptable.

- (iii) Does moral reasoning about violence mediate the relationship between VVGE and aggression?

Hypothesis 3: Moral reasoning about violence would mediate the relationship between VVGE and aggression.

Method

Participants

A total of 564 participants accessed the online questionnaire designed for this study though only 414 participants completed the questionnaire (i.e. response rate=73.4%). Comparisons could not be made between completers and non-completers as information was only captured for completers. This eventually yielded a valid sample of 307 adolescents after screening out ineligible participants. Participants were excluded if they (i) were not within the eligible age range (16 to 25 years old); (ii) indicated that they did not play any video games; (iii) scored less than four on the 'Lie subscale'; or (iv)

stated that they played VVGs but did not report the time they spent playing VVGs.

Amongst the 307 adolescents, 16 (14 males; 2 females) were receiving or had received support and services from a local Youth Justice Service (YJS) (previously known as Youth Offending Team) within the United Kingdom (UK). These participants (referred to as the 'YJS sample') were analysed separately from the non-YJS main sample to minimise the impact of possible confounding factors due to subgroup differences. Main sample comprised 291 participants (195 males; 96 females) between 16–25 years old ($M_{\text{age}}=19.12$; $SD=3.10$). Majority were of British or European nationality (British, Scottish, Irish or other European countries) (81.8%), 11.3% Asian and the remaining 6.9% of other nationalities. For the YJS sample, age range was 16–21 years old ($M_{\text{age}}=16.94$; $SD=1.24$) and a large proportion of them (93.7%) was of British or European nationality.

Measures

An online questionnaire was created using 'Online Surveys' service to capture informed consent, demographics, contact with a YJS, video gameplay habits, moral reasoning about violence, empathy, childhood experiences of violence and aggression towards parents or others. A 'Lie scale' was incorporated to screen out responses that might be biased.

VVGE

In this study, 'video game' was defined as any interactive games that was played on various platforms such as arcade games, computers (laptops and desktop computers), console systems (including portable consoles), mobile phones, and tablets. VVGs were games that contained intense violence (i.e., killing, blood and gore), or rated by the Entertainment Software Rating Board (ESRB) as 17+ Mature and above, or by the Pan European Game Information (PEGI) as PEGI 16+ and above.

Participants were asked if they have played any video games in the last 12 months. Those who did not could bypass items on video gameplay habits to complete the rest of the questionnaire. Those who played video games were next asked if they had, in the last 12 months: (i) played 'Call of Duty' (COD) and how much time was spent playing COD in the past week; and (ii) played other VVGs, names of these games, and time spent playing these VVGs in the past week. Those who did not play COD or VVGs were asked to name the non-VVGs they played and indicate the time spent playing these games.

As COD had a new game release a few months before the scheduled launch of this study, respondents were asked about COD with the initial intent of evaluating recency effects of playing a specific VVG. However, data collected revealed that a very small percentage (1.7%) of participants in the main sample played solely COD; 95.9% of those who played COD also played other VVGs. Given the high

percentage of overlap, it would not be possible to partial out the effects of playing COD alone. VVGE was thus computed based on time spent playing both COD and other VVGs.

Moral reasoning about violence

Moral reasoning about violence was measured using the MIIV (Krcmar & Valkenburg, 1999) described in Chapter 3. Participants were required to read four scenarios (two justified violence and two unjustified violence) and indicate, on a 7-point scale ranging from 1 (very, very wrong) to 7 (very, very right), how wrong or how right they felt the main character was in using violence. MIIV Justified Violence score was the average of the ratings on the two justified violence scenarios while MIIV Unjustified Violence score was the average of the ratings on the two unjustified violence scenarios. Higher scores reflected a perception of violence as more acceptable.

Empathy

The Basic Empathy Scale (BES) (Jolliffe & Farrington, 2006), a 20-item, validated self-report questionnaire, was used as a measure of empathy. Compared to other measures of empathy such as the Interpersonal Reactivity Index (IRI), the BES offered the advantage of being able to assess both affective (the ability to share the emotions of another individual) and cognitive empathy (the ability to understand the emotions of another individual), consequently allowing for different dimensions of empathy to be examined (Wang, Lei, Yang, Gao, & Zhao, 2017). Participants responded on a 5-point

scale ranging from 1 (strongly disagree) to 5 (strongly disagree). Higher scores reflected a higher level of empathy.

Childhood experiences of violence

To control for the impact of such childhood experiences, the questionnaire included items to assess the extent of childhood exposure to aggression and violence between parents (including step-parents), as well as the extent of having experienced aggression or violence inflicted by their parents (including step-parents) as a child.

A checklist of 16 items was used for this purpose – three items on psychological aggression (e.g., shouted or yelled at, threatened to hit or throw something), twelve on physical violence (e.g., threw something that could hurt, slammed against a wall) and one on sexual assault. Participants selected behaviours they recalled happening between their parents/step-parents when they were a child (i.e. 12 years old and below), as well as those that they had experienced from a parent/step-parent as a child. Items were adapted from the Revised Conflict Tactics Scale (CTS2) (Straus, Hamby, & Warren, 2003). Separate scores on exposure to violence between parents and experience of violence inflicted by parents were calculated by summing the number of behaviours checked.

Aggression

Acts of aggression was measured using a checklist of eight psychological aggression and twelve physical aggression items, adapted from the Psychological Aggression and Physical Assault

Scales of the CTS2 (Straus et al., 2003). Participants identified acts of aggression that they had engaged in when they had differences with (i) their parents (or step-parents, foster parents, adoptive parents), and (ii) others (e.g., a relative and close friends) in the past year. A summation of items checked formed the scores of aggression towards parents and aggression towards others.

Lie Scale

An 8-item Lie Scale designed to measure defensive responding was incorporated into the questionnaire. Items were extracted from the Lie subtest of the Culture-Free Self-esteem Inventories Second Edition – Form AD (Battle, 1992). It comprised items that were generally valid though socially unacceptable (e.g., “Do you gossip at times?”, “Do you ever lie?”). A score of less than four suggested that the respondent could have responded in a defensive manner, thereby possibly affecting the validity of their responses.

Procedures

Data collection

Participants for the main sample were recruited through convenience sampling. Information of the study and survey link were disseminated via emails and social media channels such as online survey platforms, UK-based video gaming Facebook groups (with permission from the group administrators) and Facebook advertisements. Participation was voluntary and participants

provided written consent before accessing the questionnaire which took around 15 minutes to complete.

The online questionnaire included one item asking respondents to indicate if they had or were receiving services from a YJS at the time of responding to the questionnaire. This was to ensure that participants who fell under the YJS sample could be identified. Only one YJS participant was identified through this channel. The rest of the YJS participants was a convenient sample recruited from a local YJS. Only one YJS was approached for permission to carry out the study as initial delays in the processing and approval of ethics application for this study limited the time available for data collection.

Assistance from Case Managers at the YJS was first sought to disseminate information of the study and survey link to young persons under their charge as a means of recruiting volunteers for the study. As this did not result in any returns, Case Managers were approached for help to set up one-to-one meetings with potential participants at the YJS premise. Recruitment of participants was thus not random or representative as Case Managers arranged meetings only for those who indicated willingness to participate in the study.

In the one-to-one meetings, participants were briefed on the purpose and requirements of the study and given the Participation Information Sheet (Appendix F). They were assured that declining to participate or withdrawing from the study would not lead to any negative consequences or affect the services they receive from the

YJS. Written consent (Appendix G) was taken and a paper-and-pencil version of the questionnaire was administered by the researcher as the YJS's facilities could not support online collection of data due to weak and unstable WiFi connection.

Treatment of data

Prior to data analysis, checks were done to ensure that participants who indicated that they played other VVGs had indeed listed at least one VVG. Those who indicated that they have played other VVGs but only listed non VVGs were re-categorised as having played other video games instead of other VVGs.

Male and female samples were analysed separately as significant differences were found between the two subgroups. Only the comparison between YJS and non-YJS samples included the YJS participants. All other analyses were conducted using the non-offending main sample. Mediation analysis was carried out only for the male subgroup using PROCESS version 3.4.1 (Hayes, 2018); bootstrapping applied with 5,000 bootstrap samples and 95% bias corrected accelerated (Bca) confidence intervals (CI). All other analyses were conducted using SPSS version 26, with an alpha level of .05. Bootstrapping with 1,000 bootstrap samples and 95% BCa CI was applied to *t*-tests and multiple regression.

Ethics

The study was given a favourable opinion by the Faculty of Medicine and Health Sciences Research Ethics Committee (Ethics

Reference Number: 122-1707) (see Ethics approval in Appendix H). In line with guidelines provided by the National Offender Management Service in relation to research being conducted in YJS, permission was sought from the Head of Service of the local YJS to carry out data collection at the YJS premise.

Participation in the study was not expected to result in any adverse reactions. Nonetheless, as the questionnaire asked about childhood experiences of violence, information of support services was provided to the participants at the end of the study.

Results

Preliminary Analyses

Internal consistency of measures

MIIV full scale and MIIV Unjustified Violence subscale showed questionable internal consistency for this sample (Cronbach's α = .62 and .60 respectively) though all other measures demonstrated good internal consistency (Cronbach's α in the range of .81 to .88, see Appendix I). The checklists measuring childhood exposure to violence and experience of violence yielded good overall internal reliability (α = .88 and .86 respectively), as did the checklists measuring aggression towards parents and aggression towards others (α = .72 and .87 respectively). This suggested that a summation of the items selected on each of the four checklists could be appropriately used as scores on each of the four measures.

Descriptive Statistics and Gender Differences

A series of independent *t*-tests were conducted to explore gender differences amongst the variables examined. The Bonferroni correction was not applied to adjust for multiple testing as the gender subgroup analyses were intended to be exploratory. In such a situation, applying the Bonferroni correction might not be necessary as it could result in possible effects that could inform future studies being missed out (Althouse, 2016; Armstrong, 2014) due to the increased chances of a type II error (Nakagawa, 2004; Perneger, 1998). Descriptive statistics and results of the independent *t*-tests are presented in Appendix J. Significant differences were found between the two subgroups on VVGE, affective empathy and childhood exposure to violence between parents.

In all, 75.3% of the 291 respondents reported having played VVGs, with a mean of 16.39 hours spent playing VVGs per week (range=0-12 hours, SD=20.80). Male participants spent significantly more time playing VVGs in a week ($M=21.00$, $SE=1.65$) than female participants ($M=7.01$, $SE=10.10$) and this difference represented a medium effect, $t(285.97)=7.18$, $p<.001$, BCa 95% CI [10.33, 17.60], $g=0.71$.

Female participants ($M=40.41$, $SE=0.76$) scored significantly higher than males ($M=35.99$, $SE=0.56$) on affective empathy $t(289)=-4.59$, $p<.001$, BCa 95% CI [-6.35, -2.45], $g=0.57$, and reported more childhood exposure to violence between parents

($M=2.74$, $SE=0.31$ for females; $M=2.01$, $SE=0.18$ for males), $t(160.83)=-2.05$, $p=.042$, BCa 95% CI $[-1.54, -0.05]$, $g=0.27$.

Main Analyses

Correlation between variables

Correlation between variables for male and female subgroups are presented in the correlation matrix at Appendix K. An examination of the Pearson product-moment correlation coefficients provided partial support for Hypotheses 1 and 2.

Hypothesis 1. *Empathy would be negatively associated with moral reasoning about violence.*

Findings generally supported Hypothesis 1. For both genders, higher levels of empathy were associated with perceptions of violence as being less acceptable, though not all associations were significant.

Justified violence: For male participants, significant negative correlations were noted between moral reasoning about justified violence, and both cognitive ($r=-.16$, 95% BCa CI $[-.30, -.002]$, $p=.026$) and affective empathy ($r=-.23$, 95% BCa CI $[-.36, -.09]$, $p=.001$). While the strength of the relationship for females appeared similar to that for males, the correlations were not significant ($r=-.15$, 95% BCa CI $[-.36, .08]$, $p=.135$ for cognitive empathy; $r=-.16$, 95% BCa CI $[-.37, .09]$, $p=.118$ for affective empathy).

Unjustified violence: Moral reasoning about unjustified violence was found to be significantly negatively correlated with cognitive empathy for both gender ($r=-.28$, 95% BCa CI $[-.41, -.13]$, $p<.001$

for males; $r = -.29$, 95% BCa CI $[-.46, -.14]$, $p = .004$ for females). For affective empathy however, a significant and stronger association was noted for females compared to males ($r = -.27$, 95% BCa CI $[-.46, -.06]$, $p = .008$ for females; $r = -.07$, 95% BCa CI $[-.20, .07]$, $p = .333$ for males).

Hypothesis 2. *VVGE was hypothesised to be positively associated with perceptions of violence as being more acceptable.*

Hypothesis 2 was partially supported. As expected, a significant positive correlation was found between VVGE and perceptions of justified violence as being acceptable, though only in male participants, $r = .19$, 95% Bca CI $[0.07, 0.31]$, $p = .009$. The inverse was found for female participants – higher levels of VVGE was associated with perceptions of justified violence being less acceptable, though this association did not reach significance, $r = -.05$, 95% Bca CI $[-.287, .188]$, $p = .651$. For unjustified violence, small but non-significant positive relationships were found between VVGE and moral reasoning about unjustified violence for both gender.

Multiple regression

In view of the differing patterns of correlation observed in the male and female subgroups, four separate hierarchical regression analyses were carried out to examine the relationship between VVGE and moral reasoning about justified and unjustified violence. Cognitive empathy, affective empathy, childhood exposure to and experience of violence were entered in Step 1 as control variables and

VVGE entered in Step 2 as predictor variable. An examination of the correlation matrix, variance inflation factor and tolerance statistic revealed no concerns with multicollinearity. Results of the regression analyses are presented in Tables 4.1 (for males) and 4.2 (for females).

For males, VVGE significantly predicted moral reasoning about justified violence ($b=0.009$ [$0.001, 0.017$], $p=.030$), lending further support to Hypothesis 2. Together, cognitive and affective empathy, as well as childhood exposure to violence between parents and experience of violence inflicted by parents accounted for 6.6% of variance in moral reasoning about justified violence. The addition of VVGE accounted for an additional 1.9% of the variance. VVGE however did not predict moral reasoning about unjustified violence ($b=0.001$ [$-0.002, 0.004$], $p=.424$).

For the female subgroup, VVGE did not predict moral reasoning about both justified ($b=-0.014$ [$-0.050, 0.024$], $p=.449$) and unjustified violence ($b=0.002$ [$-0.007, 0.011$], $p=.738$). After taking into account the control variables, VVGE accounted for less than 1% additional variance in moral reasoning about justified violence and hardly accounted for the variance in moral reasoning about unjustified violence.

Mediation analysis

Hypothesis 3. *Moral reasoning about violence would mediate the relationship between VVGE and aggression.*

This hypothesis was not supported. As previous analyses found that VVGE only predicted moral reasoning about justified violence in the males, mediation analyses were conducted on male participants only to examine if moral reasoning about justified violence was a mediator of the relationship between VVGE and aggression. Aggression was examined at two levels - aggression towards parents and aggression towards others. The models are shown in Figure 4.1. VVGE was entered as the predictor variable, aggression towards parents and others as separate outcome variables, and moral reasoning about justified violence as the mediator. Cognitive and affective empathy, as well as childhood exposure to and experience of violence were entered as covariates.

Results of the mediation analyses are summarised in Figure 4.1 and Table 4.3. In the models, VVGE significantly predicted moral reasoning about justified violence ($b=0.009$, $t(189)=2.01$, $p=.018$) and affective empathy was a significant covariate ($b=-0.032$, $t(189)=-2.28$, $p=.024$). Together, the model explained 8.5% of the variance in moral reasoning about justified violence.

Table 4.1.

Results of Hierarchical Multiple Regression Examining Relationship Between VVGE and Moral Reasoning About Justified and Unjustified Violence in Males (n=195)

Variables	Justified Violence					Unjustified Violence				
	R ²	b (BCa CI)	SE B	β	p	R ²	b (BCa CI)	SE B	β	p
Step 1										
Constant		6.841 (5.201, 8.341)	0.791		.001		2.236 (1.623, 2.967)	0.328		.001
Cognitive empathy		-0.026 (-0.074, 0.020)	0.023	-.090	.243		-0.026 (-0.045, -0.009)	0.009	-.272	.005
Affective empathy	0.066	-0.037 (-0.064, -0.011)	0.014	-.203	.013	.115	-1.752E-5 (-0.009, 0.008)	0.004	.000	.998
Exposure to violence		0.038 (-0.049, 0.130)	0.043	.066	.352		0.036 (0.008, 0.070)	0.016	.189	.022
Experience of violence		-0.020 (-0.099, 0.063)	0.042	-.038	.612		-0.043 (-0.069, -0.019)	0.011	-.242	.001
Step 2										
Constant		6.512 (4.906, 8.009)	0.797		.001		2.188 (1.557, 2.950)	0.338		.001
Cognitive empathy		-0.028 (-0.072, 0.017)	0.022	-.094	.206		-0.027 (-0.045, -0.011)	0.009	-.274	.005
Affective empathy	0.085 ($\Delta R^2 =$.019)	-0.032 (-0.060, -0.005)	0.014	-.174	.025	.119 ($\Delta R^2 =$.004)	0.001 (-0.008, 0.009)	0.004	.012	.860
Exposure to violence		0.021 (-0.060, 0.123)	0.042	.037	.607		0.034 (0.006, 0.067)	0.016	.176	.029
Experience of violence		-0.007 (-0.086, 0.071)	0.042	-.013	.868		-0.041 (-0.068, -0.019)	0.012	-.230	.001
VVGE		0.009 (0.001, 0.017)	0.004	.144	.030		0.001 (-0.002, 0.004)	0.002	.064	.424

Note. CI and Standard Errors (SE) based on 1000 bootstrap samples and 95% BCa CI.

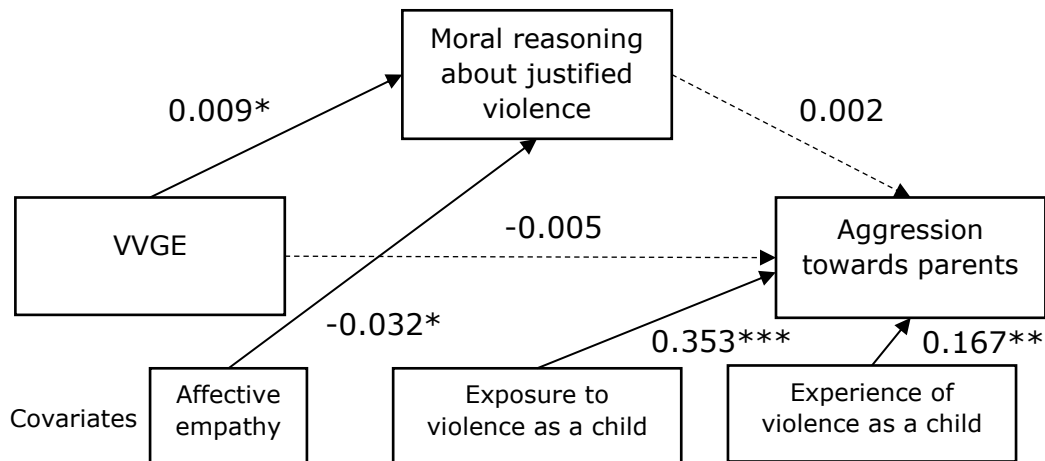
Table 4.2.

Results of Hierarchical Multiple Regression Examining Relationship Between VVGE and Moral Reasoning About Justified and Unjustified Violence in Females (n=96)

Variables	Justified Violence					Unjustified Violence				
	R ²	b (BCa CI)	SE B	β	p	R ²	b (BCa CI)	SE B	β	p
Step 1										
Constant		5.484 (3.334, 7.425)	1.158		.001		2.522 (1.630, 3.552)	.492		.001
Cognitive empathy		-.028 (-0.090, 0.042)	.035	-.102	.433		-.022 (-0.043, 0.000)	.010	-.216	.031
Affective empathy	0.067	-.013 (-0.064, 0.043)	.026	-.062	.637	.181	-.012 (-0.032, 0.005)	.010	-.156	.228
Witnessed violence		.061 (-0.156, 0.251)	.109	.122	.591		.089 (0.013, 0.176)	.048	.478	.060
Experienced violence		.036 (-0.122, 0.231)	.087	.075	.670		-.059 (-0.162, 0.019)	.044	-.335	.187
Step 2										
Constant		5.544 (3.411, 7.476)	1.173		.001		2.515 (1.630, 3.558)	.499		.001
Cognitive empathy		-.026 (-0.089, 0.046)	.035	-.094	.474		-.022 (-0.044, 0.000)	.010	-.219	.024
Affective empathy	0.076 ($\Delta R^2 =$.009)	-.014 (-0.066, 0.039)	.026	-.070	.608	.182 ($\Delta R^2 =$.001)	-.012 (-0.032, 0.005)	.010	-.154	.233
Witnessed violence		.070 (-0.149, 0.263)	.113	.141	.539		.088 (0.011, 0.178)	.048	.472	.071
Experienced violence		.036 (-0.121, 0.235)	.087	.076	.663		-.059 (-0.160, 0.022)	.044	-.335	.185
VVGE		-.014 (-0.050, 0.024)	.019	-.096	.449		.002 (-0.007, 0.011)	.005	.030	.738

Note. CI and Standard Errors (SE) based on 1000 bootstrap samples and 95% BCa CI.

(a) Aggression towards parents in males



(b) Aggression towards others in males

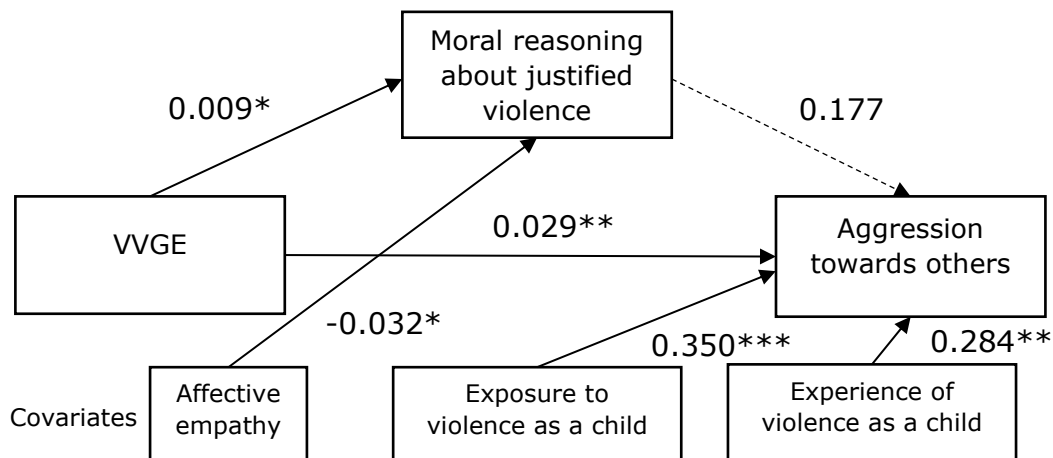


Figure 4.1. Mediation Models for Moral Reasoning About Justified Violence as a Mediator of VVGE and Aggression in Males ($n=195$) Unstandardised coefficients reported. * $p<.05$, ** $p<.01$, *** $p<.001$. Dashed lines are non-significant. Only significant covariates shown.

In model (a), VVGE was not associated with aggression towards parents, with or without moral reasoning about justified violence in the model ($b=-0.005$, $t(188)=-1.06$, $p=.293$ and $b=-0.005$ and $t(189)=-1.07$, $p=.288$ respectively). Consequently, there was no mediating effect of moral reasoning about justified violence on the relationship between VVGE and aggression towards parents.

Table 4.3.

Mediation Effects of Moral Reasoning About Justified Violence on the Relationship Between VVGE and Aggression in Males (n=195)

Effect	Aggression towards parents			Aggression towards others		
	<i>b</i>	95% CI		<i>b</i>	95% CI	
		Lower	Upper		Lower	Upper
Total	-0.005	-0.015	0.005	0.031	0.013	0.048
Direct	-0.005	-0.015	0.005	0.029	0.012	0.047
Indirect (Mediation)	0.000	-0.002	0.001	0.002	-0.001	0.005

When aggression towards others was examined as the outcome variable (Model (b)), the total effect of VVGE on aggression was significant ($b=0.031$, $t(189)=3.49$, $p<.001$). There was little change in the direct effect of VVGE on aggression towards others when moral reasoning about justified violence was added; direct effect remained significant ($b=0.029$, $t(188)=3.28$, $p=.001$). Moral reasoning about justified violence did not predict aggression towards others ($b=0.177$, $t(188)=1.25$, $p=.214$). Childhood exposure to and experience of violence were found to be significant covariates ($b=0.350$, $t(188)=3.48$, $p<.001$ and $b=0.284$, $t(188)=3.05$, $p=.003$ respectively). The model as a whole accounted for 28.6% of the variance in aggression towards others. Indirect effect of VVGE on aggression towards others showed that there was no mediating effect of moral reasoning about justified violence given that the CI included zero (indirect effect =0.002, SE=0.001, 95% CI [-0.001, 0.005]).

Exploratory Analysis

Exploratory analysis was done to compare between the YJS and main samples. Due to the unequal sample sizes between the two, a subset from the main sample was selected to match the number of participants in the YJS sample. Participants were matched on gender, age and nationality. Female participants in the YJS sample were excluded as numbers were too low for meaningful analyses by gender ($n=2$). Two male participants were also excluded as their nationalities could not be matched with participants from the main sample. The final sample comprised 12 male participants each from the YJS and main samples (age range 16 – 21 years old, $M_{age}=17.00$; $SD=1.41$ for both groups). All participants from the main sample and ten of the participants from the YJS sample played VVGs.

The Mann-Whitney test was employed to examine group differences due to small sample size and violation of assumptions of normality for some variables. Results indicated that the YJS sample perceived unjustified violence to be significantly less wrong (Median=1.75) than the main sample (Median=1.70), and that this difference represented a medium-large effect ($U=107.00$, $z=2.33$, $p=.045$, $r=.48$). No other significant differences were noted. Bonferroni correction was not applied for reasons as discussed earlier. Descriptive statistics and results of the Mann-Whitney test are presented in the Appendix L.

Discussion and Future Directions

Results of the current study provided partial support for two of the three hypotheses. Consistent with the notion that empathy was an important component in moral evaluation and development (Funk et al., 2003; Jolliffe & Farrington, 2006), lower levels of cognitive and affective empathy were noted to be associated with perceptions of violence as being acceptable (Hypothesis 1) though not all associations were found to be statistically significant.

The lack of a significant association between empathy and moral reasoning about justified violence in the female subgroup was unexpected. This could perhaps be due to the small sample size or low reliability of the moral reasoning measure. As discussed in Chapter 3, some studies reported questionable internal reliability estimates of MIIV. It was postulated that this could be due to inherent difficulties in administering the MIIV to children who might not have sufficient mental efficiency to complete the MIIV. Nonetheless, the study had tried to circumvent this issue by using an adolescent sample. Despite this, internal reliability estimates of MIIV in this study remained low, perhaps signalling a need to increase the reliability of the MIIV.

While higher levels of VVGE were found to be related to perceptions of violence as correct (Hypothesis 2), this held true only for justified violence in the male subgroup. Similar to results reported by Vieira and Krcmar (2011), no relationship was found between

VVGE and moral reasoning about unjustified violence. One possibility was that situations involving unjustified violence presented with little ambiguity as to the 'rightfulness' or 'wrongfulness' of the behaviour. Through cognitive maturity and social learning processes, adolescents and young adults would probably have developed a firm and sound understanding that violence without reason was unacceptable. This view was supported by the low mean score and small spread of responses on the MIIV Unjustified Violence subscale ($M=1.27$, $SD=0.48$ and $M=1.31$, $SD=0.56$ for males and females respectively).

On the other hand, situations of justified violence would be more ambiguous and perception of its 'rightfulness' would thus be more susceptible to external influences. Similar to how VVGE impact on aggressive behaviours, individuals who engaged in repeated violent video gameplay could have been cognitively primed to view violence as an acceptable means of resolving conflict (when a reason to do so existed) and be more desensitised to the effects of using violence. Taken together, the results suggested that in nurturing the development of moral reasoning about violence in children and adolescents, the distinction between justified and unjustified violence was important and attention should be directed towards helping them process ambiguous situations involving the use of justified violence.

No relationship was found between VVGE and moral reasoning about violence for females. This could be due to the limited range of

VVGE presented by the females. As shown by the *t*-tests, males spent significantly more time per week playing VVGs than females and an examination of the scatterplot also showed that females had a much narrower range of VVG playtime (0 – 41 hours) compared to the males (0 – 112 hours). Perhaps there exists a threshold, where only individuals who played VVG for a certain prolonged duration would exhibit lower levels of moral reasoning. Alternatively, it could also be possible that VVGE would impact on the two genders differently. Calvert et al. (2017) highlighted the lack of studies specifically designed to examine gender differences in VVGE and this would thus be an area worthy of future exploration.

Although in the male subgroup, VVGE predicted moral reasoning about justified violence, the latter did not predict aggression towards others and did not mediate the relationship between VVGE and aggression towards others. This could be due to low power of the sample size to detect the mediating effects or could be an indication that there are other more critical factors that mediate or moderate the effects of VVGE on aggression. Hence, future studies could consider utilising a larger sample size and examining other possible mediating or moderating factors such as empathy or childhood experiences of violence given that affective empathy as well as childhood exposure to violence and experience of violence were significant covariates in the proposed mediation models.

Limitations

A key limitation of this study was that the sample of 195 males probably lacked sufficient power to detect the mediating effects, if any. Fritz and Mackinnon (2007) recommended that a sample size of around 377 would be required to achieve a power of 0.80 (with estimated small effect size between VVGs and moral reasoning, and a small to medium effect size between moral reasoning and aggressive behaviour) using a bias-corrected bootstrap test. While the data collection process had set out to recruit a sample larger than that estimated to be required (414 responses obtained), the buffer was still insufficient to account for subsequent data cleaning and the need for analyses to be done separately by gender. This resulted in the sample size for mediation analysis falling short of the minimum number required for each gender.

In addition, the cross-sectional design of the current study was a limitation since no conclusions could be drawn about causality. The uneven sample size between genders and the relatively small sample size of female respondents also limited more detailed examination of specific gender differences. Nonetheless, given that no previous study has examined the role of moral reasoning about violence in mediating the relationship between VVGE and aggression amongst adolescents, the current study was designed to be exploratory in nature rather than to determine causality or investigate specific gender differences.

The sample of young offenders in this study was unfortunately too small for further quantitative analyses. Consequently, no observations or conclusions could be made beyond the finding that young offenders perceived unjustified violence as being more acceptable compared to non-offenders.

At the start of the data collection process, available file records indicated that there were at least 100 potential participants at the YJS who met the inclusion criteria for age. The actual data collection process however turned out to be more challenging than expected. Some youths were under lock-up or in a Young Offender Institution and could not be approached for the study. Case Managers were also not inclined to approach youths whom they felt would be unlikely to give consent for the study due to existing challenges in engaging them for sessions. Furthermore, owing to ethical considerations, several youths were excluded from the study as Case Managers informed that they were working on more pressing issues with the youths (e.g., lack of stable care arrangements, difficulties securing suitable accommodation arrangement, experiencing mental health difficulties or other safety concerns, etc.). Amongst those who did agree to meet for the study, a handful did not turn up for the scheduled appointments on multiple occasions and eventually had to be dropped from the list. Consequently, this substantially affected the number of YJS participants recruited for this study.

Consideration was given to either approach more YJS to recruit participants for the study or tweak the methodology to engage the available YJS participants in a qualitative study. Nonetheless, these plans were not feasible due to the limited remaining time available to complete the study. Moreover, only one of the YJS participants indicated willingness to be contacted for subsequent follow-up studies and a single case study has already been completed as part of this entire research. Hence, on hindsight, a much longer data collection timeframe should be factored into studies involving the youth offending population and such studies would best be designed as primary study of its own given the potential scale and need to include more data collection sites.

Although it was not possible to examine the relationship between VVGE, moral reasoning, empathy and aggression in an offending sample through quantitative means, Chapter 5 had examined this through a qualitative design involving an in-depth interview with a single subject. In the next chapter, the relationship between exposure to violent media, moral reasoning, empathy and offending was examined in a female offender. Associations between these variables were also examined in relation to how it fitted into a model proposed by Browne and Pennell (2000) based on their work with male offenders.

Chapter 5 : Exploring the Links Between Media Violence, Moral Reasoning, Empathy and Offending Through a Single Case Study

Abstract

This single case study explored how exposure to media violence, moral reasoning and empathy relate to offending behaviour in a young adult, SC, who was convicted of murder and detained in a secure service. Information was obtained through in-depth 1:1 interviews, media use diary, psychometrics and file reviews. Findings from the study suggested that the pathway through which media violence could have influenced SC's offending and use of violence could be represented by an adaptation of a model first proposed by Browne and Pennell (2000) to account for the development of a preference for violent films. Implications of the identified pathway on the current impact of media violence on SC were also discussed. The case study identified an existing research gap in relation to the impact of media violence on self-harming behaviours. Although findings from such single case studies might be limited in its generalisability, it is proposed that there is also potential value in adopting qualitative approaches for future studies examining the impact of media violence.

Introduction

"There is a guy who is fed up of his boring role and life and he meets another guy on an aeroplane who is everything he wants to be. They live together in a house and form an organisation called Fight Club. This becomes an anarchic group and they set fires, plant bombs and blow up credit card companies. The original guy and the one he met fight but it ends when he realises that the one he met is actually an aspect of himself and he never really existed as a separate person at all."

This is a synopsis of the film 'Fight Club' given by SC² while awaiting trial for her index offence of murder. It was reported that she identified with the main character in the film as this character discovered his "dark side" just as she had when she killed her victim. SC had in the past shared that she enjoyed watching violent films and would watch certain films (such as Fight Club and Resident Evil) repeatedly. Previous reports indicated that SC disclosed having violent fantasies involving scenes from violent films or video games, and that "violent music" associated with the violent scenes in some films would repeatedly play in her mind.

While serving the initial years of her sentence in a secure hospital, SC was said to have written about how violence excited her, and that

² Name and some personal information as well as non-critical details of the index offence have been changed to maintain anonymity of the patient.

she identified with the killers in books and films. Previous review reports also noted that staff have observed SC becoming excited and animated while watching programmes depicting violence. Having acknowledged that violent films were a significant part of her life, it was not surprising that links were made between SC's engagement in violent media and her use of violence and 'violent films' was thus identified as a trigger to her violent behaviour.

Fast forward some ten years later since her offence, SC had this to say of her relationship with violent media:

"Violent media was a big part of it and I watched films repeatedly. I steer clear now as there's no point in going there. I don't have the desire to watch them now. [...] because of my past, I can't go anywhere near drugs or alcohol. I could go on a downward spiral. It's not an option to watch violent media or films and it would relate to my past and get me thinking too much. I need to concentrate on my future".

SC now believed that she was no longer excited by violence depicted in television programmes, and found it upsetting that reports continued to state that she remained so. The specific impact of media violence on SC and its relevance as a risk factor became issues of interest for the service SC was residing in.

While various models and theories existed to account for the effects of media violence (see Browne & Hamilton-Giachritsis, 2005;

Eastin, 2013), little was known about the specific pathway through which media violence impacted on SC's use of violence and her offence. Equally, it was not clear if, and how, this continued to impact on SC more than a decade after her index offence. This single case study was thus done with the aim of addressing the following questions:

- (i) Did SC have a preference for violent media and what forms of violent media did she engage in?
- (ii) To what extent did media violence play a role in contributing to SC's offending and use of violence?
- (iii) What was the specific pathway through which media violence influenced SC's offending and use of violence? Was there a role for moral reasoning and empathy?
- (iv) Based on the identified pathway, what can be inferred of the current possible impact of media violence on SC?

Existing research has shown that violence is likely a confluence of multiple factors rather than the result of any single cause (Huesmann & Taylor, 2006). Hence, it was not the aim of this study to establish causality between media violence and SC's use of violence. Consequently, even though a case study might be limited in its generalisability and does not allow for the establishment of a cause-and-effect link (Salkind, 2002), this approach was deemed appropriate as it would generate a richer account of SC's experiences with media violence. This in turn, would allow for an examination of

how her experiences fitted into an existing model accounting for the relationship between media violence and offending. The case study with SC could also shed light on how media violence would likely impact on SC at present and the treatment implications.

Method

Design

This study was a non-experimental single case study involving multiple data collection methods. Direct work with SC included 1:1 interviews, psychometrics, and review of Media Diary. In addition, information was collated from available file information (e.g., gatekeeping assessment report, review reports, and Historical Clinical Risk Management-20, Version 3 (HCR-20^{V3}) risk assessments), discussions with ward staff, SC's daily progress notes, as well as notes from her ward round and main psychology sessions with the Lead Forensic Psychologist of the service.

Participant

Background information

SC, a female young adult, has been detained in secure services under Section 47/49 of the Mental Health Act 1983 (amended 2007) for an index offence of 'Murder'. At the time of engaging in this work, SC has been in the current secure service for about one and a half years. She was previously in a prison and a different secure service for more than a decade. SC's diagnosis was mixed personality

disorder, with features of emotionally unstable and dissocial personality disorder. She also presented with a history of life-threatening self-harming behaviour, most notably blood-letting, but also using ligatures, inserting objects into her body and punching herself in the face. SC has not self-harmed since her admission to the current service but reported that she still had a pre-occupation with blood-letting.

Index offence

SC had no known convictions prior to her index offence committed when she was an emerging adult. She was said to have attempted to strangle the victim with a chain and subsequently hit her with a weapon resulting in fatal injuries.

Family and personal history

SC came from a family of four. There was no known ante- or post-natal difficulties at birth, and SC reportedly achieved her developmental milestones at appropriate ages. SC presented with a number of adverse childhood events and traumatic experiences. For instance, she spoke about having failed to protect her brother from an incident that occurred when she was in primary school – she was not inclined to share more, except that the incident involved a man who approached her and her brother at the playground.

She also reported having been sexually abused as a teenager. SC's relationship with her family did not appear to be an emotionally supportive one prior to her offence. Her father was reportedly in poor

health and she felt neglected by her mother who had to take care of the father. She also had to shoulder the responsibility of taking care of her brother. Further, SC was often blamed and subject to physical punishments by her father for wrongdoings that her brother was responsible for. Nonetheless relationships with her family was said to have improved over time following family work that SC completed while in services.

Antisocial behaviours and substance use

SC presented with no history of aggression during her childhood, but this changed in secondary school where she was a victim of bullying. As SC felt that the school took no interest in the bullying, she took things in her own hands and retaliated by punching the bully. Following this incident, SC seemed to have gained some status amongst her peers. She then started to associate with negative peers and engaged in various antisocial behaviours during her teenage years e.g., played truant, shoplifted, fought with others frequently and set fire to another child's hair on one occasion. At the same time, SC took to carrying a knife around.

In addition, SC engaged in substance use. She admitted to drinking heavily and using cannabis and solvents (petrol and gas) regularly during her teens. In the year of her offence, SC was also drinking absinthe on a regular basis.

While in prison and the previous secure service, SC exhibited aggressive behaviours (e.g., threw or destroyed property, threatened

to harm or kill others, assaulted staff, incited others to assault staff, etc.) and disclosed violent fantasies (e.g., thoughts of assaulting or killing staff and peers, taking staff hostage by holding a razor to the throat, etc.). These incidents reduced in frequency after about five years in the high-secure hospital, and available information indicated continued progress thereafter with no incidents of violence reported.

Education and employment

SC's behaviour in school impacted on her academic performance in the last two years of her education though she managed to complete her GCSE examinations. She then enrolled in a local college but dropped out as the course was not what she envisaged. She began working at a bakery, where she reportedly enjoyed the work and had a good relationship with her workmates. Nonetheless, she subsequently experienced difficulties at work as she did not get along well with her supervisor and had to work longer hours after her supervisor left the job. Feeling weary from the additional work hours, SC started to take time off work on the pretext of illness, and eventually quit the job when questioned. Even though she started another job the following day, it was reported that she "did not really get into the job" and was a poor attendee. SC however had engaged in several vocational activities while in services.

Materials

Media use diary

A 'Media Use Diary' template (Appendix M) was created for SC to keep a record of the television programmes, games and reading materials she engaged in daily, as well as the duration of time spent on each, and her feelings before and after engaging in the said activity. The Media Use Diary provided information for exploration in the 1:1 sessions.

Psychometric measures

No pre-test measures were administered as the work with SC did not involve intervention for specific problematic behaviours. Psychometrics were administered at the end of the work with SC to provide additional information on gaming behaviour and traits of concern. SC completed measures of moral reasoning - MIIIV (Krcmar & Valkenburg, 1999) and empathy - BES (Jolliffe & Farrington, 2006) as used in the empirical study described in Chapter 4. She also completed the Internet Gaming Disorder (IGD) Scale (Lemmens, Valkenburg, & Gentile, 2015) and the Barratt Impulsiveness Scale (BIS-11) (Patton, Stanford, & Barratt, 1995).

Procedure

The work with SC spanned across 13 sessions and I had engaged her in the capacity of a Trainee Psychologist within the service. The Lead Forensic Psychologist of the service first sought verbal agreement from SC for me to meet SC to discuss the impact

of violent media (films and games) on her offending behaviours. Following this, my first session with SC was a preparatory session where I informed her of the limits of confidentiality and obtained written consent to engage her in this case study (see 'Ethical Considerations'). We also discussed goals and expectations, as well as concerns she might have. Specifically, I highlighted the possible negative impact she might experience arising from our discussions on media violence, e.g., negative emotions due to recollection of past instances of violence (as a perpetrator or as a victim), thoughts of violence, thoughts about violent films she has watched in the past, etc. Coping strategies and resources she could turn to were discussed to strengthen her coping.

The Media Use Diary was provided from the second session onwards on a weekly basis. The diary entries were reviewed for patterns on her choice of media. Activities involving violent media content were highlighted for further discussions in the weekly 1:1 sessions. In doing so, the following were explored:

- (i) Gist of the programme/game/reading material;
- (ii) Most significant/memorable segment and why;
- (iii) Who the lead/main character was;
- (iv) Whether she identified with the lead/main character, and if so, any perceived similarities/ differences;

- (v) Whether the lead/main character used violence. If so, what the role was ('hero' or 'villain') and what the consequences of violence were (rewarded or punished);
- (vi) Self-rating of the level of violence on a scale of 1 (Mild) to 5 (Very severe); and
- (vii) Significant feelings before and after engaging in the chosen activity.

Ethical Considerations

Exploration of the role of media violence in SC's use of violence and offending behaviour was deemed as part of the psychological work to be provided to SC as both SC and the service were keen to gain a deeper understanding of this. As such, ethical approval was not required from the organisation to embark on the case study. Nonetheless, written consent was obtained from SC for the study, and for the work that I undertake with her to be written up anonymously and in a manner that safeguards her confidentiality, as part of my training requirements for submission to the University. This was discussed in the initial preparatory session, where I also informed SC of the limits of confidentiality.

To ensure that SC would not feel pressured to consent to my work with her being written up for submission, I emphasised to SC that she could withdraw her consent for me to do so at any stage of our engagement without impacting on the work that we have agreed

on to further her understanding of the link between media violence and her use of violence. More importantly, I assured her that withdrawal of consent would not impact on the main interventions she was receiving at the service, namely her psychology sessions with the Lead Forensic Psychologist aimed at supporting SC to consider her care pathway, therapeutic activities with the Occupational Therapy team, as well as a group substance misuse programme. Although I was one of three co-facilitators of the substance misuse group, my interaction with SC was limited to the group sessions; I did not provide additional support to SC through individual sessions. This was to minimise role confusion and potential bias that could influence my work with SC in exploring the impact of media violence on her.

At the end of our work, another written consent was sought from SC for me to write up our work for publication in scientific journals or presentation at conferences, should an opportunity arise. SC was again given information in relation to safeguarding confidentiality and withdrawing consent without impact on her treatment. She was also informed that in the event of any potential publication, my work would be reviewed by the relevant Responsible Clinician and care team to ensure that safeguards were in place to respect confidentiality and maintain her best interest.

Results and Analysis

Psychometric Measures

SC's responses on the IGD Scale (Lemmens et al., 2015) indicated that she did not meet diagnostic criteria for IGD. Based on cut-offs reported in Stanford et al. (2009), her total score on the BIS-11 (Patton et al., 1995) was also found to be within normal limits for impulsiveness. There was no recommended cut-offs associated with the MIIV (Krcmar & Valkenburg, 1999) and BES (Jolliffe & Farrington, 2006). SC's scores were instead compared with mean scores from female participants (main sample and YJS sample) of the empirical study reported in Chapter 4 though she was of an older age group. SC's scores on the MIIV and BES were comparable to that of the non-offending sample (within one SD) (see Table 5.1). Compared to the YJS sample, SC scored lower on Cognitive Empathy and higher on Affective Empathy. Scores on the MIIV were lower than the YJS sample though the difference did not exceed one SD.

Table 5.1.

Comparison of MIIV and BES Scores Between SC, a Non-offending Female Sample (n=96) and a Youth Justice Service Female Sample (n=2)

Measure	SC	Mean Score (SD)	
		Non-offending Females (n=96)	YJS Females (n=2)
MIIV Justified Violence	4.50	4.25 (1.50)	4.75 (0.25)
MIIV Unjustified Violence	1.00	1.31 (0.56)	1.50 (0.50)
BES Cognitive Empathy	35.00	36.32 (5.53)	37.50 (0.50)
BES Affective Empathy	43.00	40.41 (7.43)	36.00 (0.00)

Question 1: Did SC have a preference for violent media and what forms of violent media did she engage in?

Consistent with previous reports, SC acknowledged that she used to enjoy watching violent films in the past and film violence was the form of media violence that she engaged most in. SC named the movie 'Scream' as one of the earliest violent film she watched and rated it a '4' or '5' (on a 5-point scale) in terms of the level of violence. She struggled to recall other specific titles of violent films that she has watched or enjoyed, stating that only 'Fight Club' and 'Resident Evil' came to mind as these films have been repeatedly mentioned in her reports. SC had also engaged in violent video games (e.g., Resident Evil) and read books containing violent themes (e.g., The Most Evil Men and Women in History), though to a lesser extent than films. According to SC, she did not play much video games in the past as she spent most of her time out with friends.

Hence, while it seemed like SC had a preference for violent media in the past, she did not engage equally in all types of media violence. Further, though she enjoyed watching films depicting violence, she was not drawn to all violent films. For instance, she stated that she did not like the film 'Resident Evil' and did not relate to it. She believed that the film was documented in her reports only because she happened to have watched the film before her offence took place. SC explained that she watched the film as she was curious to know how similar the film would be to the video game.

Based on SC's accounts, she enjoyed violent films which had storylines that validated her perception and feelings about life ("life is shit"), and where the lead character was portrayed as someone who felt 'trapped' in life and 'forced' to respond with violence. Such films appealed to SC and she could connect with the lead characters as she felt that her own experiences and perspective of life mirrored that of the lead characters.

Question 2: To what extent did media violence play a role in contributing to SC's offending and use of violence?

The film 'Fight Club' was highlighted as a violent film that SC watched repeatedly. SC had also stated that music from the film was playing at the time of her offence and she found herself pulling the chain more tightly around the victim. Interviews with SC for this case study however did not reveal evidence of a copycat crime. Neither the modus operandi nor weapon used was a replication of the film's. While SC had previously displayed aggressive and violent behaviour on numerous occasions while in services, there was also no indication that these were preceded by her engagement in media violence. Media violence however could have influenced SC in three ways – contributed to violent fantasies, reinforced pro-violence cognitions, and strengthened the notion that violence to self (self-harm) is a form of self-punishment.

Violent fantasies

In 1:1 sessions with SC, she acknowledged that some of the violent fantasies she previously had were influenced by programmes or films she watched. SC recalled that her earliest media-related fantasy occurred in her teens. After watching a television programme where the female character took someone hostage at gun-point as a revenge for killing her boyfriend, SC started to dream about being caught in a difficult situation that would ultimately force her to similarly hold a classmate hostage at gun-point. These dreams eventually developed into violent fantasies. At about the same time, SC also had increasing thoughts of threatening to stab people (but not thoughts of actually doing so) after watching the horror film 'Scream'. These accounts were consistent with previous reports indicating that as a teenager, SC started to experience images of extreme violence in the form of nightmares, daydreams or fantasies, but reported no urge to act on them.

Central to these fantasies was the idea of being in a position of power and instilling fear in her victims. This was also evident from what SC cited as the most significant aspect of the book 'The Most Evil Men and Women in History' – a King so powerful that he could make people kill themselves by cutting their own throats instead of killing them himself. This led SC to fantasise about being powerful, though she maintained that she did not fantasise about emulating any specific act.

Pro-violence cognitions

SC was drawn to violent films that validated her negative perceptions of life and her belief that violence is a necessary and appropriate response to the negative experiences in life. Such films reinforced these views she held, which can be categorised into three main themes – (i) Feeling trapped in life and seeing violence as a justifiable response; (ii) Need for power and control; and (iii) Violence to self as a form of punishment. The relevant segments of films that SC highlighted as significant in reinforcing these three themes are laid out in Appendix N.

Self-harm

While no film was identified as having directly contributed to SC's self-harming behaviours, it appeared that some violent films served to strengthened SC's idea that it was a 'win-win' situation to inflict pain on others and to inflict pain on herself. She believed that she deserved to be 'punished' for being violent to others, and allowing herself to be hurt by others (e.g., engaging in 'sado-masochistic' rituals or games with the victim that led to both sustaining injuries) was a way of 'punishing' herself, as was her self-harming behaviours. That said, it should also be pointed out that such self-harming behaviours were also driven by a multitude of factors and served other underlying functions beyond the scope of this case study.

Question 3: What was the specific pathway through which media violence influenced SC's offending and use of violence?

Taken together, the pathway through which media violence could have influenced SC's offending and use of violence can be represented by the model proposed in Figure 5.1. This was adapted from a model first proposed by Browne and Pennell (2000) (see Appendix O for original model proposed) to account for the development of preference for violent films based on their work with a group of male young offenders.

The original model proposed by Browne and Pennell (2000) was based on the notion that individuals with a history of family violence would be more vulnerable to engaging in offending behaviours and would also have a preference for violent films. This however might be moderated by individual factors such as one's temperament or empathy and moral values. Here, it is proposed that the model be tweaked to include family, social and environmental factors, instead of being limited to family history of violence. Adverse childhood events or traumatic experiences (e.g., history of bullying, childhood abuse, etc.) have also been found to be related to an increased risk of violence (Bosqui et al., 2014; Craig, Piquero, Farrington, & Ttofi, 2017; Macinnes, Macpherson, Austin, & Schwannauer, 2016).

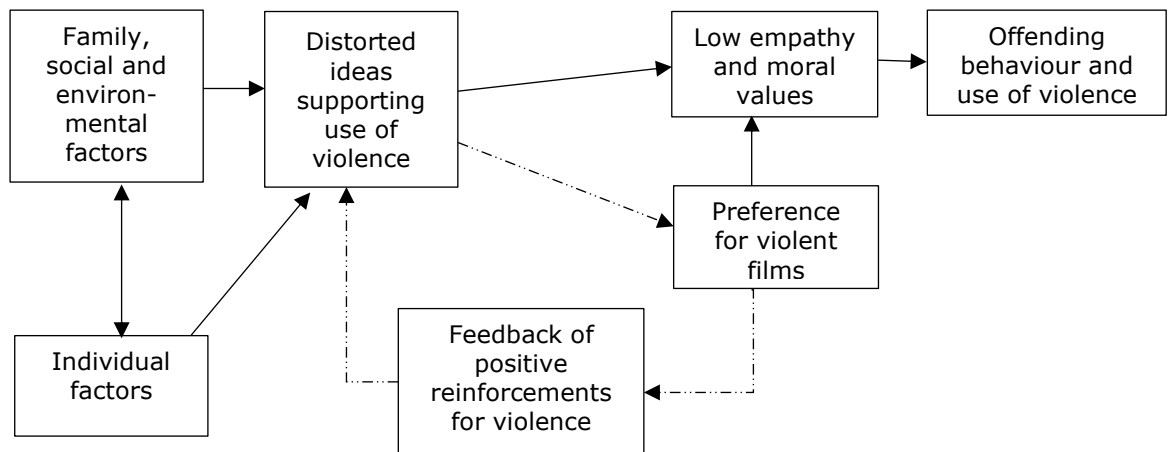


Figure 5.1. Proposed Model Showing Role of Media Violence in SC's Offending Behaviour and Use of Violence.

Family, social and environmental factors

An examination of SC's childhood and growing-up experiences revealed several adverse events and traumatic incidents as reported under 'Family and Personal History'. The series of adverse events contributed to SC's perception that everything in her life was, in her words "going wrong" and she felt "trapped" as she did not feel that she was able to share these difficulties with anyone. Her attempts to stand up for herself when bullied earned her a bad reputation, but the notoriety gained, coupled with her subsequent association with negative peers and engagement in various antisocial behaviours, meant that SC was feared by others. This provided SC with a sense of power and she equated fear with respect.

Distorted ideas supporting use of violence

Consequently, SC formed distorted ideas that supported the use of violence. She believed that it would be better to be the

perpetrator of violence rather than a victim as the former would put her in a position of power to stand up for herself and be respected by others. She also came to believe that violence was a justifiable response to her life circumstances.

Preference for violent films

As discussed earlier, SC was in the past drawn to violent films that validated her perceptions of life and shared her beliefs in relation to violence being a justifiable response as she could identify with the characters in these films. Such films in turn strengthened her pro-violence cognitions and contributed to violent fantasies. Hence, rather than SC's preference for and engagement in media violence leading directly to her offending and violence, it is postulated that media violence contributed to her use of violence via a reinforcement of her pro-violence cognitions. This specific pathway is reflected in the model by dashed lines. It is also believed that this pathway would more accurately reflect SC's accounts of the relationship between her cognitions and preference for media violence, as opposed to the original model in Browne and Pennell (2000).

Individual factors, low empathy, and moral values

Given the nature of the case study, it would not have been possible to obtain a profile of SC's temperament and personality characteristics, as well as her empathy and moral development prior to and at the point of her offending. Nonetheless, given SC's diagnosis of personality disorder, this could have been an individual

factor that increased her vulnerability to interpersonal difficulties, violent fantasies, pro-violence cognitions, and aggressive behaviours.

Further, in 1:1 sessions with SC, she related that her 'old' self was a self-centred individual with somewhat of a "wild side", did not care about what others thought of her and was not concerned about how others felt. In the initial years after her conviction, SC was also reported to have stated that "what she remembered of the victim was not her distress, but a black lump on the floor moving occasionally".

Question 4: Based on the identified pathway, what can be inferred of the current possible impact of media violence on SC?

While SC was candid in admitting that she had in the past enjoyed watching violent films that validated what she was experiencing in life, she indicated that she no longer felt this way. SC believed that since she started engaging in therapeutic work while at the high-secure hospital, she had found it increasingly overwhelming and uncomfortable to watch gory and violent films as these reminded her of her index offence, and consequently, of the hurt that she has caused to others. She thus felt disappointed and frustrated that reports continued to suggest that she was still 'excited' about violent films. There was thus a lack of clarity with regard to how SC might still be influenced by media violence. A comprehensive evaluation of this however was not possible in the context of the current work with SC, as she had limited access to violent video games (games given a

PEGI rating of 18 were not allowed in the service) and a review of her Media Use Diary did not reveal any films or television programmes rated 18 or above by the British Board of Film Classification (BBFC). Nonetheless, SC did engage in some first-person shooting games and films/television programmes that would have depicted violent scenes. Consideration of the current impact of media violence was thus based on these limited instances.

Over the period of our engagement, SC was noted to have spent an increasing amount of time playing video games (both non-violent and violent games), though this was unlikely a cause for concern as it did not impact on her involvement in other activities and treatment, and her responses to the IGD Scale did not meet the diagnostic cut-off for gaming disorder. In relation to the violent video games, SC articulated that she only enjoyed those that required strategising (as opposed to 'mindless' shooting), and unlike films, she was not interested in repeating games that she has completed. SC opined that she did not connect with the storyline or characters in the games she played and the segments which she found memorable were those that she found challenging or difficult to progress in, rather than specific scenes or acts of violence. A discussion of the films and television programmes that SC watched did not reveal pro-violence cognitions that she previously had and SC maintained that she did not experience violent fantasies arising from these films or programmes. It was also noted that there were instances where SC

had chosen to watch other programmes over a violent film as she felt that the show did not have an appealing storyline and was merely portraying gore and violence for the sake of doing so.

Looking at the specific pathway that incorporated SC's preference for media violence (indicated by the dashed lines in Figure 5.1), it can be inferred that changes in SC's cognitions regarding the use of violence could possibly impact on her preference for media violence, and this would in turn impact on the maintenance of her violence-related cognitions via her engagement in media violence.

While in the high-secure hospital, SC has had the opportunity to engage in various pieces of therapeutic work including individual trauma-focused therapy, family work, and offence-focused work. SC related that her relationship with her family has improved in the context of the work done, and there also appeared to be some shifts in her previous pro-violence cognitions. For instance, SC had reportedly said that "I always thought that when people hurt me emotionally, because I couldn't make them feel emotional pain I would make them feel physical pain. I've now learnt to deal with emotional pain through understanding childhood traumas and using EMDR was really helpful", and that "I used to always be the perpetrator because I didn't want to be the victim. Now I'm neither. I'm not focusing on violence." In a 1:1 session with SC, she also clarified that she used to think that violence was not necessarily bad as it could be a motivating force (based on a scene from 'Fight Club'),

but she now recognised that there were alternative ways of motivating someone and using violence could potentially lead to an adverse outcome. In view of these shifts, it could be possible that SC would be less drawn to the types of media violence she used to consume as she would not resonate with the violence portrayed.

What was less clear was the impact of media violence on SC's self-harming behaviours, which historically has been the greater concern (relative to interpersonal violence) during her time in services. In the course of the current work with SC, she has expressed that she tended not to watch programmes that revealed too much blood due to concerns that such scenes might remind her of self-harming. Although some researchers have suggested a link between engagement in violent video games and the ability to enact lethal self-harm (Teismann, Förtsch, Baumgart, Het, & Michalak, 2014), the literature on engagement in media violence and self-harming behaviours is relatively scarce.

Discussion and Conclusion

Information obtained for this case study was largely based on the patient's self-report and available file information. As such, quality of information obtained would be dependent on that of the information provided by the patient as well as accuracy of file records. Nonetheless, throughout the course of the work with SC, she came across as cooperative, keen, and curious to gain an understanding of herself with respect to the impact of media violence. In this regard,

it has been possible to obtain sufficiently detailed information from SC. Notably, one limitation was the lack of objective measure or data prior to SC's index offence to serve as a baseline measure. It was also a limitation that in the current setting, SC's access to violent media was restricted (for a valid reason) and hence a comprehensive evaluation of the current impact of media violence was not possible.

Despite these limitations, the current case study has addressed the four research questions of interest: (1) SC was previously drawn to violent films that validated her negative perceptions of life; (2) Such films contributed to some of SC's earlier violent fantasies as a teenager, where she fantasied about being in a position of power and instilling fear in her victims. There was however no evidence suggesting that she had acted on these early violent fantasies. The films also strengthened her belief that violence was a justifiable response to negative experiences in life, and that power and control were important; (3) Instead of exerting a direct causal impact on SC's offending or use of violence, violent films appeared to have impacted on SC by reinforcing her pro-violence cognitions as depicted in Figure 5.1; (4) Consequently, changes in her attitude towards and thoughts about the use of violence could possibly impact on her preference for media violence, thereby reducing the chances of media violence further strengthening her pro-violence cognitions.

Notwithstanding the above, it is important to bear in mind that violence is a confluence of multiple factors and SC's overall risk of

violence should not be based solely on changes in her engagement of media violence. Caution would still need to be taken regarding the possible impact of media violence on SC's self-harming, particularly bloody scenes or those depicting severe blood loss. Existing research exploring the link between media violence and self-harm behaviours is relatively scarce, and this could perhaps be an area for future exploration.

In summary, this case study has provided an understanding of the possible relationship between media violence and offending and shed some light on possible changes in SC which could have implications on risk and treatment needs. It is proposed that there could be value in adopting qualitative approaches for future studies examining the impact of media violence. Much of the published work to date centred on a quantitative approach. Understanding how individuals drawn to media violence make sense of their experiences and the meaning attached to these experiences could provide valuable insights which, when combined with quantitative data, serve to expand our knowledge in this area.

Chapter 6 : Discussion and Concluding Remarks

This research thesis was primarily exploratory in nature, set up with the aim of exploring the relationship between exposure to violent video games, moral development - specifically moral reasoning about justified and unjustified violence, empathy and aggression. Knowledge of how moral reasoning related to VVGs, and if it played a mediating role between VVGE and aggression could offer practical insights into possible strategies that could be adopted to mitigate potential negative outcomes of VVGs for those at risk of being adversely influenced. This being particularly relevant as attempting to stop or even limit children's and adolescents' engagement in VVGs could be an uphill task given the increasing popularity of video gameplay and easy access to VVGs. The overarching aim of this thesis was achieved through four core pieces of work as detailed in **Chapters 2 through 5**. The findings of each chapter would be summarised in this final chapter and taking the results of this thesis as a whole, considerations on implications and future directions would also be discussed.

Summary of Findings

The **systematic review** presented in **Chapter 2** highlighted the paucity of research in the area of VVGE and moral development. A comprehensive search of various bibliographic databases, gateways

and grey literature identified only ten relevant citations. More than half of these studies investigated the relationship between VVGE and moral disengagement, three studies looked into moral reasoning and one focused on moral evaluation. Findings from the review indicated that a greater exposure to VVGs was associated with a higher level of moral disengagement, and there was also evidence that moral disengagement mediated the impact of VVGE on aggression.

The same however could not be said of moral reasoning and moral evaluation as studies relating to these moral components yielded inconsistent results. The dearth of research in VVGE and moral reasoning, inconclusive findings from existing studies, and a lack of studies investigating the mediating role of moral reasoning in VVGE and aggression prompted the development of this thesis.

As discussed in Chapter 2, the measurement of moral reasoning in studies of VVGE and moral development was a challenge for research in this area. While the concept and measurement of moral disengagement i.e., how individuals disengage from moral self-sanctions and think in ways that make their behaviours less harmful or less distressing (Bandura et al., 1996), tended to be consistent across studies, the distinction between other moral development related terms was less clear. Studies investigating moral reasoning and moral evaluation adopted different operational definitions of the moral components of interest, consequently leading to the use of different measures and difficulties in comparing findings across

studies. To circumvent this problem, it was proposed that studies on VVGE and moral reasoning adopt a more targeted approach of examining moral reasoning in relation to the variable of interest – in this case violence, rather than measuring moral reasoning at a broad level. This was the approach taken by Vieira and Krcmar (2011), who examined the relationship between VVGE and moral reasoning about justified and unjustified violence, measured using the MIIV (Krcmar & Valkenburg, 1999).

As the MIIV has not been as widely used as other moral reasoning measures, a **critique of the MIIV** was undertaken in **Chapter 3** to review its psychometric properties and utility. On the whole, it did not present with particularly strong psychometric properties though this could in part be affected by the limited number of studies available for the review. Continued research would be needed to provide more compelling evidence of its reliability and validity, particularly internal reliability and predictive validity. Nonetheless, the MIIV was not without merits. There was some evidence of face validity, construct validity and concurrent validity. In addition, the MIIV had the advantage of allowing for a more targeted measure of moral reasoning and was unique in its distinction between the contexts of justified and unjustified violence.

From a moral development and intervention or treatment perspective, knowledge of how moral reasoning about violence differed between the contexts of justified and justified violence would

help facilitate the development of more appropriate case scenarios for use in violence intervention programmes. Hence, at this point, the MIIV was still assessed to be a suitable measure for inclusion in an **empirical study (Chapter 4)** designed to explore the association between VVGE, moral reasoning about justified and unjustified violence, empathy and aggression.

On the whole, support for the association between these variables was stronger for males than females and occurred mainly for justified violence but not unjustified violence. This might be due to the less ambiguous nature of unjustified violence and hence less variability in the extent to which individuals perceived justified violence as being 'wrong'. Significant findings from the empirical study included the following:

- (i) As expected, cognitive and affective empathy were both negatively related to moral reasoning about justified violence (for male participants);
- (ii) In line with the hypothesis, higher levels of VVGE was found to be associated with perceptions of justified violence as being acceptable in the male subgroup;
- (iii) For males, VVGE predicted moral reasoning about justified violence even after controlling for empathy, childhood exposure to and experience of violence.

Moral reasoning about violence however did not predict acts of physical and psychological aggression; this contradicted existing

literature. Further, there was no evidence that moral reasoning about violence mediated the relationship between VVGE and aggression. These findings could be a function of low power due to inadequate sample size, or suggestive of the presence of other more critical mediating or moderating factors.

The empirical study included a comparison of the main non-offending sample with a sample of young offenders from a YJS within the UK. Owing to unforeseen circumstances as detailed in Chapter 4, the sample size of the YJS sample was too small for more detailed quantitative comparisons. An examination of the relationship between media violence, moral reasoning, empathy and aggression in an offending sample was instead achieved through a **single case study** involving a female offender (**Chapter 5**).

To date, there has been no known single case study conducted to examine this and the study would thus be an addition to the current literature. Findings suggested that instead of media violence exerting a direct causal impact on offending behaviour and use of violence, media violence such as violent films appeared to have impacted on behaviours by first reinforcing pre-existing pro-violence cognitions, which in turn could have impacted on empathy and moral values, consequently contributing to the offending behaviours.

Implications and Practical Applications of Findings

Justified versus Unjustified Violence

Findings from Vieira and Krcmar (2011) as well as the empirical study (Chapter 4) suggested that VVGE could impact on one's perception and acceptance of violence only in situations when there seemed to be a reason for the violence to be perpetuated, i.e., the violence would seem justified. This should not be taken to mean that violence can be condoned just because a reason for it existed, but merely highlighted the importance of considering the context in which violence was used – justified versus unjustified. To mitigate the impact of VVGE on children and adolescents, it would be important to help them process and guide their thinking about more ambiguous situations where violence seemed justifiable.

Need for a More Validated and Targeted Measure of Moral Reasoning

To better evaluate one's moral reasoning and perception of justified and unjustified violence, a more specific measure of moral reasoning would be needed. Compared to other more established moral reasoning measures that assess one's level of moral maturity on a broad level, the MIIIV allowed for a more targeted evaluation of one's moral reasoning about justified and unjustified violence. Nonetheless, as discussed in Chapter 3, while the MIIIV presented with some merits, it did not show particularly strong psychometric

properties. There is thus need for a more validated measure of moral reasoning about violence.

As a first step, it might be worth reviewing and revising the MIIV to increase its internal reliability. While low internal reliability estimates alone should not be taken as an indication of poor internal reliability – issues such as the developmental nature of the scale, number of items, and potential difficulties in eliciting reliable responses from respondents ought to be considered as well (discussed in Chapter 3) - there is certainly room for improvement in this aspect. It was postulated that the developing nature of children and the relative complexity of the MIIV would have contributed to poor reliability estimates (E. T. Vieira, Jr, personal communication, November 16, 2019). This potential problem was however addressed by administering the tool to a sample of adolescents in the empirical study described in Chapter 4. Nevertheless, internal reliability of the MIIV remained relatively low for the empirical study, suggesting that other reasons existed to account for the low internal reliability.

Further, no studies have been done to investigate the predictive validity of the MIIV. To some degree, this was examined in the empirical study and results indicated that moral reasoning about violence did not predict aggression. This finding would need to be considered in light of the relatively low internal reliability of the MIIV in the empirical study. Hence, further examination of the predictive validity of MIIV would also be warranted.

Development of an Integrated Model

The current research has shed light on possible links between exposure to VVGs/violent films, empathy, moral reasoning about violence, aggression and violent offending. Building on an earlier model proposed by Browne and Pennell (2000) to account for the development of preferences for violent films (see Appendix O), a revised integrated model is proposed, incorporating newly acquired knowledge from the current research. The integrated model at Figure 6.1 reflected the possible associations between the different variables of interest. This was first introduced in Chapter 5 following the single case study and would be expanded on in this chapter, with inclusion of findings from the systematic review and empirical study.

The original model proposed by Browne and Pennell (2000) was based on the notion that individuals with a history of family violence would be more vulnerable to engaging in offending behaviours and would also have a preference for violent films. This might also be influenced by individual factors such as one's temperament or empathy and moral values. The original model has been retained in the revised integrated model as the 'Offending Behaviour Loop' and 'Distorted Thinking Loop' (pathways '1' and '2' in Figure 6.1), albeit with some minor tweaks.

Offending behaviour loop

Specifically, in the 'Offending Behaviour Loop', instead of limiting to only history of family violence, the integrated model

recognised the role that other family, social and environmental factors had in contributing to one's attitudes towards violence and the risk of engaging in violence (e.g., adverse childhood events or traumatic experiences such as history of bullying and experiencing childhood abuse). This was based on findings from existing literature (Bosqui et al., 2014; Craig et al., 2017; Macinnes et al., 2016) as well as the empirical study in this current research, which showed that childhood exposure to and experiences of violence significantly predicted one's aggression towards others. These factors, together with individual and personality factors (e.g., aggressive temperament) could contribute to the development of pro-violence attitudes.

Distorted thinking loop

As discussed in the single case study at Chapter 5, one's pro-violence cognitions and attitudes would in turn contribute to the development of a preference for and engagement in violent media (e.g., films or games, etc) particularly when themes reflected in the media resonated with the individual's views that violence was a justifiable and acceptable response to the challenges or interpersonal conflicts in life. This would result in a feedback loop where the exposure to and engagement in violent media reinforces one's pro-violence cognitions and attitudes. Such positive reinforcement for violence formed the 'Distorted Thinking Loop'.

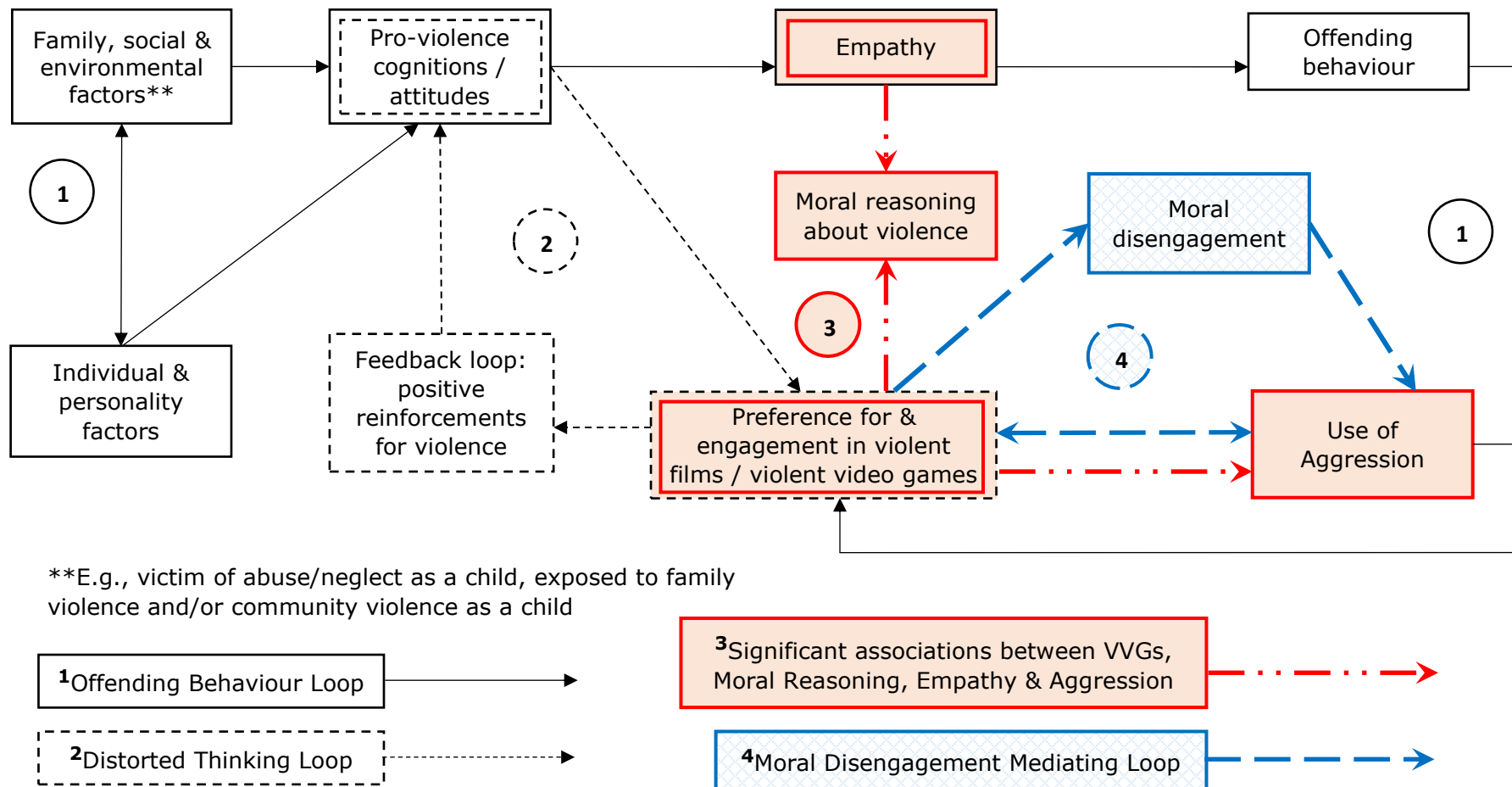


Figure 6.1. Integrated Model Reflecting Associations Between Media Violence, Moral Reasoning, Empathy and Aggression

Associations between VVGs, moral reasoning, empathy and aggression

Pathways '3' and '4' of the integrated model were the new additions to the original model by Browne and Pennell (2000). Pathway '3' (Figure 6.1, thick double-dotted arrows in red with text boxes shaded in red) showed the significant associations between VVGs, moral reasoning about violence, empathy and aggression, as revealed by the empirical study in Chapter 4. Exposure to VVGs and empathy have been found to be significantly associated with moral reasoning about violence, though this was limited to the context of justified violence in the male subgroup.

In addition, the preference for and engagement in violent films or games have also been found to be significantly associated with the use of aggression. It should be noted that in the revised integrated model, offending behaviour and use of aggression have been included as separate components. This was to reflect existing research evidence that VVGE has been found to be associated with aggression while there was no clear conclusion with regard to actual criminal behaviour (Calvert et al., 2017). Results from the single case study (Chapter 5) also provided support that engagement in violent films did not directly contribute to offending behaviour.

Moral disengagement mediating loop

While this research did not find evidence for moral reasoning about violence as a mediator of VVGE and aggression, the systematic

review (Chapter 2) concluded that there was evidence for the mediating role of moral disengagement and this was incorporated into the integrated model (Figure 6.1, Pathway '4' indicated by thick long-dash arrows in blue and text box with grid lines).

Practical Applications

A key finding of this thesis was that the exposure to VVGs was significantly associated with aggression towards others, and significantly predicated moral reasoning about justified violence but not unjustified violence, at least for the male participants. This held true even after controlling for empathy, childhood exposure to violence and childhood experience of violence.

These findings suggested that for parents and professionals working with children and adolescents (e.g., teachers, counsellors, psychologists, etc), particular attention should be given to how children and adolescents interpret seemingly justifiable acts of violence in the games that they play (e.g., violence perpetuated in retaliation to a trigger so as to protect oneself or one's loved ones, or violence used as a means of resolving a problem) and how they translate these interpretations to real-life problems. This would help them to develop sound moral reasoning skills about the use of violence, particularly when faced with the more ambiguous situations.

However, given that moral reasoning about violence was not found to have a mediating effect between VVGE and aggression towards others, caution should be taken not to 'over-react' just

because the child was noted to have engaged in VVGs. One should still bear in mind the importance of other more established risk factors of violence. For instance, other family, social and environmental factors that could contribute to pro-violence cognitions such as exposure to violence at an early age, harsh parenting and disciplinary practices, and association with negative peers, etc.

Owing to the small sample size, findings from the exploratory study comparing an offending sample with a non-offending sample could not be generalised. There were however indications that the offending sample perceived unjustified violence to be significantly less wrong than the non-offending sample, and that this was a medium-large effect. This indicated what has already been found in the existing literature that VVGE could have an impact on pro-violence attitudes and such attitudes remain a crucial risk factor to be addressed. Nonetheless, for professionals working with the offending / at-risk populations and delivering violence intervention programmes, it might still be beneficial to ensure that case scenarios crafted to challenge pro-violence attitudes and build conflict resolution skills include scenarios that seemed more ambiguous, where violence might be perceived as justifiable.

Reflections

Limitations

As highlighted in the empirical study (Chapter 4), the inadequacy of the sample size was a limitation of the study for the mediation analysis component. Despite having recruited a large number of respondents for the non-offending sample (which exceeded the recommended number required for mediation analysis), this regrettably still fell short of the recommended figure when the analysis had to be conducted separately for each gender. The study could have, at the outset, been designed to ensure that the sample for both genders would meet the required minimum number for mediation analysis.

In the initial design of the empirical study, care was taken to ensure that the questionnaire used in the study was not unnecessarily long to guard against test fatigue and the risk of attrition. Hence only one measure of moral reasoning was used. On hindsight, it might have been useful to include a second, and more established, moral reasoning measure. This would facilitate exploration of the concurrent validity of the MIIIV and would also serve as an alternative means of exploring the relationship between VVGE and moral reasoning, though this would not be focused on the moral reasoning about violence per se.

It was also a pity that the qualitative approach could not be adopted for a larger sample and was limited to the single case study.

In the initial design of the empirical study, there were plans for respondents to indicate if they would be willing to be contacted for a follow-up study where a qualitative study could be conducted to elicit insights based on the reported experiences of VVG players. This was eventually not implemented as administrative delays and oversight in the processing of the ethics application and communication of application outcome substantially reduced the available time for the study. As the single case study showed, it would have been a refreshing change to adopt a qualitative approach to investigating the impact of VVGE. This could perhaps be a consideration for future research in this area.

Future Directions

The various pieces of work in this research has culminated in an integrated model reflecting the associations between media violence, moral reasoning about violence, empathy, aggression and offending behaviour. In doing so, information from existing literature has been incorporated with new information obtained from the current work.

To develop this model, future research could still aim to ascertain the role of moral reasoning about violence as a mediator of the relationship between VVGE and aggression and consider how this would fit into the proposed integrated model. Further, in addition to the outcome variables of offending behaviour and aggression as depicted in the integrated model, it would be interesting to examine

the link between VVGE and self-harming behaviours as highlighted in the single case study (Chapter 5). While some researchers have reported the presence of such a relationship (Teismann et al., 2014), research in this area is still scarce and further research could yield important insights for the management and treatment of non-accidental self-injurious behaviours.

Looking ahead, future research could also consider more advanced multivariate analyses (e.g., Structured Equation Modelling) to investigate the structural relationships between the variables in the model. As an extension, it would also be ideal to engage in a longitudinal design to better assess the mediating effects (if any) over time. Lastly, a more concerted effort would be required to examine how this proposed integrated model applies to males and females, given that the empirical study revealed possible gender differences.

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Appendices

Appendix A

Inclusion Criteria Form

First author, date, country:

Inclusion criteria	Criterion met?	Comment
Study design: Is the study any of these types: (i) correlational; (ii) cross-sectional; (iii) before-and-after controlled trial; (iv) cohort / longitudinal? [To exclude reviews (e.g., book reviews, narrative reviews, other systematic reviews, meta-analysis), opinion papers (e.g., editorials, commentaries, newspaper articles etc.), qualitative studies, case-series, single-case experimental design]	Yes Unclear Discuss No	
AND: Is the study published between 2000 and 2019?	Yes Unclear Discuss No	
Population: Does the study target a general or non-offending population (either male or female or both)?	Yes Unclear Discuss No	
Intervention: Is the dependent variable an exposure to violent video games, where the violence is not in the context of a competitive sport?	Yes Unclear Discuss No	
Comparator: Does the study include a comparison group that is either exposed to a non-violent video game or not exposed to any video game?	Yes Unclear Discuss No	
Outcomes: Does the study contain moral development, moral judgement, moral reasoning or moral disengagement, or related terms, as the outcome measure?	Yes Unclear Discuss No	

If all questions answered with yes, include study.

Appendix B

Search Strategies for Selected Databases

ASSIA, NCJRS

1. videogam* OR (video (game* OR gaming)) OR (online (game* OR gaming)) OR (computer (game* OR gaming)) OR (arcade (game* OR gaming)) (limit to 2000 to 2019)
2. "moral reasoning" OR "moral development" OR "moral judgment" OR "moral evaluation" OR "moral disengagement" (limit to 2000 to 2019)
3. 1 and 2

OVID Embase, OVID MEDLINE, OVID PsycINFO

(mesh terms used differed slightly for each of the databases)

1. Exp Video games/
2. Exp Morals/ or exp Moral Development/ or exp Judgment
3. 1 and 2
4. Videogam*
5. (Video or online or computer or arcade) and (game* or gaming)
6. 4 or 5
7. Moral adj (reasoning or development or judgment or evaluation or disengagement)
8. 6 and 7
9. 3 or 8
10. Limit 9 to yr="2000 – Current"

PubMed

1. "Video Games"[Mesh]
2. "Moral Development"[Mesh]
3. "Retrospective Moral Judgment"[Mesh]
4. "Morals"[Mesh]
5. 2 or 3 or 4
6. 1 and 5
7. videogam*
8. (video or online or computer or arcade) and (game* or gaming)
9. 7 or 8
10. moral reasoning*
11. moral development*
12. moral judgement*
13. moral judgment*
14. moral evaluation*
15. Moral disengagement*
16. 10 or 11 or 12 or 13 or 14 or 15

17. 9 and 16
18. 6 or 16
19. 17 Filters: Publication date from 2000/01/01 to 2019/12/23

Web of Science

1. TS=(videogam*)
2. TS=("video game*" or "video gaming")
3. TS=("online game*" or "online gaming")
4. TS=("computer game*" or "computer gaming")
5. TS=("arcade game*" or "arcade gaming")
6. 1 or 2 or 3 or 4 or 5
7. TS=("moral reasoning" or "moral development" or "moral judgement" or "moral judgment" or "moral evaluation" or "moral disengagement")
8. 6 and 7

Appendix C

Quality Assessment Pro Forma

Author(s) (Year) :

Title :

Source :

Y = Yes; **P** = Partial; **N** = No; **U** = Unclear

Screening questions	Y	P	N	U	Comments	Location of information in article
Was the research question or objective in the paper clearly stated?	☐	☐	☐	☐		
Did the study target a general/non-offending population?	☐	☐	☐	☐		
Did the study include moral development, moral judgement, moral reasoning or moral disengagement as an outcome variable of interest?	☐	☐	☐	☐		

(A) Sampling and selection bias	Y	P	N	U	Comments	Location of information in article
Were participants randomly selected?	☐	☐	☐	☐		
Were the participants representative of the target population (e.g., age, gender, SES, etc)?	☐	☐	☐	☐		

Blinding - were participants aware of the research question?	☐	☐	☐	☐	[Being aware of specific research question could bias participants' responses]	
Risk of sampling and selection bias	☐ Low ☐ High ☐ Unclear					

(B) Measurement bias for exposure	Y	P	N	U	Comments	Location of information in article
Was 'violent video game' clearly defined?	☐	☐	☐	☐		
Was the exposure measure clearly described?	☐	☐	☐	☐		
Has the exposure measure been found to be a reliable way of measuring exposure to violent video games?	☐	☐	☐	☐		
Did the study examine different levels of exposure e.g. exposure measured as a continuous variable or exposure compared to no exposure?	☐	☐	☐	☐		
Did the author(s) consider the need to adapt the exposure measure to meet specific needs of the target population?	☐	☐	☐	☐		
Risk of measurement bias for exposure	☐ Low ☐ High ☐ Unclear					

(C) Measurement bias for outcome	Y	P	N	U	Comments	Location of information in article
<i>[Note: The study might include several outcome measures. For purpose of the quality assessment, measurement bias for outcome relates only to the outcome variable of interest in this systematic review, i.e., moral development, moral judgement, moral reasoning or moral disengagement.]</i>						
Was the outcome variable clearly defined?	☐	☐	☐	☐		
Has/have the outcome measure(s) been shown to be valid and reliable?	☐	☐	☐	☐	<i>[provide specific reliability and validity information if available]</i>	
Was/were the same outcome measure(s) consistently applied to all participants?	☐	☐	☐	☐		
If not, were scores standardised to allow for comparison of scores across participants?	☐	☐	☐	☐		
Was/were the outcome measure(s) appropriate for the target population? (e.g., age, gender, language ability, cognitive ability, etc)?	☐	☐	☐	☐		
Did the author(s) consider the need to adapt the outcome measure(s) to meet specific needs of the target population?	☐	☐	☐	☐		
Risk of measurement bias for outcome	☐ Low ☐ High ☐ Unclear					

(D) Attrition bias	Y	P	N	U	Comments	Location of information in article
Was the participation rate of eligible individuals at least 50%?	☐	☐	☐	☐		

Was reported loss of participants at $\leq 20\%$?	☐	☐	☐	☐	[Criteria adapted from NHLBI Quality Assessment Tool for Observational Cohort and Cross-sectional Studies]	
Risk of attrition bias	☐ Low ☐ High ☐ Unclear					

(E) Statistical bias	Y	P	N	U	Comments	Location of information in article
Were the statistical methods used appropriate for the study design?	☐	☐	☐	☐		
Were assumptions of the data tested (e.g., normality, homogeneity of variances, etc)?	☐	☐	☐	☐		
Did the author(s) report that the sample size was sufficiently large to be able to detect a difference in the main outcome between groups with at least 80% power?	☐	☐	☐	☐	[Indicate sample size]	
Was incomplete or missing information appropriately handled?	☐	☐	☐	☐		
Did the author(s) consider confounding factors and adjusted for these in the statistical analysis?	☐	☐	☐	☐		
Risk of statistical bias	☐ Low ☐ High ☐ Unclear					

(F) Reporting bias and other bias	Y	P	N	U	Comments	Location of information in article
Did the author(s) report all findings, including non-significant findings?	☐	☐	☐	☐		
Was the measurement of association presented, including	☐	☐	☐	☐		

confidence intervals, probability levels and effect sizes?						
Have the author(s) acknowledged potential biases?	☐	☐	☐	☐		
Can the results be generalised to other populations?	☐	☐	☐	☐		
Risk of reporting bias and other bias	☐ Low ☐ High ☐ Unclear					

Overall quality	☐ Poor ☐ Fair ☐ Good
Risk of bias in domains A to F above.	
<i>(Applicable only if study was reviewed by an independent 2nd reviewer)</i> Is there a discrepancy between the two reviewers with respect to the ratings in domains A to E above?	☐ Yes ☐ No
Additional notes/comments:	

Appendix D

Data Extraction Pro Forma

Date of extraction :

Author(s)/year :

Article title :

Type of publication:

Source/vol/page :

(I) Confirmation of Study Eligibility

- ☐ Study design: Correlational, cross-sectional, before-and-after controlled trial or cohort / longitudinal study.
 - ☐ **NOT** a review, opinion paper, qualitative study, case series, or single-case study.
 - ☐ Published between 2000 and 2019.
- ☐ Population: General or non-offending population.
- ☐ Intervention: Violent video game exposure (VVGE), where violence is not in context of a competitive sport.
- ☐ Comparator: Different levels of VVGE or exposure to a non-violent video game or exposure to no video game.
- ☐ Outcome: Moral development, moral judgement, moral reasoning or moral disengagement.

(II) Participant Characteristics

	Experimental Group	Comparison Group (not applicable if study examined different levels of VVGE)
Target population (describe)		
Total recruited (report numbers in each group)		
Participation rate / Total declined or withdrawn (if available)		
Gender (include sample size)		

Age range (mean, SD) (in years)		
Social Economic Status		
Ethnicity		
Country/ geographical region participants recruited from		
Setting (where participants were recruited from)		
Total valid sample size, if different from total recruited (report numbers in each group and reasons for exclusion)		

(III) Study Characteristics

Aim(s)/ Objective(s) of study	
Study design (type of study, study features, single-site/multi-site)	
Recruitment procedure (sampling, recruiting and data collection procedures, who collected data)	
Independent variable(s) (list all)	
Outcome variable(s) (list all)	
Covariate(s)/ Confounding variable(s), if applicable (list all)	
Mediating variable(s), if applicable (list all)	
Comparison group	
Study exclusion criteria (if any)	

(IV) Exposure

Exposure and exposure setting	☐ Engagement in / exposure to violent video game
Definition of 'violent' video game	
Was exposure measured as a dichotomous, categorical, or continuous variable?	
Duration of exposure (if applicable)	
Exposure measure (name and description)	
Was measure reliable and validated for use with the target population? (indicate reliability and validity information if available)	
- If not, any indication that measure was appropriate for the target population? (e.g., used in other similar studies, adapted to the specific population)	
Training required to administer measure?	
- If yes, who administered? Training provided?	
Was there missing, incomplete or invalid data?	

(V) Outcome

Outcome of interest	☐ Moral development ☐ Moral judgement ☐ Moral reasoning ☐ Moral disengagement ☐ Moral evaluation
Definition of outcome	

Was outcome measured as a dichotomous, categorical or continuous variable?	
Outcome measure (name and description)	
Was measure reliable and validated for use with the target population? (indicate reliability and validity information if available)	
- If not, any indication that measure was appropriate for the target population? (e.g., used in other similar studies, adapted to the specific population)	
Training required to administer measure?	
- If yes, who administered? Training provided?	
Number of follow-up measurements and time interval between measurements	
Was there missing, incomplete or invalid data?	

(VI) Statistical Analysis

Statistical tests used	
Were covariate(s)/ confounding variable(s) adjusted for? If yes, specify how.	
How was missing or incomplete data dealt with?	
Power analysis done?	

(VII) Results

Statistical Test	Overview of results (report n size, p values, effect sizes, and where applicable/ available, confidence intervals, power)
<Test 1>	
<Test 2> ... etc	
Researcher's conclusions	

(VIII) Summary and Other information

Key conclusion	(i)
Limitations	
Author's financial relationship and other potential conflicts of interest	

Appendix E

The MIIV Items and Response Scale

Story A-Unjustified (Frank)

Frank is a grocery store clerk. He has big muscles and exercises every day. One day, his pal Jeff asks Frank why he is lying to him. Frank gets furious and kicks his pal several times.

Story A-Justified (Paul)

Paul is walking home with his sister. A man grabs her purse, pushes her down, and runs away. Paul chases the man to get the purse back. When he gets hold of the thief, he kicks him several times and grabs the purse.

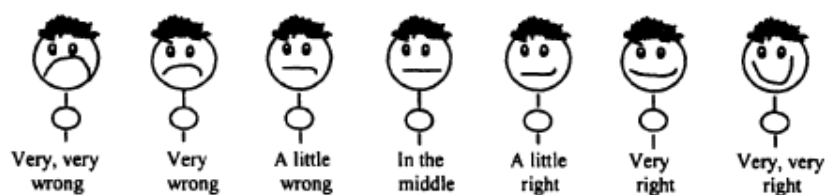
Story B-Unjustified (Barrie)

Barrie is a tall guy. One day, his neighbor accidentally parked his car too close to Barrie's car. Barrie became extremely angry and started to beat up his neighbor. His neighbor had to go to the hospital.

Story B-Justified (Philip)

Philip's grandmother lives in a neighborhood that is terrorized by some young men from a gang. The gang members regularly demand money from the older people. The older people usually refuse, but they are frightened. One day, Philip is staying over at his grandmother's when the doorbell rings. One of the gang members comes in and demands a drink and some money. Philip jumps from behind the curtain and starts to beat the gang member. The gang member had to go to the hospital.

Put a check in the circle. Was (name perpetrator) right, wrong, or in the middle?



Why was (name perpetrator) right, wrong, or in the middle?

Note: Responses are coded from 1 (very, very wrong) to 7 (very, very right).

Appendix F

Participant Information Sheet



PARTICIPANT INFORMATION

School of Medicine, Faculty of Medicine & Health Sciences

Project Title: Video gaming and the way we think

Researcher: TAN Ee Ee (msxeet@nottingham.ac.uk)

Supervisor: Dr Kevin Browne (kevin.browne@nottingham.ac.uk)

Ethics Reference Number: 122-1707

This is an invitation to take part in a Study looking at how video gaming influences the way we think. This information tells you what the Study involves.

Your participation is voluntary, and you may change your mind about being involved. You are free to withdraw at any point before or during the study. Withdrawal does not require a reason. Once you have completed and submitted the questionnaire it is not possible to withdraw the data because we won't know who you are.

What is the study about?

Previous studies have shown that video gaming can have an impact on the way we think. We are interested to find out more about how video gaming is associated with the development of reasoning in young people (aged 16 to 25 years old). Your inputs to the study would be valuable in contributing to our understanding of this.

Who is being asked to take part, and why?

All youth and emerging adults (aged between 16 and 25 years old) who enjoy playing video games (regularly or infrequently) are welcomed to participate in the study. You may have received this invitation directly from the researchers or through a friend / someone you know who is aware that you play video games.

What will I be asked to do?

If you agree to take part in this study, you will be asked to provide some basic information and complete a questionnaire, which is likely to take less than 15 minutes. The questionnaire will include questions about your video game play habits (if applicable), the way you think and act in different situations, and your thoughts on four given scenarios. It also contains questions about your relationships with significant others (e.g., parents, siblings or closest friend), including experiences of conflict situations. Your help and participation in this study is entirely voluntary and you can withdraw at any point before or during the study. Withdrawal does not require a reason and will have no negative consequences for you.

If you know someone between the ages of 16 and 25 years old who plays video games (whether regularly or infrequently), we would also be grateful if you can invite your friends to take part in this study too. This can be accessed at the following link:

<https://nottingham.onlinesurveys.ac.uk/video-gaming-and-the-way-we-think>

Will the study be of any personal benefit to me?

While there is no direct personal benefit for you in taking part in the study, your responses and the results of this study will contribute and further our understanding of how video games influence the way we think. The results of the study will also contribute towards fulfilling the requirements of a Doctorate degree.

What will happen to the information I provide?

All the information that you have provided will be kept in a password protected database and handled in strict confidence. Only members of the Study team will have access to the data, and these members have a duty of confidentiality to you as a participant and we will meet this duty. The database will not contain details that can directly or indirectly lead to you being identified.

At the end of the project, all raw data will be kept securely by the University under the terms of the Data Protection Act for a period of 7 years. The data will not be kept elsewhere. During this time precautions will be taken by all those involved to maintain your confidentiality. Only members of the Study team will have access to the data. After this time, your data will be disposed of securely.

What will you do with the data?

The results may also be published in scientific journals and presented at scientific conferences. Be assured that the data will be reported anonymously, with any identifying information removed. If you have any questions or concerns, please don't hesitate to ask. We can be contacted before and after your participation at the above address.

What are the possible risks of taking part in this study?

We believe there are no known risks associated with this Study. We will do everything possible to ensure your answers in this study will remain anonymous. We will minimise any risks by adhering to the data storage, confidentiality and security processes described above.

As you will only be asked to complete a questionnaire, it is not likely that you will experience any adverse reactions. In the unlikely event that you do experience some emotional disturbance after completing the survey, you can contact the following professional organisations for support:

- 1) Your YOT Case Manager
- 2) Counselling services / student well-being support services within an educational institution e.g., for students at University of Nottingham:
 - (i) The university's counselling service
Telephone : 0115 951 3695 (internal extension 13695)
Email : counselling.service@nottingham.ac.uk

(ii) Nottingham Nightline
Website : <http://www.nottinghamnightline.co.uk>
Telephone : 0115 951 4985 (7pm-8am every night of term)
Email : nightlineanon@nottingham.ac.uk (365 days a year)
Text : 07786 208 408 (7pm-8am every night of term)

3) Samaritans

Website : For individuals residing in UK or ROI, visit
<http://www.samaritans.org/branches> to find your nearest branch
Telephone : 116 123 (UK) or 116123 (ROI)
Email : jo@samaritans.org

THANK YOU FOR YOUR PARTICIPATION

If you have any queries or complaints about this study, please contact the student's supervisor in the first instance. If this does not resolve the query to your satisfaction, please write to the Administrator to the Division of Psychiatry & Applied Psychology's Research Ethics Sub-Committee (MS-DPAPEthics@nottingham.ac.uk, +44 (0)115 8232214) who will pass your query to the Chair of the Committee.

Appendix G

Participant Consent Form



PARTICIPANT CONSENT

School of Medicine, Faculty of Medicine & Health Sciences

Project Title: Video gaming and the way we think
Researcher: TAN Ee Ee (msxeet@nottingham.ac.uk)
Supervisor: Dr Kevin Browne (kevin.browne@nottingham.ac.uk)
Ethics Reference Number: 122-1701

Please tick each box to continue:

- ☐ I have read and understood the Participant Information.
- ☐ I agree to answer the questionnaire.
- ☐ I know how to contact the researcher if I have questions about this study.
- ☐ I understand that I am free to withdraw from the study without giving a reason.
- ☐ I understand that for anonymous questionnaire studies, once I have completed the study and submitted my questionnaire, the data cannot be withdrawn.
- ☐ I give permission for my data from this study to be shared with other researchers in the future provided that my anonymity is protected.
- ☐ I understand that non-identifiable data from this study might be used in academic research reports or publications.

Appendix H

Ethics Approval



**University of
Nottingham**
UK | CHINA | MALAYSIA

Email: FMHS-ResearchEthics@nottingham.ac.uk

Faculty of Medicine & Health Sciences Research Ethics Committee

c/o Faculty PVC Office
School of Medicine Education Centre
B Floor, Medical School
Queen's Medical Centre Campus
Nottingham University Hospitals
Nottingham, NG7 2UH

22th July 2017

Tan Ee Ee
Doctorate in Forensic Psychology
c/o Professor Kevin Browne
Director of Centre for Forensic and Family Psychology
Room B25 Yang Fujia Building
Psychiatry and Applied Psychology
School of Medicine, University of Nottingham
Jubilee Campus, Wollaton Road
Nottingham
NG8 1BB

Dear Tan Ee Ee

Ethics Reference No: 122- 1707– please always quote	
Study Title: An investigation of the association between violent video games and moral reasoning, empathy, and aggression.	
Short Title: Video gaming and the way we think.	
Chief Investigator/Supervisor: Professor Kevin Browne, Director of Centre for Forensic and Family Psychology, Division of Psychiatry and Applied Psychology	
Lead Investigators/student: Tan Ee Ee, Doctorate Student in Forensic Psychology, Division of Psychiatry and Applied Psychology (DPAP).	
Type of Study: Doctorate in Forensic Psychology, online survey, Young people	
Proposed Start Date: 01/06/2017	Proposed End Date: 31/12/2017 6mths
No of Subjects: 377+	Age: 16-25 years
School: Medicine	

Thank you for submitting the above application which has been considered by the Committee and the following documents were received:

- DPAP REC Application form and supporting documents version 1.0: 17.07.2017

These have been reviewed and are satisfactory and the study has been given a favourable opinion.

A favourable opinion is given on the understanding that the conditions set out below are followed:

1. Please submit letter/e-mail of permission from the Nottingham City Youth Offending Team and other participating youth organisations when available for our records.
2. You should follow the protocol agreed and inform the Committee of any changes using a notification of amendment form (please request a form).
3. You must notify the Chair of any serious or unexpected event.
4. An End of Project Progress Report is completed and returned when the study has finished (please request a form).

Yours sincerely

Professor Ravi Mahajan
Chair, Faculty of Medicine & Health Sciences Research Ethics Committee

Appendix I

Internal Consistency of Measures

Measure	Cronbach's alpha
MIIV (Total)	.62
MIIV Justified Violence subscale	.81
MIIV Unjustified Violence subscale	.60
BES (Total)	.88
BES Cognitive Empathy subscale	.84
BES Affective Empathy subscale	.87
Exposure to violence between parents in childhood	.88
Experience of violence inflicted by parents in childhood	.86
Aggression towards parents	.72
Aggression towards others	.87

Appendix J

Descriptive Statistics of Key Variables and Results of *t*-tests for Males (n=195) and Females (n=96)

Variables	Male (n=195)		Female (n=96)		<i>t</i>	<i>df</i>	<i>p</i>	Bootstrapped BCa 95% Confidence Interval	Effect Size (Hedges' <i>g</i>)
	Mean (SD)	SE	Mean (SD)	SE					
VVGE	21.00 (23.07)	1.65	7.01 (10.10)	1.03	7.18	285.97	<.001	10.33 – 17.60	0.71
Moral reasoning (justified violence)	4.60 (1.44)	0.10	4.25 (1.50)	0.15	1.93	289	.054	-0.04 – 0.70	0.24
Moral reasoning (unjustified violence)	1.27 (0.48)	0.03	1.31 (0.56)	0.06	-0.60	289	.546	-0.19 – 0.11	0.08
Cognitive empathy	35.32 (4.94)	0.35	36.32 (5.53)	0.56	-1.57	289	.118	-2.35 – 0.33	0.19
Affective empathy	35.99 (7.86)	0.56	40.41 (7.43)	0.76	-4.59	289	<.001	-6.35 – -2.45	0.57
Exposure to violence between parents	2.01 (2.49)	0.18	2.74 (3.01)	0.31	-2.05	160.83	.042	-1.54 – -0.05	0.27
Experience of violence as a child	2.38 (2.69)	0.19	3.07 (3.14)	0.32	-1.85	165.54	.066	-1.47 – -0.00	0.24
Aggression towards parents	1.68 (1.95)	0.14	1.70 (1.84)	0.19	-0.09	289	.930	-0.49 – 0.40	0.01
Aggression towards others	2.31 (3.18)	0.23	2.11 (2.97)	0.30	0.51	289	.61	-0.50 – 0.90	0.06

Note. VVGE = Violent video game exposure (time spent per week, hours)

Appendix K

Correlations Among Key Variables for Males (n=195) and Females (n=96)

Measure	1	2	3	4	5	6	7	8	9	Mean	SD
1. VVGE	--	-.05	.08	.02	-.10	.22*	.19	.10	.10	7.01	10.10
2. Moral reasoning (justified violence)	.19**	--	.38**	-.15	-.16	.21*	.21*	.18	.19	4.25	1.50
3. Moral reasoning (unjustified violence)	.10	.11	--	-.29**	-.27**	.26*	.15	.12	.22*	1.31	0.56
4. Cognitive Empathy	-.04	-.16*	-.28**	--	.45**	-.11	-.14	-.07	-.15	36.32	5.53
5. Affective Empathy	-.19**	-.23**	-.07	.32**	--	-.25*	-.30**	-.06	-.07	40.41	7.43
6. Exposure to violence between parents	.13	.09	.07	-.10	-.18*	--	.84**	.42**	.27**	2.74	3.01
7. Experience of violence as a child	-.01	.05	-.11	-.06	-.21**	.60**	--	.42**	.29**	3.07	3.14
8. Aggression towards parents	-.02	.03	-.05	-.11	-.06	.57**	.49**	--	.58**	1.70	1.84
9. Aggression towards others	.25**	.15*	-.01	-.13	-.10	.45**	.40**	.53**	--	2.11	2.97
Mean	21.00	4.60	1.27	35.32	35.99	2.01	2.38	1.68	2.31		
SD	23.07	1.44	0.48	4.94	7.86	2.49	2.69	1.95	3.18		

Note. Correlation coefficients for males (n=195) and females (n=96) are presented below and above the diagonal respectively. VVGE = Violent video game exposure. * $p < .05$ (two-tailed) ; ** $p < .01$ (two-tailed)

Appendix L

Descriptive Statistics of Key Variables and Results of Mann-Whitney Test in YJS Sample (n=12) and Matched Comparison Group (n=12)

Variables	Median		<i>U</i>	<i>z</i>	<i>p</i>	Effect Size, <i>r</i>
	Main sample (n=12)	YJS sample (n=12)				
VVGE	19.50	13.25	50.00	-1.27	.219	-0.26
Moral reasoning (justified violence)	4.50	5.00	81.00	0.53	.630	0.11
Moral reasoning (unjustified violence)	1.00	1.75	107.00	2.33	.045	0.48
Cognitive empathy	37.00	35.50	46.50	-1.49	1.43	-0.30
Affective empathy	37.00	36.00	56.00	-0.93	.378	-0.19
Childhood exposure to violence between parents	2.00	0.00	51.50	-1.21	.242	-0.25
Childhood experience of violence	2.00	0.50	53.00	-1.12	.291	-0.23
Aggression towards parents	1.50	1.00	63.00	-0.54	.630	-0.11
Aggression towards others	2.50	1.00	71.50	-0.03	.977	-0.01

Note. VVGE = Violent video game exposure

Appendix M

Media Use Diary Template

Date: xxx (Day)

Time	What I Chose to Do		Was Deciding Between This and...	How I Was Feeling	
	TV / Game / Read	Name of Programme / Game / Reading material		Before	After

Appendix N

Main Themes in Relation to SC's Perception of Life and Use of Violence

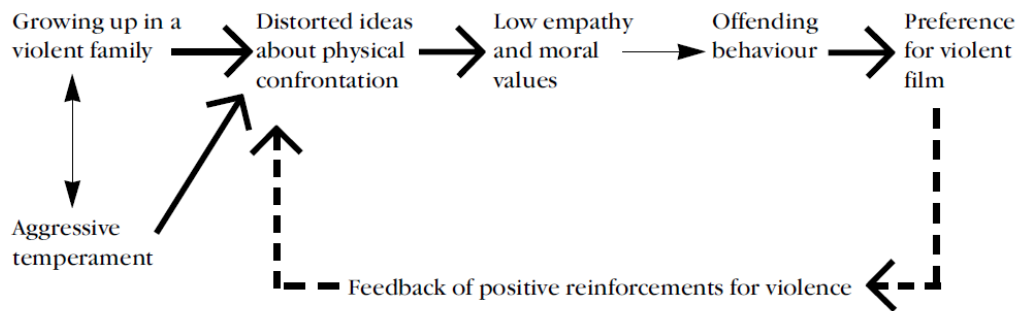
Theme	Relevant ideas / significant segments from films
1. Feeling trapped in life and seeing violence as a justified response - 'Life is shit; the way out is to inflict pain on others'.	<i>'Fight Club'</i> • SC connected with the underlying message that people at the top of the social hierarchy are being supported by the working class at the bottom, and hence, if the bottom tier crumbles, the top falls as well. Perceiving herself as being at the bottom of the social hierarchy, SC felt that if she were not able to climb up the social ladder, she would bring everyone else down with her (through the use of violence) just as the characters in the film did. • SC stated that at the time of watching the film, she felt that she had been mentally tortured by people around her. Being unable to do the same to others, she saw physical violence as the only form of release. SC explained that this was similar to what the lead character in the film experienced and thus identified with his use of violence. • The film also conveyed the sense that violence was not necessarily bad and could in fact be used to motivate others, this arising from a particular scene where the lead character used violence to motivate a teenager to pursue his dreams. <i>'Scream'</i> • Lead character perceived as having a justifiable reason to engage in the killings and this supported SC's notion that violence is acceptable when executed with a reason.

Theme	Relevant ideas / significant segments from films
2. Need for power and control - 'Victim is weak; perpetrator is powerful'.	• SC's growing up experiences prior to her index offence contributed to the notion that being in a position of power and control was necessary to stand up for herself and protect herself. She equated fear to respect and consequently believed that it was better to be the perpetrator than the victim. SC thus connected with books or films that conveyed a similar theme.
3. Violence to self as a form of punishment – 'In life, you have to experience the pain and stick with it'.	<i>'Fight Club'</i> • SC described the most significant scene for her as one where the lead character suffered a chemical burn when lye was poured onto his hand by his alter-ego. He was then told to "Stay with the pain", and that "Without pain, without sacrifice, we would have nothing". These words resonated with SC as she agreed that this was what life was – in life, one would have to experience the pain and stick with it. It also reinforced the idea that it was necessary to be hurt and to feel the pain herself. <i>'Scream'</i> • Similar to 'Fight Club', the most significant scene was one reflecting self-inflicted injuries. SC related a scene where the two killers in the film tried to kill each other and inflicted injuries on each other in a bid to fool others into thinking that they were the victims.

Appendix O

Proposed Model for the Development of Preferences for Violent Film

by Browne and Pennell (2000)



- Highly significant association
- Significant association
- - - Postulated association