INCONSISTENT CHILD SELF-REPORTS OF EXPOSURE TO VIOLENCE

MISREMEMBERING OR MISINFORMATION? HIGHLY INCONSISTENT SELF-REPORTS OF EXPOSURE TO VIOLENCE FROM CHICAGO CHILDREN

By

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ABSTRACT

Upon interviewing a sample of youths, researchers who study exposure to violence are often faced with a substantial number of reports of exposure to violence and no way to confirm the veracity of these claims. The remarkably high levels of violence exposure reported by young preschool children (Richters & Martinez, 1990), paired with the low concordance between parents and children concerning what violence the child had witnessed and experienced (Howard, Cross, Li & Huang, 1999; Shahinfar, Fox & Leavitt, 2000), suggests that child self-reports of exposure to violence may not be entirely veridical. Since self-reports appear to be the only feasible method of measuring lifelong exposure to violence, determining the possible causes of false reports and investigating possible predictors should be a significant aspect of studying youth exposure to violence.

With this thesis, I have investigated the veracity of child self-reports by comparing responses to a life-long exposure to violence questionnaire administered first between 1997 and 1999, and a second time two years later. Inconsistent reports, wherein an initial report of exposure to a particular violent instance was not confirmed by re-reporting at the second interview, were prevalent on a variety of violence-assessment items, including witnessing a murder and being the victim of a physical attack. For instance, when initially interviewed, approximately one in seven Chicago children aged 8 to 17 reported witnessing a shooting at least once during their lives. Alarmingly, 50% of these children did not confirm this instance of violence when interviewed again two years later.

In an effort to identify self- or parent-reported characteristics and behaviours predictive of inconsistent responses concerning witnessing a shooting, I conducted several series of Binomial and Multinomial Logistic Regression analyses. Explanatory variables were selected to be representative of two main likely reasons for inconsistent self-reports: misremembering due to forgetting over time and the inaccuracy of children's memories, and misinformation due to an impulsive propensity towards lying or exaggeration. My findings suggest that, in comparison to individuals who confirmed their

initial reports of having 'witnessed a shooting', individuals who retracted their initial claims were generally younger, from a higher socio-economic status level neighbourhood, admittedly lacked guilt after misbehaving, desired a lot of attention, and reported less impulsivity as measured by delinquency and behavioural impulsivity scales.

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1. INTRODUCTION

1.1 General Introduction

Researchers who study youth exposure to violence generally have no way to confirm the veracity of the many violence exposure claims made by participants. For several reasons described within this chapter, child self-reports of exposure to violence should not be assumed to be entirely veridical. Furthermore, within a large longitudinal dataset, I was able to identify false child self-reports by comparing responses to a life-long exposure to violence questionnaire administered first between 1997 and 1999, and a second time two years later. Inconsistent reports, wherein an initial report of exposure to a particular violent instance was not confirmed at the second interview, were prevalent on a variety of violence-assessment items, including witnessing a shooting and being the victim of an attack with a weapon. This lack of consistency in reporting a salient personal experience over time represents a core problem in using survey-based, self-reported data, and in exposure to violence research, generally.

The main purpose of my research was to isolate self- or parent-reported characteristics or behaviours predictive of inconsistent responses. These characteristics and behaviours were selected to be representative of two main likely reasons for inconsistent self-reports: misremembering due to forgetting over time and the inaccuracy of children's memories, and misinformation due to an impulsive propensity towards lying or exaggeration.

In this section, I initially provide an introduction to the recent research interest in youth's exposure to violence and its representation as a public health concern, then describe some problems with the various questionnaires presently used to measure exposure to violence. The reliability of child testimony is examined, with further details on childhood comprehension of deception, and the negative influences of suggestion and misinformation. Conflicting theories concerning the effect that intense emotion and trauma can have on the formation and subsequent retrieval of memories are discussed, and the accuracy of emotional memories over time is described. Finally, the role that

impulsivity plays in producing false or exaggerated information from children is presented.

1.2 Exposure to Violence

1.2.1 Beyond the law: Violence as a public health concern

Although violent behaviour has been predominantly approached as a sociological, legal issue to be addressed by law enforcement personnel and the court systems, during the 1980s and 1990s in the United States (US), it was acknowledged that many correlates and purported causes of violence were beyond the reach of the criminal justice system alone (Rosenberg, O'Carroll & Powell, 1992). As a result, violence, particularly firearm-associated violence, was targeted as a public health issue. After a 1985 Surgeon General's Conference on the topic of Violence and Public Health, wherein medical doctors, psychologists and public administrators were urged to discover the causes of violence and determine the best treatments and prevention strategies (Surgeon General, 1986), the Surgeon General stated in the *Journal of the American Medical Association* that firearm violence in the US was a "public health emergency" (Novello, Shosky & Froehlke 1992, p. 3007). In addition to this, the US Public Health Service listed the reduction of deaths and injuries associated with violence among its ten-year goals in 1990 (Novello, Shosky & Froehlke 1992), and through the 1990s, the Centers for Disease Control and Prevention (CDC) listed violence prevention among its top priorities (Karch, Lubell, Friday, Patel & Williams, 2008).

National statistics perhaps prompted this alarm, as overall homicide rates in the US steadily increased during the 1980s and peaked in 1991 at 9.8 per 100 000 (Federal Bureau of Investigation, 2006). The most recent data released by the CDC reports that in 2005, the homicide rate was 6.1 per 100 000 (Karch et al, 2008). Among young Americans aged 15 to 24, homicide has remained the second-leading cause of death over the previous two decades (CDC WISQARS, 2008), and the World Health Organization (WHO) reports that American youth homicides increased 77% between 1985 and 1994 (WHO, 2002). Youth-specific homicide and violent deaths rose globally through the

1980s and into the mid-1990s, particularly in Russia and the former Soviet Union, Africa, US, and parts of Latin America (WHO, 2002). In 1996, the World Health Assembly declared violence a leading worldwide public health problem, and estimated that in 2000, 1.6 million people world-wide lost their lives to violence (WHO, 2002). Of that group, an estimated 199 000 were youths (ages 10 to 29) who died as a result of interpersonal violence, equating to an overall, worldwide death rate of 9.2 per 100 000. In addition to casualties, the WHO estimates that for each death, 20 to 40 individuals receive injuries requiring hospitalization. Interpersonal violence, constituting a separate category than war-related casualties, was ranked as the 5th worldwide cause of death among individuals aged 15 to 29 years old, and ranked 3rd specifically for males of that age group (Peden, McGee & Krug, 2002). These statistics indicate that violence is not just an American anomaly, but that violence, in particular youth violence, is a real worldwide phenomenon that affects millions of individuals in a variety of ways.

The ultimate goal of the public health approach is to devise effective preventative strategies that will reduce the incidence of violence, and thereby reduce the associated deaths and injuries. One significant reason for this approach is the considerable cost that violence associated deaths and injuries exact on economies and health systems (Cotton, 1992). In America, while the majority of this cost is derived from the lost potential earnings of the disproportionately young victims, taxpayers bear a large share of the emergency hospital costs of firearm injuries and fatalities (Cotton, 1992). The most recent 2006 statistics estimated a cost of $158 billion each year, for the treatment of youths injured, both fatally and non-fatally, by interpersonal violence and firearms (ages 10 to 24; CDC, 2008). In addition to these costs, violence associated death and injury can impact the health and security of the entire community, through emotional and psychological distress, and fear. Although American homicide rates have decreased since the early 1990s, the sentiment that violence prevention should be perceived as a public health issue remains strong today: an editorial was recently published in the *New England Journal of Medicine* stressing to the medical community the continued importance of addressing firearm violence (Curfman, Morrissey & Drazen, 2008).

1.2.2 Prevalence of youth exposure to violence

Considering the above statistics, many researchers in the 1980s and 1990s began to document how often children were witnessing this violence, and investigate how it could impact their psychological and social development. In the 1990s, specifically youth exposure to community violence was characterized as a "public health epidemic" in the United States (Bell & Jenkins, 1993). This characterization arose from, and further encouraged, numerous studies interviewing primarily urban children about what violence they had witnessed and personally experienced. Overall, these studies depicted rampant rates of exposure to violence among inner-city youth, both as witnesses and victims.

Several researchers focused on youth living in the city of Chicago, specifically. Bell (1987) reported that 31% of elementary school children had seen someone shot, and 34% had seen someone stabbed. Dyson (1990) found nearly identical results in a group of African American children. In an interview study of 10 mothers living in a Chicago public housing complex, every mother reported that her child(ren) had witnessed a shooting or been present during live gunfire, by the age of 5 years old (Dubrow & Garbarino, 1989). In a larger study of 1000 Chicago elementary and high school children, 23% reported they had witnessed a homicide (Shakoor & Chalmers, 1991). Classroom interviews with African American children living in Chicago's southside revealed that 26% of 7 to 15 year old students, and 39% of a separate group of 10 to 19 year old students had witnessed a shooting (Bell & Jenkins, 1993).

Similar results were found in other cities across America. Gladstein, Rusonis and Heald (1992) reported that 3% of Baltimore inner-city adolescents (average age 16) reported having been shot during their life, 23% reported that they had witnessed a homicide, and 66% reported that they knew someone personally who had been shot. In a sample of 14 to 23 year olds in Detroit, 42% of respondents had witnessed a shooting or a stabbing, and 22% had witnessed a homicide (Schubiner, Scott & Tzelepis, 1993). Fitzpatrick (and colleagues) published several articles through the 1990s on the topic of Alabama African American youths' exposure to violence, finding a positive association between exposure to violence and symptoms of Post Traumatic Stress Disorder (PTSD;

Fitzpatrick, 1993; Fitzpatrick & Boldizar, 1993) and physical fighting (Fitzpatrick, 1997). Upon providing groups of children aged 7 to 18 years old with specific instructions to only record instances that were personally experienced, and not those seen in the media, it was found that 43% of children reported witnessing a murder, nearly 55% witnessed an attack with a knife, and over 70% had seen someone getting shot or shot at (Fitzpatrick & Boldizar, 1993). Additionally, nearly 15% reported being the victim of an attack with a knife, and nearly 20% had been shot or shot at, during the previous six months. In a later study, Fitzpatrick (1997) reported that 65.3% of 8 to 14 year old children witnessed someone being shot or shot at, and again, nearly half the sample, 46.7%, reported witnessing a murder. In contrast to the many studies with a very high percentage of African-American participants, Berman, Kurtines, Silverman and Serafini (1996) conducted a study with a fairly equal distribution of Hispanic, African-American and Caucasian 14 to 18 year old students from the greater Miami area. High exposure to violence was reported within this group as well; 10.5% had been a victim and 60.4% had been a witness of a shooting, and 41.6% had witnessed a murder. Some studies suggest that exposure to violence may also be prevalent among rural children, as 6% and 20% of migrant farmers' children in North Carolina reported having witnessed a murder and someone being shot at, respectively (Martin, Gordon & Kupersmith, 1995). These studies show that throughout the nineties, and across the US, children and adolescents reported extremely high rates of witnessing violent acts, including homicide and assault with a weapon, in addition to lower, but substantial levels of victimization.

1.2.3 The problem of self-report data

Regardless of the numerous reports of high exposure to violence among youth, these statistics are based upon self-report data, which can be inherently inaccurate. Inaccuracies within self-reports can not only obscure the true exposure rates, but also make it appear that exposure to violence during youth has a real effect on children's long-term outcomes. As violence exposure has been acknowledged as a public health problem, and many researchers have devoted years to the determination of these outcomes, the truth behind these self-reported rates should be of primary concern. Comparing

information provided by the child and a presumably knowledgeable secondary source is one way to investigate inaccuracies in exposure to violence self-report data. Although the majority of studies examined child-reports of exposure to violence in isolation, a few studies examined parent and child agreement on the child's exposure to violence. In one of these few studies, Richters and Martinez (1993) conducted an in-depth analysis of a low income neighbourhood of Washington, DC, entitled the Community Violence Project, funded through the National Institute of Mental Health. Children and parents were explicitly instructed not to exaggerate or conceal instances of violence. Interestingly, the younger children (ages 6 and 7) reported higher rates of exposure to violence than the older children (ages 9 and 10), and in both groups, there was moderate to poor agreement between children and parents about what the child had experienced and/or witnessed. For example, while 47% of the youngest children reported having witnessed a shooting, only 9% of their parents reported that they thought their child had witnessed this. In their discussion, the authors acknowledged that the extremely high rates of reported violence exposure within the group of younger children raised questions as to their veracity, citing the anonymity of the group test and the children's inability to differentiate between witnessed violence and violence that they had only 'heard about' as possible reasons for exaggerated responses. The authors did not, however, question the data provided by the older children, and in fact, they suggested that these reports are more reliable than parental reports, due to miscommunication between children and parents. Furthermore, the authors suggested that the parental "underestimation" of children's exposure to violence may lead to ineffective parenting through a lack of protection and support.

In an evaluation of whether low agreement between parents and children on the child's exposure to violence was associated with troubled psychosocial function, Howard, Cross, Li and Huang (1999) interviewed parent-child dyads from the Baltimore area. Only 18% of the 333 dyads were highly concordant, wherein dyad responses matched on greater than 80% of the survey items. 26% were classified as having low concordance (less than 50% agreement on survey items), and the remaining 56% were classified as

having moderate concordance (between 50 and 80% agreement). The authors reported that parents significantly "underestimated" their children's victimization on 58% of the items, including being beaten badly enough to go to the hospital emergency room, being shot and attacked with a knife, as well as their children's witnessing of violence on 53% of the items, including witnessing a rape, a shooting, an attack with a knife, and murder. Youths from low concordance dyads were more likely to perpetrate violence, suffer distress symptoms, show low problem-solving abilities, and interestingly, more likely to describe their parents as showing low involvement and monitoring. This result suggests that, perhaps, disagreement between dyads is due to a strained parent-child relationship, where, through the fault of either the parent or the child, the parent is disengaged from the child's daily experiences. In this case, the parent would be legitimately unaware of his/her child's true exposure to violence, regardless of whether the child's reports were veridical or exaggerated. Alternately, these findings may also suggest that the group of children that exaggerates their exposure to violence, resulting in discordant dyad responses, is also inclined towards exaggerating the level of disharmony within their home.

In a more recent study of pre-school children (aged 3.5 to 4.5 years) from a moderately violent neighbourhood of Washington, DC, data were also collected from children and parents about what violence the child had witnessed (Shahinfar, Fox & Leavitt, 2000). 37% of the interviewed preschool children reported witnessing, and 31.5% reported being a victim of, severe violence, where severe violence included a robbery, a threat with a weapon, a stabbing or a shooting. The authors found no significant relation between child- and parent-reports on both mild and severe violence that the child had witnessed or experienced. Moreover, even when both parents and children responded positively to an item, examination of secondary information, including the location of the event and other individuals present, often revealed that children and parents were referring to different incidents. The researchers suggested that the discrepancy between child and parental details may indicate that children and adults perceive violence in different ways, leading to different interpretations of exposure to the

event in question. Interestingly, the researchers found that the children who could not understand how to use the exposure to violence scale also showed lower cognitive development scores, as measured by the Peabody Picture Vocabulary Test-Revised. Regardless of the low concordance between parents and children, the researchers found a significant association between witnessing violence and 'internalizing behaviour' (depression, anxiety and withdrawnness), and between victimization and 'externalizing behaviour' (aggression and delinquency).

1.2.4 Reliability of exposure to violence questionnaires

Since a controlled experimental methodology cannot provide answers to a variety of psychological and sociological questions, self-report is the only feasible method of measuring what violence a child has witnessed or personally experienced. As the self-report questionnaire is the primary experimental detail under the researcher's control, it is of paramount importance that the questionnaire has high reliability and validity within the test population. Several questionnaires have been devised for use in child populations to assess the amount of community violence, and in some cases household violence the child has been a witness to or victim of. Many studies develop their own unpublished exposure to violence questionnaires, which makes the assessment of each unique instrument nearly impossible and leaves the psychometric properties of the majority of exposure to violence questionnaires largely unknown.

One fairly popular questionnaire is the *Things I Have Seen and Heard* structured interview, which assesses both victimization and witnessed violence within elementary school children (Richters & Martinez, 1990). Many studies use this survey, or adapt it for their research, and Fox and Leavitt (1995) created a cartoon version of this survey for use in preschool children. Although the title of the survey is easily misinterpreted as indicating that the children will be discussing things they had personally seen as well as things they have heard about, the title actually means to indicate that the child will discuss things they have seen, such as a mugging, as well as things they have personally heard, such as the utterance of a physical threat. In response to each of 15 instances of violence varying in severity, children were instructed to circle one of five stacks of balls

signifying the frequency of exposure, which ranged on a Likert scale of never (signified by a single, empty ball), 1 time, 2 times, 3 times, and many times (signified by a stack of five shaded balls). Children were instructed to exclude instances they had seen on television or in movies, and no timeframe of when the instances had occurred was provided. The one week test-retest reliability of this measure was determined within a group of 21 children, with a value of $r = 0.81$. Criterion validity of this questionnaire has not been published.

A very closely related survey designed for older children from age 9 and upwards is the *National Institute of Mental Health Survey of Children's Exposure to Community Violence* (Richters & Saltzman, 1990). Unlike the above questionnaire, this survey instructs children to indicate different types of violence that they had been a victim of, a witness to, or had "only heard about" from other people. The survey addressed a variety of types of community violence, including drug activity, police arrests, muggings and forced entry, homicide and suicide, as well as sexual and physical assault. Again, children were instructed to exclude instances they had seen on television or in movies, and no timeframe of when the instances had occurred was provided. Respondents reported the frequency of the incident, ranging from 'never' and 'once' to 'at least once a week' and 'almost every day'. Follow up questions addressing the location of the instance, other people involved, and the recency of the instance, were also asked. Despite the fact that this is a widely used and adapted survey, apparently nothing has been published assessing its psychometric properties; the test-retest reliability and criterion validity are unknown, and the internal consistency, measured as 0.84, is presented in an unpublished NIMH article (Richters & Saltzman, 1990). Some studies that use the survey conduct individual analyses of these properties, but as this survey is quite frequently adapted for the purposes of each study, it is difficult to determine how these values apply to the questionnaire in its entirety.

The *Child's Exposure to Violence Checklist* is a survey for children and adolescents to report levels of both witnessing violence and victimization (Amaya-Jackson, 1998). It includes 33 items, and responses are made with a 5-point Likert scale

ranging from 'never' to 'more than 10 times'. Fehon, Grilo and Lipschitz (2001) reported "good" internal consistency, with alpha coefficients of between 0.51 and 0.90 for each violence category. Within a group of 31 participants, one week test-retest reliability kappa coefficients ranged from 0.47 to 0.85 for each violence category. Although the authors represented these statistics in a positive light, for questionnaires addressing such seemingly salient events as witnessing a shooting or experiencing sexual assault, the values appear to be rather low.

Far more is known about the psychometric properties of the *Children's Report of Exposure to Violence* (Cooley, Turner & Beidel, 1995) than the above surveys. This survey was designed to assess lifetime exposure to violence within 9 to 15 year old children. It addressed a broad spectrum of exposure to violence, including violence in the media, hearsay, and violence experienced as a witness or victim, but excluded exposure to drug activity, police arrests and the possession of weapons. The survey contained 29 items that were ranked with a Likert scale, ranging from 'never' and 'once' to 'many times' and 'every day', and 3 open-ended questions probing other frightening experiences the child might want to discuss. The psychometric properties of this survey were assessed in a group of over 200 predominantly African-American children from both urban and rural North Carolina communities. Exploratory factor analytic construct validity statistics returned two separate factors that accounted for nearly half of the total sample variance: 'direct violence exposure', comprised of hearsay and witnessed violence items, and 'media violence exposure'. A moderate overall Cronbach's α value of 0.78 was found, with a higher score (0.93) for the 'direct violence exposure' factor than the 'media violence exposure' (0.75). In a subset of 41 children, two week test-retest reliability statistics showed a moderate overall Pearson r value of 0.75, which was strongly driven by the 'direct violence exposure' factor, as r values were less than 0.60 on the 'media violence factor'. Although the scores remained fairly consistent across race, sexes and ages, males and older children were more reliable. The results of the factor analysis are interesting, as they suggest that responses to witnessed and hearsay exposure to violence items are closely related, and distinct from responses to media violence items.

By examining these few surveys, there are several differences between them that make consistent assessment of exposure to violence very difficult. First, each survey contains different exposure to violence items, which makes comparing the total scores across surveys meaningless. For example, some surveys include drug trafficking and use, others include sexual assaults, and yet others include violence witnessed on television and in movies. Due to the use of these different surveys, exposure to violence rates cannot be accurately compared across cities, nor even across age groups within the same community. Second, because surveys addressed violence exposure during different time frames, from 6 months to lifelong, the total scores may seem inflated or deflated when compared with total scores from other surveys. Finally, as the psychometric properties across surveys are either unknown or vary greatly, it is unclear how well these surveys are measuring what they intend to measure. Though Cooley et al (1995) noted that most surveys do not provide information on psychometric properties, and attempted to do this with the *Children's Report of Exposure to Violence,* it has not been used as extensively as the *National Institute of Mental Health Survey of Children's Exposure to Community Violence,* or the *Things I Have Seen and Heard* survey. Furthermore, as researchers tend to adapt and tailor these pre-existing surveys for each study, the psychometric properties become invalid.

1.3 Reliability of Child Reports

1.3.1 Legal competence to provide testimony

Regardless of the validity of self-report measures, it is important to determine the validity of child testimony in general, and what factors affect the accuracy and completeness of their reports. Though inquiry into the accuracy of child testimony began over a century ago in France and Germany (Binet, 1900; Stern, 1910), both the legal system and psychologists continue to express concern over the cognitive competency of child witnesses. Up until the 1980s, children were only very rarely permitted to provide uncorroborated testimony in British, American and Canadian courts, as they were regarded to have equal competence as drunks, the insane and the mentally delayed (Ceci

& Bruck, 1995). In Canada, since the 1980s, many changes have been made to the legal system that not only permit uncorroborated testimony from children as young as 3 years old, but also attempt to make the testimonial process less stressful for children. These attempts have included allowing children to testify behind a curtain or through closed-circuit television, and in some extreme cases, even having psychologists speak for them (Wrightsman & Porter, 2006). Adults involved in legal proceedings must show a level of competence, or fitness, that indicates whether they comprehend the purpose and consequences of the trial, and are capable of communicating with their lawyer (Davison, Neale, Blankstein, Flett, 2005). For child witnesses below the age of 14, competence to provide testimony is assessed by the judge, who interviews the child to determine his/her comprehension of truth, deception and an oath (Wrightsman & Porter, 2006). Before assessing how a child testimony can become inaccurate, it may be beneficial to note the rates of false reports. One highly cited study of child sexual abuse reports from Denver found that 23% of cases were unfounded, while 53% were proven and 24% did not contain sufficient evidence for a ruling (Jones & McGraw, 1987). Though it is comforting to note that of the unfounded cases, only one-quarter were instances of malicious attempts at a false accusation, the majority of false reports (75%) were based upon misleading information provided by the child or misinterpretation by the psychologist or parent.

This presentation of the literature is not to suggest that adult memory recall and self-reports are always highly accurate, reliable, and impervious to the effects of suggestion and misdirection. Indeed, much research focuses on the suggestibility and unreliability of adult memories and eye-witness testimony; Loftus and her colleagues (1974; 1978) conducted a series of experiments that showed adult memories to be highly influenced by suggestive interview question wording. Much like children, adult respondents persisted in their false reports even when warned that the interview questions may have been misleading. Loftus and Pickrell (1995) further showed that higher confidence in a memory is not associated with increased memory veracity. Thus, both child and adult witnesses can provide false information due to the imperfections of memory. As children

are more likely to provide false reports, and background information regarding child testimony is most relevant to this thesis, the reliability of adult testimony will not be extensively addressed here.

1.3.2 Suggestibility

Several high profile cases in the 1980s and 1990s involving children as victims and eyewitnesses of alleged sexual abuse and ritual murders, including what became the most expensive trial in American history, the McMartin preschool trial in California (*People v. Buckey et al.,* 1990), have depicted children as unreliable story-tellers who conform easily under interviewer pressure. In both these cases, and many others, child false reports are related to parental and interviewer coaching and suggestion, as well as repeated questioning over months of interviews and clinical assessments. The outcome of these trials emphasizes that child reports of personal experiences are highly sensitive to suggestion and coercion, and many scientific studies support this conclusion. Suggestibility is characterized as the degree to which an individual incorporates information into his/her memories, and broadly can include information provided both before and after the event, information that is processed consciously or unconsciously, and information that affects the memory itself or merely the report of the memory (Ceci & Bruck, 1995). In his book *La Suggestibilité*, Binet (1900, as cited in Ceci & Bruck, 1995) detailed a series of studies examining suggestibility within 7 to 14 year old children. Among his many findings, he reported that children were most accurate upon free memory recall (e.g. How was the button fastened?), and became less accurate as the interview questions became increasingly suggestive (e.g. Was the button sewn on with a thread?) and misleading (e.g. What colour was the thread that fastened the button?). Additionally, he found when given the opportunity to clarify, the children did not correct their responses to the suggestive and misleading questions, which he interpreted as indicating that the false details had been incorporated into the child's memory. Furthermore, Binet found that children were highly influenced by the reports of peers in a group setting, regardless of the inaccuracy of those peer-reports. These results exemplify that upon suggestion, child false reports could be influenced by internal cognitive

processes, as well as external social factors. The German psychologist Stern (1910, as cited in Ceci & Bruck, 1995) furthered Binet's examination of suggestive questioning by comparing false reports by age of the child. He found that though the youngest children were most affected by the suggestions, the 18 year old participants could also be misled. Based on their findings, both Stern and another German psychologist, Lipmann, advised against repeated questioning of child witnesses because of the increased chance of false reports.

In contrast to the older studies that focused on child reports in neutral settings, much recent research focuses on children's suggestibility involving more realistic events, and events that involved their own body. In a series of studies by Ornstein and colleagues, children between 3 and 7 years old were interviewed with both open-ended and suggestive questions about their interaction and physical contact with the nurse and doctor in a routine medical examination (Ornstein, Shapiro, Clubb & Follmer, 1996). In comparison to the older group, the younger group performed worse on both question types, tended to omit details when responding to open-ended questions, and provided increasingly inaccurate information over delays of 1, 3, 6 and 12 weeks. The older children provided more accurate responses, with average error rates of 10%. Inaccurate responses included the denial of some interactions that did occur as well as false reports of interactions that did not occur. These results show that children, particularly those of a younger age, can provide misinformation about real-life events that involve their bodies, but overall their reports contain many factual details about the event. Taken together, these results emphasize that although children are fairly accurate in reporting the details of an event, over time they are highly susceptible to reporting false details as true. This result has important implications for youth exposure to violence reports, as it suggests that misinformation can be provided not only for instances such as a witnessing a shooting or stabbing, but even for personal victimization.

1.3.3 Reality monitoring

Another concern with child cognitive competency centres on reality monitoring, which is the ability to determine whether a memory originated from a real event, or an event that was imagined (Sussman, 2001). Child developmental psychologist Piaget (1928) theorized that children could not distinguish fantasy from reality until the age of 7 or 8, and proposed that this cognitive skill may not fully develop until the age of 11 or older. In an investigation of this cognitive development, Foley and Johnson (1985) found that adults and older children (10 and 12 years) were more accurate at differentiating between memories of a performed action and an imagined action after one week than younger children (6 and 9 years). Six year old children's accuracy on the details of performed and imagined actions was found to significantly decline after an eight week period, in comparison to immediate recall (Gordon, Jens, Shaddock & Watson, 1991). The majority of errors were reports of performing an action when the child had actually only imagined the action, a finding that has been substantiated in other studies (Sussman, 2001). Furthermore, after the eight week delay, the children were less likely to correct their responses upon follow-up test probe questioning, indicating that even when pressed with further questioning, these children persisted in their false report. These results suggest that as children get older, they become better at recalling whether an event actually happened, or whether it was only imagined, thereby providing more reliable testimony. Younger age also had a significant negative effect on the long-term reports about the details of a routine health examination, when comparing 3 year old and 7 year old children (Ornstein, Baker-Ward, Gordon & Merritt, 1997). This has important implications for children responding to exposure to violence questionnaires and being able to distinguish between personal experience and memories of things they imagined and heard about from peers or the media.

1.3.4 Truthfulness & deception

One further concern about child cognitive competency involves the age at which children can understand the morality of truth and deception, how they approach the nuanced difference between a lie and an exaggerated story, and whether they act on this

moral understanding to avoid lying. A lie is typically characterized by three components, including the provision of false information, the belief in the falseness of that information, and the deliberate intention to deceive. To assess childhood understanding of moral issues, Lyon and Saywitz (1999) asked groups of 4 to 7 year old children to define, differentiate, or identify truths and lies. The authors found that between 60 and 70% of children could accurately identify a truth or lie within a short story, but could not provide a verbal definition of these abstract concepts. The identification of lies became more accurate with increasing age, but the identification of truths was consistent across age. This result supports the notion that children may understand the concept of truth and deception before they are capable of the necessary abstract thought to produce a clear description. A study by Bussey and Grimbeek (2000) evaluated changes in understanding across age groups. Four year old children were less accurate in categorizing truths and lies than seven and 10 year old children, but still maintained high levels of comprehension (accurate on 88% of items). All three age groups appreciated the moral implications of lying at least insofar as they rated it significantly more negative than truthfulness.

When examining exaggerations and lies, Piaget (1932) found that children younger than 10 identified a lie based on the single criterion of providing false information to another individual, thereby classifying exaggerations, misunderstandings, incorrect guesses and jokes as 'lies'. Piaget proposed that adolescents and adults would use all three criteria when identifying a lie, a pattern of results that has been verified by Strichartz and Burton (1990). Peterson, Peterson and Seeto (1983) found interesting variability in the classification of false statements by adults and groups of children aged 5, 8, 9, and 11 years old. Though 50% of adults classified an exaggeration (a small chicken was described as being as big as an elephant) as a lie, the percent of children who classified an exaggeration as a 'lie' increased with age, from 60% at age 5 to 85-95% at ages 8 to 11. The classification of practical jokes and altruistic lies (lying to a bully about the location of another child) as 'lies' generally decreased with increasing age, and though the classification of an incorrect guess as a 'lie' decreased with age, 30% of adults

still considered this to be a lie. Adults and children were in agreement that various self-protective lies and, despite their harmlessness, white lies were definitely 'lies', with greater than 80% of respondents classifying each thus. As they got older, children were more willing to admit that they sometimes lied, and became more willing to agree that lying is not always wrong. Overall, these results show that as they get older, children generally identify 'lies' in a similar manner to adults, with the exception that older children are far more likely to consider an exaggeration to be a lie than the youngest children and adults. Taken alone, this finding may have positive implications for the veracity of child testimony, as it suggests that since children, particularly children between the ages of 8 and 11, classify exaggeration as lying, perhaps they are less inclined to exaggerate when reporting the details of an event.

Though children may comprehend the moral implications of lying, whether they act on this understanding is a separate issue. Children as young as 3 years old can invent and tell a lie, though they may not be particularly good at it, as they frequently inadvertently reveal the truth or invent a lie that is implausible (Lewis, Stranger, & Sullivan, 1989). In an interesting investigation of the association between action and moral understanding, after observing each child participant peek at a toy, Talwar, Lee, Bala and Lindsay (2002) asked the child to identify truths and lies in a story, answer questions about whether lying was 'good or bad', and confess whether he/she had peeked at the toy. Not only was there no significant association between lying to researchers and identifying a lie or labelling it as 'bad', the authors found that 72% of the lying children, and 81% of those who confessed, had endorsed the statement that lying was wrong. This result may be interpreted to indicate that these children consciously chose to lie and did not care that they were doing what they had acknowledged as 'wrong', somehow justified their lie thereby making it acceptable, or did not consider their own actions to be 'lies'. Additionally, the findings suggest that children aged 4 to 7 had an accurate understanding of lying and truthfulness, regardless of how they chose to act on this knowledge. The implications of these findings are highly germane to self-report data on youth exposure to violence, as they indicate that although even young children understand the concept of

deception and acknowledge that it is morally wrong, some of these children still commit acts of deception themselves.

1.4 Memory & Emotion

1.4.1 Episodic memory

Contrary to its original conception as retrieval from a series of storage containers, the current general memory theory proposes that the act of remembering is a process of dynamic reconstruction through the use of memory cues, which can include sensory information or social interactions, and situational factors, including priming and subjective feelings of familiarity. It has been widely acknowledged that memory exhibits a process of decay over time, better known as forgetting. During the late 19th century, Ebbinghaus pioneered the experimental study of memory by painstakingly testing his own long-term memory for semantic knowledge, in his case, nonsense letter strings. He discovered that forgetting occurred rapidly within the first hours and then declined steadily, but less rapidly during the remaining delay period. On average, after a month's delay, he had forgotten 75% of the original testing material (Ebbinghaus, 1885). These tests contributed towards what is presently known as the Ebbinghaus Forgetting Curve, a characteristic of memory that has been replicated in countless laboratory experiments involving both human and non-human animals (Schacter, 2001). Later, Tulving (1972) was one of the first memory psychologists to differentiate between semantic memory, the memory for facts and knowledge, and episodic memory, the memory for events and experiences from our personal past. A pattern of Ebbinghaus forgetting was also found for the episodic memories that undergraduate students recorded in a diary for a semester, showing that memories of both information and personal events decay over time (Thompson, Skowronski, Larsen & Betz, 1996). The conception of episodic memory as a seeming unique memory system encouraged some researchers to assume that highly emotional, personal memories would be permanently etched into memory and perfectly preserved over time (Brown & Kulik, 1977), while others argued that memory for traumatic events may be severely impaired (Halligan, Clark & Ehlers, 2002). Overall it

appears that although intense emotion does not hinder the creation or accuracy of memories, these memories are subject to the same effects of forgetting and suggestion over time as other, emotionally neutral memories.

1.4.2 Emotion & memory formation

In the face of refuting evidence, some clinical theorists continue to support the notion that emotional arousal can negatively impact memory formation, resulting in the development of fragmented or entirely repressed memories. Halligan, Clark and Ehlers (2002) described how intense emotional arousal can lead to decreased cognitive processing of an event, leading to impaired memory encoding and formation. In the case of traumatic experiences, a process of memory repression acts as a purported defence or coping mechanism, whereby a unique memory mechanism of dissociation inhibits traumatic memories from entering the conscious mind until a later time (Spiegel, 1997). However, though the phenomenon of dissociation and memory repression was acknowledged by the American Psychiatric Association in the Diagnostic and Statistical Manual (DSM-IV; 1994) as a common symptom associated with traumatic sexual abuse, many psychologists feel that there is little scientific evidence to support the notion of memory 'repression' (review Laney & Loftus, 2005). Memory researchers propose several alternative explanations for recovered memories that are consistent with existing memory research and do not require the unparsimonious invention of a secondary dissociative mechanism. Memories may not be thought of for long periods of time because the individual did not fully understand the event until later in life, the appropriate retrieval cues were absent, or the individual actively avoided thoughts of the instance (Geraerts, McNally, Jelicic, Mercklebach & Raymaekers, 2008). In each of these cases, it may seem to the individual that the memory had been 'lost' for a time, when in fact, it was simply not pondered for a period of time. Melchert and Parker (1997) found that a large number of individuals who felt they had recovered a repressed memory reported they had previously made conscious and continuous efforts to avoid the memory. Furthermore, repressed memories that were recovered through intensive clinical counselling have been shown to be far less frequently substantiated by evidence or

second parties than memories that were recovered spontaneously and independent of clinical interventions (Geraerts, Schooler, Mercklebach, Jelicic, Hauer & Ambadar, 2007). Researchers suggest that clinically revealed repressed memories are more likely to be false memories because of the suggestive techniques used by some clinicians during recovery, which can include repeated imagery and elaboration, hypnosis, and the administration of inhibition-reducing barbiturates (Johnson, Hashtroudi & Lindsay, 1993). Overall, there is little evidence to support the notion that emotional events can hinder memory formation and result in repressed memories, and in fact, there is a large body of literature to support the contrary.

In combination with neurobiological researchers, memory researchers generally support the hypothesis that emotional arousal may have a positive effect on memory formation. McGaugh (2000) described how hormones released during moments of autonomic arousal, ranging from intense joy to acute panic, may serve to facilitate the formation of a strong and detailed memory through activation of the amygdala and increased blood flow to the brain. Non-human animal studies have verified that heightened levels of the stress hormones epinephrine and cortisol were associated with enhanced memory performance (Borrell, de Kloet & Bohus, 1984). In humans, the administration of cortisol improved cued recall for emotionally arousing images, both positive and negative, in comparison to placebo (Buchanan & Lovallo, 2001). Interestingly, memory for emotionally arousing images was also significantly better than memory for neutral images regardless of cortisol levels, suggesting that other factors may interact with hormones to affect memory formation. Some studies have shown that social and cognitive individual differences, including temperament and coping techniques, may influence the effect that stress can have on memory (Merritt, Ornstein & Spicker, 1994). This hypothesis was strengthened by a non-human animal study, which showed that a rat's ability to master a water maze task after an acute stressor increased with heightened hypothalamic-pituitary-adrenal axis reactivity and adaptability (Stamatakis et al, 2008). Some research suggests that the physiological response to trauma, specifically, may particularly induce improved memory formation. Individuals who develop Post

Traumatic Stress Disorder after a traumatic incident often have trouble avoiding the distressing memory, experiencing symptoms such as intrusive memories, flashbacks, nightmares and event-related anxiety problems (American Psychiatric Association [APA], 2000), indicating that the creation of memories of this event was not hindered by stress. A recent study involving adult female victims of sexual assault showed that memories of traumatic events were not impaired and were rated as highly vivid and detailed, in comparison to recall of emotionally positive events (Peace, Porter & ten Brinke, 2008). The authors did not find an association between the level of emotional impact the trauma had on the individual's life (e.g. trying not to think about the event, and small reminders of the event triggering strong emotional responses) and memory impairment.

Though stress reactions may not affect the memory formation process, there is some evidence to suggest they impact the memory retrieval process. De Quervain et al (2000) showed that the administration of cortisol immediately before a recall test significantly impaired memory retrieval in comparison to the placebo group. Recall performance was not affected when the cortisol was administered immediately before or after learning the word lists. Examining the evidence, it seems that stress negatively affects the memory recall process, but does not inhibit the formation of memories of the stress-inducing event. This emphasizes the importance of reducing stress when interviewing participants about stressful situations, as this method will result in the most reliable reports. These findings also suggest that clinicians may be receiving inconsistent and unreliable reports of trauma due to the degree of stress elicited by their treatment procedures.

1.4.3 Emotion & memory accuracy

Though it may be apparent that emotional arousal assists in the formation of memories, these memories are generally not any more accurate or resistant to suggestion and misinformation than emotionally neutral memories. Peace and Porter (2004) found that in comparison to positive emotional experiences, recall of traumatic experiences remained more vivid and accurate across a 3 month and 3.5 or 5 year delay. The majority of research has examined accuracy in the recounting of emotionally arousing, albeit less

traumatic, personal experiences. Brown and Kulik (1977) proposed a unique, enduring 'flashbulb memory' for highly emotional and salient personal experiences or public tragedies, such as the memory of a wedding day or the birth of a child, or hearing about the assassination of John F. Kennedy or the attack on the World Trade Centre. Many researchers have investigated this form of memory, and have found it to be no more enduring or resistant to suggestion than other memories. One study compared undergraduate students' immediate and long-term (3 year delay) memory of details about the day they learned of the Challenger space shuttle explosion, including their location, activities before and after, the time of day, the individual who informed them of the event and the others present at the time (Neisser & Harsch, 1992). The authors found that although participants reported extremely high vividness and confidence in their reports, overall their long-term memories of the event were imperfect, with an average accuracy rating of only 2.95 out of a possible score of 7. One-quarter of the participants did not recall a single detail accurately after the 3 year delay, and only 3 participants recalled all five details correctly. Upon presentation of their original, immediate accounts as memory cues, participants were shocked by the discrepancy between their immediate accounts and long-term memory, but none could retrieve that original report. The authors concluded that it did not appear that the original memory had been altered, but that original memory had been entirely replaced with their alternate, 'false' long-term memory. A separate analysis of memory for the Challenger space shuttle disaster by Bohannon and Symons (1992) further substantiated the notion that flashbulb memories were imperfect and susceptible to forgetting and inconsistency over time, though a strong emotional response was associated with providing more consistent reports.

Furthermore, memories of public tragedies can be altered by misleading and suggestive interview techniques. While interviewing Dutch participants 10 months after a highly publicized plane crash, researchers asked participants whether they had seen the television footage of the moment that the plane crashed into the apartment building (Cronbag, Wagenaar & van Koppen, 1996). Despite the fact that this footage did not exist, 60% of participants agreed they had viewed it and answered follow-up questions

about the footage. To show that individuals were susceptible to suggestion and misinformation for not only neutral events, but highly emotional events as well, Loftus and Pickrell (1995) conducted a series of three interviews with participants. Under the pretence that all memories were provided by a parent, the participants were asked to recall details about specific childhood events, three of which were true and verified by the parent, and one of which, getting lost in the mall, was invented by the experimenters and verified to be false by the parent. On average, participants only recalled slightly greater than two-thirds of the true memories, while, overall, one-quarter of participants claimed to recall, and provided details about, the false, experimenter-invented memory. In a more recent study, researchers elicited partial or full false memories of surviving an animal attack in more than one-half of their participants (Porter, Yuille & Lehman, 1999). The results from studies of flashbulb memories indicate that emotional personal memories are subject to the same form of forgetting and suggestion over time as other, neutral memories.

1.4.4 Emotional memory in children

In regards to children specifically, many studies purport to document their ability to remember traumatic events, including abductions, murders and natural disasters, even over long periods of time and when the events occurred when the children were very young (review in Howe, 1997). Though these reported memories may exist in the individual's mind, unfortunately, these memories often cannot be assessed for completeness or accuracy over time. To investigate the effect of emotional stress on memory formation and accuracy, Merritt, Ornstein and Spicker (1994) used a medical procedure as an analogue for a stressful abuse experience. The authors found that cortisol levels measured in children undergoing urinary catheterization did not significantly impact the child's later free recall performance, and overall, there was no significant decrease in memory accuracy after a 6 week delay, even for the youngest children (age 3). This result echoes similar findings within adult populations (Buchanan & Lovallo, 2001). Merritt et al (1994) did find a weak but significant negative correlation between distress behaviour during the procedure and long-term recall of the details of the session.

This finding indicates that children overall maintained long-term accuracy, but children who displayed the most distress behaviours (e.g. eye closing, resisting instructions) recalled the fewest details of their experience. This relationship is most likely due to the fact that these children were distracted by their behaviour, and therefore did not attend to the minor details of the procedure, resulting in a lower free recall performance. Furthermore, since these children were so distressed by the procedure, it is possible that the subsequent reminder induced sufficient anxiety to affect their recall.

The generally high accuracy reported by Merritt et al (1994) is unsurprising, as the delay was a relatively short 6 weeks, and the free recall technique did not incorporate elements of suggestive or misleading questions. When evaluated over a two year period, Peterson (1999) found that children's free recall accuracy for painful medical emergencies significantly decreased, though older children were able to maintain higher accuracy than younger children. Furthermore, delay times of 6 weeks and 1 year did not have a significant effect on the free recall of emergency medical attention for a facial laceration, but over time, children increasingly agreed with false statements about the situation (Burgwyn-Bailes, Baker-Ward, Gordon & Ornstein, 2001). Although older age was a highly significant predictor of improved recall at both follow-up times, the endorsement of false and suggestive statements was extremely varied between children, with some children supporting none of these statements and others agreeing with all of them. These results serve to complement the findings within adult populations, and show that when interviewed carefully, children can freely recall accurate details of an emotional event, but that the reporting of emotional events in children is also highly susceptible to suggestion and forgetting over time.

1.5 Impulsive Behaviour

Putting inadequate measures and memory imperfections aside, impulsivity and associated impulsive behaviours might provide a partial explanation for inconsistent and exaggerated self-reports of exposure to violence. The working definition of impulsivity is fairly broad and conceptually constitutes a variety of traits and actions with both negative

and positive connotations, including temporal discounting, risk-taking, novelty seeking, and unpredictability (Depue & Collins, 1999). Based on this multi-faceted definition, it follows that analyses of the factor structure of impulsivity have produced considerably diverse results across studies. The Barratt Impulsivity Scale, presently considered to be the gold standard impulsivity assessment tool, treats impulsivity as comprised of three subfactors: motor impulsivity (acting without thought), non-planning (low self-control), and attentional impulsivity (inability to focus on a single task; Patton, Stanford & Barratt, 1995). Based on the results of a factor analysis with impulsivity scales from ten different sources, Whiteside and Lynam (2001) proposed a four-factor model of impulsivity with low premeditation, urgency, sensation seeking, and low perseverance factors. These four factors fit the definition of impulsivity proposed by the future discounting literature, which is the overall preference for immediate or short-term, smaller rewards over future, larger rewards (Kirby, Petry & Bickel, 1999). The higher present value of short-term rewards could very reasonably elicit quick decision-making in response to strong desires and emotions, and the abandonment of projects that require long-term commitment, as well as engagement in activities with an element of risk or danger, whether they are socially acceptable or unacceptable. Furthermore, as discount rates are suggested to vary in response to social or environmental cues indicative of future circumstances, cues of poor long-term outcomes such as lower life expectancy and economic uncertainty may influence impulsivity (Williams, 1957; Daly & Wilson, 2005). In a Chicago dataset, Wilson and Daly (1997) found a strong and significant relationship between higher homicide rates, arguably an assay of impulsivity, and lower life expectancy.

Interesting evidence exists to support an association between impulsivity and the kind of behaviour that could lead to inaccurate self-report data, particularly lying and exaggeration. Several childhood and adult-onset mental disorders include the combination of impulsivity and deception, indicating at least a symptomatic correlation between the two. A diagnosis of Conduct Disorder, a serious childhood disorder often preceding an adult diagnosis of Anti-Social Personality Disorder (ASPD), requires that the child has engaged in a variety of impulsive antisocial behaviours, such as stealing,

violence towards people or other animals, and truancy from school, in combination with deception of others to obtain goods or avoid obligations (American Psychiatric Association, 2000). The Diagnostic and Statistical Manual (DSM-IV-TR) lists impulsivity, failure to plan ahead, irresponsibility and deceitfulness, as indicated by repeated lying or conning others for personal profit, among the criteria for a diagnosis of ASPD (American Psychiatric Association, 2000). In addition to manipulativeness, conning others, and pathological lying, Psychopathy, a condition highly comorbid with ASPD, is also characterized by general impulsivity, the lack of realistic long-term goals, entering into many short-term commitments, and poor behavioural control (Hare, Harpur, Hakstian, Forth, Hart, & Newman, 1990). Pathological lying is also a common symptom of Borderline Personality Disorder, characterized by pervasive impulsivity and unstable relationships and moods. Impulse Control Disorders are inherently based on the individual's inability to control the compulsion to engage in specific behaviours, and include pathological gambling, kleptomania, pyromania, and intermittent explosive disorder, wherein the individual has frequent outbursts of violence towards property or people. A case has been made for further investigation into the etiology and treatment of pathological lying, in the possibility that the newest version of the Diagnostic and Statistical Manual, DSM-V, might include it within the category of Impulse Control Disorders (Dike, Baranoski & Griffith, 2005).

The neurobiology of deception and impulsivity further supports their association. Spence, Hunter and Farrow (2004) reported that engagement in verbal deception tasks produced activity within the inferior frontal lobe regions, including the orbitofrontal area which plays a key role in executive function, moral reasoning, and inhibitory, impulse control decisions. Furthermore, Yang et al (2007) found an association between increased pathological lying and white matter within the inferior frontal lobe. As white matter is an index of faster neural activity and more efficient information sharing, increases in this area may be the result of a cyclical interaction between increased lying and strengthened neural mechanisms aiding in the deception process.

Given this association between impulsivity and lying, it seems plausible that some self-report inconsistencies might be attributed to an overall propensity towards providing false information for perceived personal gains. In an investigation of casual, everyday lying within non-clinical populations, Kashy and DePaulo (1996) had adult undergraduate students and community members track their deceitful behaviour in a daily diary. High rates of lying (number of lies per social interaction) were significantly correlated with high manipulativeness, high self-consciousness and concern with public impressions, and low quality same-sex relationships. Additionally, high self-reported manipulativeness, low quality same-sex relationships, and low social responsibility were correlated with committing more self-serving lies. These results must be interpreted with caution, as it is clear that situational factors could have influenced the reporting of lying behaviour; some individuals may have made a conscious effort to tell fewer lies because they were more aware of their behaviour when forced to describe it in the daily diary. Furthermore, it is somewhat paradoxical to expect honest data from someone who is a self-proclaimed liar, but it is also troublesome to collect information from someone who admits to never lying, as everyone presumably tells lies once in a while. Nevertheless, these results are intriguing in that 'casual liars' show a profile similar to those with disorders involving pathological lying; they are manipulative, somewhat irresponsible individuals who are quite concerned with making a good social impression. This similarity also suggests that perhaps the association between impulsivity and lying exists along a continuum at sub-clinical levels within the general population. If this association is in fact valid, then increased impulsive behaviours may act as a good predictor of participants being particularly inclined towards inconsistent and false self-reports of their exposure to violence.

Although it has not been specifically associated with impulsivity, malingering, the act of inventing or embellishing symptom severity for personal gain, is one specific form of lying that is particularly significant to forensic psychologists and health care professionals. These professionals must assess their clients' health for the purposes of medical treatments and prescription of controlled substances, as well as competence to

continue with legal proceedings. Among individuals providing self-report data on exposure to violence, it may be perceived that physical gains, such as governmentally subsidized social programs, community centres or schools, could be promoted through the exaggeration of community violence. Though possible of adults, this rationale within children and adolescents seems highly improbable. There may be no immediately obvious material gains from providing false self-reports, but it is possible that falsification and embellishment of exposure to violence imparts intangible reputational benefits to the individual. Depicting oneself as someone who can withstand physical aggression could act as an indicator of superior mate quality, something that might be particularly relevant to adolescent males (Daly & Wilson, 2005). Moreover, braggartly statements that create a reputation of heightened prowess and bravery in the face of dangerous events, including community violence, could serve to ward off future confrontations from competing conspecifics (Daly & Wilson, 2005). Though the relationship between an interview setting with a stranger and the perceived opportunity to bolster one's reputation seems tenuous, it is possible that something as simple as the presence of an attractive female interviewer could elicit increased embellishment of exposure to violence. Since Wilson and Daly (2004) found a nearly immediate increase in impulsive or discounting behaviour among males upon viewing attractive females, this possibility is not entirely far-fetched. These results suggest that regard for personal reputation may elicit exaggerated and false reports of exposure to violence, particularly by adolescents.

1.6 Expectations

Within the Project on Human Development in Chicago Neighbourhoods Longitudinal Study (*PHDCN* study) dataset, I was able to identify false child self-reports by comparing responses to a life-long exposure to violence questionnaire administered once, and then a second time two years later. Additionally, children and their primary-caregivers provided information about the child's characteristics and behaviours at several interviews. Several of these survey items were selected as possible predictors of

inconsistent child self-reports of exposure to violence. Based on the above literature, specific hypotheses about the relationship between inconsistent violence reporting and the selected characteristics and behaviours were compiled.

As males are far more frequently diagnosed with Anti-Social Personality Disorder, Conduct Disorder and Psychopathy (American Psychiatric Association, 2000), far more frequently engage in risk-taking behaviour, and stand to benefit the most from a reputation for bravery and physical strength, it is hypothesized that males would exaggerate more, thereby providing more inconsistent exposure to violence reports than females.

Though potential reputational benefits would be generally helpful to individuals from all socio-economic levels, in combination with cues of uncertain future circumstances, these benefits may particularly impact individuals within the low Socio-Economic Status group. As such, it was hypothesized that increasing Socio-Economic Status (SES) would decrease the likelihood of exaggerated exposure to violence reports.

Age has been found to be the most prominent, reliable predictor of recall accuracy in children, so it was hypothesized that, insofar as unreliable reports reflect failures of memory, older age would decrease the odds of retracting an exposure to violence report.

The self- and Primary Caregiver- report variables on 'bragging', 'attention-seeking', 'self-consciousness' and 'showing off' were expected to increase the likelihood of inconsistent exposure to violence reports, on the basis that these variables may have assayed a concern for reputational benefits.

Despite the apparent paradoxical nature of asking one's tendency towards deception, the self- and Primary Caregiver-report variable on 'lying and cheating' was expected to increase the likelihood of retractions of exposure to violence.

The self-report variable of 'daydreaming' and the Primary Caregiver-report of 'confusion or being lost in a fog' were expected to increase the odds of inconsistent exposure reports, as they may have assayed reduced reality monitoring among children.

Both the self- and Primary Caregiver- report variables on 'lacking guilt after misbehaving' and 'acting without thinking', as well as the overall 'Delinquent Behaviour

Scores' were assessed as indices of impulsivity, and expected to increase the likelihood of exposure to violence retractions.

The self-reported 'Behavioural Impulsivity Scale', and the Primary Caregiver 'Impulsivity Score' and associated subscales, further assays of impulsivity, were also expected to increase the likelihood of exposure to violence retractions.

2. METHOD

2.1 Project on Human Development in Chicago Neighbourhoods (PHDCN)

2.1.1 PHDCN description

Earls, Brooks-Gunn, Raudenbush, and Sampson (1995) conducted the *Project on Human Development in Chicago Neighborhoods Longitudinal Cohort Study* (PHDCN) in three waves between 1995 and 2000. The purpose of their study was to evaluate the situational and dispositional factors contributing towards the manifestation of antisocial behaviours. To achieve this, the researchers administered various personality assessment questionnaires to children and their primary caregivers.

Access to selected datasets from the PHDCN study was requested and obtained through the Inter-university Consortium for Political and Social Research website. The data were saved on a password-protected, stand-alone computer, and all hardcopies associated with the datasets were locked within the laboratory to maintain security and comply with the policy on use of this dataset.

2.1.2 PHDCN participant selection

Over 6000 (N = 6228 in wave 1) Chicago children and adolescents participated in the PHDCN study. The data were collected from participants during three waves that were conducted over seven years: wave 1 between 1994 and 1997, wave 2 between 1997 and 1999, and the final wave 3 between 2000 and 2001. During wave 1, participants were grouped into seven "cohorts" corresponding to their age at the time of first interview: birth, 3, 6, 9, 12, 15 or 18 years old. Table 2.1 presents exact age ranges of subjects during each wave. The participants would remain in this cohort group throughout the study, regardless of their ages during waves 2 or 3. Participants were individually distinguished by subject identification numbers, which linked their response data over the three separate testing periods. Over 80% of the participants had a Primary Caregiver (PC or caregiver) who agreed to participate in the study, and was identified by his/her own subject number that was linked to his/her child's response data. In this study, 'Primary

Caregiver' was defined as an individual who lived with and spent the most time caring for the child participant (Earls, 1995).

Table 2.1: Age ranges of participants in each cohort during each wave

Cohort	Mean Age at wave 1	Age Min.	Age Max.	Mean Age at wave 2	Age Min.	Age Max.	Mean Age at wave 3	Age Min.	Age Max.
6	6.2	4.8	7.7	8.3	6.8	11.1	10.8	9.2	13.1
9	9.2	7.8	10.5	11.2	9.1	13.6	13.7	11.7	15.6
12	12.1	10.8	13.2	14.2	12.9	17.1	16.7	15.3	18.6
15	15.2	13.7	16.9	17.2	15.6	19.9	19.8	18.2	22.3

The PHDCN researchers collapsed the 847 Chicago census tracts into 343 Neighbourhood Clusters (NCs). The NCs were determined by geographic boundaries and general knowledge of Chicago neighbourhoods; racial-ethnic mix, indicating the percentages of Black, White, Latino and Other residents; and socio-economic status (SES), with three levels indicating low, medium or high SES. Refer to the PHDCN website at http://www.icpsr.umich.edu/PHDCN/sampling.html#longitudinal for full details of the participant selection process. From these 343 NCs, 80 were selected to equally represent all levels of SES and racial-ethnic mix. Neighbourhood street blocks were randomly chosen from the 80 NCs, wherein 8347 eligible child and adolescent participants were identified through an in-person screening process. The first wave of the PHDCN study recruited 6228 of those eligible child and adolescent participants; this subject pool was reduced to 5338 participants for wave 2, and 4850 in wave 3. Refer to the PHDCN website at http://www.icpsr.umich.edu/PHDCN/methods.html for full details of the methodology.

For the purposes of my research, only a subset of data from the larger subject pool was used. The details pertaining to participant retention in selected cohorts are presented in Table 2.2. Participant retention was based upon complete demographic information provided at each interview. Missing data within return participants was quite frequent, and was due to missed questions during the interview, participant misunderstanding of the question, participant not knowing the answer to the question, or the removal of a

questionnaire item in subsequent interviews. Based on the highly consistent drop-out rate of between 18.78 and 20.87 % for each cohort age, SES level and sex, none of these factors appears to influence participant retention. For example, participants from the lower SES level or the older age cohorts were not more likely to drop out than other participants.

Table 2.2: Participant retention across interviews within each cohort, SES level and sex

		Cohort				Neighbourhood SES			Sex	
	Total	6	9	12	15	Low	Med.	High	Male	Female
W1 N	3320	979	827	820	694	1240	1308	772	1656	1664
W2 N	2902	868	719	718	597	1057	1146	699	1460	1442
W3 N	2654	789	655	650	560	992	1035	627	1328	1326
% lost W1 to W3	20.06	19.41	20.80	20.73	19.31	20.00	20.87	18.78	19.81	20.31

Abbreviations: SES: Socio-Economic Status; W: Wave

2.1.3 PHDCN procedure

Research assistants administered the various questionnaires during interviews, but when face to face interviews were not possible, phone interviews were held. All interviews were held with Primary Caregivers and children individually to reduce feelings of inhibition. Participants were paid (from $5 to $20), based on their age and the length of the interview. Incentives, including the opportunity to win monthly prizes, were offered in efforts to maintain participation throughout the longitudinal study. Refer to the PHDCN website at http://webapp.icpsr.umich.edu/cocoon/ICPSR-STUDY/13701.xml for complete details of the protocol.

2.2 Terms and Measures

2.2.1 Inconsistent responses

For this research, an 'inconsistent' wave 2 to 3 response was defined as a reported lifetime experience in wave 2 that was not reported again in wave 3. For example, if a participant reported in wave 2 that he/she had witnessed a shooting, but during wave 3,

reported that he/she had never witnessed a shooting, this participant's wave 2 to 3 responses would be considered inconsistent. This response pattern is 'inconsistent' because it required that, during wave 3, the participant provided information to researchers that was contradictory to his/her wave 2 report. This type of response will also be referred to as a 'retraction', despite the denotative meaning of explicitly disavowing a statement as inaccurate (Oxford Dictionary, 1994). Use of this term is not meant to indicate that the children consciously acknowledged their previous response as incorrect and attempted to reconcile this false information at the wave 3 interview; children were not reminded of their previous responses. Rather, the term is meant to indicate the contradiction of a prior claim of exposure to violence.

All other combinations of wave 2 to 3 responses were not considered inconsistent. For example, if a participant reported in wave 2 that he/she had never witnessed a shooting, but during wave 3, reported that he/she had witnessed a shooting, this participant's wave 2 to 3 responses would not be classified as inconsistent. This is because the participant may be reporting a new instance of violence that was experienced in the interim between wave 2 and 3 interviews. Responses wherein the participant reported an exposure at both interviews is referred to as a 'reaffirmation', since the initial report was confirmed at the second interview.

Inconsistent responses were assessed only between waves 2 and 3, because the identical questionnaire was administered at both interview times. At wave 1, different questionnaires were administered, so exact inconsistent responses could not be determined. Furthermore, only the *My Exposure to Violence Questionnaire* was used to assess inconsistent responses, as this was the only measure that addressed lifetime exposure, with items phrased as: "In your whole life, have you ever…".

2.2.2 Exposure to violence measures.

The *My Exposure to Violence Questionnaire* (*My ETV*) was administered to children in cohorts 9 to 15 during wave 2, and cohorts 6 to 15 during wave 3. A shortened version of this survey was administered to cohort 6 during wave 2, which contained identical exposure to violence items, but fewer follow-up questions for each item. Both

full and short versions of the *My ETV* survey investigated what types of violent acts the participant had witnessed other people doing in their neighbourhood, as well as what violence the participant had personally experienced. The survey did not address whether the participant had ever engaged in that form of violence him/herself. The types of violence included in the survey ranged in severity, initially addressing whether the participant had ever witnessed someone else being shoved, kicked or punched, and escalating to address whether the participant had ever been shot. The participants were to report *lifetime* exposure to each form of violence, and specify the last time they had experienced the event, the number of times it had been experienced, as well as the location where the most recent event had occurred. The items on this questionnaire were used to assess inconsistent responses from child participants. One item of primary interest concerned witnessing a shooting, and was phrased "In your whole life, have you EVER seen *someone else* get shot? This doesn't include seeing someone shot with a BB gun, or any type of toy gun, like a paint ball gun or air rifle" [original emphasis]. Other items of interest included whether the child participant had ever witnessed an attack with a weapon, or had been shot or attacked with a weapon him/herself.

The *My Exposure to Violence Questionnaire* was formulated by the authors of the PHDCN study during wave 1 (1995). The *My ETV* measure was administered to a group of 80 wave 1 participants, and retested between 2 and 4 weeks later in a 23 person subset of the original group. With this methodology, Selner-O'Hagan, Kindlon, Buka, Raudenbush and Earls (1998) reported a *My ETV* score test-retest reliability of $\alpha = 0.88$. To date, the authors have not published an updated article detailing the long-term reliability of this measure.

The *My Child's Exposure to Violence Questionnaire* (*My CETV*) was administered to the Primary Caregiver of child participants from cohorts 6 to 9 during wave 3. Including nearly identical items as the child version, this survey investigated what types of violent acts the Primary Caregiver thought his/her child had ever witnessed or personally experienced. Again, similar to the child version, the *My CETV* assessed lifetime exposure to violence, and all items were phrased "In his/her whole life, has

[child's name] EVER..." [original emphasis]. The items on this questionnaire were used to compare Primary Caregiver and child-reports of exposure to violence.

2.2.3 Self-reported measures

The *Youth Self Report* (*YSR*) survey was administered to children in cohorts 12 to 15 during wave 1, cohorts 9 to 15 in wave 2 and cohorts 6 to 12 during wave 3. The *YSR* assessed emotional and behavioural problems as the participant was asked to rate on a three-point scale whether a short sentence was untrue, somewhat true or often true in describing their personality. Higher scores were indicative of that item being true. A nearly identical survey to the *YSR*, called the *Young Adult Self Report* (*YASR*), was administered to participants in cohort 15 at wave 3. In the *YASR*, the rating system and items were preserved from the *YSR*, with an additional 26 items added at the end addressing employment, relationships and substance abuse. Several items were selected from these surveys as possible predictors of inconsistent responses. The selected *YSR* and *YASR* items that were included across all waves were: "I am pretty honest", "I daydream a lot", "I try to get a lot of attention", "I feel no guilt after doing something wrong", "I lie or cheat", and "I am self-conscious or easily embarrassed". In wave 1 only, two additional items from the *YSR* were selected: "I brag" and "I show off or clown". These two items were not included in the wave 2 or 3 *YSR/YASR* questionnaires, so could not be assessed beyond wave 1. In addition to ratings on each item, *YSR* and *YASR* cumulative scores were calculated on a variety of constructs, including aggressive behaviour, delinquency, attention problems and social problems. The *YSR/YASR* Delinquent Behaviour Scores were also selected as possible predictors of inconsistent responses. The *YSR* items used to calculate the delinquent behaviour score are listed in Table 2.3. At wave 1, the maximum Delinquent Behaviour Score was 22, wherein the child rated him/herself with the maximum score of 2 on each of the 11 items. Wave 2 and 3 Delinquent Behaviour Scores were calculated from 7 items, with a maximum score of 14.

Table 2.3 Items from the *Youth Self-Report* and *Young Adult Self-Report* used to calculate the cumulative Delinquent Behaviour Score at each wave. An 'X' denotes the inclusion of the item at the designated wave.

YSR/YASR Item	Wave 1 Score	Wave 2 & 3 Score
no guilt after doing something wrong	x	x
hang out with others who get in trouble	x	x
lie or cheat	x	x
prefer being with older kids	x	
run away from home	x	x
set fires	x	x
steal at home	x	
steal outside the home	x	
swear or use obscene language	x	x
truant, skip school	x	x
use alcohol/drugs without medical purpose	x	
Maximum Score	22	14

The *Self Report of Offending* was administered to participants in cohorts 12 and 15 in wave 1, and to cohorts 9 to 15 at waves 2 and 3. This questionnaire addressed the criminal history, and violent and delinquent behaviour of each participant. Participants were asked to report if they had engaged in the specified behaviour within the past 12 months, and the circumstances surrounding that action, including if police reprimanded them. The severity of the behaviours addressed ranged from vandalism and drug trafficking to murder and rape. The researchers did not calculate an overall score, so during my undergraduate thesis research, I formulated an appropriate scale of impulsive behaviours (Beneteau, 2007). A factor analysis was conducted within the entire questionnaire first to determine which variables were associated. From the factor that accounted for the most variance, I selected the variables that reported a principle component analysis value over 0.500 for inclusion in a reliability analysis. These 12 variables were found to be highly covariant, with a Cronbach's alpha value of 0.807. For each wave, I tabulated the *Behavioural Impulsivity Sum* (*BIS*) as the number of behaviours the participant reported engaging in during the previous 12 months. A participant who did not engage in these behaviours would receive a minimum value of 0, while the participant who had engaged in all the behaviours would receive the maximum

value of 12. All 12 variables included are listed in Table 2.4. The *BIS* was used as a possible predictor of inconsistent exposure to violence responses.

Table 2.4: Items from the *Self Report of Offending* used to calculate the Behavioural Impulsivity Score

SRO Item at Wave 1, 2 & 3
been absent from school without an excuse
carried a hidden weapon
caused trouble in a public place so that people complained about it, such as being loud and disorderly
purposely damaged or destroyed property that did not belong to you? (for example, breaking, cutting or marking up something)
stolen something from a store
sold marijuana or pot
hit someone with whom you did not live with the idea of hurting them
attacked someone with a weapon
thrown objects, such as rocks or bottles, at people (other than events you have already mentioned)
been involved in a gang fight in which someone was hurt or threatened with harm
driven a motor vehicle when you did not have a driver's license or after your driver's license had been suspended
been in trouble with the police
Maximum Score: 12

2.2.4 Primary Caregiver-reported measures

During wave 1 only, the *Emotionality, Activity, Sociability, and Impulsivity Temperament* (*EASI*) survey was administered to the Primary Caregivers (PC) of children in cohorts 9 through 15. As the title indicates, the survey addressed the temperament and emotional state of the Primary Caregiver's child. The Primary Caregiver was asked to rate on a five-point scale whether statements were uncharacteristic or characteristic of his/her child. A higher mean value indicated that the Primary Caregiver felt this variable was very characteristic of his/her child. By combining subscales, a mean score was calculated on the four different characteristics of emotionality, activity, sociability-shyness, and impulsivity. I selected the Impulsivity score and the four associated

subscales that evaluated inhibitory control, decision time, sensation seeking and persistence as possible predictors of inconsistent exposure to violence reports.

The *Child Behaviour Checklist* (*CBCL*) survey was administered to the Primary Caregivers of children in cohorts 9 to 15 in wave 1, cohorts 6 to 15 in wave 2 and cohorts 6 to 12 at wave 3. Similar to the *YSR/YASR*, the *CBCL* addressed the emotional temperament and behavioural characteristics of the Primary Caregiver's child. The Primary Caregiver was asked to rate on a three-point scale whether a phrase was untrue, sometimes true or often true of his/her child, with higher scores indicating that the item was deemed to be true.

Several items were selected from this survey as possible predictors of inconsistent responses. The selected *CBCL* items that were included across all waves addressed whether the Primary Caregiver's child (is): "Confused or seems to be in a fog", "Daydreams or gets lost in his/her own thoughts", "Demands a lot of attention", "Doesn't feel guilty after misbehaving", "Lies or cheats", and "Self-conscious or easily embarrassed". In wave 1 only, two additional items from the *CBCL* were selected: "Brags or boasts" and "Shows off or clowns". These two items were not included in the wave 2 or 3 *CBCL* questionnaires, so could not be assessed beyond wave 1. Again similar to the *YSR*, a *CBCL* cumulative score was calculated on a variety of constructs, including aggressive behaviour, delinquency, attention problems and social problems. The *CBCL* Delinquent Behaviour Scores were also selected as possible predictors of inconsistent responses. The *CBCL* items that were used to calculate the Delinquent Behaviour Score are listed in Table 2.5. At wave 1, the maximum Delinquent Behaviour Score was 26, wherein the caregiver rated the child as the maximum score of 2 on each of the 13 items. Wave 2 and 3 Delinquent Behaviour Scores were calculated from 8 items, with a maximum score of 16.

Table 2.5: Items from the *Child Behaviour Checklist* used to calculate the cumulative Delinquent Behaviour Score at each wave. An 'X' denotes the inclusion of the item at the designated wave.

CBCL Item	Wave 1 Score	Wave 2 & 3 Score
not seem to feel guilty after misbehaving	x	x
hang out w/others who get in trouble	x	x
lie or cheat	x	x
prefer being with older kids	x	x
run away from home	x	x
set fires	x	x
steal at home	x	
steal outside the home	x	
swear or use obscene language	x	x
think about sex too much	x	
truant, skip school	x	x
use alcohol/drugs without medical purpose	x	
vandalize	x	
Maximum Score	26	16

During wave 3, the Primary Caregivers of the participants in cohort 15 were not interviewed, so there are no Primary Caregiver-reports available for evaluation. Thus, cohort 15 was excluded from any analyses conducted with wave 3 Primary Caregiver-reported data.

2.3 Statistical Analyses

2.3.1 General statistical analyses methodology

The statistical package SPSS version 16.0 and the publicly available share-ware program R 2.6.0 were used to conduct analyses of the various datasets. All the participant data were merged into a single file, where the subject identification numbers linked the participant's responses from each questionnaire. Data recorded as non-responses were excluded from analyses. These included cases of missed questions, not understanding the question, or not knowing the answer. Individuals who dropped out of the study during wave 2 or 3 could not be included in the analyses evaluating temporal changes.

After the initial investigation into various inconsistent responses on the exposure to violence questionnaire, the remaining data analyses involved inconsistent responses to the item phrased as:

"In your whole life, have you EVER seen *someone else* get shot? This doesn't include seeing someone shot with a BB gun, or any type of toy gun, like a paint ball gun or air rifle".

This item was selected for several methodological reasons. Aside from the response category that denied having ever witnessed a shooting, which reasonably contained the greatest number of participants, the other three response groups, 'No/Yes', 'Yes/No' retractions and 'Yes/Yes' reaffirmations, contained fairly even numbers of participants (n= 1725; 191; 166; 163, respectively). Unlike the "witnessed an attack with a weapon" item, where the terms "attack" and "weapon" are ambiguous, the "witnessed a shooting" item specifies both the weapon and the resulting injury. Furthermore, throughout the literature, an item addressing whether the participant had "witnessed a shooting" is one of the most prominent exposure to violence questions asked of children, making it a major topic of interest among researchers.

2.3.2 Binary Logistic Regressions

The Binary Logistic Regression analyses compared the participants who made 'Yes/No' retractions with the participants who responded with 'Yes/Yes' reaffirmations. The 'Yes/Yes' reaffirmations group was set as the baseline '0' category, so that the logistic model would predict for the comparison retraction group. Based on this coding, a significant positive beta value indicates higher values of the predictor variable in the retracted response group. Standardized beta coefficients for logistic regressions are presented as estimated odds ratios (e^B), and represent the multiplicative effect that increasing the independent variable by 1 has on the dependent variable, when holding all other effects constant (Lawal, 2003). When $e^B > 1$, the independent variable increases the odds of retracting a report of witnessing a shooting, in comparison to reaffirming, just as when $e^B < 1$, the independent variable decreases the odds of retracting a statement, in comparison to reaffirming. An e^B value =1 indicates that the independent variable has no

effect on the outcome of the dependent variable, namely, retracting or reaffirming exposure to violence. The standard significance level of $\alpha = 0.05$ was followed, though marginally significant results, where $0.05 < \alpha < 0.10$, are discussed out of interest.

The explanatory variables were recorded at each of the three interviews, but have been included in separate Logistic Regression equations to preserve data within the analyses. This was necessary because the source of the predictor variables, the *Youth Self-Report (YSR)* and *Child Behaviour Checklist (CBCL)* questionnaires, were administered to different cohorts at each interview. Two models were tested for the data collected at each wave; the first model included only the self- or Primary Caregiver-reported explanatory variables, while the second model added the demographic explanatory variables sex, age at the time of interview and socio-economic status. Tables 3.5 and 3.6 in the Results list the explanatory variables included in the regression analyses. Goodness of fit for the models was measured by the Likelihood Ratio Chi-Square Test. Unless otherwise stated, each model was found to be a significantly better fit to the data than a null model containing the intercept only (H_0: $\beta=0$; p values < 0.05).

2.3.3 Multinomial Logistic Regressions

The Multinomial Logistic Regressions compared the children who retracted their experience of witnessing a shooting with each of the three other response groups, 'No/No', 'No/Yes' and the reaffirmed 'Yes/Yes' group. Using a four response category dependent variable to make this comparison, Retracted 'Yes/No' responses were coded as the baseline '0' group, and the other possible responses, 'No/No', 'No/Yes' and Reaffirmed 'Yes/Yes' responses, were the comparison categories. In a multinomial regression, the beta coefficient reflects the effect of the predictor variable on the odds of being in the assigned comparison category ('No/No', 'No/Yes', or 'Yes/Yes') of the dependent variable, where odds refers to the probability of being in the assigned comparison category of the dependent variable versus the probability of being in the reference category of the dependent variable (Retraction 'Yes/No'). A significant positive beta value indicates that the predictor variable increases the odds of the assigned comparison category ('No/No', 'No/Yes', or 'Yes/Yes') of the dependent variable,

compared to the reference category (Retracted 'Yes/No' responses). A significant negative beta value decreases the odds of that dependent variable category compared to the reference category. Similar to a logistic regression, standardized beta coefficients for multinomial logistic regressions are presented as estimated odds ratios (e^B), and represent the multiplicative effect that increasing the independent variable by 1 has on the assigned dependent variable category, in comparison to the baseline dependent variable group (Lawal, 2003). The standard significance level of $\alpha = 0.05$ was followed, though some marginally significant results, where $0.05 < \alpha < 0.075$, are discussed out of interest.

The predictor variables were recorded at each of the three interviews, but have been included in separate regression equations to preserve data within the analyses. This was necessary because the source of the predictor variables, the *Youth Self-Report (YSR)* and *Child Behaviour Checklist (CBCL)* questionnaires, were administered to different cohorts at each interview. Two models were tested for the data collected at each wave; the first model included only the self-report predictors, while the second model contained the same self-report predictors as well as the demographic variables sex, age at the time of interview and SES. Tables 3.7 and 3.8 in the Results list the explanatory variables included in the regression analyses. Goodness of fit for the models was measured by the Likelihood Ratio Chi-Square Test. Unless otherwise stated, each model was found to be a significantly better fit to the data than a null model containing the intercept only (H_0: $\beta=0$; p values < 0.05).

3. RESULTS

3.1 Inconsistent Exposure to Violence Self Reports: Reaffirmations and Retractions

3.1.1 Witnessed a shooting

In the sample available for analysis, a total of 2245 respondents were asked the following lifetime exposure to violence question at Wave 2 and again, in exactly the same words, at Wave 3:

> "In your whole life, have you EVER seen *someone else* get shot? This doesn't include seeing someone shot with a BB gun, or any type of toy gun, like a paint ball gun or air rifle."

Table 3.1 presents various breakdowns of the numbers of respondents who made each combination of yes/no responses to this question. Overall, 14.7% of participants claimed at wave 2 that they had witnessed a shooting at least once in their life. In total, fully half of these respondents retracted that claim at Wave 3. The sexes did not differ in retraction rate ($\chi^2_{1df} = 0.8$, $p = .36$), although males were generally more likely to answer in the affirmative (27.0 % of males *versus* 19.5 % of females said yes in at least one of the two waves; $\chi^2_{1df} = 17.4$, $p < .001$). Similarly, retraction rates did not differ significantly across Socio-Economic Status (SES) levels ($\chi^2_{2df} = 1.3$, $p = .53$), although there were again differences in overall affirmation (31.6 % said yes at least once in the low SES group, 22.4 % in medium SES, 11.6 % in high SES; $\chi^2_{2df} = 75.2$, $p < .001$). The variable with respect to which retraction rates clearly differed was cohort ($\chi^2_{3df} = 41.0$, $p < .001$): retractions decreased with age, from a high of 77.2 % in Cohort 6 (age range 7.8 to 9.1 years at Wave 2, and 9.8 to 11.1 at Wave 3), to a low of 30.1 % in Cohort 15 (ages 16.8 to 18.1 years at Wave 2; 18.8 to 20.1 at Wave 3). Overall affirmation rates also differed across cohorts, increasing with age: 15.1 % of Cohort 6 answered yes in at least one of the two waves, versus 16.3 % of Cohort 9, 29.6 % of Cohort 12, and 36.7 % of Cohort 15 ($\chi^2_{3df} = 99.2$, $p < .001$).

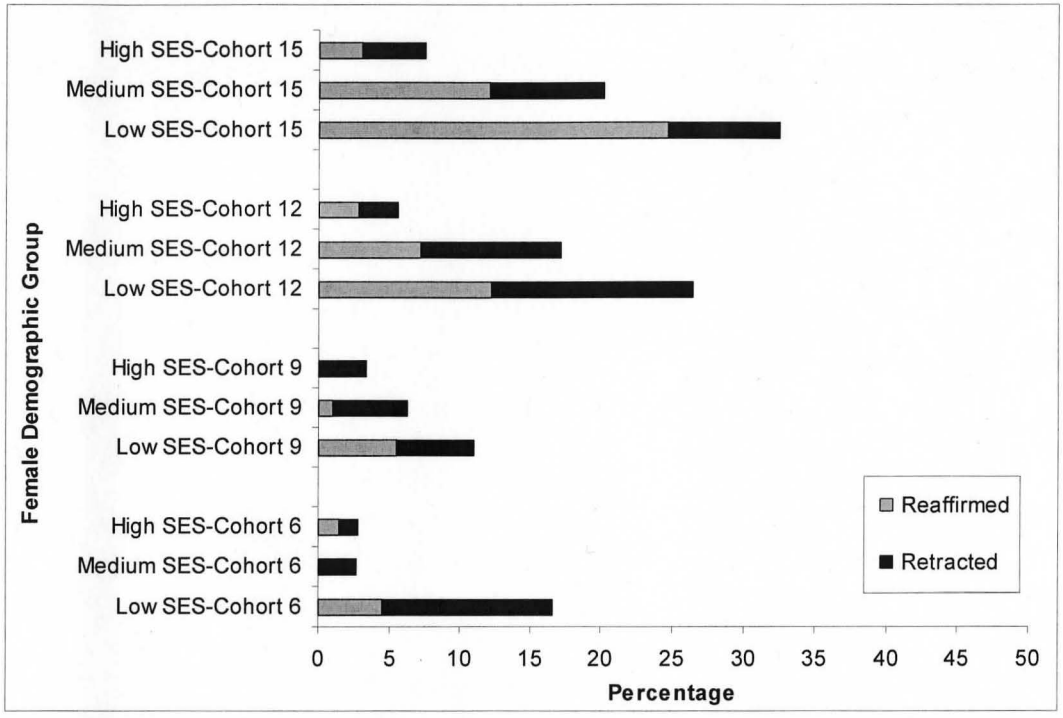
Figure 3.1 portrays retraction *versus* reaffirmation when the variables in Table 3.1 are considered in combination. The noteworthy result is that retraction of Wave 2 claims occurred in all demographic groups, regardless of whether Wave 2 affirmations were frequent or rare.

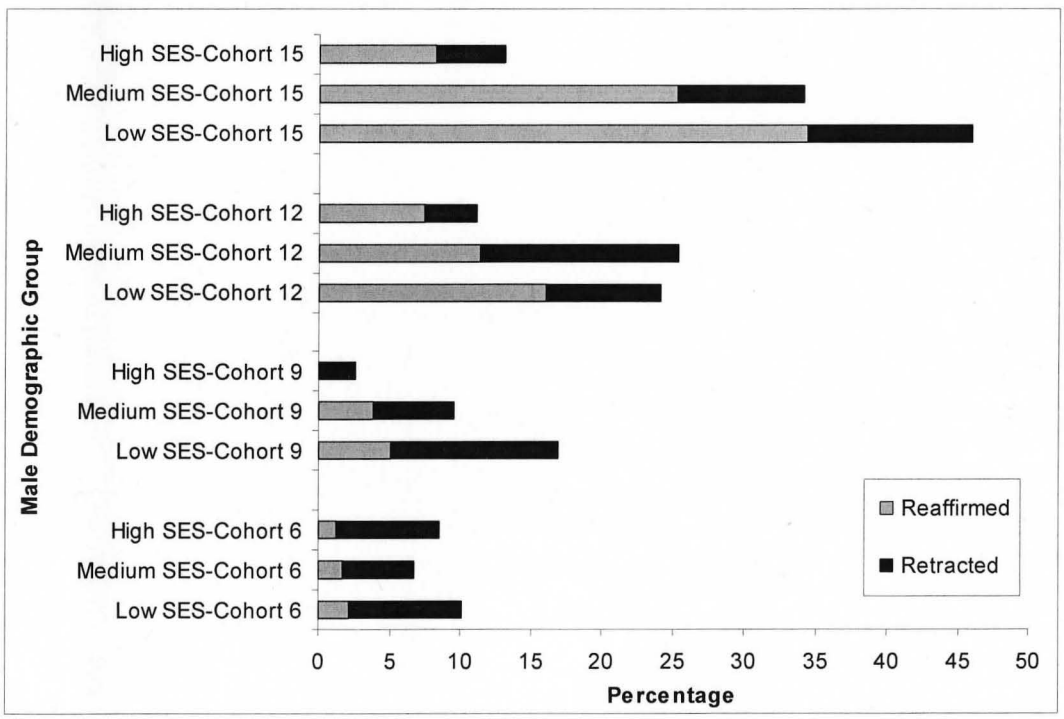
Table 3.1: Frequency and consistency of responses to an identical question (whether the respondent had ever witnessed a shooting) at Waves 2 and 3, in relation to respondent sex, neighbourhood socioeconomic status category, and cohort (age at Wave 1).

Responses		Sex		Neighbourhood SES			Cohort			
W 2 / W 3	Total	Male	Fem.	Low	Med.	High	6	9	12	15
No / No	1725	802	923	568	675	482	587	474	383	281
No / Yes	191	116	75	92	72	27	47	40	54	50
Yes / No (retract)	166	87	79	82	63	21	44	35	53	34
Yes / Yes (reaffirm)	163	93	70	88	60	15	13	17	54	79
% Yes at W2	14.7	16.4	13	20.5	14.1	6.6	8.2	9.2	19.7	25.5
% of W2 affirmations retracted at W3	50.5	48.3	53	48.2	51.2	58.3	77.2	67.3	49.5	30.1

Abbreviations: Fem.: Female; Med.: Medium; SES: Socio-Economic Status; W:Wave

Figure 3.1: Percentages of respondents in the various age and SES groups who said that they had witnessed a shooting at Wave 2 (total bar length), and then either reaffirmed or retracted that claim at Wave 3. Upper panel: female respondents; lower panel: males.





3.1.2 Witnessed a murder

At both interviews, participants from cohorts 6, 9, 12 and 15 also reported whether they had ever witnessed a murder, specifically:

> "In your whole life, have you EVER seen someone else get killed as a result of violence, like being shot, stabbed or beaten to death?".

Overall, 8.9 %, or 200 of the 2243 participants reported at wave 2 that they had witnessed a murder at least once in their life, and 67 %, or 134, of those reports were retracted at wave 3. Again, although there was a significant contingency between wave 2 and wave 3 responses, such a high retraction rate indicates that many of the wave 2 reports were false in some way.

3.1.3 Victimization

Participants from cohort 6, 9, 12 and 15 were also asked questions about their lifelong victimization to violence, with identical questions at Waves 2 and 3. Two items of severe violence victimization were asked of children, specifically:

> (1) "In your whole life, have you EVER been shot? Again, this doesn't include being shot with a BB gun or any type of toy gun" and
>
> (2) "In your whole life, have you EVER been attacked with a weapon, like a knife or bat? Again, this does not include getting shot or shot *at*".

Despite the significant contingency between wave 2 and 3 reports for both victimization questions (both $\chi^2_{1df} > 205$, $p < .001$), a large number of participants retracted their wave 2 reports of victimization when re-interviewed at wave 3. Though few participants reported having been shot (15) or attacked (131) in wave 2, 40% and over 50%, respectively, retracted these statements at wave 3. This result indicates that children's reports of the violence they have seen and personally experienced are unstable over time.

3.1.4 Natural disaster experience

In the *PHDCN* data set, another question about lifetime experiences was asked at Wave 2 and again at Wave 3: "In your whole life, have you EVER been in a natural disaster, like a fire, flood, tornado or earthquake?" A total of 1910 participants in the available data sample responded to this question at Wave 2, with 280 (14.7 %) saying

yes. Wave 3 responses are available for 233 of these 280, and 145 (62.2 %) retracted the initial claim. Thus, affirmations that one had "been in a natural disaster" were even more likely to be retracted than claims that one had witnessed a shooting. This may just mean that the definitional criterion of having "been in" a disaster is vaguer than that of having "seen" someone shot, but regardless of why such retractions occur, these data demonstrate that they are not peculiar to claims about having witnessed shootings or other interpersonal violence.

Are those who retract simply individuals who are (or were, at Wave 2) relatively prone to exaggeration or fabrication? If so, one might expect that retraction of one claim would be predictive of retracting another. But in fact, Wave 2 claims of having "been in a natural disaster" had a retraction rate of 61.9 % (13 of 21) among participants who retracted a Wave 2 report of having witnessed a shooting, a 61.3 % rate (19 of 31) among those who reaffirmed witnessing a shooting, and a 62.4 % rate (113 of 181) among those who did not claim at Wave 2 to have ever witnessed a shooting. Thus, retractions on these two items were independent.

3.1.5 Concordance between Participants and Primary Caregivers

Are children's claims about their experiences consistent with accounts provided by parents or other caregivers? One Primary Caregiver (PC) of the participants in cohorts 6 and 9 was interviewed, providing an opportunity for assessment of the concordance between accounts. PCs were asked a variety of questions about the focal child's violence exposure and victimization, including if he/she had ever "witnessed a shooting", with the same elaboration of what constitutes such an experience as had been provided to the child. Table 3.2 shows that although the Primary Caregivers of over three-quarters of the participants contradicted the focal child's report of "witnessing a shooting", there is a significant contingency between Primary Caregiver and Participant responses ($\chi^2_{1df} = 80.79$, $p < .001$). The low concordance between Participant's affirmative responses and the Primary Caregiver's reports may be based on Participants intentionally neglecting to inform their caregivers of the violence they had witnessed for fear of reduced freedoms.

To avoid this, two other questions were assessed involving incidences wherein the Primary Caregiver would definitely be informed.

Table 3.2: Concordance between Participant and Primary Caregiver (PC) responses, at Wave 3, to the question of whether the former had ever "witnessed someone else get shot".

Witnessed a shooting		Participant's response	
		Yes	No
PC response	Yes	29	46
	No	93	1138

At Wave 3, the PCs were also asked about serious physical attacks that the child had endured him- or herself. More specifically, each PC was asked:

> (1) "In his/her whole life, has [*child's name*] EVER been shot? Again, this doesn't include being shot with a BB gun or any type of toy gun" and
>
> (2) "In his/her whole life, has [*child's name*] EVER been attacked with a weapon, like a knife or bat? Again, this does not include getting shot or shot *at*".

Corresponding questions were asked to the participants of themselves, and responses between the PCs and participants were compared. Only 4 of 1311 participants claimed to have been shot. One of these claims was confirmed by the PC (a father), and three were contradicted (all by mothers). There were no cases in which the participant said "no" and the PC "yes". Affirmative responses to question (2) were more frequent, and are presented in Table 3.3. The fact that only 2 of 51 children's claims to have been attacked with a weapon (3.9 %) were confirmed by the interviewed PCs (predominantly mothers) again raises concerns about the validity of such claims.

Table 3.3: Concordance between Participant and Primary Caregiver (PC) responses, at Wave 3, to the question of whether the former had ever "been attacked with a weapon"

Attacked with weapon		Participant's response	
		Yes	No
PC response	Yes	2	17
	No	49	1244

The low rates of PC confirmation of child violence affirmations in the above three items may suggest that Primary caregivers are deliberately under-reporting the focal child's exposure, for fear of being seen as negligent or irresponsible. To address this possibility, a fourth question was assessed that did not involve inter-personal violence, to evaluate whether low affirmation concordance levels would continue in a different type of question. Primary Caregivers were asked if the child had ever "been in a natural disaster", with the same elaboration of what constitutes such a disaster as had been provided to the child. Table 3.4 shows the relationship between the responses to this question by participants and by PCs. There is a significant contingency between the two parties' responses ($\chi^2_{1df} = 142$, $p < .001$), suggesting that responses to this question are not devoid of reliability and validity, but the majority of participant "yes" responses (67.3 %) were contradicted by the PC. This result may, of course, reflect different interpretations of a vague question, but it provides further reason to question whether childhood reports of lifetime exposure to traumatic events can be taken at face value. Cases where participants said "no" and PCs said "yes" could be those in which the disaster occurred before an age that the participant can now remember, but the more numerous cases in which participant said "yes" and PC said "no" are not so readily explained away.

Table 3.4: Concordance between Participant and Primary Caregiver (PC) responses, at Wave 3, to the question of whether the former had ever "been in a natural disaster".

Natural Disaster		Participant's response	
		Yes	No
PC response	Yes	34	45
	No	70	1161

Interestingly, Primary Caregivers and their children were also not highly concordant regarding the personality characteristics of the children, as reported by the children themselves in the *Youth Self-Report (YSR)*, and Primary Caregivers in the *Child Behaviour Checklist (CBCL)*. Contingency Coefficients were calculated for identical items asked of children (about themselves) and Primary Caregivers (about their children) at each wave, including child's propensity to 'daydream', 'demand attention', lack 'guilt after misbehaving', 'act without thought', 'lie or cheat', feel 'self-conscious', 'brag' and 'show off or clown'. Nearly all of the 20 Contingency Coefficients indicated a significant association, but the values were very low, with none greater than 0.250. In wave 1, there was no significant association between Primary Caregivers and children on whether the child felt 'self-conscious or easily embarrassed', and in waves 2 and 3, there was no significant association between Primary Caregivers and children on whether the child lacked 'guilt after misbehaving'. Furthermore, the overall PC-derived and participant-derived Delinquent Behaviour Scores from each wave were weakly, but significantly correlated. The strength of the correlations decreased across waves, beginning as $r = 0.337$ at wave 1, and dropping to 0.310 by wave 3. These results suggest that Primary Caregivers and their children do not provide highly similar information about experiences of the child, nor about characteristics of the child.

3.2. Possible Predictors of "Witnessed a Shooting" Response Categories

3.2.1. Overall descriptive statistics

A group of possible predictors of retracted "witnessed a shooting" self-reports were compiled based on self- and Primary Caregiver (PC)-reported characteristics and behaviours. General information, including average participant response, standard deviation, and the number of participants who responded to the item, are presented in Tables 3.5 and 3.6 for each questionnaire item selected as a possible predictor of inconsistent responses. Table 3.5 presents the possible self-reported predictors, taken from the *Youth Self-Report* (*YSR*) and the *Self-Report of Offending* (*SRO*), while Table 3.6 displays information for the possible Primary Caregiver-reported predictors, extracted from the *Child Behaviour Checklist* (*CBCL*) and the *Emotionality, Activity, Sociability and Impulsivity Temperament Survey* (*EASI*).

Table 3.5: General descriptive information for possible self-reported predictors, measured at each wave, of 'witnessed a shooting' responses

		Wave 1			Wave 2			Wave 3		
Source	Item	Mean	S. D.	N	Mean	S. D.	N	Mean	S. D.	N
YSR	I brag	0.505	0.641	972						
	I am pretty honest	1.327	0.632	975	1.358	0.583	1387	1.391	0.589	1590
	I daydream a lot	0.728	0.741	975	0.814	0.758	1389	0.818	0.769	1590
	I try to get a lot of attention	0.536	0.694	975	0.621	0.706	1388	0.573	0.701	1591
	I don't feel guilty after doing something I shouldn't	0.411	0.671	975	0.467	0.678	1378	0.480	0.679	1583
	I act without thinking	0.499	0.620	972	0.482	0.608	1388	0.486	0.619	1586
	I lie or cheat	0.358	0.534	975	0.348	0.517	1389	0.316	0.499	1589
	I am self-conscious or easily embarrassed	0.558	0.685	975	0.597	0.683	1384	0.554	0.670	1582
	I show off or clown	0.428	0.640	974						
	Delinquent Behaviour Score	3.251	2.788	974	2.846	2.235	1381	2.649	2.195	1576
SRO	Behavioural Impulsivity Sum	1.287	2.000	1320	1.169	1.871	1519	0.858	1.526	1769

Abbreviations: S.D.: Standard Error; SRO: Self Report of Offending; YSR: Youth Self Report.

Table 3.6: General descriptive information for possible Primary Caregiver-reported predictors, measured at each wave, of "witnessed a shooting" responses

		Wave 1			Wave 2			Wave 3		
Source	Item	Mean	S. D.	N	Mean	S. D.	N	Mean	S. D.	N
CBCL	Brags, boasts	0.700	0.760	1528						
	Confused seems to be in a fog	0.232	0.517	1528	0.269	0.543	2187	0.266	0.538	1749
	Daydreams or gets lost in his/her thoughts	0.518	0.690	1528	0.375	0.593	2151	0.346	0.568	1747
	Demands a lot of attention	0.659	0.755	1528	0.656	0.776	2170	0.577	0.719	1750
	Doesn't seem to feel guilty after misbehaving	0.411	0.652	1520	0.409	0.618	2163	0.409	0.613	1741
	Impulsive or acts without thinking	0.391	0.611	1528	0.441	0.623	2186	0.438	0.606	1748
	Lies or cheats	0.362	0.575	1526	0.396	0.580	2176	0.393	0.579	1748
	Self-conscious or easily embarrassed	0.659	0.731	1528	0.649	0.701	2001	0.670	0.673	1749
	Shows off or clowns	0.578	0.722	1527						
	Delinquent Behaviour Score	1.967	2.432	1526	1.878	2.017	1980	1.949	2.221	1745
EASI	Impulsivity Score	2.671	0.578	1530						
	Inhibitory control subscale	2.449	0.931	1530						
	Decision time subscale	3.028	0.809	1530						
	Sensation seeking subscale	2.749	0.751	1529						
	Persistence subscale	2.458	0.867	1530						

Abbreviations: CBCL: Child Behaviour Checklist; EASI: Emotionality, Activity, Sociability & Impulsivity Temperament Survey; S.D.: Standard Error.

3.3.2 Specific descriptive statistics for each response category

The mean value, standard deviation and number of respondents from each of the four response categories on the self-reported *Youth Self-Report (YSR)* and Behavioural Impulsivity Sum (BIS) explanatory variables are presented in Table 3.7, and on the Primary Caregiver-reported *Child Behaviour Checklist (CBCL)* and *Emotionality, Activity, Sociability and Impulsivity Survey (EASI)* explanatory variables are presented in Table 3.8. Two *YSR* items, and two *CBCL* items were removed by *PHDCN* researchers at wave 2 and 3, so this information is missing from the tables. Mean scores at each wave on the self-reported (top panel) and PC-reported (bottom panel) Delinquent Behaviour Scores are presented in Figure 3.2.

Table 3.7: Descriptive statistics of *Youth Self-Report* and Behavioural Impulsivity Sum explanatory variables, measured at each wave, for each Response Category

		Wave 1			Wave 2			Wave 3		
Item	Response Category	Mean	S. D.	N	Mean	S. D.	N	Mean	S. D.	N
I brag	No/No	0.508	0.629	649						
	No/Yes	0.452	0.652	104						
	Retract	0.540	0.696	87						
	Reaffirm	0.508	0.660	132						
I am pretty honest	No/No	1.360	0.615	652	1.391	0.579	1016	1.419	0.584	1528
	No/Yes	1.221	0.653	104	1.226	0.545	133	1.433	0.598	164
	Retract	1.264	0.673	87	1.288	0.602	104	1.419	0.591	155
	Reaffirm	1.288	0.660	132	1.299	0.614	134	1.416	0.582	149
I daydream a lot	No/No	0.747	0.735	652	0.802	0.768	1018	0.800	0.759	1528
	No/Yes	0.635	0.751	104	0.865	0.705	133	0.933	0.744	164
	Retract	0.678	0.707	87	0.740	0.710	104	0.839	0.785	155
	Reaffirm	0.742	0.788	132	0.910	0.761	134	0.832	0.757	149
I try to get attention	No/No	0.541	0.701	652	0.625	0.710	1017	0.551	0.690	1529
	No/Yes	0.538	0.696	104	0.677	0.744	133	0.546	0.678	163
	Retract	0.529	0.644	87	0.596	0.704	104	0.671	0.757	155
	Reaffirm	0.515	0.693	132	0.552	0.632	134	0.403	0.614	149
I don't feel guilty...	No/No	0.356	0.619	652	0.442	0.681	1007	0.437	0.652	1522
	No/Yes	0.510	0.750	104	0.489	0.598	133	0.512	0.678	164
	Retract	0.460	0.744	87	0.548	0.749	104	0.584	0.738	154
	Reaffirm	0.576	0.763	132	0.575	0.665	134	0.477	0.632	149

I act without thinking	No/No	0.473	0.600	651	0.438	0.582	1017	0.522	0.596	1693
	No/Yes	0.539	0.624	102	0.579	0.606	133	0.701	0.644	187
	Retract	0.552	0.643	87	0.615	0.715	104	0.518	0.621	164
	Reaffirm	0.561	0.691	132	0.619	0.669	134	0.573	0.601	157
I lie or cheat	No/No	0.324	0.503	652	0.318	0.503	1018	0.363	0.506	1696
	No/Yes	0.462	0.606	104	0.436	0.555	133	0.465	0.541	187
	Retract	0.379	0.534	87	0.423	0.569	104	0.372	0.521	164
	Reaffirm	0.432	0.608	132	0.425	0.526	134	0.386	0.501	158
I am self-conscious...	No/No	0.572	0.676	652	0.595	0.671	1105	0.568	0.663	1676
	No/Yes	0.529	0.653	104	0.671	0.772	140	0.508	0.645	183
	Retract	0.586	0.740	87	0.556	0.649	117	0.491	0.653	161
	Reaffirm	0.492	0.715	132	0.476	0.668	145	0.462	0.626	156
I show off or clown	No/No	0.395	0.607	651						
	No/Yes	0.500	0.683	104						
	Retract	0.368	0.631	87						
	Reaffirm	0.576	0.743	132						
Delin. Behav. Score	No/No	2.813	2.503	652	2.482	2.061	1012	2.410	2.012	1264
	No/Yes	3.786	3.158	103	3.534	2.159	133	4.090	2.668	117
	Retract	3.448	2.424	87	3.635	2.497	104	3.060	2.551	120
	Reaffirm	4.864	3.340	132	4.326	2.454	132	3.770	2.442	75
BIS	No/No	0.934	1.525	973	0.770	1.353	1111	0.661	1.235	1423
	No/Yes	1.848	2.406	125	1.732	1.935	142	1.963	2.290	135
	Retract	1.860	2.361	100	1.593	2.039	118	0.977	1.389	129
	Reaffirm	3.057	3.113	122	3.284	3.044	148	2.268	2.749	82

Abbreviations: BIS: Behavioural Impulsivity Sum; Delin. Behav. Score: Delinquent Behaviour Score; S.D.: Standard Error.

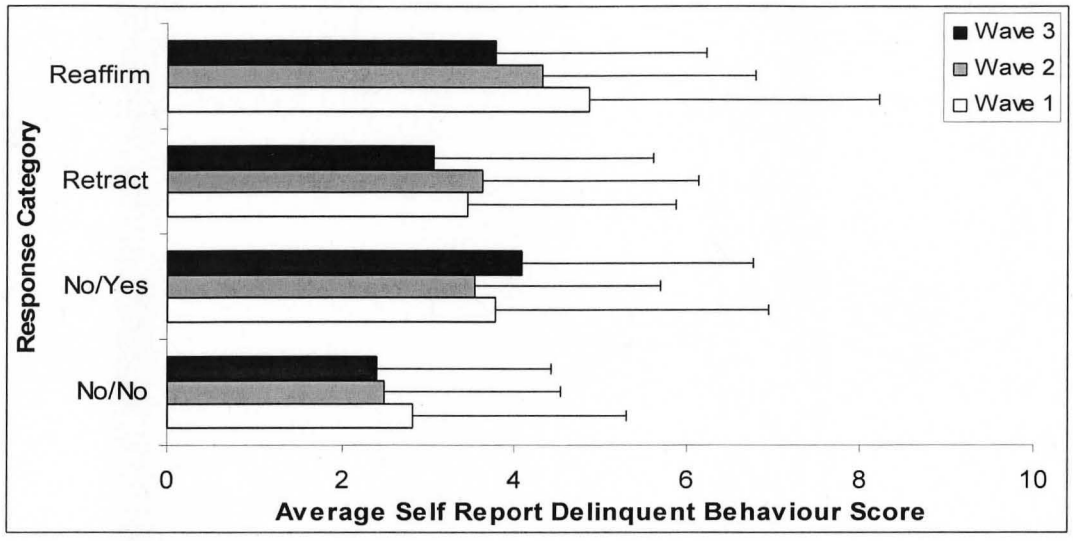
Table 3.8: Descriptive statistics of *Child Behaviour Checklist* and *Emotionality, Activity, Sociability and Impulsivity Survey* explanatory variables, measured at each wave, for each Response Category

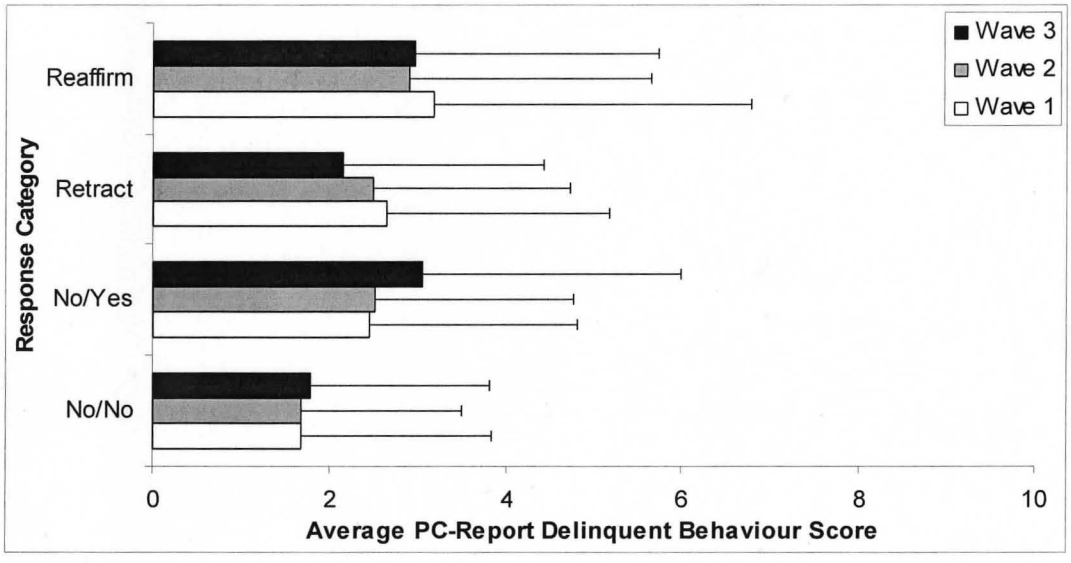
		Wave 1			Wave 2			Wave 3		
Item	Response Category	Mean	S. D.	N	Mean	S. D.	N	Mean	S. D.	N
Brags, boasts	No/No	0.661	0.742	1121						
	No/Yes	0.799	0.809	139						
	Retract	0.833	0.813	120						
	Reaffirm	0.797	0.782	148						
Confused/ in a fog	No/No	0.220	0.502	1121	0.252	0.533	1685	0.241	0.510	1401
	No/Yes	0.317	0.614	139	0.280	0.517	186	0.382	0.621	136
	Retract	0.225	0.493	120	0.300	0.559	160	0.305	0.580	131
	Reaffirm	0.243	0.542	148	0.410	0.641	156	0.432	0.706	81
Daydreams...	No/No	0.497	0.678	1121	0.375	0.590	1656	0.329	0.552	1400
	No/Yes	0.604	0.698	139	0.388	0.618	183	0.441	0.606	136
	Retract	0.633	0.777	120	0.350	0.576	157	0.338	0.591	130
	Reaffirm	0.500	0.695	148	0.387	0.618	155	0.506	0.691	81
Demands attention	No/No	0.642	0.751	1121	0.638	0.768	1673	0.535	0.698	1401
	No/Yes	0.712	0.782	139	0.768	0.811	185	0.721	0.814	136
	Retract	0.725	0.777	120	0.669	0.771	157	0.733	0.773	131
	Reaffirm	0.682	0.738	148	0.710	0.822	155	0.793	0.733	82
Doesn't feel guilty...	No/No	0.366	0.629	1116	0.385	0.607	1672	0.393	0.601	1393
	No/Yes	0.482	0.631	137	0.486	0.644	185	0.522	0.688	136
	Retract	0.504	0.687	119	0.555	0.656	155	0.438	0.623	130
	Reaffirm	0.601	0.763	148	0.430	0.648	151	0.439	0.668	82
Acts without thinking	No/No	0.358	0.593	1122	0.412	0.601	1685	0.416	0.586	1399
	No/Yes	0.432	0.626	139	0.545	0.681	187	0.596	0.693	136
	Retract	0.538	0.661	119	0.528	0.644	159	0.412	0.606	131
	Reaffirm	0.480	0.665	148	0.542	0.723	155	0.585	0.736	82
Lies or cheats	No/No	0.334	0.555	1122	0.366	0.563	1678	0.359	0.551	1400
	No/Yes	0.377	0.556	138	0.532	0.616	186	0.625	0.666	136
	Retract	0.500	0.648	120	0.475	0.594	158	0.420	0.632	131
	Reaffirm	0.452	0.655	146	0.481	0.669	154	0.543	0.690	81
Self-conscious...	No/No	0.660	0.733	1122	0.641	0.699	1544	0.670	0.665	1400
	No/Yes	0.655	0.699	139	0.750	0.718	172	0.721	0.685	136
	Retract	0.689	0.767	119	0.648	0.676	142	0.580	0.656	131
	Reaffirm	0.628	0.722	148	0.615	0.721	143	0.732	0.802	82
Shows off/ clowns	No/No	0.538	0.706	1120						
	No/Yes	0.633	0.753	139						
	Retract	0.783	0.747	120						

	Reaffirm	0.662	0.752	148						
Delin. Behav. Score	No/No	1.679	2.144	1120	1.662	1.824	1531	1.768	2.043	1399
	No/Yes	2.439	2.384	139	2.503	2.263	169	3.037	2.950	136
	Retract	2.639	2.554	119	2.475	2.250	139	2.140	2.294	129
	Reaffirm	3.162	3.625	148	2.894	2.769	141	2.951	2.797	81
EASI Impulsivity Score	No/No	2.641	0.570	1121						
	No/Yes	2.711	0.522	141						
	Retract	2.762	0.631	120						
	Reaffirm	2.792	0.625	148						
Inhibitory control subscale	No/No	2.408	0.922	1121						
	No/Yes	2.471	0.907	141						
	Retract	2.522	0.954	120						
	Reaffirm	2.682	0.972	148						
Decision time subscale	No/No	3.012	0.805	1121						
	No/Yes	2.998	0.757	141						
	Retract	3.052	0.870	120						
	Reaffirm	3.162	0.836	148						
Sensation seeking subscale	No/No	2.711	0.737	1121						
	No/Yes	2.849	0.815	141						
	Retract	2.921	0.773	119						
	Reaffirm	2.800	0.754	148						
Persistence subscale	No/No	2.432	0.844	1121						
	No/Yes	2.525	0.836	141						
	Retract	2.546	0.971	120						
	Reaffirm	2.522	0.969	148						

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score; EASI: Emotionality, Activity, Sociability & Impulsivity Temperament Survey; S.E.: Standard Error.

Figure 3.2: Average and standard deviation Delinquent Behaviour Scores, measured at each wave, for each response category. Upper panel: Self-reported Scores; lower panel: PC-reported Scores.





3.3 Binary Logistic Regressions: Comparing Retractions (Yes/No) with Reaffirmations (Yes/Yes)

By focusing only on the individuals who responded 'Yes' to having witnessed a shooting in wave 2, the differences between reaffirmed wave 2 to 3 'Yes/Yes' responders and retracted wave 2 to 3 'Yes/No' responders could be examined. A series of Logistic Regression analyses was conducted to determine whether the proposed predictors could differentiate the retracted 'Y/N' responses from the reaffirmed 'Y/Y' responses. Significant positive beta values indicated that higher values of the explanatory variable increased the likelihood of retracting the 'witnessed a shooting' response, and are referred to as 'positive predictors'. Significant negative beta values indicated that higher values of the explanatory variable decreased the likelihood of retracting the 'witnessed a shooting' report, and therefore, lower values of the explanatory variable increased the likelihood of responding inconsistently. These predictors are referred to as 'negative predictors'. The standard significance level of $\alpha = 0.05$ was followed, though some marginally significant results, where $0.05 < \alpha < 0.10$, are discussed out of interest.

3.3.1 Self-reported explanatory variables

The statistically significant results from the Logistic Regressions of the binary response category dependent variable, with the categories Retract or Reaffirm, on the demographic and self-reported explanatory variables are presented in Table 3.9. Full results are presented in Appendix A. Model 1 contained the self-report explanatory variables that were measured at waves 1, 2 and 3: "I brag", "I am pretty honest", "I daydream a lot", "I try to get a lot of attention", "I don't feel guilty after doing something I shouldn't", "I act without stopping to think", "I lie or cheat", "I am self-conscious or easily embarrassed", "I show off or clown", and the cumulative "Delinquent Behaviour Score". PHDCN researchers removed two of the self-report items that addressed 'bragging' and 'showing off or clowning' from the waves 2 or 3 questionnaires, and therefore, these items were removed from the wave 2 and 3 models. Model 2 contained the same self-report variables, and added the demographic variables of "sex", "age at time of interview" and "Socio-Economic Status" (SES).

The wave 1 regression results are presented first in the top section of Table 3.9 (model 1 $\chi^2(10) = 33.052$, $p < 0.001$; model 2 $\chi^2(13) = 36.324$, $p = 0.001$). Within model 1, after controlling for the other nine self-report variables, self-described 'showing off or clowning' and Delinquent Behaviour Scores were significant negative predictors of retracting an initial claim of witnessing a shooting. Higher self-reported tendencies to 'act without thinking' approached significance ($p = 0.081$) as a predictor of a retracted response. Within model 2, after controlling for the other nine self-report variables and three demographic variables, again, Delinquent Behaviour Scores were a negative predictor of retracting witnessing a shooting. Additionally, lower self-described 'showing off or clowning', lower self-described 'self-consciousness' and higher SES were marginally significant predictors of making a retraction (see Appendix A).

In the middle section, Table 3.9 also displays the results of the Logistic Regression of the binary response category dependent variable onto the wave 2 self-report explanatory variables, as listed above (model 1 $\chi^2(8) = 16.656$, $p = 0.034$; model 2 $\chi^2(11) = 22.525$, $p = 0.021$). Again, lower Delinquent Behaviour Scores significantly increased the likelihood of retracting, in both model 1 and 2. In model 2, SES was a significant positive predictor or response category, while younger age and lower self-described 'daydreaming' were marginally significant predictors of retractions (see Appendix A).

The significant results of the Logistic Regression of the binary response category dependent variable onto the wave 3 self-report explanatory variables, as listed above, are presented in the last section of Table 3.9 (model 1 $\chi^2(8) = 30.615$, $p < 0.001$; model 2 $\chi^2(11) = 33.327$, $p < 0.001$). Similar to both wave 1 and 2 regressions, the Delinquent Behaviour Score was a significant negative predictor in both models 1 and 2. Additionally, in both models 1 and 2, lower self-described attention seeking and not feeling guilty after misbehaving significantly increased the likelihood of retracting.

Table 3.9: Statistically significant results from separate Logistic Regressions of waves 1, 2 and 3 self-reported and demographic explanatory variables on having "witnessed a shooting" binary response category, Retract or Reaffirm

		Model 1				Model 2			
Reg	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
W 1	I show off or clown	-0.530	0.264	0.589	0.045				N.S.
N=219	Delin. Behav. Score	-0.259	0.075	0.771	0.001	-0.244	0.081	0.783	0.002
W 2	Delin. Behav. Score	-0.228	0.081	0.796	0.005	-0.177	0.091	0.838	0.051
N=236	SES				N.A.	0.465	0.211	1.592	0.027
W 3	I am pretty honest	0.339	0.17	1.404	0.046				N.S.
N=193	I try to get a lot of attention	0.631	0.228	1.879	0.006	0.615	0.231	1.850	0.008
	I don't feel guilty ...	0.774	0.279	2.168	0.006	0.763	0.282	2.144	0.007
	Delin. Behav. Score	-0.220	0.092	0.803	0.017	-0.205	0.099	0.815	0.039

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score; N.A.: Not Applicable, as this variable was not in the model; N.S.: Non-Significant; W: Wave.

3.3.2 Behavioural self-report explanatory variables

Logistic Regressions of the binary response category dependent variable, with the categories Retract or Reaffirm, on the demographic and self-reported explanatory Behavioural Impulsivity Sum (BIS) variables were also conducted. Separate Logistic Regression equations were used for the BIS calculated at each wave, because similar to above, the *Self Report of Offending* questionnaire was administered to different cohorts at each interview. For each wave, 'BIS' was entered as the sole explanatory variable in Model 1, and the demographic variables 'sex', 'age at time of interview' and 'SES' were added in Model 2. The full results of the separate equations are presented together within Table 3.10.

The model 1 results indicated that waves 1 and 2, but not wave 3 measures of Behavioural Impulsivity Sums were significant negative predictors of response category. In relation to this, the Chi-Square goodness of fit value in model 1 of wave 3 was not

significantly different from a null model (model 1 $\chi^2(1) = 2.606$, $p = 0.106$; model 2 $\chi^2(4) = 28.511$, $p < 0.001$), indicating that the BIS 3 alone does not have a significant effect on the outcome of reporting witnessing a shooting. The Chi-Square goodness of fit value showed both wave 1 (model 1 $\chi^2(1) = 11.307$, $p = 0.001$; model 2 $\chi^2(4) = 18.762$, $p = 0.001$) and wave 2 (model 1 $\chi^2(1) = 25.399$, $p < 0.001$; model 2 $\chi^2(4) = 36.063$, $p < 0.001$) models to be a significantly better fit to the data than a null model. Lower BIS values significantly increased the odds of retracting witnessing a shooting in model 2 across the three waves. Additionally, younger age at wave 1, and higher SES at waves 1, 2 and 3 were at least marginally significant predictors of inconsistent responses. These results suggest that individuals who reaffirm exposure to violence, specifically witnessing a shooting, also report engaging in higher numbers of impulsive behaviours.

Table 3.10: Results from separate Logistic Regressions of "witnessed a shooting" binary response category, Retract or Reaffirm, on wave 1, 2 & 3 self-reported Behavioural Impulsivity Sums and demographic variables

		Model 1				Model 2			
Reg	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
W 1	BIS 1	-0.126	0.040	0.882	0.001	-0.127	0.058	0.881	0.028
N=222	Sex				N.A.	-0.032	0.280	0.968	0.908
	W 1 Age				N.A.	-0.065	0.031	0.937	0.034
	SES				N.A.	0.542	0.205	1.719	0.008
W 2	BIS 2	-0.183	0.040	0.833	< 0.001	-0.245	0.059	0.783	< 0.001
N=266	Sex				N.A.	0.033	0.264	1.034	0.899
	W 2 Age				N.A.	-0.035	0.025	0.966	0.157
	SES				N.A.	0.493	0.194	1.638	0.011
W 3	BIS 3	-0.088	0.056	0.916	0.115	-0.317	0.085	0.728	< 0.001
N=211	Sex				N.A.	0.172	0.300	1.188	0.566
	W 3 Age				N.A.	0.013	0.027	1.013	0.639
	SES				N.A.	0.384	0.225	1.468	0.088

Abbreviations: BIS: Behavioural Impulsivity Sum; N.A.: Not Applicable, as this variable was not in the model; S.E.: Standard Error; W: Wave.

3.3.3 Primary Caregiver-reported explanatory variables

As an alternate source of information, the Primary Caregivers' reports on their children's characteristics were assessed as possible predictors of retracting wave 2 to 3 reports of witnessing a shooting. Separate Logistic Regression equations were used for two wave 1 Primary Caregiver-reported questionnaires, the *Emotionality, Activity, Sociability & Impulsivity Temperament Survey (EASI)* and the *Child Behaviour Checklist (CBCL)*.

The *EASI* regressions included the overall 'Impulsivity Sum', and associated subscales, 'Inhibitory control', 'Decision time', 'Sensation seeking' and 'Persistence' in model 1, and added demographic variables, 'sex', 'age at time of interview' and 'SES' in model 2. Full results of these regressions are presented in Appendix B (model 1 $\chi^2(5) = 12.026$, $p = 0.034$; model 2 $\chi^2(8) = 29.483$, $p < 0.001$). In both models, neither the overall Impulsivity Scale mean score, nor any of the four associated subscales, had a significant effect on the outcome of the exposure to violence report. Age at wave 1 and SES were significant predictors in model 2. The *EASI* questionnaire was not administered to the Primary Caregivers beyond wave 1. These results indicate that Primary Caregiver (PC) ratings on a variety of impulsivity subscales could not differentiate the children who retracted their responses from the children who reaffirmed their responses.

The statistically significant results from the Logistic Regressions of the binary response category dependent variable, with categories Retract and Reaffirm, on the Primary Caregiver-reported *CBCL* explanatory variables, as listed below, are presented in Table 3.11. Full results are presented in Appendix C. Model 1 included the CBCL explanatory variables that were measured at wave 1, 2 and 3: "'brags or boasts", "confused or seems to be in a fog", "daydreams or gets lost in his/her thoughts", "demands a lot of attention", "doesn't seem to feel guilty after misbehaving", "impulsive or acts without thinking", "lies or cheats", "self-conscious or easily embarrassed", "shows off or clowns", and the cumulative "Delinquent Behaviour Score". Model 2 included these same variables, and added the demographic variables 'sex', 'child's age at time of interview' and 'SES'.

Table 3.11: Statistically significant results from separate Logistic Regressions of "witnessed a shooting" binary response category, Retract or Reaffirm, on waves 1, 2 & 3 Primary Caregiver-reported and demographic variables

		Model 1				Model 2			
Reg	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
W 1	Daydreams...				N.S.	0.396	0.197	1.485	0.044
N=263	Delin. Behav. Score	-0.163	0.078	0.850	0.037				N.S.
	W 1 Age				N.A.	-0.118	0.032	0.888	< 0.001
	SES				N.A.	0.590	0.199	1.805	0.003
W 2	Doesn't feel guilty...	0.604	0.243	1.829	0.013				N.S.
N=271	Delin. Behav. Score	-0.228	0.087	0.796	0.009				N.S.
	W 2 Age				N.A.	-0.088	0.025	0.916	0.001
	SES				N.A.	0.534	0.187	1.706	0.004

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score; N.A.: Not Applicable, as this was not included in the model; N.S.: Not Significant; S.E.: Standard Error; W: Wave.

In model 1 for wave 1 and 2, the Primary Caregiver-reported Delinquent Behaviour Score was a significant negative predictor, but after controlling for the demographic variables in model 2, this result was not replicated. PC described lack of 'guilt after misbehaving' at wave 2 only was also a significant predictor of retracting responses in model 1, and approached significance in model 2 ($p = 0.081$). Additionally, the demographic variables younger age and higher SES from model 2 of both waves 1 and 2 were significant predictors of retractions. None of the wave 3 Primary Caregiver-reported characteristics had a significant effect on the outcome of response category at the standard $\alpha = 0.05$ level, though Primary Caregiver-described demanding 'a lot of attention', and Delinquent Behaviour Scores, were marginally significant positive and negative predictors, respectively (see Appendix C). These results show that generally, only the Primary Caregiver-reported Delinquent Behaviour Score was a stable negative predictor across all three waves, though only marginally so in wave 3. Across waves 1 and 2, but not at wave 3, younger age and higher SES level were two demographic factors that significantly predicted retracting having witnessed a shooting.

Within the *CBCL* questionnaire regressions for each wave, the Chi-Squared Goodness of Fit statistics for each model 1 regression did not provide a significantly better fit to the data than a null model (H_0: $\beta = 0$; $p > 0.05$; model 1 wave 1 $\chi^2(10) = 14.009$, $p = 0.173$; wave 2 $\chi^2(8) = 11.335$, $p = 0.183$; wave 3 $\chi^2(8) = 7.580$, $p = 0.476$). Model 2 did provide a significantly better fit to the data, which indicates that the demographic variables added significant power to the model in predicting the outcome of the response category dependent variable (model 2 wave 1 $\chi^2(13) = 32.048$, $p = 0.002$; wave 2 $\chi^2(11) = 24.626$, $p = 0.010$; wave 3 $\chi^2(11) = 18.860$, $p = 0.064$).

3.3.4 Consistency of self-reported characteristics

In addition to personal experiences, I assessed whether participants who retracted their exposure to violence reports were also more likely to be inconsistent across waves in their self-reported characteristics on the *Youth Self Report* (*YSR)* questionnaire. A Reliability Analysis compared consistency across the three waves for participants who retracted their exposure to violence, versus those who reaffirmed their exposure (Table 3.12). In comparison to those who reaffirmed their experience, participants who retracted witnessing a shooting showed slightly higher Cronbach's alpha values on three of the *YSR* items, 'honesty', 'acting without thinking' and 'lying or cheating'. These higher Cronbach's alpha values indicate that participants provided less varied responses to these items across the three interviews. In general, a Cronbach's alpha value of 0.800 or greater signifies a strongly reliable measure; neither participant group provided strongly consistent self reports on these *YSR* items. This result suggests that participants who retract witnessing a shooting are not any more inconsistent in their self-reported characteristics than participants who reaffirmed their exposure to violence.

Table 3.12: Reliability Analysis Cronbach's alpha values on *YSR* items across waves

YSR Item- Wave 1, 2, 3	Retract	Reaffirm
I am pretty honest	0.421	0.339
I daydream a lot	0.572	0.670
I try to get a lot of attention	0.540	0.576
I don't feel guilty after misbehaving	0.065	0.398
I act without thinking	0.638	0.530
I lie or cheat	0.524	0.479
I am self-conscious or easily embarrassed	0.529	0.539
Delinquent Behaviour Score	0.675	0.758

Abbreviations: YSR: Youth Self-Report.

3.4 Multinomial Logistic Regressions: Comparing Retractions (Yes/No) with 3 other response categories (Yes/Yes, Yes/No, No/No)

Contrasting individuals who retracted their experience of witnessing a shooting between waves 2 and 3 with individuals who provided other, potentially consistent responses, provides a broader approach to determining the characteristics and behaviours associated with retractions. Since it is reasonable to assume there are large differences between individuals who never reported witnessing a shooting, and individuals who reaffirmed their exposure to violence, each group was assessed separately to ensure that results were not ambiguous. In this way, the differences between the children who retracted their exposure to violence report and the other response groups could be clearly viewed. A significant positive beta value indicates that higher scores on that explanatory variable increased the odds of the assigned comparison category ('No/No', 'No/Yes', or 'Yes/Yes') of the dependent variable, compared to the reference category (Retracted 'Yes/No' responses). In this case, 'positive predictors' of the response category dependent variable indicated that higher scores on the explanatory variable increased the likelihood of responding consistently as 'No/No', 'No/Yes', or 'Yes/Yes', and therefore, lower scores on the explanatory variable were associated with being inconsistent. Likewise, 'negative predictors' of the response category dependent variable indicated that higher scores on the explanatory variables increased the likelihood of being inconsistent. Due to a change in the baseline category for the Multinomial Logistic Regressions, the

meanings of 'positive' and 'negative' predictors are opposite to that for the Binary Logistic Regressions.

The standard significance level of $\alpha = 0.05$ was followed, though some marginally significant results, where $0.05 < \alpha < 0.075$, were discussed out of interest. Results from the reaffirmation 'Yes/Yes' group are presented in the tables and appendices, but are not discussed as they are nearly identical to the Logistic Regression results above. In sections 3.4.1, 3.4.2 and 3.4.3 below, models 1 and 2 contained the same explanatory variables as was specified for the Binary Logistic Regressions in the above sections 3.3.1, 3.3.2 and 3.3.3, respectively.

3.4.1 Self-reported explanatory variables

The results of the Multinomial Logistic Regression models of the multinomial response category dependent variable, with categories 'No/No', 'No/Yes' and 'Reaffirm' compared to 'Retract', on the self-reported wave 1 explanatory variables are presented in Appendix D (model 1 $\chi^2(30)= 771.196$, $p < 0.001$; model 2 $\chi^2(39)= 909.959$, $p < 0.001$). See section 3.3.1 of the Binary Logistic Regressions for a full list of the wave 1 variables included in models 1 and 2. Within the first model, in comparison to responding 'No/No', self-described 'honesty' and 'daydreaming' were significant positive predictors, while in the second model, higher Delinquent Behaviour Scores, younger age, and lower SES increased the odds of retracting. In both models, none of the wave 1 explanatory variables significantly affected the odds of responding 'No/Yes', rather than retracting, indicating a significant similarity between the two groups.

The results of the two Multinomial Logistic Regression models of response categories to having 'witnessed a shooting' on the self-reported wave 2 explanatory variables are presented in Appendix E (model 1 $\chi^2(24)= 1404.507$, $p < 0.001$; model 2 $\chi^2(33)= 1590.100$, $p < 0.001$). See section 3.4.1 of the Binary Logistic Regressions for a full list of the wave 2 variables included in models 1 and 2. In comparison to responding 'No/No', lower wave 2 self-reports of 'honesty', 'daydreaming', 'attention-seeking', lacking 'guilt after doing something wrong', 'lying or cheating', and higher Delinquent Behaviour Scores, all increased the odds of retracting. Self-reported feeling 'self-

conscious or easily embarrassed' was a marginally significant positive predictor. These effects changed once demographic predictors were introduced in model 2; lower self-reported 'attention-seeking', and lack of 'guilt after doing something wrong' became only marginally significant predictors of retracting, in comparison to responding 'No/No'. Lower self-reported 'lying and cheating' and higher Delinquent Behaviour Scores remained significant predictors of retracting. Younger age and lower SES also increased the odds of making a retraction of witnessing a shooting, in comparison to responding 'No/No'. In both models, none of the wave 2 self-reported *Youth Self-Report (YSR)* items or demographic variables were significant predictors of responding 'No/Yes', in comparison to retracting a response, again indicating a significant similarity between the two groups.

The results of the two Multinomial Logistic Regression models of response categories to having 'witnessed a shooting' on self-reported wave 3 explanatory variables are presented in Appendix F (model 1 $\chi^2(24)= 1966.882$, $p < 0.001$; model 2 $\chi^2(33)= 2265.777$, $p < 0.001$). See section 3.3.1 of the Binary Logistic Regressions for a full list of the wave 3 variables included in models 1 and 2. In model 1, lower self-described 'honesty', 'acting without thinking', 'lying or cheating', and 'self-consciousness' significantly increased the odds of retracting having witnessed a shooting, in comparison to responding 'No/No'. Upon controlling for demographics in model 2, only lower self-reports of feeling 'self-conscious or easily embarrassed' remained as significant predictors of retracting , in comparison to responding 'No/No', in addition to higher Delinquent Behaviour Scores, younger age and lower SES. Furthermore, in comparison to responding 'No/Yes', higher self-reports of 'attention-seeking' and lacking 'guilt after doing something wrong', as well as lower Delinquent Behaviour Scores in model 1 significantly increased the odds of retracting. In model 2, these relationships remained the same, and lower 'acting without thinking' self-reports also increased the odds of retracting rather than responding 'No/Yes'. Interestingly, in comparison to responding 'No/Yes', older age significantly increased the odds of retracting; this is the only instance wherein older age was associated with retracting.

3.4.2 Behavioural self-report explanatory variables

The results of separate Multinomial Logistic Regressions of the multinomial response categories dependent variables onto demographic and wave 1, 2 and 3 measures of Behavioural Impulsivity Sums explanatory variables are presented together in Table 3.13. When wave 1 BIS was the sole predictor in model 1, decreases in the BIS increased the odds of retracting, rather than responding 'No/No'. Interestingly, upon controlling for the demographic explanatory variables in model 2, this relationship was reversed. In comparison to responding 'No/No', the odds of retracting the response significantly increased with higher wave 1 BIS, younger age and lower SES. The predictors in both models did not have a significant effect on the odds of responding 'No/Yes' rather than retracting witnessing a shooting, indicating similar behavioural impulsivity in these two response groups. When comparing responding 'No/No' with retracting, similar results were found for both models with explanatory variables measured in waves 2 and 3. None of the wave 2 explanatory variables differentiated the 'Yes/No' response category from the retraction category, but in wave 3, higher BIS significantly increased the odds of responding as the former.

Table 3.13: Full results from the Multinomial Logistic Regressions of "witnessed a shooting" multinomial response category, Retract, Reaffirm, No/No or No/Yes, on wave 1, 2 & 3 Behavioural Impulsivity Sum and demographic variables

		Model 1				Model 2			
	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
Wave 1	N=1320								
No/No	BIS 1	0.406	0.047	1.500	< 0.001	-0.328	0.052	0.720	< 0.001
	Sex					-0.043	0.209	0.958	0.837
	Age at wave 1					0.116	0.024	1.123	< 0.001
	SES					0.725	0.141	2.066	< 0.001
No/Yes	BIS 1	0.071	0.057	1.074	0.210	-0.024	0.060	0.977	0.695
	Sex					0.210	0.259	1.234	0.417
	Age at wave 1					0.017	0.029	1.017	0.568
	SES					-0.008	0.177	0.992	0.963
Yes/Yes	BIS 1	0.208	0.051	1.231	< 0.001	0.124	0.056	1.132	0.027
	Sex					0.111	0.262	1.118	0.671
	Age at wave 1					0.057	0.030	1.059	0.054
	SES					-0.502	0.191	0.605	0.009
Wave 2	N=1519								
No/No	BIS 2	0.421	0.049	1.524	< 0.001	-0.340	0.054	0.712	< 0.001
	Sex					-0.017	0.192	0.983	0.930
	Age at wave 2					0.092	0.019	1.096	< 0.001
	SES					0.721	0.131	2.056	< 0.001
No/Yes	BIS 2	0.096	0.058	1.100	0.100	0.020	0.061	1.020	0.741
	Sex					0.108	0.242	1.114	0.656
	Age at wave 2					0.001	0.023	1.001	0.982
	SES					0.061	0.166	1.063	0.713
Yes/Yes	BIS 2	0.294	0.051	1.341	< 0.001	0.233	0.056	1.262	< 0.001
	Sex					0.015	0.246	1.015	0.951
	Age at wave 2					0.029	0.023	1.030	0.210
	SES					-0.444	0.179	0.641	0.013
Wave 3	N=1519								
No/No	BIS 3	0.699	0.067	2.012	< 0.001	-0.189	0.065	0.828	0.004
	Sex					-0.022	0.181	0.979	0.904
	Age at wave 3					0.087	0.018	1.091	< 0.001
	SES					0.778	0.127	2.177	< 0.001
No/Yes	BIS 3	0.321	0.073	1.378	< 0.001	0.267	0.072	1.307	< 0.001
	Sex					0.368	0.245	1.446	0.133
	Age at wave 3					-0.047	0.024	0.954	0.054
	SES					0.050	0.172	1.052	0.770
Yes/Yes	BIS 3	0.179	0.079	1.196	0.023	0.305	0.077	1.357	< 0.001
	Sex					-0.173	0.274	0.841	0.529
	Age at wave 3					-0.015	0.027	0.985	0.569
	SES					-0.370	0.211	0.691	0.079

Abbreviations: BIS: Behavioural Impulsivity Sum; S.E.: Standard Error.

3.4.3 Primary Caregiver-reported explanatory variables

Primary Caregiver's reports on their children's characteristics were also assessed as possible predictors of response categories to having 'witnessed a shooting'. Separate Multinomial Logistic Regression equations were used for two Primary Caregiver-reported questionnaires, the *Emotionality, Activity, Sociability and Impulsivity Survey (EASI)* and the *Child Behaviour Checklist (CBCL)*. The results of the Multinomial Logistic Regression models containing *EASI* explanatory variables are presented in Appendix G. None of the *EASI* Impulsivity measures had a significant effect on response category, but lower SES level significantly increased the odds of retracting, in comparison to the 'No/No' category.

The results of the Multinomial Logistic Regressions of the multinomial response category dependent variable, with categories 'No/No', 'No/Yes' and 'Reaffirm' compared with 'Retract', on the Primary Caregiver-reported items measured at wave 1 are presented in Appendix H. See section 3.4.3 of the Binomial Logistic Regressions for a full list of wave 1 explanatory variables in models 1 and 2. In model 1, lower Primary Caregiver-reported 'bragging', 'daydreaming', 'attention seeking', 'guilt after misbehaving' and 'self-consciousness' significantly increased odds of retracting, in comparison to responding 'No/No'. In model 2, Primary Caregiver (PC)-reported 'confusion or seeming lost in a fog', child's age at wave 1 and SES level were significant positive predictors of the response category 'No/No'. Higher PC-reported Delinquent Behaviour Scores significantly predicted retracting, in comparison to responding 'No/No' in both models. In both models, only low PC-reports of 'confusion or seeming lost in a fog' increased the odds of responding inconsistently, rather than responding 'No/Yes'.

Appendix I shows the full results of the Multinomial Logistic Regression of response categories to having 'witnessed a shooting' onto the explanatory variables measured in wave 2. See section 3.4.3 for a full list of the wave 2 explanatory variables included in models 1 and 2. When compared to responding 'No/No' in model 1, PC-reported 'daydreaming', 'attention-seeking', lack of 'guilt after misbehaving' and 'self-consciousness' were positive predictors. In model 2, 'attention seeking' remained

marginally significant, and Delinquent Behaviour Scores became a negative predictor of responding 'No/No'. None of the predictors in models 1 or 2 significantly affected the odds of responding 'No/Yes' rather than retracting.

Finally, in Appendix J, the results of the Multinomial Logistic Regression of the four group response category dependent variable on the Primary Caregiver-reported explanatory variables measured in wave 3 are presented. The odds of responding 'No/No' were affected by the wave 3 predictors in a similar manner to that seen in waves 1 and 2. PC-reports of 'daydreaming', 'attention seeking', lacking 'guilt after misbehaving', 'acting without thinking' and feeling 'self-conscious or easily embarrassed' were positive predictors of the response category 'No/No'. Upon entering the demographic explanatory variables in model 2, 'attention seeking' and Delinquent Behaviour Scores became negative predictors of responding 'No/No', while feeling 'self-conscious' remained as a positive predictor. Additionally, the odds of retracting, rather than responding 'No/No', were higher as child's age at wave 3 and SES level increased. As was the case in wave 2, none of the predictors in models 1 or 2 significantly affected the odds of responding 'No/Yes' rather than retracting, indicating a significant similarity between the two groups.

4. DISCUSSION

4.1 Summary

This research investigated the levels of inconsistent self-reports of exposure to violence over a two year period in a group of children who participated in the *PHDCN* Longitudinal Cohort Study. For each exposure to violence item that was assessed, including witnessing a shooting or murder, being the victim of an attack with a weapon or a shooting, and experiencing a natural disaster, 40% or greater of the initial positive claims of exposure to violence were contradicted at the second interview. Although these retractions constitute a small section of the entire participant pool, they represent a very large portion of those who initially reported exposure to violent events. Furthermore, confirmation of the children's positive claims of violence exposure by Primary Caregivers was very low: 67% or more of child claims of witnessing a shooting, being the victim of an attack with a weapon or shooting, or experiencing a natural disaster, were refuted by caregivers. Such high levels of inconsistent and unconfirmed self-reports are problematic for researchers, as they are likely to lead to overestimation of the true levels of violence exposure and victimization in the population and mask the true effects of exposure to violence.

Furthermore, this research investigated several possible predictors of inconsistent responses, in order to discern the cause(s) of, and contributing factors associated with, retracting an exposure to violence statement. Logistic and Multinomial Logistic Regression analyses were conducted to differentiate children who provided inconsistent responses from those who provided consistent responses. Several of the explanatory variables, including the Delinquent Behaviour Scores and the Behavioural Impulsivity Sums, as well as the demographic variables age and Socio-Economic Status (SES), were shown to be reliable significant predictors of response categories. The explanatory variables that differentiated the three consistent response categories from the retraction category are discussed first, followed by an evaluation of the results for specific explanatory variables.

Before beginning, it should be noted that although only the individuals who initially responded 'Yes', and later contradicted this response by reporting 'No' they had never witnessed a shooting, were considered to be 'inconsistent', individuals in each response category had the potential to exaggerate and misreport their exposure. With such high rates of inconsistent responses, it is likely that a subset of each of the other response categories provided inaccurate information; for example, some individuals may have falsely reported having never witnessed a shooting, upon deciding that for privacy reasons, they did not wish to disclose their experience. Nevertheless, as I presently have no way of measuring these 'invisible' inconsistencies, the assertions I make on this issue are speculative.

4.2 Differentiating inconsistent from consistent responses

When comparing the group of individuals who retracted their 'witnessed a shooting' report with the group of individuals who reaffirmed their exposure in the Logistic Regression analyses, several significant predictors were found. There were few differences between the groups on the self-reported *Youth Self-Report (YSR)* items measured at waves 1 and 2, but at wave 3, higher self-described honesty, attention-seeking, and lack of guilt after doing something wrong were predictive of retracting reports. Individuals who retracted and reaffirmed were also very similar on the Primary Caregiver-reported *Child Behaviour Checklist (CBCL)* items measured at all three waves. At waves 1 and 2, younger age and higher SES were also predictive of making a retraction. The most reliable predictors of inconsistency, in comparison to reaffirmations, were lower scores on the *YSR* Delinquent Behaviour Score and the Behavioural Impulsivity Score, which were both included as assays of impulsivity. Primary Caregiver-reported *CBCL* Delinquent Behaviour Scores were also negative predictors of inconsistency, in selected models and waves. Though it was hypothesized that inconsistency would be associated with increased impulsivity, higher impulsivity among individuals who consistently report exposure to violence is also a logical association. Daly and Wilson (2005) described how cues of environmental uncertainty or reduced life

span, such as community violence, could elicit risky and impulsive behaviour. As it is not unreasonable to suppose that many individuals who reaffirmed their violence reports actually witnessed a shooting, it would follow that these individuals might also report high levels of impulsivity. This association supplements the findings of my undergraduate thesis, wherein increased exposure to violence reports were associated with heightened impulsive behaviour (Beneteau, 2007). An alternate explanation might be that the individuals who reaffirmed their reports were impulsively exaggerating their experience initially, and continued to do so at the next interview, which was reflected in the heightened impulsivity scores and created the illusion of truthful and consistent reporting. Though this explanation may apply to some of the individuals who reaffirmed their reports, it is impossible to know how many. When reviewing the overall results, in comparison to individuals who reaffirmed having 'witnessed a shooting', individuals who retracted were younger, from a higher SES level, admittedly didn't feel guilty after misbehaving, and scored as less impulsive.

Interestingly, the results of the Multinomial Logistic Regression showed very few differences between individuals who retracted their 'witnessed a shooting' report and those who initially responded 'No', but responded 'Yes' at the next interview. The latter response category is interpreted as the report of a novel 'witness to a shooting' instance that was experienced since the initial interview, but there may be exaggerations within this group, too. The effect of the few significant predictors did not extend beyond one wave, making them rather unstable and unreliable measures. Increased self-described attention-seeking and lack of guilt after misbehaving measured at wave 3, and decreased Primary Caregiver-described confusion measured at wave 1, were significant predictors of retractions. Additionally, decreased self-reported Delinquent Behaviour Scores and Behavioural Impulsivity Sums at wave 3, but not Primary Caregiver-reported Delinquent Behaviour Scores, were significant predictors of making a retraction. This negative association is in the opposite direction to what was expected, but only for impulsivity measured at wave 3. Although it does not follow the general a priori hypothesis, the increase in impulsivity solely at wave 3 may be related to the new exposure to a shooting

that these individuals claim to have experienced. This novel exposure might act as a cue of an uncertain future, thereby increasing impulsivity when measured at wave 3. Regardless of the differences in wave 3 impulsivity, the overall similarity between these two response categories is striking, particularly with respect to the age and SES variables which were highly significant predictors elsewhere. Individuals who retracted their responses were characteristically and behaviourally very similar to individuals who reported a novel violence exposure, which invites two opposing interpretations. It may be the case that these two groups are highly similar because they are both being inconsistent, but where the falseness in the retracted responses is identified upon its violation of logic, any falseness in the 'No/Yes' responses is masked by its plausibility as the report of a novel experience. One wonders how many of these children would retract their novel wave 3 'witnessed a shooting' report if interviewed two years in the future? Alternately, the similarity between these two response categories could indicate the fundamental difficulty in detecting exaggeration and differentiating it from verifiably false and inconsistent claims. Neither alternative is appealing, and both leave the researcher unable to reliably distinguish the inconsistent responses from the novel reports based upon the explanatory variables at hand.

Individuals who consistently reported having never 'witnessed a shooting' in their lives proved to be quite different from the individuals who retracted their report of 'witnessing a shooting'. Younger age and lower SES level were stable significant predictors of inconsistent responses, and in many cases, very few explanatory variables remained significant upon the introduction of these demographic explanatory variables. In this comparison, although there were many characteristics on which the two response categories differed, few of these differences were in the expected direction. Among the explanatory variables that significantly predicted retractions after controlling for demographic variables was lower self-reported lying and cheating, and lower self- and Primary Caregiver-reported self-consciousness and ease of embarrassment. Among those that did not were lower self-described honesty, lower self- and Primary Caregiver-reported daydreaming and lower Primary Caregiver-reported attention-seeking and

seeming lack of guilt after misbehaving. Excluding the self-reported honesty item, all of these associations were in the opposite direction to what was expected. Only the Behavioural Impulsivity Sums and self- and Primary Caregiver (PC)-reported Delinquent Behaviour Scores were stable negative predictors across multiple waves, indicating that individuals who retracted their reports were more impulsive than those who reported having never 'witnessed a shooting'. This finding reinforces the difficulty of differentiating inconsistent from consistent participants based on explanatory variables, as it appears that the consistent responders described themselves in a different way than might be typically expected. For example, paradoxically, increased self-descriptions of lying and cheating significantly decreased the likelihood of responding inconsistently, and presumably, inaccurately. As was suggested in the Introduction, perhaps the reluctance to admit to the occasional lie should be considered an indicator of deceptiveness in itself. In fact, specifically questioning the participants' deceptive behaviour is commonly used within the malingering subscales included in assessment questionnaires in an effort to detect the participants' attempts at portraying him/herself in an unduly positive manner (Wrobel, Lachar, Wrobel, Morgan, Gruber & Neher, 1999).

4.3 Reviewing Specific Hypotheses

Overall, several of the demographic explanatory variables were found to be significant predictors in the direction hypothesized a priori. It was expected that males would generally be more inclined towards exaggerating their exposure to violence, and therefore would provide more inconsistent reports on whether they had 'witnessed a shooting'. In contrast, sex was never a significant predictor of report retractions, indicating that although males claimed higher initial exposure to violence, males and females were equally likely to reaffirm or retract having 'witnessed a shooting'. Though this finding may reflect the widespread utility of reputational benefits, it is contradictory to most research showing that males typically engage in higher levels of risky behaviour than females (Daly & Wilson, 2005). The explanatory variable SES showed varying directionality as a predictor of retractions; increasing SES level decreased the likelihood

of being inconsistent in comparison to those who reported having never 'witnessed a shooting', but increased the likelihood of being inconsistent in comparison to reaffirming reports. This indicates that, when in comparison to those who never witnessed a shooting, lower SES increased the likelihood of retracting, but when in comparison to those who reaffirmed the report, lower SES decreased the likelihood of retracting. It is not unreasonable to find the latter association in a few instances after considering the literature that depicts lower SES neighbourhoods as generally having higher violence rates (e.g. Bell & Jenkins, 1993), therefore making them more likely to affirm their exposure to violence. Furthermore, in comparison to responding 'No/No' or reaffirming, younger age was a stable and significant predictor of retracting having 'witnessed a shooting'. This result aligns with previous findings and the a priori hypothesis that younger age would be associated with less accurate memory recall and less developed reality monitoring, thereby increasing the likelihood of inssconsistent reporting.

Only a few of the self- and caregiver-reported explanatory variables were found to be significant predictors in the direction hypothesized a priori. Self- and PC- descriptions of 'bragging', 'acting without thinking', and 'showing off or clowning' were largely not significant predictors of response category. In the few instances when they were significant, higher scores decreased the likelihood of being inconsistent, which was opposite to what was expected. Self- and PC-described 'self-consciousness or ease of embarrassment' and 'attention seeking' were occasional predictors of response category with varying directionality. Overall, higher PC-reported self-consciousness significantly decreased the odds of being inconsistent, rather than responding 'No/No'. Although in the opposite direction, this higher self-consciousness may have increased the children's awareness of the negative outcomes and consequences of deception, thereby reducing their tendency to exaggerate and produce inconsistent reports. Increased self-described 'attention-seeking' significantly predicted inconsistency, in comparison to responding 'No/Yes' or reaffirming, but acted oppositely on inconsistency in comparison to responding 'No/No'.

Self- and Primary Caregiver-described lying and cheating were similar between inconsistent individuals and those who responded 'No/Yes' and reaffirmed their reports, but individuals who reported having never 'witnessed a shooting' rated themselves as higher on this item than the inconsistent group. Though it would be convenient, it is unrealistic to assume that the children who exaggerated their exposure to violence reports would admit to being a 'liar', and the results show that they definitely did not admit to this. This result supports the findings of Talwar, Lee, Bala and Lindsay (2002), which showed that a large number of children who rated the act of lying as morally wrong still lied to the researchers. In this case, by rating oneself as having 'never' lied or cheated, the children acknowledge that lying is an undesirable quality, but this rating should not be taken as indicative of a reduced propensity towards lying.

It was hypothesized that reported 'daydreaming' and being 'confused or lost in a fog' could indicate reduced reality monitoring, wherein the children may be unable to distinguish between real experiences and their imaginings of violent actions were expected to be more likely to provide false information. This hypothesis was not supported, because in nearly every instance when these variables were significant, higher scores were associated with a lower likelihood of retracting reports. Although they appeared to associate with reality monitoring, it is possible that these variables did not measure what they were intended to measure. For instance, increased daydreaming may not necessarily result in memory source confusion if the daydreamer has highly developed reality monitoring abilities, as is the case of most adults.

Surprisingly, the Primary Caregiver-reported *Emotionality, Activity, Sociability and Impulsivity Temperament Survey (EASI)* Impulsivity Score and its associated subscales were completely unrelated to response category. Regressions on these explanatory variables produced unusually large beta coefficients, due to the large standard error values that reduced the effectiveness of the model. Visual inspection of the data did not reveal any outliers that could account for the large standard error values, and the data appeared to generally follow a normal distribution, wherein the majority of the data were centred around the middle with few extremely low and high scores. Although

this issue most likely affected the reliability of the regression analyses, the cause of the high standard errors is unclear. These extreme values may have contributed towards the result that none of the *EASI* Impulsivity measures were significant predictors of response category. Following the a priori hypothesis, in the few cases where it reached significance, increased self- and PC-described 'lack of guilt after misbehaving' predicted inconsistent responses in comparison to 'No/Yes' and reaffirmed responses. This hypothesis was not substantiated for retractions in comparison to 'No/No' responses, as individuals who reported having never 'witnessed a shooting' were rated by themselves and caregivers to lack guilt after misbehaving. This relationship seems quite backwards, as one would expect that a lack of guilt would complement the propensity towards lying and exaggeration. This item may expose the same discrepancy between childhood moral understanding and action that the lying and cheating item uncovered. When the item is phrased to the children as "I don't feel guilty after doing something I shouldn't", the morally acceptable response of 'not true' is obvious, and many children undoubtedly responded in this way irrespective of their own emotions. Nevertheless, it appears that in comparison to the other three response categories, the children who had never 'witnessed a shooting' were rated as showing and feeling less guilt after misbehaving. Additionally, though the Delinquent Behaviour Scores and Behavioural Impulsivity Sums were frequently significant predictors of retracting having witnessed a shooting, the directionality did not always follow the a priori hypothesis. Explanations for this were provided above, and will not be elaborated further.

4.4 A Profile for differentiating Retractions from Reaffirmations

It was hoped that the Logistic Regression analyses would isolate a few key characteristics and behaviours that could easily distinguish the participants who were shown to be inconsistent from those who consistently reaffirmed having witnessed a shooting. As costly and labour-intensive longitudinal projects are not viable options for most researchers studying youth exposure to violence, the opportunity to verify participants' reports over time is rarely present. In addition to helping to create a more

accurate image of violence exposure among youth, it would assist researchers enormously if specific characteristics could be used to determine if an initial report of violence was likely to be retracted or reaffirmed at a later interview. My results show the inherent problems with self-report data, and the difficulty in differentiating false reports from consistent reports. None of the proposed explanatory variables emerged as clear and pervasive predictors of inconsistent reports. However, my results can contribute a preliminary outline of a few characteristics that warrant further investigation as predictors of false reports. In comparison to those who reaffirmed having 'witnessed a shooting', individuals who retracted their report were generally younger, from a higher SES level neighbourhood, admittedly lacked guilt after misbehaving and desired a lot of attention, and reported less impulsivity as measured by the Delinquent Behaviour Scores and Behavioural Impulsivity Sums. Self- and caregiver-reported characteristics that may initially be expected to clearly indicate a propensity towards exaggeration, including lying, bragging and showing off, had no effect on the likelihood of providing a report that was later retracted or reaffirmed. Future investigation of these significant predictors may improve the discrimination of children who are exaggerating from those who are legitimately reporting violence exposure.

4.5 Reasons for Inconsistency: Misremembering or Misinformation?

Generally, two explanations for inconsistent child self-reports of exposure to violence have been proffered, one based upon misremembering facts over time, and another based upon the provision of misinformation to researchers. The misremembering explanation centred on general memory failure, specifically anchored by the demonstration in previous research that even memories for emotional events could be false, and all types of memories are prone to inaccuracy over time, particularly the memories of children. My findings partially supported this explanation, in that younger age fairly reliably increased the likelihood of retracting reports, but presumed measures of poor reality monitoring did not affect response category as was expected following this explanation. Upon further reflection, this explanation seems inadequate to explain the

overwhelming number of children who provided false reports of violence exposure and victimization. Although previous literature emphasized how, over time, participants could forget many details of the event, including the location and the time of day of the event, or the others present at the time, none of the participants forgot the event itself in its entirety! None of the undergraduates forgot that the Challenger space shuttle exploded, none of the Danish citizens forgot that the plane crash had occurred, and none of the children forgot that they had endured a painful medical experience. When proffered alone, general forgetting over time cannot account for the contradictory 'Yes/No' responses provided by children about whether they had 'witnessed a shooting'.

An alternate explanation for inconsistent retracted self-reports of exposure to violence could be that the initial reports of 'witnessing a shooting' were, in fact, lies or exaggerations that were forgotten over time, and thus, were not confirmed at the later interview. It was proposed that the exaggerations may have been elicited by the possible benefits obtained from a reputation of physical prowess and courage in the face of dangerous circumstances. Though the literature suggests an association between impulsivity and lying, my results do not show a clear association between the two. This ambiguity may be partially due to the imperfect measurement of impulsivity and the propensity toward exaggeration by the available *PHDCN* self-report items. Inconsistent individuals reported higher impulsivity than individuals who reported having never 'witnessing a shooting', but lower impulsivity than individuals who reaffirmed their exposure to violence. The reputational benefits obtained by exaggerated violence exposure were expected to be greatest among males and individuals from a low SES level, but again, my results do not clearly support this expectation. Although males did report increased exposure to violence, sex was never predictive of inconsistent reports, and lower SES level was predictive of inconsistency only in comparison to responding 'No/No'. Taken together, these results provide partial support for the explanation that inconsistent reports were due to the provision of misinformation, rather than a failure of memory.

In conclusion, the results of my research show several important facts about inconsistent self-reports from children. My primary result was the demonstration of very high levels of inconsistent self-reports about a salient personal experience, specifically, having been a witness to or victim of several forms of violence. Not only were these self-reports inconsistent over time, but they were largely unsubstantiated by the children's Primary Caregivers. Furthermore, my results showed that in comparison to individuals who confirmed their exposure to violence at a following interview, individuals who retracted their exposure to violence claim were more likely to be younger, higher SES individuals who scored lower on delinquency and behavioural impulsivity scales, admittedly desired attention, and didn't feel guilty after doing something wrong. Finally, my results show the difficulty in differentiating individuals who provided inconsistent responses from those who provided consistent reports of exposure to violence. Several characteristics and behaviours that were expected to be strong predictors did not significantly increase the likelihood of retracting having witnessed a shooting. In many cases, individuals who were inconsistent shared characteristics and behaviours in common with individuals who were consistent. This similarity across groups suggests the disturbing possibility that responses such as 'No/Yes', which were perceived to be consistent reports of a novel violence exposure between the initial and follow-up interviews, may have been no more veridical than the demonstrably inconsistent retracted 'Yes/No' reports. To ensure the collection and use of more accurate exposure to violence data, my results suggest that researchers should consider validating their surveys, and should use secondary sources to verify children's self-reports.

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Appendix A: Results from Binary Logistic Regressions of inconsistent 'witnessed a shooting' reports on self-reported and demographic explanatory variables as measured at waves 1, 2 and 3

		Model 1				Model 2			
Reg	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
W 1	I brag	0.164	0.225	1.178	0.467	0.145	0.232	1.156	0.532
N=219	I am pretty honest	0.018	0.156	1.018	0.907	-0.030	0.229	0.971	0.897
	I daydream a lot	-0.059	0.210	0.943	0.781	-0.086	0.214	0.918	0.689
	I try to get attention	0.187	0.246	1.206	0.448	0.183	0.250	1.201	0.463
	I don't feel guilty ...	0.082	0.228	1.086	0.718	0.052	0.230	1.053	0.822
	I act without thinking	0.479	0.274	1.615	0.080	0.443	0.277	1.558	0.110
	I lie or cheat	0.529	0.332	1.697	0.111	0.504	0.334	1.656	0.131
	I am self-conscious...	0.340	0.219	1.405	0.121	0.392	0.228	1.479	0.086
	I show off or clown	-0.530	0.264	0.589	0.045	-0.492	0.266	0.612	0.064
	Delin. Behav. Score	-0.259	0.075	0.771	0.001	-0.244	0.081	0.783	0.002
	Sex					-0.278	0.302	0.757	0.357
	Wave 1 Age					-0.031	0.041	0.969	0.439
	SES					0.369	0.224	1.446	0.099
W 2	I am pretty honest	0.093	0.163	1.097	0.569	0.182	0.231	1.199	0.432
N=236	I daydream a lot	-0.317	0.192	0.728	0.100	-0.350	0.197	0.705	0.076
	I try to get attention	0.204	0.211	1.227	0.333	0.193	0.213	1.212	0.366
	I don't feel guilty ...	0.337	0.237	1.400	0.155	0.310	0.240	1.363	0.198
	I act without thinking	0.195	0.223	1.215	0.383	0.181	0.226	1.199	0.422
	I lie or cheat	0.485	0.322	1.625	0.132	0.489	0.328	1.630	0.137
	I am self-conscious...	0.264	0.203	1.302	0.193	0.306	0.208	1.357	0.141
	Delin. Behav. Score	-0.228	0.081	0.796	0.005	-0.177	0.091	0.838	0.051
	Sex					-0.221	0.283	0.802	0.434
	Wave 2 Age					-0.062	0.035	0.940	0.082
	SES					0.465	0.211	1.592	0.027
W 3	I am pretty honest	0.339	0.170	1.404	0.046	0.333	0.262	1.395	0.204
N=193	I daydream a lot	0.058	0.211	1.060	0.781	0.041	0.219	1.042	0.853
	I try to get attention	0.631	0.228	1.879	0.006	0.615	0.231	1.850	0.008
	I don't feel guilty ...	0.774	0.279	2.168	0.006	0.763	0.282	2.144	0.007
	I act without thinking	-0.283	0.277	0.754	0.308	-0.353	0.283	0.703	0.213
	I lie or cheat	0.197	0.384	1.218	0.608	0.269	0.393	1.308	0.494
	I am self-conscious...	-0.060	0.243	0.942	0.806	-0.083	0.246	0.921	0.737
	Delin. Behav. Score	-0.220	0.092	0.803	0.017	-0.205	0.099	0.815	0.039
	Sex					-0.169	0.328	0.845	0.608
	Wave 3 Age					-0.036	0.043	0.965	0.402
	SES					0.412	0.257	1.509	0.110

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score; S.E.: Standard Error; W: Wave.

Appendix B: Results of Logistic Regression of 'witnessed a shooting' response categories on Primary Caregiver-report *EASI* and demographic explanatory variables as measured at wave 1

	Model 1				Model 2			
Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
Impulsivity Scale	284.845	275.582	5.087×10^{123}	0.301	289.804	277.920	7.250×10^{125}	0.297
Inhibitory control subscale	-71.533	68.897	0.000	0.299	-72.779	69.479	0.000	0.295
Decision time subscale	-71.434	68.904	0.000	0.300	-72.482	69.490	0.000	0.297
Sensation seeking subscale	-70.890	68.890	0.000	0.303	-71.956	69.472	0.000	0.300
Persistence subscale	-71.055	68.892	0.000	0.302	-72.210	69.473	0.000	0.299
Sex					-0.226	0.264	0.798	0.391
Wave 1 Child Age					-0.159	0.043	0.853	< 0.001
SES					0.499	0.197	1.647	0.011

Abbreviations: S.E.: Standard Error; W: Wave.

Appendix C: Results from the Binary Logistic Regressions of inconsistent 'witnessed a shooting' reports on Primary Caregiver-report *CBCL* and demographic explanatory variables as measured at waves 1, 2 and 3

		Model 1				Model 2			
Reg	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
W 1	Brags or boasts	-0.110	0.172	0.896	0.522	-0.006	0.183	0.994	0.974
N=263	Confused/ in a fog	-0.167	0.303	0.846	0.582	-0.232	0.326	0.793	0.476
	Daydreams...	0.232	0.187	1.261	0.215	0.396	0.197	1.485	0.044
	Demands attention	-0.038	0.170	0.962	0.822	0.066	0.181	1.068	0.715
	Doesn't feel guilty...	-0.205	0.228	0.814	0.368	-0.244	0.238	0.783	0.303
	Acts without thinking	0.387	0.240	1.472	0.107	0.385	0.251	1.469	0.125
	Lies or cheats	0.288	0.275	1.334	0.294	0.228	0.283	1.256	0.422
	Self-conscious...	-0.005	0.169	0.995	0.974	0.141	0.187	1.151	0.451
	Shows off or clowns	0.224	0.195	1.252	0.250	0.359	0.205	1.432	0.079
	Delin. Behav. Score	-0.163	0.078	0.850	0.037	-0.104	0.078	0.901	0.181
	Sex					-0.248	0.268	0.781	0.356
	Wave 1 Child's Age					-0.118	0.032	0.888	< 0.001
	SES					0.590	0.199	1.805	0.003
W 2	Confused/ in a fog	-0.281	0.267	0.755	0.291	-0.305	0.273	0.737	0.264
N=271	Daydreams...	0.033	0.243	1.033	0.893	-0.002	0.255	0.998	0.992
	Demands attention	0.005	0.165	1.005	0.974	0.020	0.171	1.020	0.909
	Doesn't feel guilty...	0.604	0.243	1.829	0.013	0.444	0.254	1.559	0.081
	Acts without thinking	0.196	0.230	1.217	0.394	0.188	0.236	1.207	0.424
	Lies or cheats	0.434	0.277	1.544	0.117	0.356	0.284	1.428	0.210
	Self-conscious...	0.107	0.167	1.113	0.521	0.203	0.186	1.225	0.274
	Delin. Behav. Score	-0.228	0.087	0.796	0.009	-0.117	0.094	0.890	0.213
	Sex					0.044	0.261	1.045	0.866
	Wave 2 Child's Age					-0.088	0.025	0.916	0.001
	SES					0.534	0.187	1.706	0.004
W 3	Confused/ in a fog	-0.163	0.274	0.850	0.552	-0.066	0.279	0.936	0.814
N=207	Daydreams...	-0.066	0.252	0.936	0.794	-0.200	0.259	0.819	0.442
	Demands attention	0.339	0.195	1.403	0.083	0.152	0.211	1.165	0.470
	Doesn't feel guilty...	0.507	0.311	1.661	0.103	0.536	0.331	1.709	0.105
	Acts without thinking	-0.086	0.285	0.918	0.764	-0.119	0.290	0.888	0.682
	Lies or cheats	0.238	0.357	1.268	0.506	0.333	0.373	1.395	0.372
	Self-conscious...	0.009	0.201	1.009	0.963	-0.190	0.216	0.827	0.380
	Delin. Behav. Score	-0.127	0.112	0.880	0.254	-0.206	0.125	0.814	0.099
	Sex					0.159	0.301	1.173	0.597
	Wave 3 Child's Age					0.004	0.029	1.004	0.881
	SES					0.343	0.226	1.410	0.129

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score; S.E.: Standard Error; W: Wave.

Appendix D: Results of the Multinomial Logistic Regression of response category on Self-Reported *YSR* and demographic explanatory variables as measured in wave 1

W 1		Model 1				Model 2			
N=968	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
No/No	I brag	0.126	0.189	1.135	0.503	-0.112	0.194	0.894	0.562
	I am pretty honest	1.033	0.118	2.809	0.000	0.133	0.186	1.142	0.474
	I daydream a lot	0.412	0.163	1.510	0.012	0.198	0.171	1.219	0.246
	I try to get attention	0.171	0.179	1.187	0.339	0.047	0.183	1.048	0.799
	I don't feel guilty...	-0.082	0.189	0.921	0.663	-0.052	0.189	0.949	0.782
	I act without thinking	-0.027	0.213	0.973	0.899	-0.126	0.215	0.881	0.557
	I lie or cheat	0.241	0.267	1.272	0.367	0.134	0.270	1.143	0.620
	I am self-conscious...	0.090	0.169	1.095	0.593	-0.012	0.175	0.988	0.945
	I show off or clown	0.180	0.219	1.197	0.410	0.227	0.221	1.254	0.306
	Delin. Behav. Score	-0.040	0.060	0.961	0.503	-0.129	0.063	0.879	0.040
	Sex					-0.255	0.235	0.775	0.278
	Wave 1 Age					0.083	0.032	1.086	0.010
	SES					0.583	0.159	1.792	<0.001
No/Yes	I brag	-0.333	0.244	0.717	0.172	-0.386	0.251	0.680	0.124
	I am pretty honest	0.030	0.150	1.030	0.843	-0.158	0.232	0.854	0.497
	I daydream a lot	-0.045	0.205	0.956	0.826	-0.083	0.216	0.920	0.701
	I try to get attention	-0.033	0.227	0.968	0.884	-0.066	0.233	0.936	0.776
	I don't feel guilty...	0.093	0.232	1.098	0.687	0.095	0.232	1.100	0.683
	I act without thinking	-0.152	0.266	0.859	0.568	-0.162	0.271	0.850	0.549
	I lie or cheat	0.231	0.323	1.259	0.475	0.249	0.330	1.283	0.450
	I am self-conscious...	-0.111	0.215	0.895	0.606	-0.155	0.224	0.856	0.487
	I show off or clown	0.453	0.263	1.573	0.085	0.469	0.267	1.599	0.079
	Delin. Behav. Score	0.032	0.072	1.032	0.658	0.003	0.077	1.003	0.969
	Sex					-0.067	0.296	0.935	0.821
	Wave 1 Age					0.034	0.040	1.035	0.390
	SES					0.020	0.202	1.020	0.923
Yes/Yes	I brag	-0.252	0.227	0.777	0.266	-0.257	0.236	0.774	0.277
	I am pretty honest	0.066	0.144	1.068	0.645	0.046	0.223	1.047	0.836
	I daydream a lot	0.008	0.192	1.009	0.965	-0.018	0.204	0.982	0.931
	I try to get attention	-0.084	0.217	0.919	0.698	-0.076	0.224	0.927	0.734
	I don't feel guilty...	-0.034	0.217	0.967	0.877	-0.039	0.219	0.962	0.858
	I act without thinking	-0.360	0.251	0.698	0.152	-0.353	0.257	0.702	0.169
	I lie or cheat	-0.367	0.312	0.693	0.239	-0.359	0.318	0.699	0.259
	I am self-conscious...	-0.274	0.208	0.761	0.188	-0.328	0.218	0.721	0.132
	I show off or clown	0.519	0.249	1.680	0.037	0.479	0.255	1.614	0.060
	Delin. Behav. Score	0.206	0.065	1.228	0.002	0.210	0.071	1.234	0.003
	Sex					0.290	0.285	1.336	0.308
	Wave 1 Age					0.035	0.038	1.036	0.358
	SES					-0.368	0.199	0.692	0.065

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score; S.E.: Standard Error; W: Wave.

Appendix E: Results from the Multinomial Logistic Regression of 'witnessed a shooting' response categories on Self-Reported *YSR* and demographic explanatory variables as measured in wave 2

N=1368		Model 1				Model 2			
	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
No/No	I am pretty honest	1.313	0.118	3.716	< 0.001	0.315	0.180	1.371	0.080
	I daydream a lot	0.401	0.144	1.493	0.005	0.230	0.149	1.258	0.123
	I try to get attention	0.394	0.150	1.483	0.008	0.299	0.155	1.349	0.053
	I don't feel guilty ...	0.352	0.175	1.422	0.044	0.337	0.177	1.400	0.057
	I act without thinking	-0.072	0.182	0.931	0.693	-0.236	0.187	0.790	0.206
	I lie or cheat	0.684	0.244	1.982	0.005	0.480	0.245	1.616	0.050
	I am self-conscious...	0.301	0.159	1.351	0.058	0.136	0.162	1.146	0.402
	Delin. Behav. Score	-0.247	0.066	0.781	< 0.001	-0.351	0.071	0.704	< 0.001
	Sex					-0.108	0.211	0.897	0.607
	Wave 2 Age					0.067	0.027	1.069	0.015
	SES					0.756	0.146	2.130	< 0.001
No/Yes	I am pretty honest	-0.011	0.149	0.989	0.942	-0.232	0.223	0.793	0.297
	I daydream a lot	0.225	0.175	1.253	0.198	0.214	0.182	1.239	0.240
	I try to get attention	0.142	0.182	1.153	0.434	0.098	0.189	1.103	0.603
	I don't feel guilty ...	-0.097	0.219	0.907	0.657	-0.127	0.224	0.881	0.569
	I act without thinking	-0.154	0.223	0.858	0.491	-0.201	0.231	0.818	0.384
	I lie or cheat	0.080	0.295	1.083	0.787	0.030	0.297	1.031	0.919
	I am self-conscious...	0.172	0.193	1.187	0.373	0.157	0.198	1.171	0.426
	Delin. Behav. Score	-0.005	0.079	0.995	0.949	-0.028	0.086	0.972	0.743
	Sex					0.203	0.260	1.225	0.435
	Wave 2 Age					0.012	0.034	1.012	0.720
	SES					0.128	0.181	1.136	0.480
Yes/Yes	I am pretty honest	-0.041	0.149	0.960	0.783	-0.180	0.223	0.835	0.419
	I daydream a lot	0.208	0.174	1.231	0.232	0.240	0.181	1.271	0.186
	I try to get attention	-0.102	0.187	0.903	0.583	-0.143	0.193	0.866	0.457
	I don't feel guilty ...	-0.237	0.215	0.789	0.272	-0.231	0.221	0.793	0.295
	I act without thinking	-0.215	0.221	0.807	0.331	-0.167	0.228	0.847	0.465
	I lie or cheat	-0.410	0.297	0.664	0.168	-0.432	0.301	0.649	0.151
	I am self-conscious...	-0.233	0.201	0.793	0.247	-0.264	0.205	0.768	0.198
	Delin. Behav. Score	0.199	0.077	1.220	0.010	0.159	0.084	1.173	0.058
	Sex					0.219	0.261	1.245	0.401
	Wave 2 Age					0.055	0.034	1.056	0.102
	SES					-0.381	0.192	0.683	0.048

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score; S.E.: Standard Error; W: Wave.

Appendix F: Results from the Multinomial Logistic Regression of 'witnessed a shooting' response categories on Self-Reported *YSR* and demographic explanatory variables as measured at wave 3

N=1562		Model 1				Model 2			
	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
No/No	I am pretty honest	1.152	0.099	3.166	< 0.001	0.111	0.159	1.117	0.486
	I daydream a lot	0.178	0.124	1.194	0.152	-0.019	0.130	0.981	0.885
	I try to get attention	0.017	0.129	1.018	0.893	-0.156	0.134	0.855	0.244
	I don't feel guilty ...	0.058	0.147	1.059	0.695	-0.008	0.149	0.992	0.957
	I act without thinking	0.385	0.177	1.470	0.029	0.221	0.179	1.247	0.217
	I lie or cheat	0.468	0.238	1.597	0.049	0.403	0.242	1.497	0.096
	I am self-conscious...	0.510	0.155	1.665	0.001	0.389	0.157	1.475	0.013
	Delin. Behav. Score	-0.068	0.059	0.934	0.251	-0.211	0.065	0.810	0.001
	Sex					0.005	0.192	1.005	0.980
	Wave 3 Age					0.074	0.026	1.077	0.004
	SES					0.820	0.135	2.271	< 0.001
No/Yes	I am pretty honest	-0.173	0.135	0.841	0.201	0.210	0.217	1.234	0.332
	I daydream a lot	0.032	0.162	1.032	0.844	0.137	0.173	1.146	0.430
	I try to get attention	-0.567	0.184	0.567	0.002	-0.633	0.193	0.531	0.001
	I don't feel guilty ...	-0.386	0.196	0.680	0.050	-0.501	0.206	0.606	0.015
	I act without thinking	0.392	0.222	1.480	0.077	0.449	0.229	1.567	0.050
	I lie or cheat	-0.313	0.304	0.732	0.305	-0.324	0.315	0.724	0.304
	I am self-conscious...	0.115	0.203	1.122	0.570	0.144	0.207	1.155	0.486
	Delin. Behav. Score	0.186	0.072	1.204	0.010	0.271	0.081	1.311	0.001
	Sex					0.484	0.261	1.623	0.063
	Wave 3 Age					-0.091	0.036	0.913	0.012
	SES					0.029	0.186	1.029	0.876
Yes/Yes	I am pretty honest	-0.330	0.153	0.719	0.031	-0.210	0.242	0.810	0.384
	I daydream a lot	-0.027	0.185	0.973	0.884	-0.009	0.197	0.991	0.963
	I try to get attention	-0.616	0.216	0.540	0.004	-0.632	0.225	0.531	0.005
	I don't feel guilty ...	-0.643	0.240	0.526	0.007	-0.673	0.248	0.510	0.007
	I act without thinking	0.249	0.253	1.283	0.325	0.350	0.260	1.419	0.179
	I lie or cheat	-0.059	0.339	0.943	0.862	-0.069	0.350	0.934	0.845
	I am self-conscious...	0.015	0.234	1.015	0.950	0.060	0.236	1.062	0.799
	Delin. Behav. Score	0.155	0.081	1.168	0.054	0.159	0.091	1.172	0.081
	Sex					0.091	0.289	1.095	0.752
	Wave 3 Age					0.024	0.039	1.025	0.536
	SES					-0.382	0.226	0.682	0.091

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score; S.E.: Standard Error.

Appendix G: Results of the Multinomial Logistic Regression of 'witnessed a shooting' response categories on Primary Caregiver-Reported *EASI* and demographic explanatory variables as measured at wave 1

N=1529		Model 1				Model 2			
Reg	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
No/No	Impulsivity total	-62.150	170.075	0.000	0.715	-63.059	172.484	0.000	0.715
	Inhibitory control subscale	15.580	42.519	5.835×10^6	0.714	15.749	43.121	6.911×10^6	0.715
	Decision time subscale	16.003	42.519	8.910×10^6	0.707	16.034	43.123	9.194×10^6	0.710
	Sensation seeking subscale	15.693	42.519	6.539×10^6	0.712	15.704	43.122	6.611×10^6	0.716
	Persistence subscale	15.632	42.524	6.148×10^6	0.713	15.791	43.122	7.207×10^6	0.714
	Sex					-0.163	0.193	0.850	0.399
	Wave 1 Child Age					0.017	0.031	1.017	0.575
	SES					0.774	0.131	2.169	< 0.001
No/Yes	Impulsivity total	-178.613	250.466	0.000	0.476	-184.704	257.294	0.000	0.473
	Inhibitory control subscale	44.652	62.616	2.467×10^{19}	0.476	46.166	64.324	1.121×10^{20}	0.473
	Decision time subscale	44.669	62.615	2.508×10^{19}	0.476	46.129	64.324	1.080×10^{20}	0.473
	Sensation seeking subscale	44.637	62.617	2.430×10^{19}	0.476	46.070	64.324	1.018×10^{20}	0.474
	Persistence subscale	44.719	62.622	2.639×10^{19}	0.475	46.201	64.326	1.161×10^{20}	0.473
	Sex					0.147	0.246	1.159	0.549
	Wave 1 Child Age					0.031	0.039	1.032	0.421
	SES					0.077	0.168	1.080	0.648
Yes/Yes	Impulsivity total	-259.482	257.479	0.000	0.314	-324.883	283.333	0.000	0.252
	Inhibitory control subscale	65.182	64.370	2.034×10^{28}	0.311	81.548	70.836	2.605×10^{35}	0.250
	Decision time subscale	65.074	64.367	1.826×10^{28}	0.312	81.283	70.832	1.998×10^{35}	0.251
	Sensation seeking subscale	64.580	64.371	1.113×10^{28}	0.316	80.724	70.833	1.143×10^{35}	0.254
	Persistence subscale	64.722	64.374	1.284×10^{28}	0.315	80.974	70.835	1.468×10^{35}	0.253
	Sex					0.217	0.244	1.242	0.373
	Wave 1 Child Age					0.150	0.038	1.162	< 0.001
	SES					-0.469	0.177	0.625	0.008

Abbreviations: EASI: Emotionality, Activity, Sociability & Impulsivity Temperament Survey; S.E.: Standard Error.

Appendix H: Results from the Multinomial Logistic Regression of 'witnessed a shooting' response categories on Primary Caregiver-Reported *CBCL* and demographic explanatory variables as measured at wave 1

N=1507		Model 1				Model 2			
	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
No/No	Brags, boasts	0.586	0.123	1.796	< 0.001	0.016	0.137	1.016	0.908
	Confused/ in a fog	0.225	0.226	1.253	0.318	0.504	0.230	1.656	0.028
	Daydreams...	0.295	0.137	1.343	0.031	-0.144	0.148	0.866	0.332
	Demands attention	0.610	0.126	1.840	< 0.001	0.143	0.136	1.154	0.293
	Doesn't feel guilty...	0.329	0.174	1.389	0.060	0.125	0.175	1.133	0.475
	Acts without thinking	0.049	0.169	1.050	0.773	-0.255	0.176	0.775	0.146
	Lies or cheats	0.075	0.205	1.078	0.713	0.138	0.213	1.148	0.518
	Self-conscious...	0.870	0.126	2.387	< 0.001	0.179	0.137	1.197	0.191
	Shows off/ clowns	0.063	0.140	1.065	0.654	-0.152	0.152	0.859	0.317
	Delin. Behav. Score	-0.125	0.063	0.883	0.049	-0.190	0.061	0.827	0.002
	Sex					0.011	0.195	1.011	0.956
	Wave 1 Child Age					0.077	0.023	1.080	0.001
	SES					0.836	0.132	2.307	< 0.001
No/Yes	Brags, boasts	0.093	0.151	1.098	0.536	0.037	0.172	1.038	0.831
	Confused/ in a fog	0.544	0.262	1.722	0.038	0.655	0.274	1.926	0.017
	Daydreams...	-0.020	0.170	0.981	0.908	-0.097	0.188	0.907	0.606
	Demands attention	0.093	0.156	1.097	0.551	0.050	0.172	1.051	0.771
	Doesn't feel guilty...	0.056	0.213	1.057	0.794	0.028	0.219	1.028	0.898
	Acts without thinking	-0.235	0.213	0.791	0.272	-0.342	0.228	0.710	0.134
	Lies or cheats	-0.354	0.259	0.702	0.171	-0.382	0.276	0.682	0.166
	Self-conscious...	0.036	0.159	1.037	0.819	-0.025	0.175	0.975	0.887
	Shows off/ clowns	-0.103	0.172	0.902	0.551	-0.209	0.194	0.811	0.280
	Delin. Behav. Score	0.035	0.076	1.035	0.645	0.031	0.072	1.032	0.663
	Sex					0.240	0.246	1.272	0.329
	Wave 1 Child Age					0.011	0.029	1.011	0.704
	SES					0.073	0.168	1.076	0.664
Yes/Yes	Brags, boasts	0.082	0.148	1.085	0.581	-0.027	0.167	0.973	0.870
	Confused/ in a fog	0.170	0.274	1.186	0.535	0.238	0.284	1.269	0.402
	Daydreams...	-0.197	0.175	0.821	0.258	-0.339	0.191	0.713	0.075
	Demands attention	0.041	0.155	1.042	0.791	-0.027	0.169	0.973	0.873
	Doesn't feel guilty...	0.117	0.203	1.124	0.564	0.084	0.210	1.088	0.690
	Acts without thinking	-0.190	0.209	0.827	0.363	-0.259	0.223	0.772	0.247
	Lies or cheats	-0.303	0.248	0.739	0.221	-0.278	0.262	0.757	0.289
	Self-conscious...	-0.015	0.159	0.985	0.926	-0.124	0.173	0.883	0.472
	Shows off/ clowns	-0.137	0.170	0.872	0.419	-0.278	0.189	0.757	0.142
	Delin. Behav. Score	0.138	0.069	1.148	0.046	0.114	0.066	1.121	0.085
	Sex					0.268	0.243	1.307	0.269
	Wave 1 Child Age					0.098	0.028	1.103	0.000
	SES					-0.479	0.178	0.619	0.007

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score ; S.E.: Standard Error.

Appendix I: Results from the Multinomial Logistic Regression of 'witnessed a shooting' response categories on Primary Caregiver-Reported *CBCL* and demographic explanatory variables as measured at wave 2

N=1973		Model 1				Model 2			
	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
No/No	Confused/ in a fog	-0.117	0.174	0.890	0.501	-0.025	0.182	0.976	0.893
	Daydreams...	0.660	0.161	1.936	< 0.001	0.213	0.173	1.237	0.219
	Demands attention	0.703	0.116	2.021	< 0.001	0.238	0.130	1.269	0.067
	Doesn't feel guilty...	0.326	0.163	1.385	0.045	0.106	0.172	1.112	0.539
	Acts without thinking	0.091	0.159	1.095	0.568	-0.123	0.172	0.884	0.474
	Lies or cheats	0.276	0.193	1.318	0.153	0.312	0.202	1.366	0.122
	Self-conscious...	1.137	0.118	3.117	< 0.001	0.180	0.131	1.198	0.169
	Delin. Behav. Score	-0.014	0.069	0.986	0.837	-0.271	0.070	0.763	< 0.001
	Sex					-0.052	0.176	0.949	0.768
	Wave 2 Child Age					0.078	0.018	1.081	< 0.001
	SES					0.873	0.119	2.395	< 0.001
No/Yes	Confused/ in a fog	-0.295	0.220	0.745	0.179	-0.322	0.237	0.725	0.174
	Daydreams...	0.081	0.197	1.084	0.681	0.045	0.216	1.046	0.834
	Demands attention	0.145	0.139	1.156	0.298	0.108	0.161	1.114	0.502
	Doesn't feel guilty...	-0.166	0.198	0.847	0.403	-0.213	0.218	0.808	0.328
	Acts without thinking	0.042	0.189	1.043	0.825	0.023	0.212	1.023	0.914
	Lies or cheats	0.224	0.226	1.252	0.321	0.234	0.248	1.263	0.346
	Self-conscious...	0.242	0.143	1.274	0.090	0.152	0.162	1.164	0.348
	Delin. Behav. Score	0.006	0.081	1.006	0.940	-0.025	0.086	0.976	0.776
	Sex					0.186	0.220	1.205	0.396
	Wave 2 Child Age					0.011	0.023	1.011	0.631
	SES					-0.030	0.152	0.970	0.844
Yes/Yes	Confused/ in a fog	0.201	0.209	1.223	0.337	0.189	0.230	1.208	0.412
	Daydreams...	0.008	0.205	1.008	0.969	0.037	0.228	1.037	0.872
	Demands attention	0.001	0.147	1.001	0.996	0.046	0.169	1.047	0.784
	Doesn't feel guilty...	-0.474	0.208	0.623	0.023	-0.486	0.230	0.615	0.035
	Acts without thinking	-0.193	0.202	0.825	0.339	-0.205	0.228	0.815	0.369
	Lies or cheats	-0.322	0.238	0.725	0.176	-0.319	0.267	0.727	0.232
	Self-conscious...	-0.116	0.156	0.890	0.457	-0.200	0.174	0.819	0.250
	Delin. Behav. Score	0.201	0.079	1.223	0.011	0.140	0.086	1.150	0.103
	Sex					-0.026	0.229	0.975	0.911
	Wave 2 Child Age					0.087	0.023	1.091	< 0.001
	SES					-0.581	0.175	0.559	0.001

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score; S.E.: Standard Error.

Appendix J: Results from the Multinomial Logistic Regression of 'witnessed a shooting' response categories on Primary Caregiver-Reported *CBCL* and demographic explanatory variables as measured at wave 3

N=1724		Model 1				Model 2			
	Item	Beta	S. E.	e^B	p value	Beta	S. E.	e^B	p value
No/No	Confused/ in a fog	-0.280	0.195	0.756	0.151	-0.029	0.199	0.971	0.884
	Daydreams...	0.380	0.178	1.462	0.033	-0.005	0.187	0.995	0.979
	Demands attention	0.327	0.124	1.387	0.008	-0.282	0.136	0.755	0.038
	Doesn't feel guilty...	0.470	0.192	1.599	0.014	0.309	0.200	1.363	0.123
	Acts without thinking	0.551	0.188	1.735	0.003	0.263	0.205	1.300	0.201
	Lies or cheats	0.106	0.214	1.112	0.621	0.152	0.227	1.164	0.504
	Self-conscious...	1.472	0.133	4.357	< 0.001	0.449	0.148	1.567	0.002
	Delin. Behav. Score	0.032	0.073	1.033	0.660	-0.152	0.074	0.859	0.041
	Sex					-0.072	0.184	0.931	0.697
	Wave 3 Child Age					0.067	0.019	1.070	< 0.001
	SES					0.797	0.128	2.219	< 0.001
No/Yes	Confused/ in a fog	0.061	0.225	1.063	0.785	0.036	0.251	1.037	0.886
	Daydreams...	0.021	0.212	1.021	0.922	0.006	0.238	1.007	0.978
	Demands attention	-0.218	0.152	0.804	0.152	-0.247	0.179	0.781	0.166
	Doesn't feel guilty...	-0.102	0.229	0.903	0.656	-0.133	0.254	0.875	0.601
	Acts without thinking	0.166	0.221	1.181	0.453	0.176	0.260	1.193	0.498
	Lies or cheats	0.129	0.248	1.138	0.603	0.200	0.286	1.222	0.483
	Self-conscious...	0.160	0.164	1.173	0.330	0.274	0.190	1.315	0.149
	Delin. Behav. Score	0.091	0.083	1.095	0.273	0.096	0.090	1.101	0.284
	Sex					0.331	0.242	1.392	0.172
	Wave 3 Child Age					-0.038	0.025	0.963	0.134
	SES					0.014	0.172	1.014	0.937
Yes/Yes	Confused/ in a fog	0.160	0.243	1.173	0.511	0.081	0.277	1.085	0.769
	Daydreams...	0.040	0.229	1.041	0.861	0.197	0.263	1.218	0.453
	Demands attention	-0.275	0.168	0.759	0.102	-0.157	0.202	0.855	0.437
	Doesn't feel guilty...	-0.401	0.266	0.669	0.131	-0.493	0.298	0.611	0.098
	Acts without thinking	0.097	0.243	1.102	0.691	0.236	0.297	1.266	0.426
	Lies or cheats	-0.163	0.281	0.850	0.562	-0.207	0.331	0.813	0.532
	Self-conscious...	-0.132	0.185	0.876	0.475	0.161	0.214	1.175	0.452
	Delin. Behav. Score	0.076	0.092	1.079	0.410	0.143	0.101	1.153	0.156
	Sex					-0.155	0.273	0.857	0.571
	Wave 3 Child Age					0.001	0.028	1.001	0.969
	SES					-0.396	0.211	0.673	0.060

Abbreviations: Delin. Behav. Score: Delinquent Behaviour Score ; S.E.: Standard Error.