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Mapping externalizing behaviours across South African high school boys

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Abstract

Adolescent externalizing behaviour (EB), constituting of rule-breaking and aggressive behaviour, has consistently been linked to later criminality. Substance use is a common form of rule-breaking amongst adolescents. Given the association between adolescent EB and criminality, it is important to explore this topic in crime-ridden settings. Additionally, crime is reported to be predominantly committed by males. Due to the notable dearth of studies on EB within a South African context, this study aimed to investigate the prevalence of EB amongst South African high school males, across early (13-14 years) and late (15-18 years) adolescence. We hypothesized that rule-breaking behaviour (including substance use) would be more prevalent than aggression across both age groups and that rule-breaking behaviour (including substance use) would be more prevalent in the older age group than the younger age group. Due to the COVID-19 pandemic, we used data collected previously in a larger study with similar sample characteristics, recruited via purposive sampling, and self-report measures, including the Child Behaviour Checklist. Our results support our second hypothesis. However, rule-breaking behaviour, was more prevalent than aggression in both age groups, whereas substance use was only found to be more prevalent in the older age group. This evidence provides some potential insight into EB amongst South African high school males, which, if expanded upon, could be used to inform interventions targeted at minimising adverse outcomes associated with such behaviours within the adolescent period. Hence, this study creates a foundation for future research on this topic within a South African context.

Keywords: externalizing behaviour, aggression, rule-breaking, substance use, male, youth, adolescents, Child Behaviour Checklist, South Africa

The recent urgency to focus on research based on externalizing behaviour is due to its association with prospective criminality (Givens & Reid, 2019; Liu, 2004). Externalizing behaviour is broadly defined as conduct issues apparent in an individual's outward behaviour (Synmeou & Georgiou, 2017). The Child Behaviour Checklist (CBCL), a commonly used measure of externalizing behaviours internationally (Achenbach, 1991; Ameis et al., 2014; Brasil & Bordin, 2010; Carneiro et al., 2016; Fleckman et al., 2016; Givens & Reid, 2019), classifies externalizing behaviour as rule-breaking behaviour and aggressive behaviour (Achenbach, 1991; Fleckman et al., 2016; Harden et al., 2015). Moreover, studies have identified substance use as a form of rule-breaking behaviour among adolescents (Border et al., 2018; Givens & Reid, 2019; Griffith-Lendering et al., 2011; Hasan & Husain, 2016; Kelly et al., 2015; Peeters et al., 2019; Sarracino et al., 2011). Given the link between externalizing behaviour and potential criminality (Salihovic & Stattin, 2017), investigating these types of behaviours in settings fraught with crime is important.

South Africa is one of the most violent countries in the world. Recent crime statistics include that during the 2018/19 period there was a total of 617, 210 violent contact crimes (Statistics South Africa, 2019). These reported statistics are in stark contrast with the violent crime statistics reported in Australia, for example, where there have been less than 100 incidences of violent crimes per 100, 000 people (OSAC, 2019). Further, it has been reported that males are predominantly the perpetrators of violent crime and have been overrepresented among young offenders in South Africa (Department of Correctional Services, 2008). Several studies have also ascertained that males display more externalizing behaviours in comparison to females (Border et al., 2018; Givens & Reid, 2019). Externalizing behaviours show a developmental trajectory, where such behaviours tend to exacerbate over time, and thus, is pivotal to identify such behaviours in their embryonic state before the effects thereof become detrimental. Accordingly, considering that externalizing behaviours among males during adolescence are associated with an increase in juvenile and adult arrests (Will et al., 2014), it is important to identify these behaviours in males earlier in their development, before its progressive course leads down a potentially adverse pathway.

Aggressive Behaviour

Aggressive behaviour can be defined as behaviour intended to cause injury to others. (Frick, 2016; Givens & Reid, 2019; Hasan & Husain, 2016; Liu, 2004; Orue et al., 2016).

Although not all individuals who demonstrate aggression within adolescence will display future criminality, those who do display criminal behaviour show a history of elevated aggression in adolescence (Givens & Reid, 2019). Early indicators of aggressive behaviour in adolescence show a strong progressive course to criminality, which is demonstrated by several longitudinal studies (Givens & Reid, 2019; Peeters et al., 2019; Reef et al., 2011). In sum, aggression appears to be linked with transgressive outcomes.

Rule-Breaking Behaviour

Rule-breaking is an infraction upon rules and societal laws (Givens & Reid, 2019). Research shows that rule-breaking behaviour has links to criminal conduct and consequently follows a progressive pattern to criminality (Reef et al., 2011). Rule-breaking behaviour has shown to be most prevalent in adolescence (Hyde et al., 2015). However, aggressive behaviour possesses more deleterious effects compared to rule-breaking behaviour, where individuals who showed aggressive behaviour in childhood were more involved in criminal activities in adulthood compared to those who engaged in rule-breaking behaviour (Frick, 2016; Hyde et al., 2015). Substance use is considered a form of rule-breaking behaviour (Pedersen et al., 2018; Peeters et al., 2019).

Substance Use

The link between externalizing behaviours, specifically rule-breaking behaviour, and substance use among adolescents is supported by literature (Colder et al., 2018; Givens & Reid, 2019; Patrick et al., 2016; Pedersen et al., 2018; Peeters et al., 2019). Colder et al. (2018) concluded that an increased likelihood of alcohol use was associated with elevated degrees of externalizing behaviours in a sample of adolescents. Similarly, within a large sample of adolescents aged 15 to 18 years, it was found that externalizing behaviours were significantly related to cigarette, cannabis and alcohol use (Pedersen et al., 2018). In sum, it is clear that there is a relationship between substance use and externalizing behaviours.

Externalizing Behaviour in Adolescence and Long-Term Effects

Several longitudinal studies track externalizing behaviours over time. These studies enabled researchers to trace such behaviours across or within particular developmental periods (i.e., childhood, adolescence and young adulthood) during which these behaviours are most prevalent, as well as its long-term effects (Border et al., 2018; López-Romero et al., 2012;

McGee et al., 2011; Reef et al., 2011). The studies that follow report on samples including adolescents and/or associated long term outcomes.

A longitudinal study by López-Romero et al. (2012) mapped externalizing behaviours in their sample of 138 children aged six to eleven and again at ages twelve to seventeen, six years later. They found that participants who displayed high levels of externalizing behaviours, in the initial observation, consistently displayed such behaviours in the follow up assessment, that is, during the adolescent period. In another study, Border et al. (2018) studied participants aged 12-19 years over nine years, who displayed high levels of externalizing behaviours, to trace its developmental pattern. They concluded that 51.94% of 1205 participants, who displayed externalizing behaviours from the age of 12-17 were involved in law breaking activities following their 18th birthday.

Similarly, a recent longitudinal study investigating the development of externalizing behaviours among adolescents and young adults aged 14-22 (Peeters et al., 2019), found that externalizing behaviour followed a stable pattern at ages 14, 16 and 19. Rule-breaking behaviour, such as smoking and cannabis use, showed an increase in trajectory from the ages of 14 to 19. The study concluded that high levels of externalizing behaviour, and rule-breaking in particular, during adolescence, are linked to an increased probability of unemployment and low levels of education in adulthood. The studies above point to the potential adverse outcomes associated with externalizing behaviours in adolescence. Hence, identifying levels of such behaviours in this developmental period might aid in earlier identification and tracking thereof and allow for possible intervention. Such intervention would be particularly important in settings fraught with crime.

South Africa and Crime

South Africa has a considerably high crime rate. In 2017, South Africa tallied 35.9 homicides per 100,000 people in the country. In contrast, during 2017, statistics reported for New Zealand were 0.7 homicides per 100,000 people (UNODC, 2019). Moreover, during the 2018-2019 period, 497,093 incidences of assault had been reported in South Africa (Statistics South Africa, 2019). In the same period, a total of 617,201 violent contact crimes were reported (Crime Stats 2018/19, 2019). This is in contrast to non-violent, property-related crimes that reportedly amounted to 495,161 in the same period. This highlights the consistently violent and aggressive nature of crime within South Africa. Crime rates in Cape Town during the 2018/2019

period were of the highest rate among South African cities with 13,747 crimes, which suggests impact on at least 3.17% of the total Cape Town population (SAPS, 2019). Furthermore, crime statistics for South Africa have shown that youth are amongst the leading perpetrators of violence and crime in the country (Statistics South Africa, 2017). Therefore, behaviours in adolescence that potentially contribute to these violent criminal outcomes need understanding and consequent intervention.

Rationale

Given the association between externalizing behaviours and criminality and that adolescents appear to be overrepresented in terms of perpetrators, it is especially important to understand, identify and track such behaviours in this developmental period. Doing so may then allow for possible intervention. Such intervention is especially important given that research suggests that the exhibition of externalizing behaviours during the adolescent period is typically followed by an intensification of such behaviours later on. It is noted that previous literature primarily focuses on tracking externalizing behaviours from childhood into adulthood. There is a notable lack of studies employing a cross-sectional design investigating externalizing behaviours across ages within the adolescent period specifically (e.g., comparing early and late adolescence), and which specifically focus on aggression, rule-breaking, and substance use, in the same study.

Further, given that South Africa is infamously acknowledged as the "world capital of crime" (Schuld, 2013, p.60), and the brutality with which crime is enacted as well as the fact that the males are more likely to engage in violent criminal activities as opposed to females (Bhorat et al., 2017), future studies on externalizing behaviour among males in this context may be especially significant.

Aims and Hypotheses

The primary aim of this study was to investigate the manifestation and prevalence of self-reported externalizing behaviours using the CBCL for high school males in early (13-14 years old) and late adolescence (15-18 years old). The manifestation of such behaviours refers to the different ways that these behaviours are reported by the participants (e.g., aggression and/or rule-breaking, including substance use). Regarding prevalence, here we aimed to determine whether aggressive behaviour or rule-breaking behaviour was more prevalent in younger or older age groups. We hypothesized that:

i) Rule-breaking behaviour (including substance use) would be more prevalent across age groups than aggressive behaviour

ii) Rule-breaking behaviour (including substance use) would be more prevalent in the older age group than the younger age group.

Methods

Design and Setting

This study formed part of a larger study that aimed to explore the prevalence of traumatic brain injury and investigate the behavioural, emotional, and executive functioning in a sample of male young offenders and non-offenders. This study was a sub-study of the larger study as we aimed to determine the prevalence and manifestation of specific externalizing behaviours in early and late adolescent high school males (non-offenders of the larger study). The data for the larger study was collected from four high schools within Cape Town during 2018 and 2019. We originally aimed to use the data collected as part of this larger study in our study, and to collect additional data. However, due to the current COVID-19 circumstances and related social-distancing restrictions, we had to fully rely on the previously collected data from the larger study.

This study employed a descriptive study design and made use of the Child Behaviour Checklist Youth Self-Report (CBCL, YSR) questionnaire as a measure of externalizing behaviour (aggression and rule-breaking behaviour), the Alcohol Use Disorders Identification Test (AUDIT), to measure alcohol intake, and the Maudsley Addiction Profile (MAP) and Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) as measures of substance use. This study was also cross-sectional, as the study looked at the two age divisions at a single point in time (Blanche et al., 2006). The independent variables of the proposed study were the age of the participants (younger vs. older age groups), whereas the dependent variables were externalizing behaviours (aggression, rule-breaking and substance use).

Participants

The sample in the larger study included males aged 13-18 years, fluent in English and/or Afrikaans, and from low to middle socioeconomic status backgrounds, who attended high schools within Cape Town at the time of data collection. Participants were recruited using purposive sampling, allowing for population representation (Blanche et al., 2016). The sample

for the current study included 41 participants within the early adolescent group (13 to 14 years) and 58 participants within the late adolescent group (15 to 18 years of age).

Exclusion criteria

Participants who did not meet the target sample demographics were excluded. Further, participants who scored 20 or above on the Beck's Depression Inventory, for the larger study, were excluded.

Power analysis

Using G power (Version 3.1.9.4), a priori power analysis was conducted and indicated a minimum sample size of 100 participants, with the assumption of a target power of .80 and a large effect size (Cohens $f2 = .40$) with $a = .05$. As noted, data was already collected on approximately 100 participants.

Measures

Screening Measures

Demographic Questionnaire. This questionnaire was completed by the study participants and used to obtain demographic information such as age and socio-economic status, which was controlled for in the analyses.

Beck Depression Inventory (BDI-II). The BDI-II is a measure that consists of 21 self-reported questions and is used to evaluate the existence and severity of depressive symptoms (De Sá Junior et al., 2018). The severity of depressive symptoms is rated from 0-3, with 0 representing the absence of symptoms and 3 representing severe symptoms of depression (Jackson-Koku, 2016). The BDI-II has a high test-retest reliability and an internal consistency of a=93 (Jackson-Koku, 2016). This measure has been used successfully in South African samples (Bantjes et al., 2016), with high reliability and validity reported for its use within a South African context (Makhubela & Mashegoane, 2016). The BDI-II was used to screen for depression in the data collection of the larger study during 2018 and 2019.

Substance Use Measures

Alcohol Use Disorders Identification Test (AUDIT). The AUDIT is a questionnaire developed to detect alcohol use disorders (Nadkarni et al., 2019). The AUDIT consists of 10 items and evaluates 3 conceptual areas, namely, alcohol consumption (items 1 to 3), alcohol reliance (items 4 to 6) and adverse effects associated with alcohol use (items 7 to 10 (Babor & Robaina, 2016). The AUDIT has been utilized as a screening measure for alcohol use within a

South African context, successfully (Morojele et al., 2017; Pengpid et al., 2013). This measure was used to measure alcohol intake of adolescents in the data collection of the larger study during 2018.

Maudsley Addiction Profile (MAP). The MAP is a short questionnaire, consisting of 60 items, that is used to evaluate and measure four areas namely, substance use, psychological and physical health, social and personal performance and risky health conduct, in individuals with alcohol and drug issues (Kamarzarin et al., 2012; Marsden et al., 1998). The MAP is considered a reliable measure of drug and alcohol use, reinforced by its adequate test-retest reliability (Dannatt et al., 2014; Marsden et al., 1998). Studies with a South African sample have utilised MAP successfully to screen for substance-related problems (Dannatt et al., 2014). The MAP was used to evaluate the substance use of adolescents in the data collection of the larger study during 2018.

Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST). The ASSIST is a measure used to evaluate a range of subscales specifically focusing on substance use (Dannatt et al., 2014; WHO, 2013). The ASSIST screens for psychoactive substances such as tobacco, alcohol and illegal drugs and consists of 8 questions (WHO, 2013). The ASSIST is a valid measure across cultures as well as internationally (WHO, 2013). This measure has been utilised as a screening measure successfully in a South African sample (Dannatt et al., 2014). The ASSIST was used to assess the extent of substance use among adolescents in the three months before the assessment and replaced the AUDIT and the MAP in the data collection of the broader study during 2019.

Externalizing Behaviour Measure

Child Behaviour Checklist, Youth Self-Report (CBCL, YSR). The CBCL, a measure of externalizing behaviours, serves as a high quality standardized screening tool for child and adolescent emotional, behavioural and social competency problems and makes use of self-reporting from parents, teachers and the participant themselves (Bordin et al., 2013). However, the data collected for the larger study made use of the Child Behaviour Checklist Youth Self-Report questionnaire (CBCL, YSR), which only included self-reports from learners, given poor return rates from parents and in an effort not to overburden teachers. The CBCL, YSR has been culturally and linguistically adapted for Sub-Saharan African populations and was successfully used within South Africa. (Cluver et al., 2007; Kariuki et al., 2016). Kariuki et al. (2016) found

the measure to have strong psychometric properties with a test retest reliability of 0.82 and a Cronbach's alpha reliability coefficient ranging from 0.67 to 0.95 (Kariuki et al., 2016). All of these psychometric values are highly acceptable for future use in the South African context.

The CBCL, YSR comprises two main sections, the social competence/adaptive functioning section and the behavioural profile section (Bordin et al., 2013). The larger study focused on the latter section. The behavioural profile section includes 118 items to be scored either zero (not true), one (sometimes true) or two (very true). The items provide information for three broad-band scales – internalizing behaviour, externalizing behaviour and total behaviour problems. The larger study focused on the externalizing behaviour scale. The CBCL, YSR was utilised in the data collection for the larger study in 2018 and 2019.

Procedure

The data collection process during 2018 and 2019 for the data used in this study followed the following process: Researchers applied for ethical clearance. Once ethical clearance was received from all relevant ethical bodies (see Appendix A, B & C), the data collection process commenced. Data was collected from high schools within Cape Town. The targeted high schools were contacted for permission to have the study conducted. Once the school principals agreed, consent forms (see Appendix D) were provided to the principal which were distributed to parents (for children under the age of 18). A consent form was sent directly to the participants who were of 18 years of age (see Appendix F). The parental consent forms served as permission for their children to participate in the study. Following the parents' consent, the participants received assent forms (see Appendix E) which served as an invitation to participate in the study and outlined all the necessary information associated with the study. All assented participants were then tested. All participants were interviewed at the time and venue provided by the school. The duration of the interviews was approximately one hour. The participants were provided with a Pick n Pay voucher worth R50 as well as a snack pack comprising of a fizzer, a juice box and a packet of chips.

The interviews required the completion of the measures mentioned above in addition to others relevant to the larger study. Following the interview, the participants were debriefed (see Appendix G) on the study experience and space and time was allowed for any questions and concerns participants raised about the study. The data collected was safely stored and securely computed.

Statistical Analyses

The RStudio Statistics Package was used to analyze the data. The alpha level was set to $p<0.05$. We checked assumptions of normality and homogeneity of variance before running the analyses.

Descriptive Statistics

We calculated descriptive statistics for the two age groups (13-14-year-olds and 15-18-year-olds) for: (a) mean age and standard deviation in both age groups, (b) reported frequencies of externalizing behaviour (rule-breaking and aggressive behaviour) and depression in both age groups, (c) frequencies of substance use for both age groups, (c) prevalence of externalizing behaviours amongst those who reported substance use, relative to those who did not. We made use of t-tests to determine whether there were significant differences between the two age groups on the continuous variables. In addition, we made use of chi-square tests to determine whether there were any significant differences between the two age groups on the categorical variables.

Multiple Hierarchical Regression Analysis

We made use of a multiple hierarchical regression analysis in order to determine whether the grouping variable (younger vs older age groups) significantly predicted externalizing behaviours (rule-breaking and aggressive behaviour), while controlling for depression (BDI-II).The need to control for depression is supported by research showing a relationship between the presence of depressive symptoms and externalizing behaviour in adolescence (Chan et al., 2008; Colman et al., 2009).

Ethical Considerations

For this study, we sought ethical approval from the University of Cape Town's (UCT's) Department of Psychology's Research Ethics Committee (REC).

Since we relied on data collected as part of the larger study in 2018 and 2019, we included the ethical approval documentation for the larger study in the appendices. Ethical approval and permission for previously collected data was granted by the UCT Department of Psychology's REC – PSY2017-052 (see Appendix A) and WCED respectively - 20180308-249 (see Appendix B & C).

Informed Consent and Assent. In the collection of the data for the larger study, researchers sought informed consent from participants' parents. The participants were also provided with all

the necessary information through assent forms. Those aged 18 years at the time of the study were asked to provide consent.

Voluntary participation was made clear to participants, including that non-participation and participants withdrawal from the study at any point would not result in any negative consequences to them.

Confidentiality and Anonymity. Moreover, researchers of the larger study ensured that the principles of confidentiality and anonymity were maintained, and it was also explained to participants that any information they provide would be confidential and anonymized and only utilised for the purposes of their research. Each participant was interviewed individually to ensure that confidentially was maintained. The participants' identities were anonymized by means of allocating a participant number to each participant and using this number to record their data.

The data collected was captured electronically and safeguarded in a password-protected computer. Moreover, hardcopies of the data were protected by means of storing it in a locked cupboard with limited and restricted access.

Risks and Benefits. In keeping with non-maleficence, the larger study did not pose any major risk to the participants. However, in the event that participants felt tired, they were allowed to rest. Due to the personal nature of the questions posed in this study, the participants were potentially at risk of experiencing psychological distress and thus, were informed about school counselling services that were available to them. In the event that participants reported risky behaviours to the point of concern i.e., if they scored high in the clinical range of the CBCL and substance use measures mentioned, they were referred to the school counselor.

Results

Sample Characteristics

There were initially 108 participants in the sample. However, one participant's data was removed because it was an outlier on the CBCL measure, relative to the rest of the data. Further, all participants with BDI scores over 20 were excluded, resulting in a total number of 80 participants. Of these 80 participants, 34 were in the younger age group (ages 13-14 years; M=13.75, *SD* = 0.44) and 46 were in the older age group (ages 15-18 years; M = 16.10; *SD* = 1.22). Table 1 shows the descriptive statistics for the CBCL (externalizing behaviours,

aggression, rule-breaking) and BDI-II (depression). Results show that reports of aggression, rule-breaking and externalizing behaviour were significantly more prevalent in older age groups than younger age groups. However, no significant between-group differences were found for the BDI-II scores.

Table 1

Descriptive statistics of younger (13-14 years) and older (15-18 years) age groups for aggression, rule-breaking, externalizing behaviour and depression

	Group					95% CI	
	Younger	Older				Younger	Older
Variable	(*n*=34)	(*n*=46)	*T*	*p*	ESE	*ci_lower-ci_upper*	*ci_lower - ci_upper*
Aggression	52.74 (3.91)	55.33 (6.41)	-2.24	0.03*	0.23	51.42-54.05	53.47-57.18
Rule-Breaking	53.71 (5.25)	58.11 (7.59)	-3.07	0.003*	0.31	51.94-55.47	55.92-60.30
Externalizing behaviour	48.47 (9.53)	54.37 (9.55)	-2.74	0.008*	0.30	45.27-51.61	51.61-57.13
Depression	10.53 (4.43)	11.33 (4.48)	-.79	0.43	0.09	9.04-12.02	10.03-12.62

Note. Means with standard deviations in parentheses are depicted above. Rule-breaking, aggression and externalizing behaviour was measured with the CBCL. Depression was measured with the BDI-II. T-test conducted and reported in this table. ESE = effect size estimate (Cohen's d). CI= Confidence Intervals, ci_lower=Lower confidence interval limit, ci_upper=Upper confidence interval limit, *p<0.05.

Table 2 shows the qualitative ranges for the CBCL scores and the frequencies with which participants' scores fell within these categories for rule-breaking behaviour and aggression. As shown in Table 2, there was a higher prevalence of scores in the normal range on the CBCL in the younger age group, while there was a higher prevalence of scores in the borderline and clinical range on the CBCL in the older age group. This highlights that the older age group demonstrated more problematic externalizing behaviours than the younger age group. Further, a higher percentage of scores fell within the normal range for aggression relative to rule-breaking; and, inversely, more borderline and clinical scores were reported for rule-breaking behaviour, especially for the older group. It is also clear that the maximum scores within in the clinical

range on the CBCL are higher in the older age group relative to the younger age group, also indicating potentially more problematic levels of externalizing behaviour within this group.

Table 2

Frequency of scores within the Child Behaviour Checklist (CBCL) categories for both age groups

	Older age group			Younger age group		
	Normal	Borderline	Clinical	Normal	Borderline	Clinical
Rule-breaking	24 (52.17)	12 (26.09)	10 (21.74)	28 (82.35)	4 (11.76)	2 (5.88)
	50-58	60-64	65-74	50-58	60-62	65-69
Aggression	36 (78.26)	6 (13.04)	4 (8.70)	30 (88.24)	4 (11.76)	0 (0)
	50-58	60-61	65-77	50-58	60-63	

Note. Percentages reported in parentheses. Ranges reported below. Responses are scored on a Likert-type scale. There are three possible responses: "very often true"; "somewhat or sometimes true"; or "never true". T-scores for these scales ranging from 60 to 65 are classified as 'borderline' and t-scores above 65 are classified as being in the 'clinical' range.

Table 3 shows the frequencies of substance use as reported for the younger and older age groups. As shown in Table 3, reports of substance use is significantly more prevalent in the older age group than younger age group. As illustrated in Figure 1, reports of alcohol use, cannabis use and cigarette use account for the significant mean difference between older and younger age groups.

Table 3

Frequencies of substance use for younger (13-14 years) and older (15-18 years) age groups

	Group			
	Younger	Older		
Reported	(n=34)	(n=46)	$\chi 2$	*p*
No substance use	19 (55.88)	11 (23.91)	7.22	0.007*
Substance use	15 (44.12)	35 (76.09)		

Note: Percentages reported in parentheses. Chi-squared test conducted and reported in table, *p<0.05.

Figure 1

Reports of specific substances used in both age groups (younger vs older age groups)

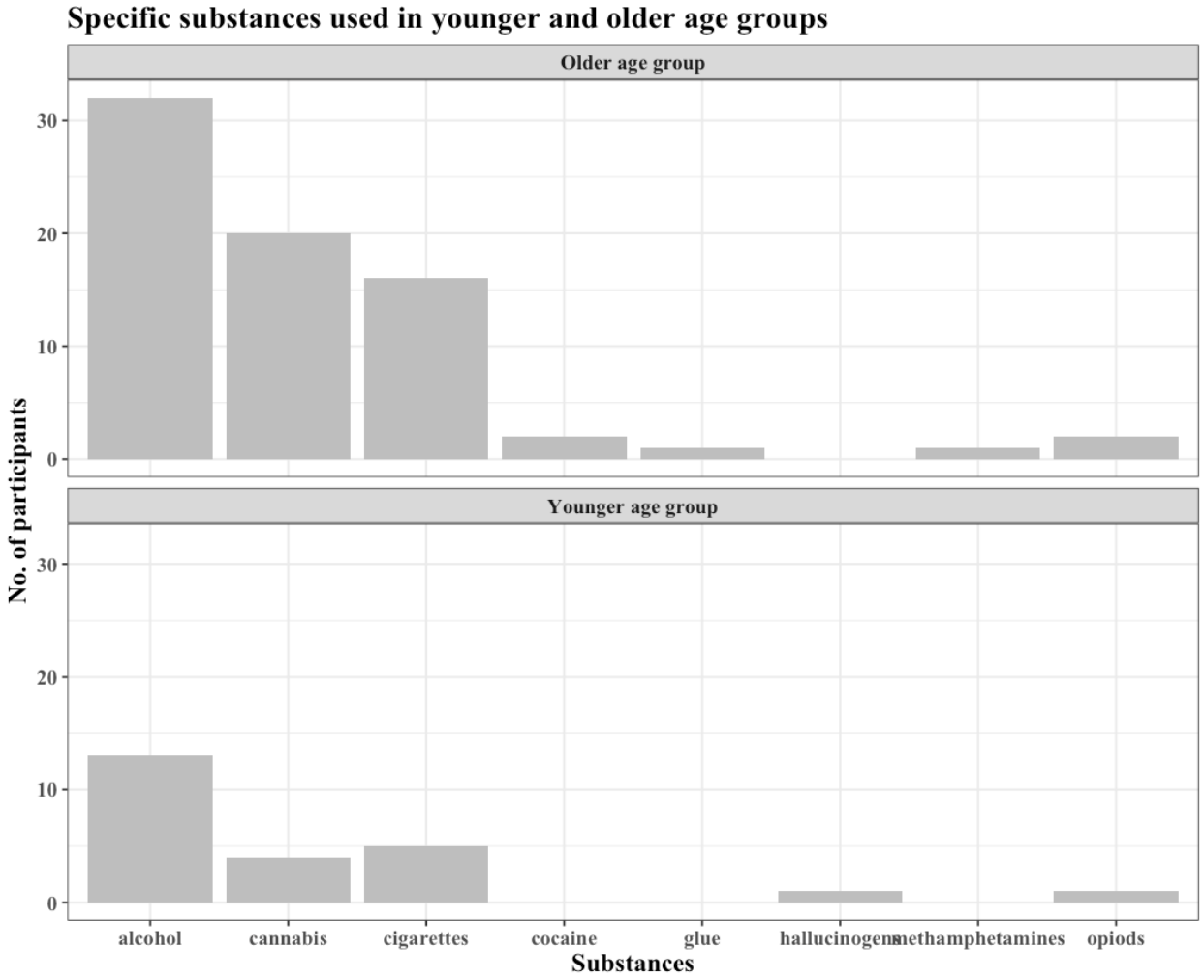


Table 4 shows the prevalence of rule-breaking behaviour and aggressive behaviour amongst those who reported substance use and those who did not. Reports of rule-breaking behaviour were significantly more prevalent among those who also reported using substances. There were no significant differences in aggression for those who report using substances, relative to those who did not.

Table 4

Reported aggression and rule-breaking according to substance use as reported on the ASSIST

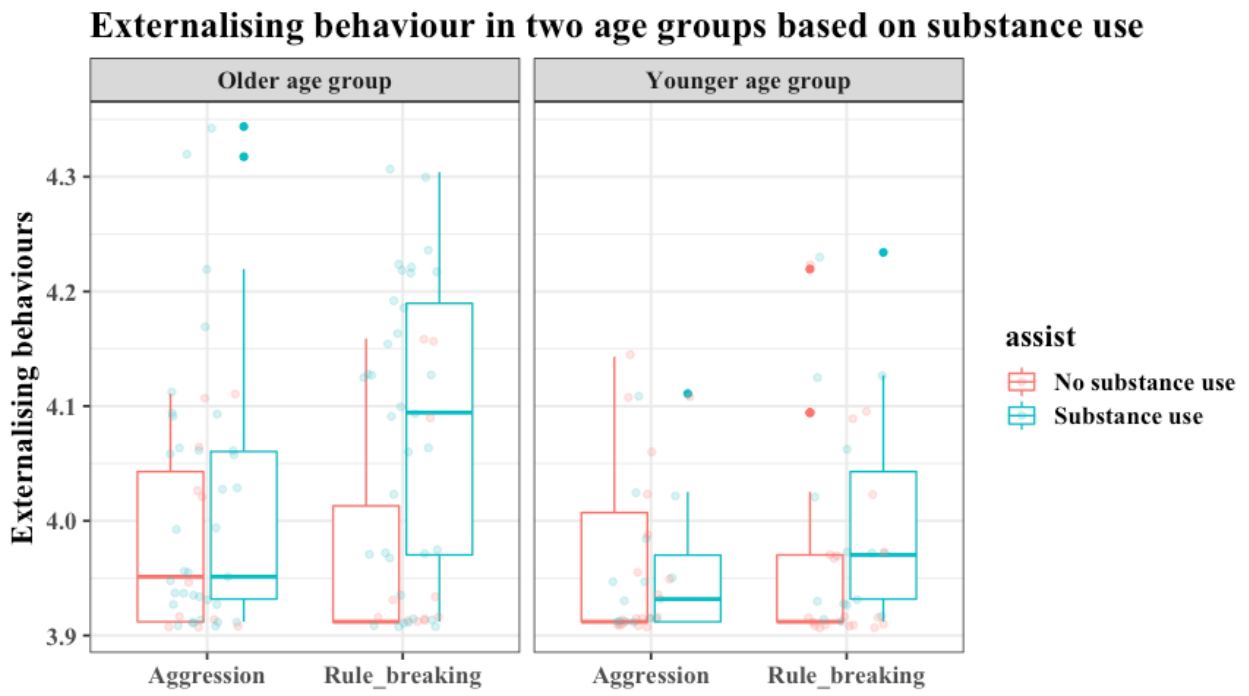
	Group					95% CI	
	Substance use	No substance use				Substance use	No substance use
Variable	(*n*=50)	(*n*=30)	*T*	*p*	ESE	*ci_lower-ci_upper*	*ci_lower - ci_upper*
Aggression	54.72 (6.19)	53.40 (4.44)	-1.1	0.27	0.11	53-56.44	51.81-55
Rule-Breaking	58.02 (7.36)	53.20 (5.2)	-3.45	.0009*	0.34	56.02-60.1	51.34-55.06

Note: Means with standard deviations in parentheses are reported above. ESE = effect size estimate (Cohen's d). T-test conducted and reported in this table. CI= Confidence Intervals, ci_lower=Lower confidence interval limit, ci_upper=Upper confidence interval limit, *p<0.05.

Figure 2 depicts the prevalence of rule-breaking and aggressive behaviour for the two age groups (younger vs older age groups) separately, based on whether they report using substances or not. In the older age group, it is clear that reports of both rule-breaking and aggression are more prevalent for those who report using substances compared to those who do not. However, this difference is not enough to yield statistical significance, p>0.05. In the younger age groups, reports of rule-breaking are more prevalent for those who report using substances; however, reports of aggression are more prevalent for those who report not using substances.

Figure 2

The boxplot above illustrates externalizing behaviour (aggression and rule-breaking) in both age groups (younger vs older age groups) based on substance use



Prevalence of externalizing behaviours among younger and older age groups

Hierarchical Linear Regression Analysis.

Two models were conducted; one with rule-breaking and another for aggression as our dependent variables. The control variable, BDI-II (depression), was first added into our model, followed by the grouping predictor variable (younger age group vs older age group).

Table 5 shows the results from the hierarchical linear regression analyses. For rule-breaking, the BDI-II scores accounted for 5% of the variance. Correlations were computed between rule-breaking and depression, which indicated a weak correlation of 0.22. This accounts for the minimal 5% variance, for the BDI-II, seen in the model. When the grouping variable (younger vs older age groups) was added, an additional 9% of variance was accounted for, which is only a small margin. Despite this, addition of the grouping variable to the model was statistically significant. Furthermore, an ANOVA was conducted comparing the first model, which included only the control variable, to the second model, which included both the control

and the predictor variable. This result was statistically significant, F (2, 77) = 7.692, p = 0.007. This indicates that regardless of the control variable (depression), there are statistically significant differences in the prevalence of rule-breaking behaviour in the younger and older age groups.

For aggression, the BDI-II scores accounted for 9% of the variance. Correlations were computed between aggression and depression, which indicated a moderate correlation of 0.3. This indicates that as aggression increased, depression also increased which accounts for the 9% variance that BDI-II demonstrated in the model. When the grouping predictor variable (younger vs older age groups) was added, an additional 4% of variance was accounted for, which is a very small margin. The addition of the grouping predictor variable in this model was statistically significant, $R^2 = .13$, F (2, 77) = 5.658, $p = .005$. Furthermore, an ANOVA was conducted comparing the first model and the second model for aggression which yielded a non-significant result, F (2, 77) = 3.693, p = 0.058. This indicates that the significant differences in prevalence of aggression between the younger and older age groups is confounded by depression. However, depression only confounded the result minimally as the *p*-value was on the borderline of significance.

Table 5

Hierarchical Linear Regression Analysis

Variable	Significant predictor(s)	R^2	R^2 change	*F*	*df*	*p*
Rule-breaking	BDI-II	.05	.05	4.156	1, 78	0.04*
	+ Grouping Variable	.14	.09	6.102	2, 77	0.003*
Aggression	BDI-II	.09	.09	7.368	1, 78	0.008*
	+ Grouping Variable	.13	.04	5.658	2, 77	0.005*

Note: The first row for rule-breaking and aggression represents the model in which the controls were added. The subsequent row represents the outcome variable in addition to the controls for the final model statistics. BDI-II indicates depression, Grouping Variable indicates the younger and older age groups, *p<0.05.

Discussion

This research was aimed at investigating the prevalence of externalizing behaviours namely aggressive and rule-breaking behaviours (including substance use) across early (ages 13

to 14) and late (ages 15-18 years) adolescence in a sample of South African male high school students. We hypothesized that rule-breaking behaviour (including substance use) would be more prevalent across the two age groups than aggressive behaviour and that rule-breaking behaviour (including substance use) would be more prevalent in the older age group than the younger age group. Even though there is a robust relationship between externalizing behaviours displayed in adolescence, criminality and many other adverse outcomes, there is a notable lack of research investigating its prevalence within the South African context. This is surprising considering that the South African context is fraught with conditions, evidenced by the pervasiveness of community crime and violence and social disadvantage, found to propel the development of externalizing behaviours.

Summary of results

The hypothesis that rule-breaking (including substance use) would be more prevalent than aggression across both age groups could only be partially supported as rule-breaking was found to be significantly more prevalent than aggression in both age groups but substance use was only found to be more prevalent in the older age group, relative to the younger age group.

The results of between-group analyses show that reports of rule-breaking behaviour was significantly more prevalent in older (15-18 years) age groups, relative to younger (13-14) age groups. Reports of substance use, as a form of rule-breaking, were also significantly more prevalent in older age groups, relative to younger age groups. These findings support our hypotheses that rule-breaking (including substance use) would be more prevalent in older age groups compared to younger age groups.

Further, regarding the BDI-II scores (measuring depression), the older age group reported only slightly higher levels of depression; however, these differences were not statistically significant and both groups scored between 11-16, which equates to a mild mood disturbance according to the BDI-II. The hierarchical regression analyses demonstrated that the control variable (BDI-II) accounted for some of the variance in both of the models for rule-breaking and aggressive behaviours. However, the addition of the grouping predictor variable (younger vs older age groups) only changed the R^2 value of both models minimally, thus demonstrating little additional variance in the models. Consequently, the null hypothesis for the grouping predictor variable cannot be rejected. We discuss each of these findings below.

Aggression and Rule-Breaking Behaviour

Our findings demonstrated that rule-breaking behaviour was significantly more prevalent than aggressive behaviour for both age groups. This is consistent with existing research with regards to rule-breaking behaviour being more prevalent than aggressive behaviour throughout both early and late adolescence (Bongers et al., 2003; Bongers et al., 2004; Stanger et al., 1997). The reduced prevalence of aggressive behaviour during adolescence, relative to rule-breaking, may be attributed to a few factors. One explanation for this trajectory is ascribed to the socioemotional development that transpires during this period, in which the individual is confronted with the task of learning to suppress overt aggressive behaviour and rather utilize other, appropriate means of expressing their emotions (Tremblay, 2010). In the adolescent period, in particular, rule-breaking behaviour is associated with an increase in the social status of adolescence within their peer groups (Sandstrom & Cillessen, 2006). This is in contrast to the connotations of aggressive behaviour in adolescence as such behaviour is associated with increased rejection (Sandstrom & Cillessen, 2006). Thus, it is reasonable to assume that adolescents are more likely to express their emotions though rule-breaking behaviours, relative to aggressive behaviours. Furthermore, the adolescent period is characterized by an increase in the ability to regulate or manage emotions and to make decisions based on contextual elements or motivation (Schäfer et al., 2017; Steinberg, 2005; Steinberg, 2008). Since, the inability to regulate emotions has been linked to the display of externalizing behaviours, and aggressive behaviour in particular (Dodge & Pettit, 2003; Dodge et al., 2006; Singh & Waldman, 2010), the reduced prevalence of aggressive behaviour within our sample may be attributed to the increase in the ability to regulate emotions as well as negative connotations associated with aggressive behaviour, typical of the adolescent period.

Moreover, our research findings are in line with existing literature with respect to rule-breaking being more prevalent within older as compared to younger age groups. Accordingly, the increase in rule-breaking behaviour in late adolescence is accounted for by the increased rejection of conventional values and increased levels of rebelliousness as children enter late adolescence and strive for an increased sense of independence (Frick, 2016). Further, rule-breaking behaviour has been found to be an expression of the maladaptive pursuit to attain a subjective sense of maturity and adult status (Frick, 2016). As adolescences progress into late adolescence and young adulthood, the pursuit of attaining an adult status increases, thus resulting

in increased rejection of conventional values (Frick, 2016). This idea may support the increase in rule-breaking behaviours as adolescents age.

Besides age, other possible contributory factors to the high prevalence of externalizing behaviours amongst adolescents reported in the literature, are exposure to community violence, atypical family structures, intimate partner violence, parenting mental health and stress, and economic hardship (Barkin et al., 2001; Donenberg et al., 2020; Scarpa, 2001; Ward et al., 2015). Such factors have been shown to be more prevalent in countries with low-socioeconomic contexts or where social inequality is rife, such as South Africa (Stein et al., 2003). Since our data were collected from participants within low to middle-socioeconomic status contexts, the aforementioned factors may account for the prevalence of externalizing behaviours found. These external factors evidently bear insidious influences on behaviour and mental health.

Substance Use

Contrary to our expectations, we found that rates of substance use, as a form of rule-breaking behaviour, was only significantly higher within the older age group, relative to the younger age group. The progressive use of substances with age during adolescence has been attributed to the increased rate of rule-breaking behaviour in adolescence accounted for by increased rejection of conventional values and increased levels of rebelliousness as children enter adolescence (Frick, 2016). This is the adolescent's attempt at gaining an increased sense of independence. In addition, as aforementioned, rule-breaking behaviour amongst adolescents is associated with increased social status amongst peer groups, thus encouraging adolescents to engage in behaviours such as substance use (Sandstrom & Cillessen, 2006). It is also interesting to note that alcohol, cannabis and cigarette use mostly accounted for the difference between older and younger age groups. This finding is consistent with evidence found by Pedersen et al. (2018). The presence of alcohol, cannabis and cigarette use accounting for the most of the increased use of substances for older vs. younger age groups may be because the use of those substances are the most socially-accepted in general society as well as easily accessible (Pedersen et al., 2018).

In our results, it is clear that reports of both rule-breaking and aggressive behaviour were more prevalent in the older age group, for those who report using substances. In the younger age group, reports of rule-breaking behaviour was more prevalent for those who report using substances; however, reports of aggressive behaviour was more prevalent for those who report not using substances. Accordingly, our findings are in line with research supporting the

association between substance use and externalizing behaviour (Colder et al., 2013). It has been found that among adolescents presenting with behavioural issues, that levels of substance use increase with age (Colder et al., 2013). Since externalizing behaviour is associated with a disregard for conventional values and that most substances are illegal which constitutes a breaking of rules, these behavioural patterns may result in increased alienation from traditional institutions (schools), exclusion from positive peer-groups and engagement with deviant peers who promote and reinforce substance use behaviours (Colder et al., 2013).

Additionally, similar to the discussion above for externalizing behaviours, there are several factors such as poor or harsh parenting, single-parent households, poor social support, parental depression and family chronic stress (Kjeldsen et al., 2014; Miller-Lewis et al., 2006; Ward et al., 2015) that can contribute to increased externalizing behaviours, which includes substance use, among adolescents (Conger et al., 1994; Duncan & Magnuson, 2002; Evans et al., 2004; Felner et al., 1995). This provides insight into our findings considering that participants originated from high schools in low-to-middle-socioeconomic contexts.

Regarding reports of aggressive behaviour being more prevalent for those who report not using substances in the younger group compared to the older age group, it suggests that their aggressive behaviour is not attributed to substance use. Rather, it alludes to the probability that their display of aggressive behaviour could potentially be linked to emotional dysregulation (Hertz et al., 2012) or pubertal changes typical of the initial adolescent period (Halpern et al., 1993).

Depression

Our initial analysis indicated significant differences between the two age groups for rule-breaking and aggressive behaviour. However, our hierarchical regression analysis and ANOVA suggested that for aggression even though the between group differences were significant, depression confounded this result. Even though our findings are consistent with Bacchini et al. (2011), who found that externalizing behaviour and depression were weakly correlated, the bulk of the literature supports the strong association between the two variables (Bacchini et al., 2011; Chan et al., 2008; Colman et al., 2009; Lansford et al., 2008). Colman et al. (2009) concluded that behavioural problems in adolescence were significantly associated with the presence of depressive symptoms. The relationship between aggression and depression may be linked to the negative feedback such as rejection obtained in the social environment or within interpersonal

relationships in response to the aggressive behaviour, resulting in a reduced self-worth or depressive symptoms (Capaldi, 1992).

Moreover, our results concluded that the same relationship between aggressive behaviour and depression, did not apply to rule-breaking as the BDI-II scores did not account for the significant differences between the two age groups. This implies that regardless of the presence of depression, differences in rule-breaking between the younger and older age groups remained significant. A potential explanation for this is that rule-breaking behaviours are attributable to an increase in the social status of adolescents among their peer group (Sandstrom & Cillessen, 2006). This social achievement is considered an important one given that the crisis during the adolescent period typically is the resolution and attainment of social belonging. Reinforcingly, Ueno (2005) argues that an integration into social or friendship groups, provides a sense of belonging which could contribute to the adolescent's mental health and a reduction in depression symptoms. Thus, our findings are consistent as depression did not contribute to the significant difference in rule-breaking behaviours between the two age groups.

Implications of our results

Our findings show that rule-breaking behaviour and substance use were more prevalent in the older age group. Furthermore, there was a higher frequency of scores for rule-breaking in the borderline and clinical ranges, relative to the younger age group. These findings suggest that interventions aimed at reducing the adverse outcomes associated with these behaviours, should be implemented at an earlier stage in adolescence. This implication may assist in preventing the increased trajectory of these behaviours with age. More importantly, as discussed within the exploration of our results, substance use is a form of rule-breaking behaviour thus interventions should be targeted at the amelioration of substance use amongst adolescents. Furthermore, this study found that aggressive behaviour and depression were correlated within our sample, hence the implication that interventions would be more efficacious when addressing both aggressive behaviour and depression especially in adolescent males from low-SES contexts.

Considering the significance of this topic within a South African context, this research study lays the foundation for future research to be conducted within this field. Our research indicated that externalizing behaviours showed significant difference in the age trajectories within adolescence while highlighting the importance of depression in aggressive behaviour and substance use as a component of rule-breaking behaviour among adolescents. The implications

associated with externalizing behaviours in adolescence are its link to an increased risk of future unemployment, mental health issues including anxiety and depression as well as future criminal behaviour (Farrington, 2006; Fergusson & Horwood, 1998; Fergusson et al., 2005). Consequently, our finding may be important in terms of laying the foundation for future research with the hope of informing intervention strategies, policies and practices to reduce the numerous adverse outcomes associated with externalizing behaviour in adolescence.

Limitations and Future Directions

Our research presented with a few limitations which limits the generalizability of the results to the broader South African adolescent population. One such limitation is our relatively small sample size of 80 participants. Due to the COVID-19 pandemic and related restrictions we could not fulfil our initial aim of extending our sample size. Despite this limitation, our research served as a stepping stone for future research on this topic. In addition, although our findings demonstrated a weak correlation between externalizing behaviour, in general, and depression, and that BDI-II scores minimally confounded the result for aggressive behaviour in the hierarchical linear regression analysis, we acknowledge that these results could be more pronounced if BDI-II scores over 20 were not excluded. We controlled for the effect of depression, however, given that it was not a focus of our study but because it can impact how individuals engage with assessments (Lansford et al., 2008). Another limitation to our study was utilizing self-report measures which may present with issues around reliability as the questions could have been misinterpreted by participants. Further, self-report measures present us with issues around social desirability bias where respondents may have answered in a manner that they believe they are expected to, rather than based on their actual behaviors. However, the measures used in this study have strong psychometric properties and have been used locally and internationally. We recognize though that having either or both teacher and parent reports of externalizing behaviours would have strengthened the results of the study. Lastly, our study was limited since we were unable to control for several other potential predictors or confounding variables to externalizing behaviours, such as community violence, poor parenting practices, parental education, financial status, family stress, peer groups, atypical family structures and parental mental health to mention a few. However, this highlights significant areas for future research to be explored and conducted.

We propose that more research should be conducted on externalizing or risky behaviours among adolescents within low-to middle-income contexts as the prevalence of such behaviours may be high and research of this nature especially significant here, but evidently lacking. Further, longitudinal studies should also be conducted to track the development of such behaviours across the lifespan as this will offer more insight into its development and inform interventions to reduce the adverse outcomes associated with the display of externalizing behaviours in adolescence.

Conclusion

It is important to trace externalizing behaviours due to its association with potential criminality. South Africa is infamously acknowledged for its high crime rates that are largely perpetrated by adolescent and young adult males. Externalizing behaviours in adolescence are strongly associated with adverse outcomes later on in life. Hence, tracing externalizing behaviours during the period of adolescence, were especially significant in allowing prevention strategies to be implemented before such behaviours permeate into adulthood. This study, in particular, demonstrated the high prevalence of externalizing behaviours and substance use in late adolescence, thus emphasizing the need for interventions in early adolescence to prevent an increase in trajectory as demonstrated in this study. Furthermore, this study demonstrated a particular need for interventions focusing on rule-breaking (including substance use) behaviour amongst adolescence. This study's significance is further reinforced as there has been a notable dearth in literature tracing externalizing behaviours during adolescence specifically. Hence our research has aimed to create a foundation for future research into the prevalence of externalizing behaviours during this crucial phase of development. Specifically, an assessment of mental health and externalizing behaviours, including substance use, among adolescents may better inform age appropriate intervention strategies aimed at reducing the related adverse outcomes and increased trajectory of these behaviours into adulthood.

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Appendix A

UCT Ethics

UNIVERSITY OF CAPE TOWN

Department of Psychology

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

15 November 2017

Nina Steenkamp
Department of Psychology
University of Cape Town
Rondebosch 7701

Dear Nina

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, *The prevalence of traumatic brain injury and an investigation of behavioural, emotional, and executive functioning in a sample of male young offenders*. The reference number is PSY 2017-052].

I wish you all the best for your study.

Yours sincerely

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

Appendix B

Western Cape Department of Education Ethics Approval 2018

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 C

Western Cape Department of Education Ethics Approval 2019

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 **04 February 2019 till 27 September 2019**
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: 30 January 2019

Appendix D

Parent Consent Form

UCT Department of Psychology

Parent Consent Form

Informed consent for you and your child to participate in research

You and your son are being invited 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 take part in the research study. We are also asking if you would agree to complete a brief questionnaire. Your and your son's participation is entirely voluntary. Before you decide about taking part, read the information below and if you have any questions, please feel free to contact one of the principal investigators. You and/or your son will not be disadvantaged in any way by participating or not participating in this study.

1. Title of Research Study

Investigating parenting factors, prevalence of head injuries and associated problems in Boys

2. Principal Investigators and Contact Number

Masters in Psychology (students)
Nina Steenkamp
Zayaan Goolam Nabi
Honours in Psychology (students)

Aimee Tredoux
Nathan Phillander
Winnie Nkoana
Department of Psychology
University of Cape Town

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

3. Source of Funding or Other Material Support

National Research Foundation (NRF)

4. What is the purpose of this research study?

The purpose of this research is to investigate how common head injuries are among boys in the Western Cape, and how these injuries affect boys. We are particularly interested in boys' behaviour, emotional outcomes (e.g., feeling happy or angry), executive functioning (e.g., thinking, planning, and flexibility) and possible learning difficulties, as well as their family lives and exposure to community violence.

5. What will be done if your child takes part in this research study?

You (the parent) will be asked to complete a brief questionnaire about your family, your son's developmental history (such as when your son started walking and talking), and about his behaviour (such as how well your son interacts with his peers). Your son will be asked to complete some questionnaires about behaviour (such as how your son interacts with his friends and peers), emotions, family and your parenting. Your son will also be

asked about any learning difficulties he experiences at school, and to participate in activities which will assess his knowledge of words and how words relate, as well as his problem-solving skills and memory. Additionally, your son will be asked about his experiences in your community and how these experiences may influence his behaviour (such as how your son interacts with others, and/or his emotions, such as feelings of sadness or anger).

6. If your child chooses to participate in this study, how long will he 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 your son wishes to stop his participation, he is free to do so without penalty. Your son will not be treated differently at school if he or you decide to withdraw from the study. Withdrawal from the study will not appear on your son's school record or elsewhere.
After completing the questionnaires, your son will be invited back to a second session, where he will be asked to solve problems, such as figuring out a pattern or puzzle, and explaining the meanings of some words.

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

200 boys will be invited to participate.

8. What are the possible discomforts and risks?

There is a small risk associated with participation in this study, as asking about your son's experiences of exposure to community violence may potentially cause him some feelings of distress. Should your son get tired during the study, he will be allowed to rest. If your son wishes to discuss any information about the study, what he will be asked to do, or any discomforts he may experience, you may on behalf of your child contact the principal investigators listed in #2 of this form.

9. What are the possible benefits to you?

You or your son may or may not personally benefit from participating in this study. 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.

10. What are the possible benefits to others?

The findings may help in our understanding of the cognitive, behavioural and emotional outcomes of boys with and without head injuries.

11. If your child chooses to take part in this research study, will it cost your child anything?

Participating in this study will not cost your child anything.

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

Your son will receive a R50 Checkers / Pick 'n Pay shopping voucher, after completing both the questionnaire and the assessment (games and puzzles) sessions.

13a. Can your child withdraw from this research study?

Your son is free to withdraw his consent and to stop participating in this research study at any time. If your son does withdraw his consent, there will be no penalty.
If you or your son have any questions regarding your and your son's rights in this research, you may contact Rosalind Adams in the Psychology Department . Her email address is rosalind.adams@uct.ac.za or you may contact her via telephone – 021 650 3417.

Alternatively, if you have any questions about the study you or your son may contact the supervisor (Dr Leigh Schrieff) at leigh.schrieff-elson@uct.ac.za , or student researchers at:
ninasteenkamp1@gmail.com (Nina Steenkamp),
glmzay001@myuct.ac.za (Zayaan Goolam Nabi),
nkoanasamantha@gmail.com (Winnie Nkoana),
TRDAIM001@myuct.ac.za (Aimee Tredoux)
PHLNAT003@myuct.ac.za (Nathan Phillander)

13b. If your child withdraws, can information about your child still be used and/or collected?

Information already collected may be used, if permission is granted by both you and your son. We will ask you about the use of your information, if you or your son decide to withdraw from the study.

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

Only certain people have the right to review these research records. These people include the researchers for this study. Your son's research records will not be released without your permission unless required by law or a court order. All the information you and your son give will be strictly confidential and will not include your son's name or information that could identify him directly, when shared in any reports about the data.

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

The information gathered from you will be demographic information, information on your son's developmental history, records of your responses to questionnaires regarding your son's behaviour, information such as how your son interacts with and relates to

others, and information about your son's emotions, such as being happy or sad, and how this may influence his behaviour. If you and your son 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 or your son. For example, the limited data set cannot include you or your son's 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's parent / guardian 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 son's performance and other data will be collected, used and shared with others. You have received a copy of this form. You and your son are aware that you may ask questions before you sign, and you have been told that you and your son can ask other questions at any time.

You voluntarily agree to allow your son to participate in this study. You hereby authorize the collection, use and sharing of your son's 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 E

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 head injuries, learning difficulties and associated behaviours of young people. In order to do this, we are talking to young people who have had such an injury or difficulties and also to those who have never had such an injury or difficulties.

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/table-top 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 any physical risk; however, during the session you will be asked some questions about community violence which may potentially lead to some feelings of distress. The other 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/ Pick ‘n Pay/Shoprite 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 head injury and/or learning difficulties.

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 (the researchers of this study) will have access to the data.

It will only be used for academic research purposes; such as in a research report. No-one will be able to identify you from the 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.

I would like to take part in this study:

Signature of Participant _____ Date _____

Signature of Investigator _____ Date _____

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 telephone number is 021 650 3417, and her email address is rosalind.adams@uct.ac.za .

Alternatively, you may contact the researchers involved in the study, if you have any questions about the study:

Supervisor:

Dr. Leigh Schrieff: leigh.schrieff-elson@uct.ac.za or 021 650 3708

Masters Psychology Researchers (students):

Nina Steenkamp: ninasteenkamp1@gmail.com

Zayaan Goolam Nabi: glmzay001@myuct.ac.za

Honours Psychology Researchers (students):

Aimee Tredoux: trdaim001@myuct.ac.za

Nathan Phillander: phlnat003@myuct.ac.za

Winnie Nkoana: nkoanasamantha@gmail.com

Appendix F

Participant Consent Form

UCT Department of Psychology

Participant Consent Form

PERMISSION TO PARTICIPATE IN RESEARCH

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

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/table-top 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 any physical risk, however, during the session you will be asked some questions about community violence which may potentially lead to some feelings of distress. The other 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/ Pick ‘n Pay/Shoprite 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 head injury and/or learning difficulties.

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 (the researchers of this study) will have access to the data.
It will only be used for academic research purposes; such as in a research report. No-one will be able to identify you from the 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.

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 interview will be scheduled and other data will be collected, used, and shared with others:

_____ _____

Signature of Person Obtaining Consent and Authorization Date

I have been informed about this study's purpose, procedures, possible benefits, and risks; and how my responses and other data will be collected, used and shared with others. I have received a copy of this form. I have been given the opportunity to ask questions before I sign, and I have been told that I can ask other questions at any time.
I voluntarily agree to participate in this study. I hereby authorize the collection, use and sharing of my interview responses and other data. By signing this form, I am not giving away any of my legal rights.

_____ _____

Signature of Person Consenting and Authorizing Date

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 telephone number is 021 650 3417, and her email address is rosalind.adams@uct.ac.za .

Alternatively, you may contact the researchers involved in the study, if you have any questions about the study:

Supervisor:

Dr. Leigh Schrieff: leigh.schrieff-elson@uct.ac.za or 021 650 3708

Masters Psychology Researchers (students):

Nina Steenkamp: ninasteenkamp1@gmail.com

Zayaan Goolam Nabi: glmzay001@myuct.ac.za

Honours Psychology Researchers (students):

Aimee Tredoux: trdaim001@myuct.ac.za

Nathan Phillander: phlnat003@myuct.ac.za

Winnie Nkoana: nkoanasamantha@gmail.com

Appendix G

Participant Debriefing Letter

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