Internalizing and externalizing behaviours in South African male young offenders and non-offenders with and without traumatic brain injuries

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1 November 2018

Supervisor: Dr Leigh Schrieff

Word count:

Abstract: 250

Main Body: 7577

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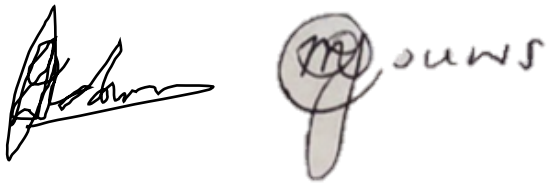
SIGNATURE: 

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Abstract

Background: Male adolescents engage in risk-taking behaviours and are at increased risk for sustaining traumatic brain injuries (TBIs). Majority of the young offending population is male. Crime and TBIs are rife in South Africa and research suggests the young offending male population experience increased exposure to crime and violence and are more prone to sustaining TBIs than non-offending populations. Post-TBI symptoms are associated with internalizing and externalizing behaviours in adolescents.

Aim and methods: We aimed to identify the association between internalizing and externalizing behaviours in male young offenders (YO) with TBI in comparison to a control group. We hypothesized that YO with TBI would have higher rates of internalizing and externalizing behaviours compared to YOs and non-offenders (NOs) with and without TBIs. The sample included 40 male, YOs and 38 matched NOs from two high schools in Cape Town.

Results: There was no significant difference found in internalizing behaviours between YOs who did and did not sustain a TBI and the NOs. Reported TBI was a significant predictors of externalizing behaviours. YOs had higher externalizing behaviours, particularly rule breaking behaviours, and were significantly more likely to use illegal substances.

Conclusion: Our findings suggest that reported TBI is predictive of externalizing behaviours, irrespective of population, i.e. YO or NO. This is unusual as most research finds TBI and subsequently, externalizing behaviours, to be higher in YO populations. TBI was found to be high across both samples and speaks to the high levels of crime, particularly among male adolescents in South Africa.

Keywords: Crime, externalizing behaviours, internalizing behaviours, TBI, young offenders.

Traumatic brain injury (TBI) is one of the leading causes of adolescent morbidity and mortality rates globally, occurring nearly three times higher in low-to upper-middle income countries (e.g., South Africa) as compared to high income countries (HIC) (Dewan et al., 2018). South Africa has high rates of crime, with the majority of these crimes being violent. The perpetrators of these violent crimes are most often adolescent males, many of whom are re-offenders (Clark, 2012; Leoschut & Kafaar, 2017). The male young offender population are particularly vulnerable to sustaining TBIs as they are more likely to be involved in risk taking behaviours and/or criminal activities in comparison to the general population (Farrer, Frost, & Hedges, 2013). TBI and criminal activity are positively correlated with internalizing behaviours (e.g., depression and anxiety) and externalizing behaviours (e.g., aggression and bullying), particularly within the young offending, male population, which may suggest that sustaining a TBI could increase the likelihood of offending in young males (Imbach, Aebi, Metzke, Bessler, & Steinhausen, 2013; Hughes et al., 2015). Research on this topic is scant in South Africa; the majority of the data comes from HICs. Therefore, our study aimed to investigate how TBI outcomes, specifically internalizing and externalizing behaviours, manifest in the South African, male young offending population, given the contextual vulnerabilities of the context to both TBI and crime.

Crime in South Africa

South Africa has one of the highest rates of crime and violence globally (Victims of Crime in South Africa [VOCS], 2017/18). Souverein, Ward, Visser and Burton (2016) reported that homicide prevalence rates were as high as 344.6 violent bodily assaults and 31.1 murders per 100 000 in 2012 to 2013, with the majority of these crimes being committed by males under the age of 25. In comparison to the United States of America, South Africa's figures have previously been reported to be six times higher (Pelser, 2008; VOCS, 2017/18). In May 2010, the Department of Correctional Services for South Africa estimated that approximately 57

145 people between the ages of 14 and 25 were incarcerated in South African prisons, with the majority of crimes being violent (Clark, 2012). Male adolescents are 15 times more likely to commit a crime in comparison to a female adolescents in South Africa (Leoschut & Kafaar, 2017). International studies have shown that the prevalence of crimes committed by young males, positively correlates with TBI rates. Taking into consideration the high rates of crime and violence in South Africa, the prevalence of TBI among young offenders requires further investigation (Imbach et al., 2013).

Traumatic Brain Injuries

TBI is defined as a head injury that causes damage to the brain, as it is shifted around in the skull from its original position, whereby an individual loses consciousness and has amnesia with continuing social, behavioural and/or cognitive impairments (Hughes et al., 2015). TBI can arise from an object coming into forceful contact with the individual's head and may expose parts of the brain (Hughes et al., 2015).

Regarding the epidemiology of TBI, low and upper middle-income countries have rates of TBI that are approximately three times higher than HICs. In South Africa, men are twice as likely as women to sustain a TBI compared to women, which appears to be an international trend (Vaughn, Salas-Wright, Delisi, Perron, 2014). The leading mechanisms of TBI-related mortality and morbidity in South Africa are motor vehicle accidents (MVAs'; 57%) followed by interpersonal violence (Alexander et al., 2009; Dewan et al., 2018). Interpersonal violence speaks to the high rates of crime and violence in our country (Alexander et al., 2009). Given the high rates of MVAs and crime in the country, rates of TBI are estimated to be high in South Africa. There is a growing body of research that investigates the association between crime and TBI.

Young offenders and TBI

Youth who have sustained TBIs are more likely to have poor mental health and be involved in offending behaviours (Maas et al., 2017). TBI rates are higher in young offender samples than in the general population (Vaughn et al., 2014). Within the male, young offender population, rates of severe TBI are shown to be as high as 67% globally (Farrer et al., 2013). A comparative analysis of five studies, in high income countries, indicated that young offenders were three times more likely to have sustained a TBI than their non-offending peers (Vaughn et al., 2014). A study in Finland showed that males who sustained a TBI during childhood were four times at risk for developing a mental disorder with offending in adulthood, emphasizing that illegal behaviours tended to occur after an incidence of TBI had taken place (Williams, Cordan, Mewse, Tonks, & Burgess, 2010).

The South African male young offender population is of particular interest in studying TBI and the effects on subsequent behaviour as South African adolescent males, in comparison to females of the same age, have higher rates of participation in criminal behaviours and involvement in gang violence with the possible outcome of incarceration. These behaviours are positively correlate to a history of TBI (Hughes et al., 2015). This suggests that TBI may act as one of the mechanisms for offending in young males, which is highly relevant in South Africa where crime rates are problematically high (Alexander et al., 2009). However, the prevalence of TBI among young offenders is unknown in South Africa, therefore it is important to identify the rates at which TBI is occurring in this vulnerable population.

TBI Sequelae

Post-TBI sequelae can result in possible long-term complications, ranging from changes in personality and lowered executive functioning to experiencing severe emotional disturbance (Farrer et al., 2013). Internalizing and externalizing behaviours are two of the

prominent post-TBI sequelae (Bordin et al., 2013). Understanding how sustaining a TBI may influence behaviour within a young offender population is important in order to understand its interaction with criminal activity.

Internalizing and externalizing behaviours: Definitions.

Internalizing behaviours are negative behaviours that are directed inward and include symptoms such as anxiety, psychosomatic reactions, social withdrawal and depression (Eisenberg et al., 2016). On the other hand, externalizing behaviours are directed outward, towards others and include law-breaking activities and violent behaviours, conduct disorder and increased aggression (Bordin et al., 2013).

Internalizing behaviour outcomes, young offenders and TBI. Research suggests that young offenders who have sustained a TBI may experience poor mental health functioning, specifically increased rates of comorbid psychological problems such as anxiety, depression and suicidality (Hughes et al., 2015). Underwood and Washington (2016) estimate that up to 10% of young offenders that have sustained TBIs, have chronic mental illness, which increases with severity during adulthood. In Korea a significant difference in internalizing behaviours between young offenders and non-offenders was found 48% of the young offenders had either depression or anxiety whereas the non-offending group had a 23.1% prevalence rate for the same disorders (Sohn, 2003).

Adolescents who display internalizing behaviours are prone to increased levels of anger, sadness, and emotionality, but seem to have better control over the behaviours they display in comparison to adolescents with externalizing behaviours (Eisenberg et al., 2016). Chitsabesan, Lennox, Williams, Tariq and Shaw (2015) reported that one third of young offenders' parents believed that TBI caused lifelong effects for their child, including the inability to regulate emotions and behave appropriately, lowered academic performance, and negatively impacted their social functioning.

Externalizing behaviour outcomes, young offenders and TBI. The impact and negative outcomes of TBI are widespread, but are not limited to mental health issues. Problematic externalizing behaviours have been described as highly prevalent in young, male offenders with TBI and are associated with rule-breaking and violent behaviour (Eisenberg et al., 2016). Poor impulse control is a common feature in patients with TBI, resulting in impulsive behaviours such as impatience, increased irritability, verbal or physical aggression and poor judgment and decision-making abilities (Vaughn et al., 2014). These symptoms can contribute to increased risk of offending in adolescents. Individuals with low self-control tend to be impulsive, insensitive and negative emotional risk takers, reflecting the externalizing behaviours associated with TBI (Vaughn et al., 2014).

Findings are consistent across the literature that there is an association between TBI and criminal behaviours and consequent behaviours ranging from violence, and aggression to poor inhibition (Farrer et al., 2013). Aggression is a common externalizing behavioural characteristic present in young offenders and is higher in this population than in non-offenders (Steiner et al., 2011). Our responses to threatening stimuli activate various emotions and it is important that we are able to regulate our emotions in socially acceptable ways. Young offenders have been shown to have heightened levels of emotional dysregulation and are unable to differentiate between the appropriate response mechanisms to use in stressful situations, often acting out aggressively and violently (Steiner et al., 2011).

Rationale, Aims and Hypotheses

In South Africa, youth crime rates are unacceptably high and violence is commonplace (Pelser, 2008, VOCS, 2017/18). TBI has been shown to result in neural deficits that promote impulsivity, risky behaviour, and apathy, which increase the likelihood of engaging in illegal activities (Maas et al., 2017). Internationally and locally, adolescent males are particularly vulnerable to sustaining TBIs and have an increased susceptibility to criminality (Kang,

Wood, Louden, & Ricks, 2018). Furthermore, TBI incidence rates within low-to-upper middle-income countries are not evident in current literature. It is important to understand the prevalence of internalizing and externalizing behaviours in South African young offenders with TBI in order to understand the contribution of such behaviours to offending outcomes and recidivism (Kang et al., 2018). The early identification of mental illness and behavioural issues within TBI patients can inform rehabilitative approaches that will improve their quality of life, reducing the negative impacts associated with TBI outcomes and possibly decrease the risk of criminal behaviour.

Given the high proposed rates of TBI, crime and the impact of post-TBI behavioural outcomes in the South African young male offender population, our study aimed to investigate the relationship between TBI, criminality, and internalizing and externalizing behaviours of offending youth in the Western Cape, South Africa.

The proposed study's primary aim was to obtain data from young male offenders and non-offenders in order to determine the prevalence and manifestation of internalizing and externalizing behaviours in these individuals with and without TBI. The hypotheses tested were:

H1: Reported TBI will be higher in the young offender group compared to the non-offender group.

H2: Internalizing and externalizing behaviours will be higher in the young offenders with TBI compared to young offenders without TBI and the non-offender control group.

Methods

Design and setting

This study is a sub-study of a parent project. The parent study is investigating the prevalence and behavioural, emotional and executive functioning outcomes of TBI among young male offending and non-offending South Africa populations. Our study investigated the internalizing and externalizing behavioural outcomes of TBI in offending and non-offending conditions. A quantitative, cross-sectional design was used to assess internalizing and externalizing behaviours among young offenders with and without TBI, in comparison to a non-offending control group. The main statistical analyses run were a series of hierarchical multiple regressions. The reported presence of TBI and the grouping variable (young offender versus non-offender) are the independent variables and internalizing and externalizing behaviours are the dependent variables. The young offender data was sourced from a previous related study's database (Ockhuizen, 2014). In that study, a quantitative cross-sectional design was used. The young offender data was collected from a youth development centre in Cape Town. The participants were interviewed at the institution (Ockhuizen, 2014). The control data was collected from two low SES school in Cape Town. Participants were interviewed at their school, in a private room.

Participants

Non-offenders were recruited using purposive sampling and young offender data was sourced retrospectively. Our study included 80 male participants; 40 young offenders and 40 non-offenders. Participants were between the ages of 13 and 18 (M = 15.76; SD = 1.41) at the time of the study and were fluent in either English and/or Afrikaans. All participants came from low SES backgrounds in the Western Cape region of South Africa and were matched on age, language and SES. Young offenders were defined as adolescent males who had engaged

in law breaking behaviour, whereas non-offenders were males in the same age category who had not.

G power was used to calculate the required sample size that would obtain a statistical power of $p < .05$. In order for a large effect size ($f = .35$) to be achieved, using multiple regression, a sample size of 35 participants was required. The decision to use a large effect size was based on previous, international studies that researched the effects of TBI in young offenders and non-offenders, looking at similar outcomes to ours (Williams et al., 2010). This sample size will generate power of .86.

Exclusion Criteria

Participants were excluded from the study if they were female, non-South African citizens, did not speak English and/or Afrikaans, were not between the ages of 13 and 18, and did not come from low SES backgrounds in the Western Cape.

Measures

Measures used in the current study are described below. The young offender data were collected using all of the same measures, with the exception of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST); the Maudsley Addiction Profile (MAP) was used in that study. We sourced information on use of illegal substances from these measures (ASSIST and MAP).

Demographics questionnaire. A demographics and asset index questionnaire was distributed to non-offender participants to assess SES (see Appendix A). However, the response rates were poor across both schools and thus could not be used. Instead, a set of questions, relating to the area of residence and the structure of their home, was completed during the interviews to assess SES among the control group (see Appendix B). Area of residence was particularly informative of SES as many of the participants lived in low SES communities, such as Khayelitsha and Gugulethu.

Comprehensive Health Assessment Tool (CHAT). The CHAT (Offender Health Research Network [OHRN], 2013) is a measure, that was specifically developed for children and adolescents in England, who offended and came into contact with the Youth Justice System (YJC). The CHAT focuses on areas of physical and mental health (OHRN, 2013). Few tests have been completed on the psychometric properties of the CHAT, therefore there are no available scores on its reliability and validity. However, Williams et al. (2010) have used the CHAT successfully, in similar research to identify the presence of TBI in young offenders. For the purpose of this study, only the Neurodisability Assessment on TBI, from the CHAT was used to identify whether participants had sustained a TBI (see Appendix A). This was established through a yes/ no response and questions regarding the frequency of such incidence and duration of loss of consciousness. This measure is useful in our current study as there are high rates of health-related issues in the young offending population (Williams et al., 2010).

Alcohol Use Disorders Identification Test (AUDIT). The AUDIT consists of 10 questions, which address alcohol dependence, consumption and alcohol related consequences (Peltzer, Davids, & Njuho, 2011; see Appendix B). The AUDIT has been used in a South African sample and has shown excellent sensitivity (.90) and specificity with approximately 91.5% of participants correctly classified (Peltzer et al., 2011). Ten studies evaluated the internal consistency of AUDIT, and found a mean reliability score of a =.80 for measuring alcohol dependence with an item total correlation of .95, which is highly satisfactory (Meneses-Gaya, Zurardi, Loureiro, & Crippa, 2009). It is important to measure alcohol dependence, as alcohol use and TBI have been known to increase the risk of violence (Peltzer, Davids, & Njuho, 2011). Adolescent, male young offending populations engage in high risk behaviours, such as substance abuse (Souverein et al., 2016).

Alcohol, Smoking and Substance Involvement Screening Test (ASSIST). The ASSIST was developed by the World Health Organization (WHO, 2010) in response to the rising levels of substance use across the globe. It is an 8-item questionnaire and screens for a variety of substances, ranging from tobacco products and alcohol, to illegal substances such as cannabis, over the last 3 months. This measure is culturally neutral and is therefore appropriate to use in the South African context. A South African study showed that ASSIST scored high on reliability (*a* =.83). Furthermore it also had a high content validity score, KMO= .769 (Simelane-Mnisi & Mji, 2017). We administered the ASSIST measures to the non-offender group (see Appendix C).

Maudsley Addiction Profile (MAP). MAP was used to assess the use of illegal substances among young offenders. The test consists of four subsections, only the section relating to drug use was relevant in this study (see Appendix D). Illegal drug use was assessed based on use during the past month and consisted of 10 items which were scaled from 0 to 4 (Hibbert, & Best, 2010). Participants could receive total score out of 40 for illegal drug use, with lower scores indicating lower frequency of use. MAP shows excellent reliability (.94) and validity (.81) (Hibbert & Best, 2010; Marsden et al., 1998). MAP has shown good test-retest reliability and validity within South African research (Dannatt, Cloete, Kidd, & Weich, 2014). Due to the differing measures of illegal substance use between offenders and non-offenders, we categorized responses into yes/no, to compare the outcomes of those who did and did not use substances.

Beck's Depression Inventory (BDI-II). The second edition of BDI, a self-report measure consisting of 21 items, was used to measure and assess the severity of the depressive symptoms within the sample (see Appendix E). BDI-II has been used in offender populations and demonstrated high internal consistency (*a* =.90) (Palmer & Binks, 2008), and also in a sample of adolescents in South Africa, with excellent internal reliability (*a*=.91)

(Pluddemann, Flisher, McKetin, Parry, & Lombard, 2010). It is important to consider depression, as it is commonly reported as an outcome post-TBI.

Child Behaviour Checklist, Youth Self-Report (CBCL, YSR). The internalizing and externalizing behaviours of the young offenders and non-offenders were assessed using the CBCL; YSR questionnaire. The CBCL is comprised of three questionnaires which rely on self-reporting from the participant, teachers and parents, yet due to restricted access and time, only the YSR was administered (Kariuki, Abubakar, Murray, Stein, & Newton, 2016; see Appendix F). The YSR is a comprehensive behavioural checklist with 118 items scaled according to cut-off scores which categorize the behaviours as 'clinical', 'borderline', or 'non-clinical'. The YSR was created for individuals aged 11-18 years with items like "I am inattentive or easily distracted" (Bordin et al., 2013, p. 6). The CBCL has been culturally and linguistically adapted for South African populations (Kariuki et al., 2016). A study conducted in South Africa found the measure to have an internal consistency of .94 (95% CI), and a test-retest reliability of .76, both satisfactory. Majority of the subscales used in the measure had a Cronbach's alpha coefficient between .65 and .86, with internalizing scores having a coefficient of .87 while externalizing was .86, which is highly acceptable for further use in the South African population (Kariuki et al., 2016).

Procedure

Control group. After receiving ethical clearance (see ethical considerations below), non-offender participants were recruited from two high schools in low to middle SES regions of Cape Town. The schools provided us with class lists, and the names of individuals from grade 8 to grade 12. A sample of 50 boys per grade, were randomly selected by an external individual who used a random number generator to randomly select potential male participants. A letter of information and consent form was handed to the selected participants, entailing what the study was about and what participation in the study involved, which had to

be signed by their parents, if they agreed for their child to participate in the study (see Appendix G). Those participants who received their parent's approval to participate, were asked to sign an assent form if they also agreed to participate in the study (see Appendix H). Thereafter participants were privately assessed in a quiet room, on the above mentioned measures, during school hours. The interviews were conducted by five honours students and one masters student across both schools. The school secretary informed us which classroom the participant was in and we would find it and request to interview the student. Interviews were conducted in pairs, as a safety precaution. The assessments lasted approximately one hour and participants were provided with snacks. Once completed, each participant was given a debriefing form and given the opportunity to ask questions (see Appendix I).

Young offender group. Previously collected data from a young development centre in Cape Town (see Ockhuizen, 2014) was used in order to match non-offending participants to offending participants based on demographics and the above measures. Participants with completed CBCL questionnaires and screening measures were selected first. Next, participants were matched as closely as possible to non-offenders on age and language. Once we had selected the young offenders we would be including, their raw data was computed and scored for later analyses.

Ethical considerations

Ethical approval was granted by the Research Ethics Committee (REC) in the Department of Psychology at the University of Cape Town (UCT) for the study (see Appendix J). The Western Cape Department of Education granted us ethical clearance so that high schools could be approached to recruit non-offender participants (see Appendix K). The previous study from which the young offender data was recruited was also approved by UCT department of Psychology's REC (see Appendix L). As explained in the consent and assent forms, participation in the study was voluntary and participants were permitted to withdraw

at any stage, without penalties. The participants identities and information remained confidential, and their names were replaced with numbers. After completing the interviews, participants received a snack pack, debriefing letter (Appendix E) and were asked if they had any questions. Participants who had borderline or clinical depression scores or indicated any signs of suicidality on the measures of depression or the internalizing behaviour questions for the CBCL, were referred immediately to the school counsellor or social worker. There were no known risks or benefits to participating in this study.

Data Management and Statistical Analysis

The statistical analyses were run using SPSS (version 25.0). The data was cleaned before inferential statistics were run. The significance levels were set at $p < .05$ for all analyses. Overall, the statistical analysis consisted of five major stages.

Stage 1: Sample characteristics were run and tabulated on all the variables of interest, that were involved in building the regression model. Depression, alcohol and illegal substance use were identified as potential confounding variables.

Stage 2: Between-group analyses were done using chi-square tests of independence for the categorical variables (TBI and illegal substance use) to determine whether there was a significant difference between reported TBI rates and the use of illegal substances (a control variable) amongst non-offenders and young offenders. Thereafter, we ran ANOVAs to determine whether there was a significant difference between the grouping variable and the remaining two control variables, depression and alcohol use, with the grouping variable as the independent variable.

Stage 3: A hierarchical multiple regression was run and analysed in order to determine whether a significant relationship existed between the grouping variable (young offenders vs non-offenders), reported TBI and internalizing behaviours. The identification of

any confounds were entered in the first block. In the second block, the grouping variable was added into the model and thereafter TBI was introduced in the last block.

Stage 4: In the third main analysis we ran another hierarchical regression, in order to determine the level of significance of grouping variable and TBI in externalizing behaviours. The variables were entered in the same order, as mentioned in Stage 2.

Stage 5: In the final stage we ran additional hierarchical regressions on the various subscales of the behavioural outcomes (internalizing and/or externalizing behaviours), that were found to be significant, determined by the results of the previously run multiple regressions. The predictor variables (control, grouping and TBI variables) remained in the same order as the previous regressions, however the various individual subscales of internalizing and externalizing behaviours were entered as outcome variables. This was done in order to determine which specific internalizing and externalizing behaviours are predicted by the grouping variable and/ or the presence of TBI.

Results

Sample Characteristics

The final sample size was *N*=78. Two outliers (i.e. > 3 SDs) were identified using box-plots. These cases were therefore removed from the dataset, as they interfered with the normal distribution of the data. Hence, the final numbers were 40 young offenders and 38 non-offenders. Participants were between the ages of 13 and 18 (M = 15.67; SD = 1.41). Participants were matched on SES, age and language; therefore, analyses predicted no significant between-group differences with regard to these variables.

The frequency of TBI, as reported by participants in both young offenders and non-offenders, can be found in Table 1. These results show that the incidence of reported TBIs are

greater in the young offender group, than the non-offender group. However, TBIs were reported by more than 30% of participants in both groups.

Table 1

Frequencies of TBI: Young offenders vs. non-offenders (N = 78)

	Group			
Reported TBI	Non-offender (*n*=38)		Young offender (*n*=40)	
TBI	12	**(31.58)**	18	**(45.00)**
No TBI	26	(68.42)	22	(55.00)
Total	38	(100.00)	40	(100.00)

Note. TBI = individuals who reported sustaining a TBI. NO TBI = individuals who did not report sustaining a TBI. Percentages are reported in parentheses.

Table 2 shows that 40% more young offenders than non-offenders reported using illegal substances. The usage of illegal substances ranged from marijuana, buttons, tik and cocaine.

Table 2

Frequencies of illegal substance (ASSIST/MAP): Young offenders vs. non-offenders (N = 78)

	Group			
Reported	Non-offender (*n*=38)		Young offender (*n*=40)	
No illegal substance use	21	(55.26)	6	(15.00)
Illegal substance use	17	**(44.74)**	34	**(85.00)**
Total	38	(100.00)	40	(100.00)

Note. Percentages are reported in parentheses.

Results from Table 3 show that young offenders scored higher on externalizing behaviours (M = 61.15, SD = 12.35) in comparison to non-offenders (M = 55.11, SD = 10.56). Depression scores were also far greater in the young offenders (M = 24.13, SD = 12.06) than in non-offenders (M = 13.68, SD = 8.34). The remaining variables, namely internalizing behaviours and alcohol use, have negligible differences across both groups.

Table 3

Descriptive statistics of non-offenders vs young offenders, according to measures (N=78)

	Group			
	Non-offenders		Young offenders	
	M	*SD*	*M*	*SD*
Internalizing problems	61.89[a]	9.75	60.05	8.55
Externalizing problems	**55.11[a]**	10.56	**61.15**	12.35
Rule breaking behaviours	**59.29[a]**	10.30	**64.83**	11.24
Aggressive behaviour	56.96[a]	8.81	58.33	9.84
Age	15.58	1.42	15.93	1.39
AUDIT	5.58[b]	5.30	5.53	8.19
BDI	**13.68[b]**	8.34	**24.13**	12.06

Note. Means (M) and standard deviations (SD) are reported for each measure. AUDIT = Alcohol Use Disorder Identification Test. BDI = Becks Depression Inventory.

[a]T-scores. [b]Raw scores. For Age, data is presented in years.

Between-groups analyses:

Unless otherwise stated, all the assumptions underlying all the parametric tests were upheld for the between-group analyses.

A Chi square test of independence was run on reported TBI and the grouping variable. Overall the relationship between TBI and the grouping variable was not significant, X^2 (1, N

= 78) = 1.48, p = .16. Therefore, this indicates that there is no significant difference found between young offenders and non-offenders who reported sustaining TBIs. The effect size was small, *Cramer's V* = .14. Percentage frequencies regarding TBI in young offenders and non-offenders are reported in Table 1.

Table 4

Chi-square test on TBI and the Grouping variable (N= 78)

	Value	*df*	*p* (2- sided)	*p* (1-sided)
Pearson X^2	1.48	1		
Fisher's Exact Test		1	.25	.16

Note. X^2 = Chi square. *df* = degrees of freedom

A second chi square test of independence was run to determine whether there was a significant relationship between illegal substance use and the grouping variable. Table 5 confirms that there is a significant relationship between the two, X^2 (1, N = 78) = 13.96, p < .001. The effect size was medium, *Cramer's V* = .42. The percentage frequencies, regarding the reported use of illegal substances in young offenders and non-offenders are reported in Table 2.

Table 5

Chi-square test of illegal substance use and the Grouping variable (N= 78)

	Value	*df*	*p* (2- sided)	*p* (1-sided)
Pearson X^2	13. 96	1		
Fisher's Exact Test		1	**< .001*** **	**< .001*** **

Note. X^2 = Chi square. *df* = degrees of freedom. ***$p < 0.001$

Lastly the results of the between-groups ANOVA on depression (BDI), alcohol use (AUDIT) and the grouping variable in Table 6, shows that the two groups differ significantly in terms of the measure of depression, F (1, 76) = .19. 51, $p < .001$. Alcohol use is however, not a significant predictor across non-offenders and young offenders, F (1, 76) = .001, p = .97.

Table 6

Between-groups analysis of BDI and AUDIT across young offenders vs. non-offenders

	SS	*df* 1	*df* 2	*F*	*p*
BDI	2124.30	1	76	.79	**< .001*** **
AUDIT	.06	1	76	.00	.97

Note. BDI = Beck Depression Inventory. AUDIT = Alcohol Use Disorder Identification Test. SS = sum of squares. *F* = F statistic. *df* = degrees of freedom. ***$p < 0.001$

Hierarchical regressions

Before the regression models were analysed, preliminary inspections were conducted and confirmed that the assumptions of linearity, homoscedasticity and normality were upheld for all regression models, unless otherwise stated. VIF values were checked in order to

determine whether there was multicollinearity between the variables of our model. No values were substantially above 1 for both internalizing and externalizing behaviours (VIF_{max}= 1.44), therefore we concluded that multicollinearity was not an issue. The independence of residuals was upheld, as shown by the Durbin-Watson statistic, 2.05 (internalizing behaviours) and 1.93 (externalizing behaviours). The plotted graphs, showing the outcome of standardized predicted residuals against standardized residuals, indicated that homoscedasticity was met for both sets of behavioural outcomes. Lastly, the assumption of normality of standardized residuals were upheld, as all values fell well below 3, showing that this model has low levels of error and is therefore acceptable and generalizable beyond this sample.

Model diagnostics were also considered for both regression models; Mahalanobi's distances have a general cut-off score of 15, given the sample size of our study (Fields, 2018). However, the maximum value fell slightly above this score at 17,03. This case was identified, as it could potentially disrupt the normal distribution of the standardized residuals. Overall this case was not influential as the residuals were normally distributed, regardless. Regarding Cook's distance, all values within our dataset were acceptable, as they fell within the suggested limits of less than 1, therefore no case has a disproportionate influence on the model (Fields, 2018).

Hierarchical Regression Analyses: Behavioural outcomes

Internalizing behaviours. Depression, measured by BDI, was not included as a control variable in this model because internalizing behaviours, that are measured by the CBCL include depression, as an outcome variable.

Table 7 shows that the controls; alcohol and illegal substances account for the most variance within the model (12%) and had a significant effect, F (2, 75) = 4.98, $p < .01$. The grouping variable was also found to have a significant effect F (2, 74) = 5.17, $p < .05$, however it only predicted a further 6% of the variance. In the last step, TBI was added to the

model and the results showed that it was not a significant predictor in determining internalizing behaviours, F (1, 73) = .3.88, p = .99. The grouping variable had a higher beta value (β = -.26, p < .05) than TBI (β = .01, p = .99). Therefore, the overall model showed that the control variables explained for most of the variance and only one of the hypothesized variables, namely grouping variable significantly contributed to the overall model.

Table 7

Results of hierarchical multiple regression, predicting internalizing behaviours (N= 78)

						Change Statistics				
						R^2				
	Variable	R	R^2	Adjusted R^2	SES	Change	F Change	*df*1	*df*2	*p*
Step 1	Controls	.34	.12	.09	8.70	.12	3.83	2	75	**< .01****
Step 2	Grouping	.42	.17	.14	8.48	.06	9.09	1	74	**< .05***
Step 3	TBI	.42	.17	.13	8.54	.00	.00	1	73	.99

Note. Control variables include alcohol use and illegal substance use. R = correlation coefficient. SES = standard error of estimate. *df* = degrees of freedom. * p < 0.05. ** p < 0.01

Externalizing behaviours. Overall, the regression model explaining externalizing behaviours in Table 8, was found to be statistically significant, R=.36, R^2= .13, F (1,75) = 5.75, p < .05 and explained 33% of the variance in externalizing behaviours. The three control variables: depression, alcohol use and illegal substances were statistically significant, F (3, 74) = 9.13, p < .001 and explained most of the variance (27%) of externalizing behaviours. The addition of the grouping variable to the model, only explained a further 1% of the overall variance and was not a significant predictor of externalizing behaviours, F (1, 73) = 1.22, p = .27. Adding TBI to the model explained a further 5% of the variance and was a significant predictor in determining externalizing behaviours, F (1, 72) = 5.08, p < .05. TBI was recorded as having a higher beta value (β= .22, p < .05) than the grouping variable (β=

.13, p = .27). Therefore, in the final model, only 1 of the variables of interest (TBI) was statistically significant, after controlling for depression, alcohol use and illegal substance use. Results from the regression analysis provided partial confirmation on our suggested research hypotheses.

Table 8

Results of hierarchical multiple regression, predicting externalizing behaviours (N= 78)

				Adjusted		Change Statistics				
	Variable	R	R^2	R^2	SES	R^2 Change	F Change	*df*1	*df*2	*p*
Block 1	Controls	.52	.27	.24	10.32	.27	9.13	3	74	**< .001*** **
Block 2	Grouping	.53	.28	.24	10.30	.01	1.22	1	73	.27
Block 3	TBI	.57	.33	.28	10.04	.05	5.08	1	72	**< .05***

Note. Control variables include depression, alcohol use and illegal substance use. SES = standard error of estimate. *df* = degrees of freedom. R = correlation coefficient. * $p < 0.05$. ***$p < 0.001$

Subscales of externalizing behaviours. The two individual subscales of externalizing behaviours (rule breaking behaviours and aggressive behaviours) were entered as the outcome variables. For rule breaking behaviours, the grouping variable was the only significant variable within the model, F (1, 73) = .30, $p < .05$ and explained 6% of the variance in rule breaking among the participants (Table 9), with higher rule breaking behaviours among young offenders as compared to non-offenders (see Table 3). Neither the control variables, F (3, 74) = .19, p = .45, nor TBI had a significant effect F (1, 72) = .30, p = .90 in determining rule breaking behaviours.

Table 9

Results of hierarchical multiple regression, predicting rule breaking behaviour (N=78)

				Adjusted		Change Statistics				
	Variable	R	R^2	R^2	SES	R^2 Change	F Change	*df*1	*df*2	*p*
Block 1	Controls	.19	.04	.00	11.10	.04	.90	3	74	.44
Block 2	Grouping	.30	.09	.04	10.85	.06	4.45	1	73	**< .05***
Block 3	TBI	.30	.09	.03	10.92	.00	.09	1	72	.90

Note. Control variables include depression, alcohol use and illegal substance use. SES= standard error of estimate. *df* = degrees of freedom. R = correlation coefficient. * $p < 0.05$.

In Table 10 we can see that overall, the model was not found to be significant and none of the variables significantly predicted aggressive behaviours. Therefore, the significant difference of externalizing behaviours found between young offenders and non-offenders is caused primarily as a function of differences in rule breaking behaviours. Rule breaking occurs at rates that are far higher in young offenders than non-offenders (see Table 3).

Table 10

Results of hierarchical multiple regression, predicting aggressive behaviours (N=78)

				Adjusted		Change Statistics				
	Variable	R	R^2	R^2	SES	R^2 Change	F Change	*df*1	*df*2	*p*
Block 1	Controls	.26	.05	.01	8.78	.05	1.19	3	74	.32
Block 2	Grouping	.25	.06	.01	8.76	.02	1.28	1	73	.26
Block 3	TBI	.25	.06	.00	8.82	.00	.10	1	72	.76

Note. Control variables include depression, alcohol use and illegal substance use. SES= standard error of estimate. *df* = degrees of freedom. R = correlation coefficient.

Discussion

Crime in South Africa is high and most often committed by adolescent males (Leoschut & Kafaar, 2017). Rates of TBI in South Africa are estimated to be high, yet are unknown within the general, and more specifically, within the male young offender population (Kang et al., 2018). Sustaining a TBI has neurological and behavioural implications. Internalizing and externalizing behaviours are prominent among male young offenders, yet, these behaviours are also common TBI sequelae (Bordin et al., 2013).

Therefore our study aimed to investigate (1) whether or not reported TBI was higher in young offenders compared to non-offenders and (2) whether internalizing and externalizing behaviours would be higher in young offenders with TBIs than young offenders without TBIs and non-offenders generally. Below I will discuss the findings of this study in relation to the literature and how they differ in a South African context, ending with a discussion of this study's limitations and recommendations for future studies.

TBI among offenders and non-offenders

We hypothesized that reported TBI would be higher among the young offender group compared to the non-offender group. Prevalence rates of TBI in South Africa remain unknown in the literature as most studies on TBI prevalence have been conducted in HICs (Alexander et al., 2009). The CHAT was used to assess the reported presence of TBI among both groups. While there was no significant difference regarding TBIs between young offenders and non-offenders (p = .16), the number of reported TBIs among offenders was higher, at least descriptively. Our research found that 45% of young offenders reported sustaining TBIs compared to 32% of non-offenders.

Our findings diverged from the literature in that TBI was relatively high among both samples. International literature commonly found TBI to be significantly higher in the young offender population, which may speak to the high incidence of TBI in South Africa generally

(Farrer et al., 2013; Vaughn et al., 2014). Understanding the rates and commonality of TBI in South Africa is important as TBI results in cognitive and behavioural outcomes that can be detrimental to the individual, their family and society. Research has shown that sustaining a TBI is commonly associated with increased impulsivity, apathy and risk-taking behaviours, which arguably leads to an increased risk of criminality and re-offending among offenders (Williams et al., 2010). Therefore, our first hypothesis is not supported.

Internalizing and externalizing behaviours among offenders and non-offenders

We hypothesized that both internalizing and externalizing behaviours would be higher in young offenders with TBIs compared to the non-offender group. The CBCL was used to measure internalizing and externalizing behaviours among young offenders and non-offenders. The AUDIT, ASSIST/MAP and BDI-II measures were used to control for potential confounding variables, specifically, alcohol use, illegal substance use and depression across the sample.

Internalizing behaviours. Our findings initially showed that internalizing behaviours were significantly higher among young offenders compared to non-offenders ($p < .05$) when a simple between-groups analysis was done. However, when a regression analyses was run, the control variables, alcohol and illegal substance use, were significant predictors of internalizing behaviours ($p < .01$). Alcohol and illegal substance use explained more of the variance between the groups (12%) than the grouping variable (6%) and whether or not participants had sustained a TBI (1%). Alcohol use was not significantly different between young offenders and non-offenders ($p = .99$). However, illegal substance use was significantly higher among young offenders than non-offenders ($p <.001$) and once removed, group population no longer significantly predicted internalizing behaviours ($p = .38$). Approximately 85% of young offenders reported using illegal substances compared to 45% of non-offenders. Therefore internalizing behaviours are explained more by illegal substance

use than whether or not the individual is an offender or non-offender and whether or not they have a TBI.

Our findings did not aligned with the literature on young offenders with TBI experiencing higher rates of internalizing behaviours (Hughes et al., 2015). This may be due to research which suggests that internalizing behaviours worsen during adulthood and may therefore be undetectable during adolescence when participants were tested (Underwood & Washington, 2016). These findings could indicate that the characteristics of male young offenders in South Africa are largely related to illegal substance use, which is used at much higher rates in comparison to the general male adolescent population in South Africa, worsening TBI outcomes and play a role in criminal behaviour. Therefore we accepted the null hypothesis, as young offenders with TBI did not experience increased internalizing behaviours compared to offenders without TBI and the non-offending control group.

Externalizing behaviours. Overall, a significant difference was found in externalizing behaviours. Again, much of the variance in the model was explained by the control variables (27%; $p <$. 05), while whether or not the participant was an offender or non-offender only contributed 1% and was found to be non-significant (p = .27). Lastly, TBI explained 5% of the variance and was a significant predictor of externalizing behaviours ($p <$ .05) Therefore, in our research externalizing behaviours were not significantly higher among young offenders compared to non-offenders. However, sustaining a TBI was a significant predictor of externalizing behaviours in our research.

Our findings diverged from the literature in that externalizing behaviours were not significantly predicted by the grouping variable (young offender or non-offender) (Eisenberg et al., 2016). This could be due to the high rates of TBI across our sample, as TBI appears to be predictive of externalizing behaviours. Our second finding that TBI is significantly predictive of externalizing behaviours, aligned with the literature on TBI and explains how

individuals who experience externalizing behaviours are more likely display problematic behaviours, such as aggression, bullying and law breaking behaviour (Steiner et al., 2011). Our hypothesis was partly confirmed, as TBI was a significant predictor of externalizing behaviours.

Hierarchical multiple regressions were run on the subcategories of externalizing behaviours, specifically aggression and rule breaking behaviour. The findings showed that aggression was not a significantly different externalizing behaviour among either offenders or non-offenders (p = .26), with or without TBI (p = .76). However, rule breaking behaviour was a significantly different externalizing behaviour among the young offender sample (p<.05) while presence of TBI remained non-significant (p =.90). Therefore, we can tentatively conclude that individuals who sustain TBIs are more likely to experience externalizing behaviours post-TBI, and young offenders who sustain TBIs are more likely to engage in rule-breaking behaviour, which could be associated with criminal activity among adolescent male offenders in South Africa (Kang et al., 2018; Hughes et al., 2015). Research conducted with young offenders in South Africa showed that approximately half of young offenders re-offend at least once (49.4%), and approximately 1 in 5 re-offend more than twice (21.3%) (Leoschut & Kafaar, 2017). Therefore, it is vital to understand the behavioural and cognitive profiles of individuals who have sustained TBIs in order to offer effective rehabilitation methods for both offending and non-offending TBI patients. It is recommended that screening for TBIs be conducted in schools and youth correctional centres so these individuals may receive targeted behavioural rehabilitation in order to reduce the chances of offending and re-offending.

Limitations and recommendations for future research

Our study was limited by the fact that the questionnaires were self-report measures which are susceptible to social desirability bias, especially when asked about illegal or

socially undesirable behaviours, and to faulty or inaccurate memories, which could lead to the over or under-reporting of TBIs (Wang & Gorenstein, 2013). Due to limited resources and time, we were unable to get parents or legal guardians to complete the parent CBCL form and teachers to complete the teacher version, which act to corroborate the answers given by the adolescent participants (Kariuki et al., 2016). Additionally, it was beyond the scope of this study to categorise the severity of the reported TBIs, or to corroborate the reported TBI with medical documents.

Future studies. Given the results, it is suggested that the role of depression and illegal substance use and its effect on post-TBI behavioural outcomes and recidivism among offenders be investigated further. Our research demonstrated that illegal substance use and depression are highly prevalent among young offending adolescents in the Western Cape. Illegal substance use should be investigated further in relation to its contribution to criminality and TBI as the literature indicated that those who used illegal substances were 4.4 times more likely to commit a crime (Leoschut & Kafaar, 2017). This could contribute to a better understanding of the high recidivism rates among young offenders in South Africa.

Conclusion

In this study we investigated the effects of TBI on internalizing and externalizing behavioural outcomes among male young offenders. Furthermore, we considered that post-TBI behavioural outcomes may influence offending behaviours which are highly prevalent among male adolescents in South Africa. Our research diverged from findings in HICs, in that TBI prevalence was relatively high across both offenders and non-offenders. Our findings showed that sustaining a TBI significantly predicted externalizing behaviours in both young offenders and non-offenders. Therefore, it may be important to consider implementing screening measures for TBIs in schools and youth correctional centres in South Africa, to

investigate prevalence rates which are currently unknown and provide a better understanding of the post-TBI behaviours in order to inform appropriate rehabilitation and reduce recidivism rates among offenders with TBIs.

Acknowledgements

Firstly we would like to thank and acknowledge the National Research Fund (NRF) for financing this study.

Secondly, we would like to thank the participants and the high schools in the Western Cape, who played major roles in attributing to the completion of our thesis and for adding to the research and literature in the field of TBI in South Africa, which we hope will go on to spur further studies.

Furthermore, we would like to thank Nina Steenkamp for allowing us to join on her Master's project, and assisting us with data collection.

Thank you to Nicholas Reid for his assistance with statistics.

We would also like to thank our fellow researchers (Asheeqa, Zayaan and Kimberly) as the data collection was a team effort that would not have been as rewarding without all of you.

Lastly, we would like to thank and extend our gratitude to our supervisor, Leigh Schrieff, for investing so much of your time into us and this project and for your constant guidance. This past year would have not been possible without your knowledge and support!

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Appendix A

Demographic Questionnaire and Asset Index

DEMOGRAPHIC QUESTIONNAIRE AND ASSET INDEX

GENERAL INFORMATION

Full name (Parent):	
Telephone:	Work: ( ) Home: ( ) Cell:
How would you describe your ethnicity / race?	1. Black 2. Coloured 3. White 4. Asian 5. Other(specify):
Home Language:	
Full name (Child):	
Gender:	M F
Date of Birth:	
Grade:	

HOUSEHOLD INCOME: (Please circle appropriate number)

Household income per year:	1. R0 2. R1 – R5 000 3. R5001 – R25 000 4. R25 000 – R100 000 5. R100 001+

PARENTAL EDUCATION: (Please circle appropriate number)

	Biological mother	Biological father	Guardian
Highest level of education reached? Mark one response for each person as follows:			
1. 0 years (No Grades / Standards) = No formal education (never went to school)	1.	1.	1.
2. 1-6 years (Grades 1-6 / Sub A-Std 4) = Less than primary education (didn't complete primary school)	2.	2.	2.
3. 7 years (Grade 7 / Std 5) = Primary education (completed primary school)	3.	3.	3.
4. 8-11 years (Grades 8-11 / Stds 6-9) = Some secondary education (didn't complete high school)	4.	4.	4.
5. 12 years (Grade 12 / Std 10) = Secondary education (completed senior school)	5.	5.	5.
6. 13+ years = Tertiary education (completed university / technikon / college)	6.	6.	6.
7. Don't know	7.	7.	7.

PARENTAL EMPLOYMENT: (Please circle appropriate number)

Hollingstead categories:	Biological mother	Biological father	Guardian
1. Higher executives, major professionals, owners of large businesses)	1.	1.	1.
2. Business managers of medium sized businesses, lesser professions (e.g. nurses, opticians, pharmacists, social workers, teachers)	2.	2.	2.
3. Administrative personnel, managers, minor professionals, owners / proprietors of small businesses (e.g. bakery, car dealership, engraving business, plumbing business, florist, decorator, actor, reporter, travel agent)	3.	3.	3.
4. Clerical and sales, technicians, small businesses (e.g. bank teller, bookkeeper, clerk, draftsperson, timekeeper, secretary)	4.	4.	4.
5. Skilled manual – usually having had training (e.g. baker, barber, chef, electrician, fireman, machinist, mechanic, painter, welder, police, plumber, electrician)	5.	5.	5.
6. Semi-skilled (e.g. hospital aide, painter, bartender, bus driver, cook, garage guard, checker, waiter, machine operator)	6.	6.	6.
7. Unskilled (e.g. attendant, janitor, construction helper, unspedified labour, porter, unemployed)	7.	7.	7.
8. Homemaker	8.	8.	8.
9. Student, disabled, no occupation	9.	9.	9.

MATERIAL AND FINANCIAL RESOURCES (ASSET INDEX): (Please circle appropriate number)

Which of the following items, in working order, does your household have?

Items	Yes	No
1. A refrigerator or freezer	1.	1.
2. A vacuum cleaner or polisher	2.	2.
3. A television	3.	3.
4. A hi-fi or music center (radio excluded)	4.	4.
5. A microwave oven	5.	5.
6. A washing machine	6.	6.
7. A video cassette recorder or dvd player	7.	7.

Which of the following do you have in your home?

Items	Yes	No
1. Running water	1.	1.
2. A domestic servant	2.	2.
3. At least one car	3.	3.
4. A flush toilet	4.	4.
5. A built-in kitchen sink	5.	5.
6. An electric stove or hotplate	6.	6.
7. A working telephone	7.	7.

Do you personally do any of the following?

Items	Yes	No
1. Shop at supermarkets	1.	1.
2. Use any financial services such as a bank account, ATM card or credit card	2.	2.
3. Have an account or credit card at a retail store	3.	3.

Appendix B

Demographics Questionnaire

Short Questionnaire

1. What area do you in live?

2. What material is your house made of? (E.g. bricks, wood, metal)

3. Who lives with you?

4. How many rooms does your house have?

Appendix C

Comprehensive Health Assessment Tool

CHAT NEURODISABILITY ASSESSMENT

- Every young person admitted will be seen by a member of health care staff and receive a neurodisability assessment using this tool within **10 DAYS** of arrival.
- This will be completed by a Registered Mental Health Nurse (RMN), Child and Adolescent Mental Health (CAMHS) Practitioner or a Registered Learning Disability Nurse.
- Prior to interview with the young person, review their notes and discuss their presentation/functioning with a staff member who knows them well to obtain any relevant information. Look for any evidence of special schooling, school difficulties/exclusions, early developmental problems, injuries, reports that may indicate learning disability, speech and language or social communication difficulties (autistic spectrum disorders).
- Refer to other parts of the CHAT to inform the **care plan**.

Neurodisability Assessment: Young Persons Details

Surname:	**Forenames:**	
NHS Number:	**Admission Number:**	
Gender:	**DOB:**	
Date & time of Reception Health Screening:	**Date & time of this Assessment:**	
Completed by (print your name):	**Your designation:**	**Your signature:**
Are there any neurodisability issues arising from other information? Check other CHAT parts for potential risk factors and other pertinent information. Consider any previous assessment findings and any reported speech and language and/or learning difficulties. Summarise here:-		

Traumatic Brain Injury

This section focuses specifically on Traumatic Brain Injury. Traumatic Brain Injury – is when the head receives a severe blow or jolt, for example in an accident, fall or assault, the brain can be damaged. There are other forms of Acquired Brain Injury which may have been caused by a stroke, haemorrhage, infection, hypoxic/anoxic brain injury and medical accidents. These are not included here, but check whether the young person has experienced any of these as they may influence their presentation.

Any loss of consciousness (LoC) over 30 minutes **OR** repeated loss of consciousness on more than three occasions (any length of time) where the young person has experienced symptoms following the injury:-

- **Review physical health/medical records and CHAT assessment (contact GP if necessary).**
- **Discuss with health worker need for further assessment of acquired brain injury (persistent symptoms for 3 months following a head injury requires further assessment and investigation while recent head injury also requires medical advice)**
- **For all young people who have experienced traumatic head injuries and have ongoing symptoms (those with and without LoC) take account of their symptoms within the care plan e.g. daily living skills and occupational functioning**

Tick **No** or **Yes** as appropriate for each question and include additional notes	**No**	**Yes**
Have you ever had an injury to the head that caused you to be knocked out and/or dazed and confused? E.g. from a fall, blow to the head (including boxing or fighting) or road traffic accident. If **Yes**, please explain: If **No**: move onto Learning Disability and Educational Needs	☐	☐

Surname: Forenames:
DOB: NHS Number:

Tick **No** or **Yes** as appropriate for each question and include additional notes	**No**	**Yes**
How many times have you been knocked out and/or dazed and confused? For each occasion ask how it happened. **When was the last occasion?**		
Did you seek any medical attention after being knocked out and/or dazed and confused? If **Yes**, what treatment did you receive? Did you have to stay in hospital?	☐	☐

Surname: Forenames:
DOB: NHS Number:

Describe the worst time s/he has been knocked out and/or dazed and confused					
	Dazed or confused	Unconscious for < 30 min	Unconscious for > 30 but < 60 min	Unconscious for > 60 min but < 24hrs	Unconscious > 24hrs
Road accident (as a pedestrian, cyclist or by car)					
Fall when sober					
Fall when under the influence of drink/drugs					
Sports injury e.g. boxing					
Fight					
Other					

Surname: Forenames:
DOB: NHS Number:

After a head injury or accident some people experience symptoms. We would like to know if you now suffer from any of the symptoms below. As many of these symptoms can occur normally, we would like to compare yourself now with before the accident. For each one please check the box that best describes your experiences.

Compared with before the accident, do you **NOW** suffer from:-

	Not experienced at all	**No more of a problem**	**A mild problem**	**A moderate problem**	**A severe problem**
Headaches					
Feelings of dizziness					
Nausea and/or vomiting					
Forgetfulness, poor memory					
Poor concentration					
Confusion					
Fogginess					
Difficulties recalling everyday events					

Is there a need in this area (Traumatic Brain Injury)? **If YES include need for further assessment**	**NO** ☐	**YES** ▪

Surname: Forenames:
DOB: NHS Number:

ACTION FOR CARE PLAN

INFORMATION FROM THE YOUNG PERSON Tick **No** or **Yes** as appropriate for each question and include additional notes	**No**	**Yes**
Have you struggled with schoolwork? If **Yes** please provide details below: (clarify whether in primary, secondary school or both)	☐	▪
Did you have any additional support in lessons? If **Yes** please provide details below:	▪	▪
Has anyone told you that you have a learning disability or learning needs? If **Yes** please provide details below:	▪	▪
Do you struggle with reading or writing? (show them a story in a magazine and discuss it with them) If **Yes** please provide details below:	▪	▪
Do you struggle telling the time? (check using non digital clock) If **Yes** please provide details below:	▪	▪

Surname: Forenames:
DOB: NHS Number:

Appendix D

Alcohol Use Disorders Identification Test

AUDIT questionnaire

Please circle the answer that is correct for you

1. How often do you have a drink containing alcohol?

· Never
· Monthly or less
· 2-4 times a month
· 2-3 times a week
· 4 or more times a week

2. How many standard drinks containing alcohol do you have on a typical day when drinking?

· 1 or 2
· 3 or 4
· 5 or 6
· 7 to 9
· 10 or more

3. How often do you have six or more drinks on one occasion?

· Never
· Less than monthly
· Monthly
· Weekly
· Daily or almost daily

4. During the past year, how often have you found that you were not able to stop drinking once you had started?

· Never
· Less than monthly
· Monthly
· Weekly
· Daily or almost daily

5. During the past year, how often have you failed to do what was normally expected of you because of drinking?

· Never
· Less than monthly
· Monthly
· Weekly
· Daily or almost daily

6. During the past year, how often have you needed a drink in the morning to get yourself going after a heavy drinking session?

· Never
· Less than monthly
· Monthly
· Weekly
· Daily or almost daily

7. During the past year, how often have you had a feeling of guilt or remorse after drinking?

· Never
· Less than monthly
· Monthly
· Weekly
· Daily or almost daily

8. During the past year, have you been unable to remember what happened the night before because you had been drinking?

· Never
· Less than monthly
· Monthly
· Weekly
· Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

· No
· Yes, but not in the past year
· Yes, during the past year

10. Has a relative or friend, doctor or other health worker been concerned about your drinking or suggested you cut down?

· No
· Yes, but not in the past year
· Yes, during the past year

Scoring the AUDIT

Scores for each question range from 0 to 4, with the first response for each question (eg never) scoring 0, the second (eg less than monthly) scoring 1, the third (eg monthly) scoring 2, the fourth (eg weekly) scoring 3, and the last response (eg. daily or almost daily) scoring 4. For questions 9 and 10, which only have three responses, the scoring is 0, 2 and 4 (from left to right).

A score of 8 or more is associated with harmful or hazardous drinking, a score of 13 or more in women, and 15 or more in men, is likely to indicate alcohol dependence.

Saunders JB, Aasland OG, Babor TF et al. Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption — II. Addiction 1993, 88: 791–803.

Appendix E

Alcohol, Smoking and Substance Involvement Screening Test

A. WHO - ASSIST V3.0

INTERVIEWER ID		COUNTRY		CLINIC	
PATIENT ID		DATE			

INTRODUCTION ***(Please read to patient)***

Thank you for agreeing to take part in this brief interview about alcohol, tobacco products and other drugs. I am going to ask you some questions about your experience of using these substances across your lifetime and in the past three months. These substances can be smoked, swallowed, snorted, inhaled, injected or taken in the form of pills (show drug card).

Some of the substances listed may be prescribed by a doctor (like amphetamines, sedatives, pain medications). For this interview, we will not record medications that are used as prescribed by your doctor. However, if you have taken such medications for reasons other than prescription, or taken them more frequently or at higher doses than prescribed, please let me know. While we are also interested in knowing about your use of various illicit drugs, please be assured that information on such use will be treated as strictly confidential.

NOTE: BEFORE ASKING QUESTIONS, GIVE ASSIST RESPONSE CARD TO PATIENT

Question 1
(if completing follow-up please cross check the patient's answers with the answers given for Q1 at baseline. Any differences on this question should be queried)

In your life, which of the following substances have you ever used? *(NON-MEDICAL USE ONLY)*	No	Yes
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	3
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	3
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	3
d. Cocaine (coke, crack, etc.)	0	3
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	3
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	3
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	3
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	3
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	3
j. Other - specify:	0	3

Probe if all answers are negative: "Not even when you were in school?"	*If "No" to all items, stop interview.* *If "Yes" to any of these items, ask Question 2 for each substance ever used.*

Question 2

In the past three months, how often have you used the substances you mentioned *(FIRST DRUG, SECOND DRUG, ETC)*?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	2	3	4	6
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	2	3	4	6
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	2	3	4	6
d. Cocaine (coke, crack, etc.)	0	2	3	4	6
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	2	3	4	6
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	2	3	4	6
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	2	3	4	6
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	2	3	4	6
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	2	3	4	6
j. Other - specify:	0	2	3	4	6

If "Never" to all items in Question 2, skip to Question 6.

If any substances in Question 2 were used in the previous three months, continue with Questions 3, 4 & 5 for each substance used.

Question 3

During the past three months, how often have you had a strong desire or urge to use *(FIRST DRUG, SECOND DRUG, ETC)*?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	3	4	5	6
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	3	4	5	6
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	3	4	5	6
d. Cocaine (coke, crack, etc.)	0	3	4	5	6
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	3	4	5	6
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	3	4	5	6
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	3	4	5	6
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	3	4	5	6
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	3	4	5	6
j. Other - specify:	0	3	4	5	6

Question 4

During the past three months, how often has your use of *(FIRST DRUG, SECOND DRUG, ETC)* led to health, social, legal or financial problems?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	4	5	6	7
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	4	5	6	7
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	4	5	6	7
d. Cocaine (coke, crack, etc.)	0	4	5	6	7
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	4	5	6	7
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	4	5	6	7
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	4	5	6	7
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	4	5	6	7
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	4	5	6	7
j. Other - specify:	0	4	5	6	7

Question 5

During the past three months, how often have you failed to do what was normally expected of you because of your use of *(FIRST DRUG, SECOND DRUG, ETC)*?	Never	Once or Twice	Monthly	Weekly	Daily or Almost Daily
a. Tobacco products					
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	5	6	7	8
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	5	6	7	8
d. Cocaine (coke, crack, etc.)	0	5	6	7	8
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	5	6	7	8
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	5	6	7	8
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	5	6	7	8
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	5	6	7	8
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	5	6	7	8
j. Other - specify:	0	5	6	7	8

Ask Questions 6 & 7 for all substances ever used (i.e. those endorsed in Question 1)

Question 6

Has a friend or relative or anyone else ever expressed concern about your use of *(FIRST DRUG, SECOND DRUG, ETC.)?*	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	6	3
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	6	3
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	6	3
d. Cocaine (coke, crack, etc.)	0	6	3
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	6	3
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	6	3
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	6	3
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	6	3
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	6	3
j. Other – specify:	0	6	3

Question 7

Have you ever tried and failed to control, cut down or stop using *(FIRST DRUG, SECOND DRUG, ETC.)?*	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
a. Tobacco products (cigarettes, chewing tobacco, cigars, etc.)	0	6	3
b. Alcoholic beverages (beer, wine, spirits, etc.)	0	6	3
c. Cannabis (marijuana, pot, grass, hash, etc.)	0	6	3
d. Cocaine (coke, crack, etc.)	0	6	3
e. Amphetamine type stimulants (speed, diet pills, ecstasy, etc.)	0	6	3
f. Inhalants (nitrous, glue, petrol, paint thinner, etc.)	0	6	3
g. Sedatives or Sleeping Pills (Valium, Serepax, Rohypnol, etc.)	0	6	3
h. Hallucinogens (LSD, acid, mushrooms, PCP, Special K, etc.)	0	6	3
i. Opioids (heroin, morphine, methadone, codeine, etc.)	0	6	3
j. Other – specify:	0	6	3

Question 8

	No, Never	Yes, in the past 3 months	Yes, but not in the past 3 months
Have you ever used any drug by injection? *(NON-MEDICAL USE ONLY)*	0	2	1

IMPORTANT NOTE:

Patients who have injected drugs in the last 3 months should be asked about their pattern of injecting during this period, to determine their risk levels and the best course of intervention.

PATTERN OF INJECTING	INTERVENTION GUIDELINES
Once weekly or less or Fewer than 3 days in a row	Brief Intervention including "risks associated with injecting" card
More than once per week or 3 or more days in a row	Further assessment and more intensive treatment*

HOW TO CALCULATE A SPECIFIC SUBSTANCE INVOLVEMENT SCORE.

For each substance (labelled a. to j.) add up the scores received for questions 2 through 7 inclusive. Do not include the results from either Q1 or Q8 in this score. For example, a score for cannabis would be calculated as: **Q2c + Q3c + Q4c + Q5c + Q6c + Q7c**

Note that Q5 for tobacco is not coded, and is calculated as: **Q2a + Q3a + Q4a + Q6a + Q7a**

THE TYPE OF INTERVENTION IS DETERMINED BY THE PATIENT'S SPECIFIC SUBSTANCE INVOLVEMENT SCORE

	Record specific substance score	no intervention	receive brief intervention	more intensive treatment *
a. tobacco		0 - 3	4 - 26	27+
b. alcohol		0 - 10	11 - 26	27+
c. cannabis		0 - 3	4 - 26	27+
d. cocaine		0 - 3	4 - 26	27+
e. amphetamine		0 - 3	4 - 26	27+
f. inhalants		0 - 3	4 - 26	27+
g. sedatives		0 - 3	4 - 26	27+
h. hallucinogens		0 - 3	4 - 26	27+
i. opioids		0 - 3	4 - 26	27+
j. other drugs		0 - 3	4 - 26	27+

NOTE: *FURTHER ASSESSMENT AND MORE INTENSIVE TREATMENT may be provided by the health professional(s) within your primary care setting, or, by a specialist drug and alcohol treatment service when available.

Appendix F

Maudsley Addiction Profile

SECTION B: SUBSTANCE USE

CARD 1

None	1 day only	2 days only	3 days only	1 day a week	2 days a week	3 days a week	4 days a week	5 days a week	6 days a week	Every day	Some other number
0	1	2	3	4	9	13	17	21	26	30	

CARD 2

Oral	Snort/sniff	Smoke/chase	Intravenous	Intramuscular
1	2	3	4	9

a. Enter number of days used in past 30 days [Card 1] – enter "0" for no use;
b. Enter amount used on a typical day in the past 30 days [verbatim]
c. Record route(s) of administration [Card 2]

SUBSTANCE	DAYS USED	AMOUNT USED ON TYPICAL DAY	ROUTE(S)
B1. Alcohol			
B2. Heroin			
B3. Illicit methadone			
B4. Illicit benzodiazepine		Drug:	
B4. Cocaine powder			
B5. Crack cocaine			
B6. Amphetamine			
B7. Cannabis			
B8. Other:			

Appendix G

Beck Depression Inventory

Beck's Depression Inventory

This depression inventory can be self-scored. The scoring scale is at the end of the questionnaire.

1.
- 0 I do not feel sad.
- 1 I feel sad
- 2 I am sad all the time and I can't snap out of it.
- 3 I am so sad and unhappy that I can't stand it.

2.
- 0 I am not particularly discouraged about the future.
- 1 I feel discouraged about the future.
- 2 I feel I have nothing to look forward to.
- 3 I feel the future is hopeless and that things cannot improve.

3.
- 0 I do not feel like a failure.
- 1 I feel I have failed more than the average person.
- 2 As I look back on my life, all I can see is a lot of failures.
- 3 I feel I am a complete failure as a person.

4.
- 0 I get as much satisfaction out of things as I used to.
- 1 I don't enjoy things the way I used to.
- 2 I don't get real satisfaction out of anything anymore.
- 3 I am dissatisfied or bored with everything.

5.
- 0 I don't feel particularly guilty
- 1 I feel guilty a good part of the time.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

6.
- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

7.
- 0 I don't feel disappointed in myself.
- 1 I am disappointed in myself.
- 2 I am disgusted with myself.
- 3 I hate myself.

8.
- 0 I don't feel I am any worse than anybody else.
- 1 I am critical of myself for my weaknesses or mistakes.
- 2 I blame myself all the time for my faults.
- 3 I blame myself for everything bad that happens.

9.
- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

10.
- 0 I don't cry any more than usual.
- 1 I cry more now than I used to.
- 2 I cry all the time now.
- 3 I used to be able to cry, but now I can't cry even though I want to.

11.

0 I am no more irritated by things than I ever was.
1 I am slightly more irritated now than usual.
2 I am quite annoyed or irritated a good deal of the time.
3 I feel irritated all the time.

12.

0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.

13.

0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions more than I used to.
3 I can't make decisions at all anymore.

14.

0 I don't feel that I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel there are permanent changes in my appearance that make me look unattractive
3 I believe that I look ugly.

15.

0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.

16.

0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.

17.

0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.

18.

0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.

19.

0 I haven't lost much weight, if any, lately.
1 I have lost more than five pounds.
2 I have lost more than ten pounds.
3 I have lost more than fifteen pounds.

20.

0 I am no more worried about my health than usual.
1 I am worried about physical problems like aches, pains, upset stomach, or constipation.
2 I am very worried about physical problems and it's hard to think of much else.
3 I am so worried about my physical problems that I cannot think of anything else.

21.

0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I have almost no interest in sex.
3 I have lost interest in sex completely.

INTERPRETING THE BECK DEPRESSION INVENTORY

Now that you have completed the questionnaire, add up the score for each of the twenty-one questions by counting the number to the right of each question you marked. The highest possible total for the whole test would be sixty-three. This would mean you circled number three on all twenty-one questions. Since the lowest possible score for each question is zero, the lowest possible score for the test would be zero. This would mean you circles zero on each question. You can evaluate your depression according to the Table below.

Total Score	Levels of Depression
1-10	These ups and downs are considered normal
11-16	Mild mood disturbance
17-20	Borderline clinical depression
21-30	Moderate depression
31-40	Severe depression
over 40	Extreme depression

Appendix H

Child Behaviour Checklist, Youth Self Report

Please print **CHILD BEHAVIOR CHECKLIST FOR AGES 6-18** For office use only ID #

CHILD'S FULL NAME First Middle Last

CHILD'S GENDER ☐ Boy ☐ Girl | CHILD'S AGE | CHILD'S ETHNIC GROUP OR RACE

TODAY'S DATE Mo. ____ Day ____ Year ____ | CHILD'S BIRTHDATE Mo. ____ Day ____ Year ____

GRADE IN SCHOOL _____

NOT ATTENDING SCHOOL ☐

Please fill out this form to reflect *your* view of the child's behavior even if other people might not agree. Feel free to print additional comments beside each item and in the space provided on page 2. ***Be sure to answer all items.***

PARENTS' USUAL TYPE OF WORK, even if not working now.
(Please be specific — for example, auto mechanic, high school teacher, homemaker, laborer, lathe operator, shoe salesman, army sergeant.)
PARENT 1 (or FATHER)
TYPE OF WORK _____
PARENT 2 (or MOTHER)
TYPE OF WORK _____

THIS FORM FILLED OUT BY: (print your full name)

_____

Your gender: ☐ Male ☐ Female

Your relation to the child:
☐ Biological Parent ☐ Step Parent ☐ Grandparent
☐ Adoptive Parent ☐ Foster Parent ☐ Other (specify)

I. Please list the sports your child most likes to take part in. For example: swimming, baseball, skating, skate boarding, bike riding, fishing, etc.

☐ None
a. _____
b. _____
c. _____

Compared to others of the same age, about how much time does he/she spend in each?

	Less Than Average	Average	More Than Average	Don't Know
a.	☐	☐	☐	☐
b.	☐	☐	☐	☐
c.	☐	☐	☐	☐

Compared to others of the same age, how well does he/she do each one?

	Below Average	Average	Above Average	Don't Know
a.	☐	☐	☐	☐
b.	☐	☐	☐	☐
c.	☐	☐	☐	☐

II. Please list your child's favorite hobbies, activities, and games, other than sports. For example: video games, dolls, reading, playing, crafts, cars, computers, singing, etc. (Do ***not*** include listening to radio, TV, or other media.)

☐ None
a. _____
b. _____
c. _____

Compared to others of the same age, about how much time does he/she spend in each?

	Less Than Average	Average	More Than Average	Don't Know
a.	☐	☐	☐	☐
b.	☐	☐	☐	☐
c.	☐	☐	☐	☐

Compared to others of the same age, how well does he/she do each one?

	Below Average	Average	Above Average	Don't Know
a.	☐	☐	☐	☐
b.	☐	☐	☐	☐
c.	☐	☐	☐	☐

III. Please list any organizations, clubs, teams, or groups your child belongs to.

☐ None
a. _____
b. _____
c. _____

Compared to others of the same age, how active is he/she in each?

	Less Active	Average	More Active	Don't Know
a.	☐	☐	☐	☐
b.	☐	☐	☐	☐
c.	☐	☐	☐	☐

IV. Please list any jobs or chores your child has. For example: doing dishes, babysitting, making bed, working in store, etc. (Include both paid and unpaid jobs and chores.)

☐ None
a. _____
b. _____
c. _____

Compared to others of the same age, how well does he/she carry them out?

	Below Average	Average	Above Average	Don't Know
a.	☐	☐	☐	☐
b.	☐	☐	☐	☐
c.	☐	☐	☐	☐

Be sure you answered all items. Then see other side.

1-15 Edition - 201

Please print. Be sure to answer all items.

V. 1. About how many close friends does your child have? (Do *not* include brothers & sisters)

❒ None ❒ 1 ❒ 2 or 3 ❒ 4 or more

2. About how many times a week does your child do things with any friends outside of regular school hours? (Do *not* include brothers & sisters) ❒ Less than 1 ❒ 1 or 2 ❒ 3 or more

VI. Compared to others of his/her age, how well does your child:

	Worse	Average	Better	
a. Get along with his/her brothers & sisters?	❒	❒	❒	❒ Has no brothers or sisters
b. Get along with other kids?	❒	❒	❒	
c. Behave with his/her parents?	❒	❒	❒	
d. Play and work alone?	❒	❒	❒	

VII. 1. Performance in academic subjects. ❒ **Does not attend school because** _____

Check a box for each subject that child takes	Failing	Below Average	Average	Above Average
a. Reading, English, or Language Arts	❒	❒	❒	❒
b. History or Social Studies	❒	❒	❒	❒
c. Arithmetic or Math	❒	❒	❒	❒
d. Science	❒	❒	❒	❒
e. _____	❒	❒	❒	❒
f. _____	❒	❒	❒	❒
g. _____	❒	❒	❒	❒

Other academic subjects–for example: computer courses, foreign language, business. Do ***not*** include gym, shop, driver's ed., or other nonacademic subjects.

2. Does your child receive special education or remedial services or attend a special class or special school?

❒ No ❒ Yes—kind of services, class, or school:

3. Has your child repeated any grades? ❒ No ❒ Yes—grades and reasons:

4. Has your child had any academic or other problems in school? ❒ No ❒ Yes—please describe:

When did these problems start?

Have these problems ended? ❒ No ❒ Yes–when?

Does your child have any illness or disability (either physical or mental)? ❒ No ❒ Yes—please describe:

What concerns you most about your child?

Please describe the best things about your child.

Please print. Be sure to answer all items.

Below is a list of items that describe children and youths. For each item that describes your child ***now or within the past 6 months***, please circle the ***2*** if the item is ***very true or often true*** of your child. Circle the ***1*** if the item is ***somewhat or sometimes true*** of your child. If the item is ***not true*** of your child, circle the ***0***. Please answer all items as well as you can, even if some do not seem to apply to your child.

0 = Not True (as far as you know) **1 = Somewhat or Sometimes True** **2 = Very True or Often True**

0 1 2 1. Acts too young for his/her age
0 1 2 2. Drinks alcohol without parents' approval (describe): _____
_____
0 1 2 3. Argues a lot
0 1 2 4. Fails to finish things he/she starts
0 1 2 5. There is very little he/she enjoys
0 1 2 6. Bowel movements outside toilet
0 1 2 7. Bragging, boasting
0 1 2 8. Can't concentrate, can't pay attention for long
0 1 2 9. Can't get his/her mind off certain thoughts; obsessions (describe): _____
_____
0 1 2 10. Can't sit still, restless, or hyperactive
0 1 2 11. Clings to adults or too dependent
0 1 2 12. Complains of loneliness
0 1 2 13. Confused or seems to be in a fog
0 1 2 14. Cries a lot
0 1 2 15. Cruel to animals
0 1 2 16. Cruelty, bullying, or meanness to others
0 1 2 17. Daydreams or gets lost in his/her thoughts
0 1 2 18. Deliberately harms self or attempts suicide
0 1 2 19. Demands a lot of attention
0 1 2 20. Destroys his/her own things
0 1 2 21. Destroys things belonging to his/her family or others
0 1 2 22. Disobedient at home
0 1 2 23. Disobedient at school
0 1 2 24. Doesn't eat well
0 1 2 25. Doesn't get along with other kids
0 1 2 26. Doesn't seem to feel guilty after misbehaving
0 1 2 27. Easily jealous
0 1 2 28. Breaks rules at home, school, or elsewhere
0 1 2 29. Fears certain animals, situations, or places, other than school (describe): _____
_____
0 1 2 30. Fears going to school
0 1 2 31. Fears he/she might think or do something bad
0 1 2 32. Feels he/she has to be perfect
0 1 2 33. Feels or complains that no one loves him/her
0 1 2 34. Feels others are out to get him/her
0 1 2 35. Feels worthless or inferior
0 1 2 36. Gets hurt a lot, accident-prone
0 1 2 37. Gets in many fights
0 1 2 38. Gets teased a lot
0 1 2 39. Hangs around with others who get in trouble
0 1 2 40. Hears sounds or voices that aren't there (describe): _____
_____
0 1 41. Impulsive or acts without thinking
0 1 2 42. Would rather be alone than with others
0 1 2 43. Lies or cheats
0 1 2 44. Bites fingernails
0 1 2 45. Nervous, highstrung, or tense
0 1 2 46. Nervous movements or twitching (describe): _____
_____
0 1 47. Nightmares
0 1 2 48. Not liked by other kids
0 1 2 49. Constipated, doesn't move bowels
0 1 2 50. Too fearful or anxious
0 1 2 51. Feels dizzy or lightheaded
0 1 2 52. Feels too guilty
0 1 2 53. Overeating
0 1 2 54. Overtired without good reason
0 1 2 55. Overweight
56. Physical problems ***without known medical cause:***
0 1 2 a. Aches or pains (***not*** stomach or headaches)
0 1 2 b. Headaches
0 1 2 c. Nausea, feels sick
0 1 2 d. Problems with eyes (***not*** if corrected by glasses) (describe): _____
0 1 2 e. Rashes or other skin problems
0 1 2 f. Stomachaches
0 1 2 g. Vomiting, throwing up
0 1 2 h. Other (describe): _____
_____

Please print. Be sure to answer all items.

0 = Not True (as far as you know) **1 = Somewhat or Sometimes True** **2 = Very True or Often True**

0 1 2 57. Physically attacks people
0 1 2 58. Picks nose, skin, or other parts of body (describe): _____
_____

0 1 2 59. Plays with own sex parts in public
0 1 2 60. Plays with own sex parts too much

0 1 2 61. Poor school work
0 1 2 62. Poorly coordinated or clumsy

0 1 2 63. Prefers being with older kids
0 1 2 64. Prefers being with younger kids

0 1 2 65. Refuses to talk
0 1 2 66. Repeats certain acts over and over; compulsions (describe): _____
_____

0 1 2 67. Runs away from home
0 1 2 68. Screams a lot

0 1 2 69. Secretive, keeps things to self
0 1 2 70. Sees things that aren't there (describe): _____
_____
_____

0 1 2 71. Self-conscious or easily embarrassed
0 1 2 72. Sets fires

0 1 2 73. Sexual problems (describe): _____
_____
_____

0 1 2 74. Showing off or clowning

0 1 2 75. Too shy or timid
0 1 2 76. Sleeps less than most kids

0 1 2 77. Sleeps more than most kids during day and/or night (describe): _____
_____

0 1 2 78. Inattentive or easily distracted

0 1 2 79. Speech problem (describe): _____
_____

0 1 2 80. Stares blankly

0 1 2 81. Steals at home
0 1 2 82. Steals outside the home

0 1 2 83. Stores up too many things he/she doesn't need (describe): _____
_____
_____

0 1 2 84. Strange behavior (describe): _____
_____

0 1 2 85. Strange ideas (describe): _____
_____

0 1 2 86. Stubborn, sullen, or irritable
0 1 2 87. Sudden changes in mood or feelings

0 1 2 88. Sulks a lot
0 1 2 89. Suspicious

0 1 2 90. Swearing or obscene language
0 1 2 91. Talks about killing self

0 1 2 92. Talks or walks in sleep (describe): _____
_____

0 1 2 93. Talks too much

0 1 2 94. Teases a lot
0 1 2 95. Temper tantrums or hot temper

0 1 2 96. Thinks about sex too much
0 1 2 97. Threatens people

0 1 2 98. Thumb-sucking
0 1 2 99. Smokes, chews, or sniffs tobacco

0 1 2 100. Trouble sleeping (describe): _____
_____

0 1 2 101. Truancy, skips school

0 1 2 102. Underactive, slow moving, or lacks energy
0 1 2 103. Unhappy, sad, or depressed

0 1 2 104. Unusually loud
0 1 2 105. Uses drugs for nonmedical purposes (***don't*** include alcohol or tobacco) (describe): _____
_____
_____

0 1 2 106. Vandalism
0 1 2 107. Wets self during the day

0 1 2 108. Wets the bed
0 1 2 109. Whining

0 1 2 110. Wishes to be of opposite sex
0 1 2 111. Withdrawn, doesn't get involved with others

0 1 2 112. Worries
113. Please write in any problems your child has that were not listed above:
0 1 2 _____
0 1 2 _____
0 1 2 _____

Please be sure you answered all items.

Appendix I

Parental consent form

UCT Department of Psychology

Parent Consent Form – Non-offenders

Informed Consent to Participate in Research and Authorization for Collection, Use, and Disclosure of Questionnaire and Other Personal Data

Your son is being asked to take part in a research study. This form provides you with information about the study and asks for your permission for your son to part take in the research study. Consent is also asked for the collection of questionnaire data, as well as other information (demographics and information about income) necessary from you. Signing this will also give the researcher permission to access medical records of your son in order to confirm any head injuries. The Principal Investigator (the person in charge of this research) or a representative of the Principal Investigator will describe this study to you and answer all of your questions before you sign this consent form. Your son's participation is entirely voluntary. Before you decide whether or not he may take part, read the information below and ask questions about anything you do not understand. You and/or your son will not be disadvantaged in any way by not participating in this study.

1. **Name of Participant ("Study Subject")**

_____

2. **Title of Research Study**

   The prevalence of traumatic brain injury and an investigation of behavioural, emotional and executive functioning in a sample of male young offenders.

3. **Principal Investigators and Telephone Numbers**

Jamie Lee Adams
Kimberly Blake
Melissa Gouws
Zayaan Goolam Nabi
Asheeqa Petersen
Honours in Psychology (students)
Department of Psychology
University of Cape Town
021 650 3417

Nina Steenkamp
MA in Neuropsychology (student)
Department of Psychology
University of Cape Town
021 650 3417

Dr Leigh Schrieff-Elson
Supervisor
Department of Psychology
University of Cape Town
021 650 3708

4. Source of Funding or Other Material Support

National Research Foundation.

5. What is the purpose of this research study?

The purpose of this research is to investigate the prevalence of traumatic brain injury (TBI) among young offenders and non-offenders in the Western Cape; and to investigate their behaviour (e.g., aggression and anti-social traits), emotional outcomes (e.g., feeling happy or angry), and executive functioning (e.g., thinking, planning, and flexibility) by administering neuropsychological pen and paper measures and questionnaires.

6. What will be done if you take part in this research study?

You will be asked to complete a parent/caregiver information and socio-economic status questionnaire, a questionnaire about your son's developmental history, and you will be asked questions regarding your son's behaviour.

7. If you choose to participate in this study, how long will you be expected to participate in the research?

Completing the questionnaires will take place during one session, which should not last longer than one hour. If at any time during the session you wish to stop your participation, you are free to do so without penalty.

8. How many people are expected to participate in the research?

200, 100 non-offenders and 100 young offenders

9. What are the possible discomforts and risks?

There are no known risks associated with participation in this study. Should you or your son get tired during the study, you will be allowed to rest. If you wish to discuss the information above or any discomforts you may experience, you may ask questions now or call the Principal Investigators listed in #3 of this form.

10a. What are the possible benefits to you?

You or your son may or may not personally benefit from participating in this study but the findings may help in our understanding of the cognitive, behavioural and emotional outcomes of young offenders with and without TBI. Should behavioural problems be identified during the process of this study, your son will be referred to the school counsellor or to the nearest Western Cape Education department school clinic if there is no counsellor at your son's school.

10b. What are the possible benefits to others?

The information gained from this research study will help improve our understanding of the offending behaviour of young offenders with TBI.

11. If you choose to take part in this research study, will it cost you anything?

Participating in this study will not cost you anything.

12. Will you receive compensation for taking part in this research study?

Your son will receive a R50 Checkers shopping voucher.

13a. Can you withdraw from this research study?

You and your son are free to withdraw your consent and to stop participating in this research study at any time. If you do withdraw your consent, there will be no penalty. If you have any questions regarding your rights in this research, you may phone the Psychology Department office and get in touch with Rosalind Adams.

Her email address is rosalind.adams@uct.ac.za or you may contact her via telephone – 021 650 3417.

13b. If you withdraw, can information about you still be used and/or collected?

Information already collected may be used.

14. Once personal and performance information is collected, how will it be kept secret (confidential) in order to protect your privacy?

Only certain people have the right to review these research records. These people include the researchers for this study and certain University of Cape Town officials. Your research records will not be released without your permission unless required by law or a court order. Your son's identity will not be revealed and all the information you give will be strictly confidential. Any information collected will have your name removed so that it is anonymous.

15. What information about you may be collected, used and shared with others?

This information gathered from you will be demographic information, information on your son's developmental history, and records of your responses to questionnaires regarding your son's behaviour. If you agree to be in this research study, it is possible that some of the information collected might be copied into a "limited data set" to be used for other research purposes. If so, the limited data set may only include information that does not directly identify you. For example, the limited data set cannot include your name, address, telephone number, ID number, or any other numbers or codes that link you to the information in the limited data set.

16. Signatures

As a representative of this study, I have explained to the participant the purpose, the procedures, the possible benefits, and the risks of this research study; and how the participant's performance and other data will be collected, used, and shared with others:

_____ _____

Signature of Person Obtaining Consent and Authorization **Date**

You have been informed about this study's purpose, procedures, possible benefits, and risks; and how your performance and other data will be collected, used and shared with others. You have received a copy of this form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time.

You voluntarily agree to participate in this study. You hereby authorize the collection, use and sharing of your performance and other data. By signing this form, you are not giving away any of your legal rights.

_____ _____

Signature of Person Consenting and Authorizing **Date**

Please indicate below if you would like to be notified of future research projects conducted by our research group:

_____ (initial) Yes, I would like to be added to your research participation pool and be notified of research projects in which I might participate in the future.

Method of contact:

Phone number: _____

E-mail address: _____

Mailing address: _____

_____

Appendix J

Participant Assent Form

UCT Department of Psychology

Participant Assent Form

PERMISSION TO PARTICIPATE IN RESEARCH

We are inviting you to be in our research study. We would like to learn more about traumatic brain injuries and associated behaviours of young people. In order to do this, we are talking to young people who have had such an injury and also to those who have never had such an injury.

If you agree to be in this study, we will ask you to meet with us twice. During the first session, we will ask you to answer some questions about your life. These may be very personal questions about your behaviour. This session will last approximately 1 hour. During the second session, we will ask you to do pen and paper tasks with us that will help us to understand your thinking and behaviour better. This session will be approximately 2 hours long.

Taking part in this study will not place you at risk in any way. These activities will not harm you, but some of them may be long and you may feel tired at times. If you do, you can stop and rest at any time. There will be no penalty if you choose not to be part of this study or if you choose to stop being part of it. Other than receiving refreshments during the sessions and being compensated with a R50 checkers voucher at the end of the second session for your participation, there are no known personal benefits to taking part in this study. You will, however, be helping us to better understand behaviours associated with having a traumatic brain injury.

Your identity will not be revealed and all the information you give will be strictly confidential. Any information collected will have your name removed so that it is anonymous, and only certain people will have access to the data.
It will only be used for academic research purposes; such as in a research report.

If you sign this paper it means that you would like to take part in this study. If you would not like to take part in this study, you do not have to sign this form. It is up to you. Before you say whether you want to be part of this study or not, I will answer any questions that you may have. If you have a question later that you didn't think of now, you can ask me next time.

You are free to withdraw your permission and to stop participating in this research study at any time. If you do withdraw your consent, there will be no penalty.
If you have any questions regarding your rights in this research, you may phone the Psychology Department office and get in touch with Rosalind Adams.
Her email address is rosalind.adams@uct.ac.za or you may contact her via telephone – 021 650 3417.

I would like to take part in this study:

Signature of Participant _____ Date _____

Signature of Investigator _____ Date _____

Appendix K

Debriefing form

Debriefing Letter

Thank you for partaking in the study titled: The prevalence of traumatic brain injury and an investigation of behavioural, emotional and executive functioning in a sample of male young offenders. Your participation and answers to questionnaires and interviews are appreciated.

Should you have any worries or concerns regarding your participation in this study or feel anxious or unsettled in relation to your participation, you may contact the researchers or their supervisor involved in this study: Dr. Leigh Schrieff-Elson (leigh.schrieff-elson@uct.ac.za; Tel: 021 650 3708); Researcher: Nina Steenkamp (ninasteenkamp1@gmail.com).

This current study is being conducted at UCT by a Psychology Masters and 5 Honours students. This study aims to investigate the prevalence of traumatic brain injury among young offenders as compared to non-offenders in the Western Cape; and to investigate their emotional outcomes, behavioural outcomes, and executive functioning (e.g., thinking, planning and flexibility). Thus, the information gathered from this research will enable greater understanding of offending behaviour of young offenders with TBI in a South African context and can play a role in informing interventions which aim to prevent offending from occurring in the first place

Appendix L

University of Cape Town, Psychology Department Research Ethics Approval

UNIVERSITY OF CAPE TOWN

Department of Psychology

University of Cape Town Rondebosch 7701 South Africa
Telephone (021) 650 3417
Fax No. (021) 650 4104

28 May 2018

Jamie Adams and Melissa Gouws
Department of Psychology
University of Cape Town
Rondebosch 7701

Dear Jamie and Melissa

I am pleased to inform you that ethical clearance has been given by an Ethics Review Committee of the Faculty of Humanities for your study, *Internalizing and externalizing behaviours in South African male young offenders with traumatic brain injuries*. The reference number is PSY2018-064.

I wish you all the best for your study.

Yours sincerely

University of Cape Town
PSYCHOLOGY DEPARTMENT
Upper Campus
Rondebosch

Lauren Wild (PhD)
Associate Professor
Chair: Ethics Review Committee

Appendix M

Letter of ethical approval from the Western Cape Department of Education

Western Cape Government
Education

Directorate: Research

Audrey.wyngaard@westerncape.gov.za
tel: +27 021 467 9272
Fax: 0865902282
Private Bag x9114, Cape Town, 8000
wced.wcape.gov.za

REFERENCE: 20180308–249
ENQUIRIES: Dr A T Wyngaard

Ms Nina Steenkamp
18 Vissershof Road
Bothasig
7441

Dear Ms Nina Steenkamp

RESEARCH PROPOSAL: THE PREVALENCE OF TRAUMATIC BRAIN INJURY AND AN INVESTIGATION OF BEHAVIOURAL, EMOTIONAL AND EXECUTIVE FUNCTIONING IN A SAMPLE OF MALE YOUNG OFFENDERS

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The Study is to be conducted from **02 April 2018 till 28 September 2018**
6. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
7. Should you wish to extend the period of your survey, please contact Dr A.T Wyngaard at the contact numbers above quoting the reference number?
8. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
9. Your research will be limited to the list of schools as forwarded to the Western Cape Education Department.
10. A brief summary of the content, findings and recommendations is provided to the Director: Research Services.
11. The Department receives a copy of the completed report/dissertation/thesis addressed to:

    The Director: Research Services
    Western Cape Education Department
    Private Bag X9114
    CAPE TOWN
    8000

We wish you success in your research.

Kind regards.
Signed: Dr Audrey T Wyngaard
Directorate: Research
DATE: 09 March 2018

Appendix N

Ethical approval for Ockhuizen's 2014 Study

University of Cape Town, Psychology Department Research Ethics Committee Approval

DEPARTMENT OF PSYCHOLOGY

REPORT OF THESIS COMMITTEE

Student Name: (HELEN) JU-REYN OCKHUIZEN

Student #: OCKHEL001

Degree: MA NEUROPSYCHOLOGY

Title (as proposed) THE PREVALENCE OF TBI AND AN INVESTIGATION OF EXECUTIVE FUNCTIONING AMONG THOSE THAT HAVE SUSTAINED A TBI) IN A SAMPLE OF JUVENILE DELINQUENT BOYS

Supervisor: LEIGH SCHRIEFF

Co-supervisor: –

Committee members: PROF. MARK SOLMS

DR. LAUREN WILD

DR. SUSAN MALCOLM-SMITH

WE:

1. Approve the proposal, and recommend that the student continue with the research.

(2.) Approve the proposal, and recommend that the student may continue with the research. However, we recommend that change(s), as noted below, be incorporated in the research, to the satisfaction of the supervisor.
Assent form adapted ;

(3.) Approve the proposal in terms of its ethical implications. If necessary, explanatory notes appear below.

4. Find the proposal unsatisfactory, for the reason(s) listed below. The student is hereby requested to re-present the proposal to a departmental thesis committee by _____.

NOTES: