# Do Antisocial and Prosocial Traits Vary Across Different Socioeconomic Status Groups in a Sample of South African Adolescents?

Candice Knipe

KNPCAN002

A minor dissertation submitted in fulfilment of the requirements for the award of the degree of Master of Arts in Neuropsychology

ACSENT Laboratory

Department of Psychology

Faculty of Humanities

University of Cape Town

2024

University of Cape Town

## COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

Signature: Signed by candidate Date: 09/02/2024

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

University of Cape Town

**Acknowledgements**

I extend my sincerest appreciation to my supervisor, A/Professor Leigh Schrieff-Brown, for her feedback and guidance throughout this journey. Winnie, your unwavering encouragement and assistance during the completion of my thesis, as well as your invaluable contribution to data collection, have been truly indispensable. Simone, your expertise in R Studio and statistics were crucial, and I am grateful for your assistance. To my friends, your constant check-ins and uplifting words kept me motivated and inspired throughout this process. My heartfelt gratitude also goes out to my family for their support. Special thanks to my father, Leon, and Jessica for their dedicated efforts in facilitating access to participants, going above and beyond to ensure the success of my research project. Lastly, I want to thank the study participants for their willingness to take part in this research.

## Abstract

South Africa, globally recognized for its high crime rates, prompts a nuanced exploration of the interconnections between crime, antisocial traits, and protective factors such as prosocial traits within its unique context. The current research therefore aimed to examine the prevalence of antisocial and prosocial traits in adolescents from different socioeconomic backgrounds within this context. Existing research predominantly focuses on higher income countries, leaving a notable gap in understanding within the South African low – to middle-income country landscape. Despite its middle-income classification, South Africa grapples with pervasive inequality with much of the population living in poorer socioeconomic settings, emphasizing the importance of investigating the extent of both antisocial and prosocial traits across diverse socio-economic settings. The study utilized a cross-sectional and correlation design. Online self-report questionnaires were used to gather demographic and socio-economic status information, antisocial scores using the Inventory of Callous Unemotional Traits, and prosocial scores using the Prosocial Tendency Measure. The sample, comprised of South African adolescents, of which 52% were male, 45% were female, 3% were non-binary, aged 13-18 ($N$=44). I used multiple linear regression to analyse the collected data. The study's findings demonstrated that gender emerged as a significant predictor for both prosocial and antisocial behaviours among adolescents (ICU: $p$=0.03; PTM: $p$=0.04). However, the results did not support a significant association between socioeconomic status and these outcomes. This research contributes to a more comprehensive understanding of the factors shaping antisocial and prosocial traits, particularly during adolescence, within the South African context.


Key words: socioeconomic status, antisocial, prosocial, adolescence, crime

# Abbreviations

**Measures and Procedures:**

ASSIST: Alcohol, Smoking and Substance Involvement Screening Test

BDI-II: Beck Depression Inventory-II

CHAT: Comprehensive Health Assessment Tool

COVID-19: Coronavirus Disease 2019

DSM-IV: Diagnostic and Statistical Manual of Mental Disorders 4th Edition

FSM: Family Systems Model

ICU: Inventory of Callous-Unemotional Traits

LAPS: Leahy Antisocial Personality Scale

NGO: Non-Government Organisation

NICRO: South African National Institute for Crime Prevention and the Reintegration of Offenders

PTM: Prosocial Tendency Measure

SA: South Africa

SADAG: South African Depression and Anxiety Group

SAPS: South African Police Service

SES: Socioeconomic Status

SSS: Subjective Social Status

TBI: Traumatic Brain Injury

WCED: Western Cape Education Department

WHO: World Health Organisation

## Table of Contents

## List of Figures

## List of Tables

# Do Antisocial and Prosocial Traits Vary Across Different Socioeconomic Status Groups in a Sample of South African Adolescents?

Crime rates in South Africa (SA) stand notably higher than the global average, with the nation ranking third globally for its crime statistics (World Population Review, 2023). This stark reality is exemplified by the data provided by the South African Police Service (SAPS), for the period of April 2021 to March 2022, in which over 600,000 cases of contact crimes were reported in the country (Kempen, 2023). It should be further noted that gender-based violence (GBV) emerges prominently as a notable criminal phenomenon in SA, which is evident by the alarming rate of women fatally victimised by intimate partners (Govender, 2023). As with the general crime rate, the prevalence of this specific form of crime surpasses global norms, with the rate of women killed by intimate partners in the local context being five times higher than the corresponding global average (World Bank Brief, 2023). These statistics underscore the immediate need to examine potential contributing factors and explore preventative measures. The literature relating to crime intervention, tends to focus on antisocial and prosocial behaviours and traits. Moreover, it has been well-established in the literature that adolescence is a significant developmental period for these traits and behaviours (Manasse & Rebellon, 2023; Moffitt, 2018). Thus, this literature review will firstly explore what is currently understood about crime in SA and the link between crime and adolescents; secondly, it will elaborate on antisocial and prosocial behaviour and the factors influencing each behaviour with a particular focus on SES.

## Literature Review

### Crime in South Africa and Adolescence

In trying to understand the trend of crime in SA, many scholars argue that it is a common feature of transitional societies, specifically after transitioning from a nation characterised by pervasive colonial violence to one seemingly characterised by peace and

inclusion (Breetzke, 2012; Forde et al., 2021; Parashar, 2019; Whyman et al., 2023). Breetzke (2012) posits that the spatial legacy of apartheid offers an explanatory framework for the crime trend in SA. The argument suggests a perpetuating cycle initiated by pre-1994 conditions whereby vast regions experienced insufficient social and economic development by the apartheid government as well as the harsh impact of apartheid laws. This created elevated crime and delinquency levels in these regions. Consequently, these regions established ecological contexts that facilitated the ongoing perpetuation of crime and delinquency post-1994. This perspective is shared by Forde et al. (2021) who further argued that these ecological contexts have not been addressed post-1994, with lingering issues such as unequal land distribution, disparate access to basic utilities, and ongoing apartheid-related displacement, now occurring though gentrification. Therefore, the absence of spatial reparations has also contributed to the persistence of environments conducive to criminal activities.

These environments also increase the vulnerability of certain demographic groups, particularly adolescents. For instance, Statistics SA's (2018) latest publication provides insights into the age distribution of crime perpetrators, revealing that 10.3% of households reported perpetrators aged 15 years and younger. Concerning the specific types of crimes committed by this age group, households reported 21.7% for auto theft, 13% for murder, and 11.8% for deliberately damaging dwellings. Additionally, home robbery and housebreaking accounted for 7.4% and 5.1%, respectively. Given the concerning statistics revealing the extent of adolescents in criminal activities, it also becomes crucial to examine their influence on crime. Thus exploring the dynamics of crime involvement among adolescents within the larger context of SA’s historical transitions and ongoing socioeconomic challenges is essential for a comprehensive understanding of the factors influencing crime trends and potential interventions.

The participation of youth in criminal activities, especially in the context of SA, can be understood through several factors. For instance, Notshulwana (2012) posits that criminal behaviour in SA stems from a "legacy of violence," a concept aligned with Breetzke's (2012) assertion that apartheid had created ecological frameworks conducive to the sustained perpetuation of crime and delinquency. This proposition gains further support from studies on the normalisation and desensitization of aggressive behaviours, specifically among the youth, as violence is pervasive within most communities in the country (Hoosen et al., 2022; Leoschut & Kafaar, 2017; Sui et al., 2021). Hoosen et al.'s (2022) systematic review on youth perceptions of violence revealed that participants resorting to maladaptive coping mechanisms, such as aggression or involvement in gangsterism, following exposure to violence. Notably, Scorgie et al. (2017) reported in their qualitative study on violence experienced by adolescents in Johannesburg that some participants expressed a lack of surprise toward the commonality of violence in their neighbourhoods. Elaborating on this, adolescents may encounter various forms of violence, including domestic violence, corporal punishment, familial engagement in criminal pursuits, gangsterism, and substance abuse (Scorgie et al., 2017; Sui et al., 2021). Consequently, there is a recurrence and type of inevitability of exposure to violence due to its presence in various aspects of their lives (North et al., 2020; Sui et al., 2021).

An additional factor to consider is that adolescents may resort to criminal activities as a pragmatic strategy to achieve specific objectives. For example, conditions associated with economic deprivation, including elevated unemployment rates and food insecurity, which are identified as potential contributors to youth involvement in criminal behaviour (Ekpo & Ajake, 2013). In this context, engagement in unlawful activities may be perceived as a requisite for survival. A recent article by the Daily Maverick in which they spoke to confirmed shoplifters, revealed that many adults shoplift to obtain food and other necessities,

such as baby food, medicine, and essential toiletries (Cruywagen, 2023). Moreover, the National Institute for Crime Prevention and Reintegration of Offenders (NICRO, 2023), an NGO dedicated to crime reduction, reported recently that 20.8% and 50.3% of the people they assist are under 18 and between 18-35 years of age, respectively. The report further noted that theft is the most common offence at 24%. Hence, adolescent involvement in criminal activities in South Africa might be connected to their basic need for survival.

A last consideration lies in the fact that adolescence is a period marked by increased susceptibility to delinquent activities, primarily due to heightened engagement in antisocial behaviours (Moffitt, 1993, 2018). Within the SA context, this susceptibility may be exacerbated by the influence of previously mentioned factors. Moreover, SA grapples with elevated levels of poverty, adding another layer to the complexity. Thus, the heightened risk of exposure to crime is further compounded by the need to survive in the face of poverty, potentially leading those in impoverished conditions to resort to criminal activities. These interrelated factors collectively expose adolescents to an augmented array of risk factors precisely during a developmental phase when they may potentially be predisposed to developing antisocial traits.

**Antisocial Traits**

Antisocial behaviour is a diverse concept that includes a broad spectrum of traits and behaviours that typically deviate from the accepted social norms regarding appropriate conduct (Brazil et al., 2018). Illustrative examples include aggression, dishonesty, and callousness (Brazil et al., 2018). These behaviours may give rise to detrimental consequences for society, manifesting in actions such as stealing, physical assault, and vandalism (Chinchilla & Kosson, 2016). Research indicates that antisocial behaviours tend to increase during adolescence and subsequently diminish in young adulthood (Devenish et al., 2017; Moffitt, 2018; Moore et al., 2017). This fluctuation in antisocial behaviours is considered a

natural component of adolescent development and is associated with the concept of the maturity gap (Moffitt, 2018).

In Moffitt's (1993) taxonomy of antisocial behaviour, the manifestation of antisocial traits during adolescence is referred to as adolescence-limited traits. The taxonomy delineates adolescence-limited antisocial behaviour as beginning when adolescents reach the maturity gap and concluding when young adulthood is reached. The maturity gap, defined as "the gap between biological and social maturity" (Moffitt, 1993, p. 685), is recognized as the causal factor in this behavioural classification. Consequently, adolescents actively engage in behaviours perceived as 'mature' to mitigate the developmental gap and assert their autonomy. These behaviours often manifest as antisocial actions, including delinquency and substance use, eliciting disapproval from authority figures and thereby reinforcing the sense of autonomy among adolescents (Sijtsema & Lindenberg, 2018). However, there are several factors which can either protect against or further risk the development of antisocial traits during adolescence (Khaliq & Rasool, 2019).

### *Antisocial Traits and Gender*

Gender has been shown to influence the development of antisocial behaviours. For instance, Moffitt (2018) reported that males are significantly more associated with antisocial behaviours. This assertation is further supported as gender is often identified as a determinant of antisocial behaviour in the existing literature (see, e.g., Miller et al., 2011; Carvalho et al., 2017; Jiang et al., 2020). However, Miller et al. (2011) observed that the connection between girls / women and psychopathy has been insufficiently investigated in the literature, making it challenging to establish a consensus on the role of gender in psychopathy.

### *Antisocial Traits, Substance Use and Peer Association*

Another factor associated with antisocial behaviours in adolescence involves engagement in substance use and associations with peers involved in delinquent activities.

For instance, Ferguson and Meehan (2010) reported that engaging in substance use and associating with peers involved in delinquent activities are risk factors contributing to the development of antisocial traits. In their review, Sijtsema and Lindenberg (2018) reported similar findings, indicating that both peer influence and peer selection are connected with the development of antisocial behaviour during adolescence. Conversely, Ferguson and Meehan (2010) findings indicated that positive interactions with family members and positive experiences at school were deemed protective factors against the development of antisocial traits. Ferguson and Meehan (2010) also highlighted that the effect of these factors increase as adolescents age.

***Antisocial Traits and Exposure to Violence***

Exposure to violence is recognized as another risk factor, supported by evidence suggesting a link between such exposure and the development of antisocial traits (Bacchini et al., 2015; Tsang, 2018). Bacchini et al. (2015) reported that adolescents who observed violence at school, in the neighbourhood, or experienced family violence were significantly associated with antisocial behaviour engagement. Moreover, their findings indicated that witnessing violence outside of the home exerted the most substantial impact on their behaviour. This finding is in alignment with Tsang's (2018) observation that exposure to violence, whether as a victim or witness, is associated with involvement in delinquent activities. In the context of SA, this risk factor is particularly significant as Leoschut and Kafaar (2017) noted that about 64% of adolescents in SA experience "lifetime poly-victimisation", which is defined as having multiple instances of victimisation in varying contexts throughout their lives. This implies that adolescents in South Africa are more vulnerable to the development of antisocial traits due to their frequent exposure to violence.

### *Antisocial Traits and SES*

A risk factor prominently highlighted in the literature is SES (Moffitt, 1993; Piotrowska et al., 2015). The rationale lies in the influential role of SES in shaping an individual's upbringing environment, determining the exposure to the aforementioned risk and protective factors. The link between antisocial traits and SES was noted by Moffitt (1993) in his flagship journal on antisocial traits in adolescence and this idea was subsequently developed by new research (see, e.g., Manasse & Rebellon, 2023). For instance, Moore et al. (2017) illustrated this link in a nationally representative cross-sectional survey, which linked low SES and long-term antisocial behaviour. SES is a significant factor as it has also been shown to be a mediating variable in the relationship between antisocial traits and other related causes (Moore et al., 2017).

An explanatory framework for comprehending the association between SES and the emergence of antisocial traits during adolescence can be found in Bronfenbrenner's (1979) ecological systems theory. This theory posits that individual development is a combination of influences from diverse contexts, including neighbourhood, family, and school. Thus, in alignment with Moffitt's (1993) argument that adolescence represents a phase of heightened vulnerability to the development of antisocial traits, residing in an environment characterised by low SES serves as a contributing factor as this environment is simultaneously linked with other well-established risk factors, such exposure to violence, substance use, and negative peer association (Hoosen et al., 2022). Consequently, this context has the potential to generate a compounded effect on individuals, thereby significantly increasing their susceptibility to the development of antisocial traits.

To illustrate this point, beginning by examining the context of the neighbourhood, particularly in low SES environments where frequent exposure to violence is a prevalent risk factor. In the context of SA, adolescents from low SES backgrounds may confront daily

instances of violence, including incidents related to gang activities, homicide, and GBV (Leoschut & Kafaar, 2017; Scorgie et al., 2017; Sui et al., 2021). This illustrates how the environment in which adolescents are situated can play a role in shaping their development by exposing them to potential adverse risks as per Bronfenbrenner's (1979) ecological framework.

To examine the potential impact of an individual's home life, we can observe the effect of family income. In their study, Piotrowska et al. (2015) identified the impact of parental income on antisocial behaviour, revealing a nonlinear relationship. As parental income increased, there was a corresponding decrease in antisocial behaviour. We can expand on this idea by the reasoning that income determines whether one's needs (e.g., food, clothing) are met. For instance, adolescents from low SES environments may engage in antisocial behaviours (e.g., theft, lying) as a way to meet their basic needs (Ekpo & Ajake, 2013). Adolescents of more socially advantaged backgrounds are less likely to be lacking in terms of basic needs and so do not need to engage as frequently in such behaviours. Furthermore, these socio-economic challenges can adversely affect the capacity of caregivers to deliver effective parenting, consequently heightening the probability of youth engaging in delinquent behaviours (Silva & Stattin, 2016). Conger et al. (2010) offered a framework to understand this relationship through the family stress model (FSM) which argues that families with low SES experience significant economic and psychological stressors and this affects the parent-child relationship. Explaining that caregivers devote more energy towards managing financial burdens, for example by holding multiple employments, and consequently are unable to provide positive parenting, such as empathy, nurturance, material resources, and guidance (Conger et al., 2010; Khaliq & Rasool, 2019). It is important to note that adolescents, irrespective of their SES backgrounds, may exhibit certain behaviours due to the maturity gap rather than out of necessity. Put differently, alongside the risk associated

with the maturity gap, adolescents from low SES groups face an additional risk of unmet needs.

Another aspect of an adolescent's life involves their school and social circle. In their study, Zhu et al. (2020) underscored the significance of peer influence by demonstrating that having friends with higher prestige, marked by academic achievement and aspiration, as opposed to those exhibiting deviant behaviours such as problematic conduct and aggression, predicted greater engagement in prosocial behaviours. Conversely, the reverse was also observed. Similarly, in their review of the literature, Sijtsema and Lindenberg (2018) identified that peer influences played a central role in the development of conduct issues and weapon carrying. This association is particularly crucial in the context of low SES environments, as individuals in such circumstances may face additional challenges in accessing positive influences within their school and social environments (Devenish et al., 2017). For example, within the SA context, gangsterism and substance use prevails in several historically disadvantaged communities (Silber & Geffen, 2009). As a result, adolescents in these areas often encounter peers engaged in delinquency, gangsterism, and substance abuse (Silber & Geffen, 2009). Therefore, it becomes clear that adverse influences from peers and social environments, which may be more prevalent in low SES settings, can contribute to the emergence of antisocial behaviours in adolescents.

Nonetheless, while adolescence may present an elevated risk for the development of antisocial traits, it also introduces protective factors (Carlo et al., 2014). Prosocial traits, for example, possess the potential to mitigate the susceptibility associated with this developmental stage (Carlo et al., 2014).

**Prosocial Traits**

Prosocial traits are considered attributes whereby individuals voluntarily engage in behaviours that would benefit others (Carlo & Randall, 2002). In adolescents, engaging in

prosocial behaviour is associated with positive social adjustment and more favourable outcomes in adulthood (Carlo & Randall, 2002). Carlo and Randall (2002) described six distinct types of prosocial behaviours that youth typically engage in: emotional, dire, compliant, anonymous, public, and altruistic.

Emotional prosocial behaviours are characterised as providing emotional support during eventful situations. Dire prosocial behaviours are defined as offering help during emergencies. Compliant prosocial behaviours are assisting when help is requested. Anonymous prosocial behaviours are helping without being acknowledged for your support, whereas public prosocial behaviours are helping with the acknowledgement of others. Finally, altruistic prosocial behaviours are considered helping without the desire of a reward or benefit. As adolescents undergo cognitive and affective development, they progressively participate in prosocial behaviours, encompassing various forms of helping actions (Carlo & Randall, 2002). The nature of these prosocial behaviours is contingent on various factors.

***Prosocial Traits and Gender***

As with antisocial traits, gender is often identified as a determinant of prosocial behaviour in the literature. However, a meta-analysis conducted by Xiao et al. (2019) on gender and prosocial behaviour in adolescence revealed that gender differences may be contingent on the data collection method. Specifically, larger gender differences were typically observed in self-reported studies as opposed to those employing experimental approaches. Furthermore, Xiao et al. (2019) postulated that this phenomenon could be attributed to socialisation processes and the reinforcement of gender stereotypes where individuals conform to societal norms dictating appropriate behaviour for their gender. That is, individuals are exposed to societal norms that dictate what is considered appropriate behaviour for their gender and consequently adhere to these gender-specific expectations and stereotypes. Expectations tied to gender-specific qualities associate women with empathy and

generosity, considered feminine, and men to assertiveness and aggression, considered masculine (Wood & Eagly, 2015). This is evident within the literature as many studies reporting gender differences utilised self-report measures (see, e.g., Acar et al., 2022).

### *Prosocial Traits and the Influence of Social Relationships*

In their review of the literature, Crone and Achterberg (2022) observed that the inclination towards prosocial behaviour is impacted by the social relationship between the individual and the recipient, in other words, whether the recipient is a stranger or a friend. This was also reported by Padilla-Walker et al. (2018) who used two theories, dispositional and relational, to explain this influence.

Dispositional theories propose a connection between prosocial behaviours and individuals' self-perceptions, driven by a desire to embody positive traits. When prosocial behaviours are associated with dispositional attributes, individuals engage in helping actions as an integral part of their self-concept (Padilla-Walker et al., 2018). Moreover, the dispositional perspective is more closely linked to exhibiting helping behaviours towards strangers rather than relatives or friends (Padilla-Walker et al., 2018).

Relational theories propose that prosocial behaviour is contingent upon the connection between the giver and the receiver (Padilla-Walker et al., 2018). The primary aim of engaging in helpful actions is usually to enhance the relationship with the recipient, and this approach is typically directed toward individuals known to the giver. During adolescence, the importance of peer relationships becomes evident (Chávez et al., 2022). Consequently, adolescents exhibit a greater inclination towards prosocial behaviour when interacting with familiar individuals, such as friends and classmates, as opposed to strangers. This inclination is rooted in their fundamental need for social acceptance, as highlighted by both Crone and Achterberg (2022) and Padilla-Walker et al. (2018).

### *Prosocial Traits and SES*

Another connection in the development of prosocial traits during adolescence is the presence of opportunities to engage in prosocial acts, coupled with the possession of the necessary resources to carry them out (Andreoni et al., 2021; Zhang et al., 2022). This particularly refers to the impact of SES on the cultivation of prosocial traits.

Prosocial traits are often commonly associated with higher SES groups, particularly in relation to elevated parental income and/or education levels (Silke et al., 2018). This association may be explained by the increased opportunities for prosocial behaviour among adolescents from high SES backgrounds. These individuals are less likely to confront stressors commonly experienced in lower SES groups, such as food insecurity. In simpler terms, adolescents from higher SES backgrounds have their basic needs met, enabling them to redirect their focus toward engaging in altruistic activities and acts of kindness.

In a notable example, Macchia and Whillans (2022) conducted a study involving an extensive representative sample of nearly a million respondents from 133 countries. Their findings revealed that participants with higher incomes were more likely to contribute through both monetary donations and volunteering their time, in contrast with their lower-income counterparts. Likewise, in their study, Andreoni et al. (2021) discovered that individuals with higher incomes were more inclined to return a (mis)delivered letter—a task involving a small cost and a bit of time, as noted by the researchers—compared to their low-income counterparts. Consequently, the primary conclusion is that individuals from high SES groups are more likely to engage in prosocial behaviours that include monetary contributions and volunteering time. However, both studies' findings lack controls for the significant influence of greater control over their finances and time that high-income individuals have.

Silke et al.’s (2018) review of the relationship between prosocial traits and adolescents also revealed that higher SES tended to be associated with higher prosocial behaviours. Notably, this association does not preclude the existence of prosocial traits

among lower SES groups. Silke et al. (2018) highlighted that lower SES groups engaged more often in particular prosocial behaviours, such as altruistic behaviours as opposed to public prosocial behaviours. Consequently, understanding the association between SES background and prosocial traits is more complex than simply an exclusive association with lower or higher SES groups. The complexity is further compounded by the lack of differentiation in the literature regarding the types of prosocial behaviour. This poses a challenge as distinct prosocial traits have been correlated with diverse SES backgrounds, as observed in studies like those conducted by Silke et al. (2018) and Davis et al. (2018).

Thus, the prevalent link between high SES and prosocial traits in existing literature warrants careful examination. Many studies, including those mentioned earlier, predominantly evaluate specific prosocial behaviours, such as monetary donations or volunteering time to causes, often observed in high-income individuals. Moreover, the disproportionate emphasis on prosocial traits typically found within higher SES groups may result in a gap in the literature, neglecting the exploration of prosocial behaviours typically associated with lower SES groups.

For instance, Staub and Vollhardt (2008) offered a theoretical perspective on why prosocial behaviours may develop in low SES groups. They suggest that prosocial traits may manifest in low SES backgrounds from a sense of *altruism born of suffering* (Staub & Vollhardt, 2008). This theory posits that individuals who have endured suffering become more attuned to the needs of others and consequently engage in altruistic prosocial behaviours toward those undergoing negative experiences (Staub & Vollhardt, 2008; Vollhardt & Staub, 2011). For example, Piff et al. (2010) proposed that individuals in low-income groups are more inclined to exhibit charitable behaviours, especially towards others within the same income bracket, in contrast to those in high-income groups. In a separate study, Davis et al. (2018) found that adolescents with low SES backgrounds were more prone

to participating in altruistic prosocial behaviours while demonstrating a reduced likelihood of engaging in public helping behaviours. Staub and Vollhardt's (2008) theory extends the idea that experiences of violence or discrimination may promote altruism. In other words, while adolescents in low SES backgrounds may face challenges engaging in some prosocial behaviours due to the associated stressors, these very challenges could foster other prosocial behaviours (Davis et al., 2018). Altruistic prosocial behaviours are likely observable in the SA context, where over half of adolescents experience lifetime poly-victimisation (Leoschut & Kafaar, 2017). This perspective also implies that in lower SES communities in SA, prosocial traits may emerge as a result of shared struggles within the community.

In our context, understanding the dynamics between crime and antisocial traits, along with protective factors like prosocial traits, is essential. However, it is noteworthy that the majority of studies exploring these traits have taken place in higher income countries, where income gradients differ significantly from SA. Consequently, there is a critical need to investigate the extent of both antisocial and prosocial traits across diverse socioeconomic settings within the SA context, with a particular emphasis on adolescence.

## Rationale, Specific Aims, and Hypotheses

The aim of this cross-sectional and correlational study research was to investigate the extent of both antisocial and prosocial traits within the context of SES backgrounds in a sample of adolescents in SA. Additionally, it aimed to address a research gap as the majority of studies exploring these traits have primarily focused on higher-income countries, where income gradients differ significantly from those in SA, thus, there is a crucial need to examine the prevalence of antisocial and prosocial traits across the diverse socioeconomic settings within the SA context. Furthermore, given the notably high global crime rates in SA, particularly involving adolescents, the study sought to explore the potential link between socioeconomic backgrounds and the manifestation of antisocial and prosocial traits during

adolescence. Existing literature indicates that antisocial traits peak during this developmental stage (Manasse & Rebellon, 2023; Moffitt, 1993), suggesting a possible contribution to increased susceptibility to criminal activities among adolescents. Conversely, prosocial traits have been documented as mitigating factors against antisocial behaviours (Tolan et al., 2013). SES emerges as a significant factor in the SA context, given the substantial economic disparities within society. Furthermore, SES has been identified as playing a pivotal role in predicting both antisocial and prosocial traits in the literature (Moffitt, 2018; Piotrowska et al., 2015; Silke et al., 2018). Although most research suggests a connection between low SES and antisocial traits and high SES and prosocial traits, a true consensus is lacking in the literature.

Consequently, I hypothesized that (1) individuals with low to middle SES would report significantly higher antisocial traits, and (2) SES would not significantly predict prosocial traits.

This theoretical framework is grounded in the understanding that SES backgrounds may either exacerbate or mitigate susceptibility to antisocial traits, potentially influenced by the unique stressors experienced by adolescents from diverse SES backgrounds.

To this end, literature shows that adolescents in low SES environments often face compounded risks, such as exposure to violence, substance use and negative peer associations. Conversely, adolescents in high SES environments tend to be more protected from these experiences as such risks are less pervasive in their environments. Given this background, the first hypothesis posits that low SES has the potential to exacerbate antisocial traits, whereas high SES can mitigate susceptibility to these specific traits. Further, literature indicates that various prosocial behaviours are strongly associated with different SES groups, depending on factors such as resource availability or recipient characteristics. Therefore, the

second hypothesis posits that prosocial traits are not significantly influenced by SES. Thus, no difference in reported prosocial behaviours are expected.

## Method

### Design and Setting

The present investigation adopted a correlational research design to examine the association between SES and both antisocial and prosocial traits. It was conducted online using self-report questionnaires. The sample consisted of high school-going adolescents. The independent variable (IV) in this study was SES level, assessed through three self-report questionnaires and using the SA quintile school system. The dependent variables (DVs) were (1) antisocial traits and (2) prosocial traits. Antisocial traits were evaluated using the Inventory of Callous-Unemotional Traits (ICU) as callous-unemotional traits, linked to antisocial tendencies, are associated with having a lack of empathy, diminished responsiveness to punishment, and impaired social bonds (Viding & Kimonis, 2018). These factors collectively contribute to the emergence of antisocial behaviours (Viding & Kimonis, 2018). Prosocial Tendencies Measure (PTM) was employed to measure prosocial traits. Controls variables included alcohol and substance use, depression, demographic variables such as age and gender, and traumatic brain injury (TBI), which are all considered variables capable of influencing outcomes, such as antisocial and prosocial traits (Mak et al., 2019; Williams et al., 2010). A multiple linear regression analysis was performed to determine if SES can significantly predict antisocial and prosocial traits.

### Participants

The study involved 44 participants, with the target age range being 13-18 years. The initial sampling used to recruit participants was convenience sampling via schools. Schools were randomly selected from the Western Cape Education Department's (WCED) list of schools in Cape Town. Schools that were contacted varied in terms of their SES context

based on the quintile system as it was anticipated that within schools, SES would have variability among individuals, thereby contributing to the overall diversity in SES levels. The proposal for the study was submitted in May 2020, approximately two months after the national shutdown in March 2020. Consequently, an additional sampling method was contemplated as a contingency plan in case recruiting a sufficient sample size via secondary schools became challenging due to the impact of COVID-19. Hence, community sampling through social media and snowballing methods were also used.

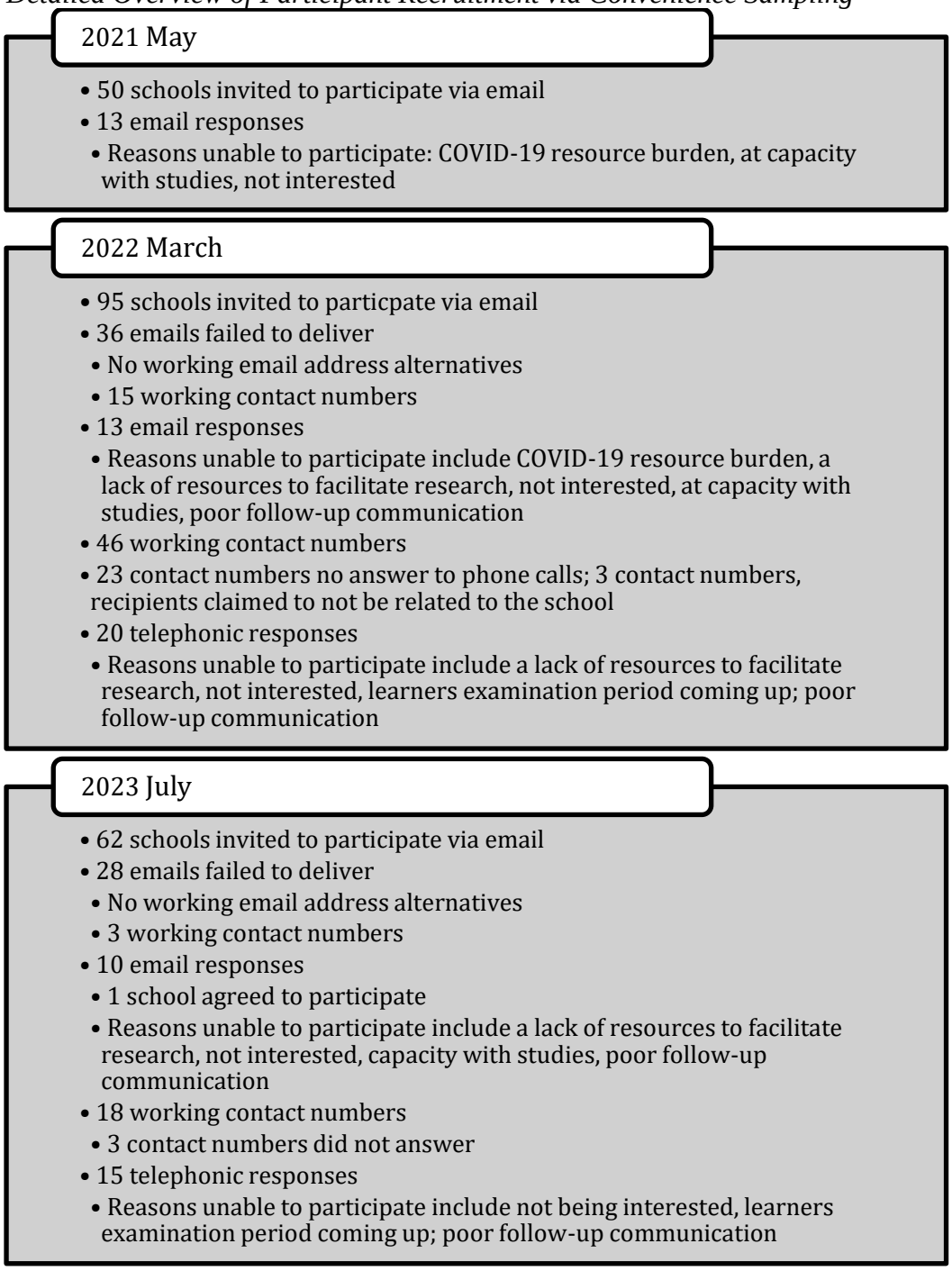
Figure 1 illustrates a flowchart representing the sequential steps of participant recruitment via schools over the years (2021-2023). The study received WCED approval in October 2020 allowing for data collection during two of the school terms in 2021, as collection in the fourth term is not allowed for school-based research due to learners preparing for final examinations. In 2021, participant recruitment was significantly affected by continuing, albeit reduced, COVID-19 restrictions, as many schools faced increased pressure related to COVID-19 and were unable to accommodate the study, while other schools had already committed to facilitating a sufficient number of research studies for the year. Moreover, the majority of schools contacted via email did not respond, and those contacted by phone either could not be reached or declined participation upon answering.

In 2022, the study faced a continued lack of positive responses from contacted schools, prompting a shift to community sampling. This approach resulted in the study receiving 23 completed consent forms from caregivers, of which 16 adolescents assented and actively participated in the study for the year. Schools that responded in 2022 cited similar reasons as those contacted in 2021. Due to the limited number of participants, the study's timeline was extended into 2023 to increase participant recruitment. In 2023, changes in the approval process by the WCED resulted in renewed approval being granted only in June. As a result, data collection was restricted to the third term of 2023. Despite these challenges, I

received a positive response from a single school, contributing to 6 more consent forms completed by caregivers. In total, I received 33 consent forms from caregivers, with 28 participants assenting and completing the questionnaire for the year, mainly through community sampling. Anecdotally, it is worth mentioning that some potential participants declined to take part, citing the questionnaire's length as a factor.

Figure 1

*Detailed Overview of Participant Recruitment via Convenience Sampling*



## Measures

### *SES measures*

**Demographic information and household assets.** A brief questionnaire was utilised to capture demographic information and the household assets owned by participants (refer to Appendices A & B). The questions pertaining to participants' household assets were derived from selected inquiries in the Household Asset Status form (Agincourt, 2020). It is noteworthy that the complete form was not employed, as its primary purpose is the collection of household asset data in rural areas. The specific questions utilised in this study were items 19-24.

**Hollingshead's Four-Factor Socioeconomic Status.** Hollingshead's scale was a self-report measure utilised to assess the social status of individuals based on four SES factors, including: (1) parental occupation, (2) parental education, (3) marital status, and (4) gender (Hollingshead, 1975; see Appendix C). Notably, this study omitted the use of information related to marital status and gender. Parental occupation was rated on a 9-point scale where 9 denoted the highest occupation level, and educational attainment was measured on a 7-point scale, with 7 indicating the highest level of attainment. The overall score had a range of 8 to 66, with a higher score signifying a higher SES. Participants' overall SES status was computed following the specified guidelines. The guidelines indicated that each factor (occupation or education) is determined by applying a respective factor weight (5 and 3), followed by summing these scores to yield a composite score, resulting in a range between 8 and 66. In instances where both parents are employed, individual totals for each parent are aggregated and subsequently divided by 2 to derive an estimation of socioeconomic status. However, in cases where only one parent is employed, the socioeconomic status score is determined based on their perceived status, or if the child resides solely with one parent. Documentation regarding the participants' living arrangements has been recorded for

reference. Hollingshead's scale is frequently employed in literature exploring the impact of SES (Cirino et al., 2002; Duran-Bonavila et al., 2017). Cirino et al. (2002) documented a high level of agreement between Hollingshead's scale and two other SES scales, namely the Nakao and Treas scale and the Blishen, Carroll, and Moore scale. Moreover, the scale has previously been applied in research focused on a SA sample (Gerhold et al., 2017).

**Subjective Social Status (SSS).** The SSS served as a self-report measure employed to assess participants' perceptions of their social status relative to society (Adler et al., 2000; see Appendix D). The measure featured an image of a 10-runged ladder, with the first rung equivalent to 10 and the last to 1. Participants were prompted to "place" themselves on the ladder's rungs, indicating their perceived position in society. A higher rung signified a higher subjective social standing. Research shows that the SSS has previously exhibited significant correlations with objective indicators of SES, such as education history and income (Adler et al., 2000). This measure has been applied in the SA literature (see, e.g., Mutyambizi et al, 2019).

**School quintile.** Quintiles were utilised in SA to categorise the amount of provincial funding public schools received (WCED, 2013). The classification consisted of five quintiles, with quintile 1 denoted as the 'poorest' and quintile 5 as the 'least poor'. Schools falling under quintiles 1-3 were exempt from requiring learners to pay fees. Determination of quintiles was based on the infrastructure of the school and its surrounding community, as well as the poverty levels in the community. Nevertheless, it was anticipated that even within schools of a particular quintile, SES would have variability among individuals, thereby contributing to the overall diversity in SES levels.

### *Covariates*

**Beck's Depression Inventory – Second Edition (BDI-II).** The BDI-II was a 21-item self-report instrument which was utilised in the current study to detect depressive symptoms

in participants (Beck, Steer, & Brown, 1996; see Appendix E). Each item comprised four statements, and participants were required to choose the statement that most accurately reflected their experience. Wang and Gorenstein (2013) documented that the average Cronbach's alpha was approximately .90, ranging between .83 and .96, signifying a high level of internal consistency for the BDI-II. This measure has been used successfully in a SA population (see, e.g., Makhubela & Mashegoane, 2016).

**Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST).** The ASSIST was an 8-item self-report measure employed to detect the use of various harmful substances, such as tobacco, alcohol, and psychoactive substances (World Health Organization [WHO], 2010; see Appendix G). The ASSIST demonstrated good to excellent reliability across different substances in screening for substance abuse (WHO ASSIST Working Group, 2002). This measure proved effective in a SA population (see, e.g., Paruk et al., 2015).

**Comprehensive Health Assessment Tool (CHAT).** The CHAT was a semi-structured interview employed to screen for TBI; Offender Health Research Network, 2013; see Appendix F). The measure consists of four sections: physical and mental health, substance misuse, and neuro-disability. This study utilised only the TBI component of the neuro-disability section as a screening tool. The CHAT demonstrated a 78% sensitivity for screening for TBIs (Chitsabesan et al., 2014). However, there has not been a subsequent psychometric assessment measuring reliability. This measure has been used successfully in a SA population (see, e.g., Tredoux et al., 2022).

***Outcome measures***

**Inventory of Callous-Unemotional Traits (ICU).** The ICU was a 24-item self-report instrument used to measure callous-unemotional traits (see Appendix H). These traits are associated with antisocial characteristics such as, lack of empathy, reduced responsiveness to

punishment, and impaired social bonds (Essau et al., 2006; Viding & Kimonis, 2018). The ICU features three subscales: (1) uncaring, (2) unemotional, and (3) callousness. Items under each subscale are evaluated using a 4-point Likert scale ranging from 0 to 3. Calculating overall scores requires reversing half of the items. The ICU demonstrated internal consistency within the range of .74 to .85 (Kimonis et al., 2008). Its construct validity was also assessed, revealing associations with the Big Five personality questionnaire (Essau et al., 2006). Essau et al. (2006) reported that the ICU could be utilised to measure callous-unemotional traits in adolescents. The ICU was previously successfully utilised in the SA context using an adolescent population (see, e.g., Tredoux et al., 2022).

**Prosocial Tendencies Measure (PTM).** The PTM was a 23-item self-report measure that assesses six types of prosocial behaviours, namely: altruism (5 items), compliant (2 items), emotional (4 items), public (4 items), anonymous (5 items), and dire (3 items; Carlo & Randall, 2002; see Appendix I). The items are evaluated using a 5-point Likert scale ranging from 1 to 5, where 1 denotes "does not describe me at all" and 5 represents "describes me greatly". Carlo and Randall (2002) demonstrated that the PTM's subscales exhibited good test-retest reliability correlation coefficients over a 2-week period: public (.61), anonymous (.75), dire (.72), emotional (.80), compliant (.73), and altruism (.60). The PTM was previously successfully utilised in the SA context (see, e.g., Schwär & Mahony, 2012).

## Procedure

This study began after receiving ethical approval from the Department of Psychology's Research Ethics Committee at UCT and the WCED.

### *Recruiting from schools*

Secondary schools in the Western Cape were contacted via email and telephone and invited to participate in the study. The administrators of potential schools were contacted, and those who expressed willingness to participate were subsequently requested to facilitate the

distribution of consent forms (see Appendix J) to parents and legal guardians of their learners via email. Those parents / legal guardians who consented to take part in the study were instructed to include the email address which the assent form (see Appendix K) and full questionnaire would be sent to. Learners were able to access the assent form from the email address provided by their parents. Learners who assented would then gain access to the questionnaire via the same Google Form as the assent form. Both the assent and consent forms delineated the study's purpose and procedural details. Participants were allocated 250MB of data to compensate them for their participation. Following the completion of the questionnaire, participants were provided with a debriefing form immediately after completion (see Appendix L).

***Recruiting using community sampling***

Despite the impact of COVID-19, schools were still employed as a recruitment avenue, given that the WCED had approved the study and this had been the original plan for the study in order to sample learner participants across SES strata. However, after many unsuccessful recruitments attempts with many schools, as previously detailed, the study found more success through community sampling. The study's outreach to potential learner participants in the community was implemented through social media platforms such as Twitter, Instagram, and WhatsApp as well as word-of-mouth communication, and face-to-face recruitment. However, even if learners expressed interest, obtaining parental consent remained a prerequisite for their participation. Consequently, participants who were interested in participating were sent a link to the consent form which needed to be completed by their parents. Upon securing parental consent, learners were provided with a link to the Google Form, requesting their assent to participate in the study. As with recruitment through schools, participants were allocated 250MB of data to compensate them for their

participation. Similarly, following the completion of the questionnaire, participants were provided with a debriefing form immediately following completion (see Appendix L).

**Data management and statistical analysis**

The questionnaires employed in this study were administered via Google Forms and scored while adhering to the respective scoring guidelines prescribed for each measurement instrument. Data analysis and storage were completed using R-Studio (RStudio Team, 2023) and Excel. For the purpose of ensuring replicability, refer to Appendix O. Significance levels were established at $p < .05$, following convention.

***Descriptive statistics.*** Descriptive statistics were computed for the following: a) participant demographic information, b) substance exposure, c) depression scores, and d) outcome variables, specifically, Hollingshead's scale, SSS, ICU, and PTM scores. Information on participants' assets will not be reported due to insufficient variability in the data.

***Multiple linear regression analysis.*** Multiple linear regression analysis was used to assess the potential significant correlations between SES, measured by Hollingshead's scale and SSS outcomes, and antisocial traits (ICU outcomes) and prosocial traits (PTM outcomes). The regression analysis included controls for outcomes on the BDI-II and ASSIST to adjust for the influence of these variables. Notably, TBIs did not necessitate control measures, as no instances were reported by the participants.

**Ethical Considerations**

This research adhered to the ethical guidelines outlined in the UCT Ethics Code for Research Involving Human Subjects. Approval was secured from the REC of UCT's Department of Psychology (reference number: PSY2020-044, see Appendix M) and the WCED (see Appendix N). Given challenges in participant recruitment, annual renewal of approval from the WCED was necessitated throughout the successive years of the study.

### *Informed Consent and Confidentiality*

Consent forms were provided via Google Forms to the parents or legal guardians of participating learners through email channels by their respective schools as well as through contact with parents via WhatsApp advertisements, word-of-mouth communication, and face-to-face recruitment. The consent forms detailed the study's objectives and the methodologies as well as that the data collected during the study would be treated with confidentiality and anonymity. It was emphasised that participation was voluntary and assurance that withdrawal at any stage would have no adverse consequences. Upon obtaining parental consent, email addresses were requested to facilitate the distribution of assent forms and questionnaires to the learners. Learners were then provided with detailed information, akin to that in the consent form, and were required to assent to participation.

### *Potential Risks and Benefits*

No known risks were associated with participation in the study. Participants scoring within the clinical range of the BDI-II were notified via email and were referred to either their school counsellor or the SA Depression and Anxiety Group (SADAG). There were no benefits specifically associated with participation in the study. However, the data could be utilised to enhance understanding of the impact of SES on antisocial and prosocial traits in adolescents.

### *Debriefing*

Upon the completion of the study, participants were debriefed immediately after with a form explaining the study further. Participants were also provided with the contact details of the researcher and supervisor. This provision aimed to address any questions or concerns that participants might have had about the study (refer to Appendix L).

# Results

## Sample characteristics

Table 1 provides an overview of the sample characteristics among participants. Gender distribution reveals a nearly equal representation. The average age for participants is around 15 years, with a concentration of participants in either the 9th or 10th grade, which is typical of that age group in SA. Residential arrangements indicate participants predominantly cohabitate with parents, followed by living solely with mothers. Instances of participants residing solely with fathers or a guardian were less common. Analysis of BDI-II scores indicates that, on average, participants fall within the category of mild mood disturbance. However, a notable observation arises from the BDI-II data range, which illustrates that some participants fall within the more extremes of the measure. Table 1 also provides a summary of participants' exposure to substances. It shows that significant proportion of participants have not engaged in substance use. Among those with reported substance exposure, tobacco emerges as the most prevalent, followed by alcohol and cannabis. Notably, exposure to illegal drugs was less frequent within the participant cohort. Further, Table 1 presents summaries of the SES measures used with the participants. The interpretation of the Hollingshead reveals a predominant concentration of participants within the "medium business, minor professional, technical" stratum. Examining the SES distribution based on the Hollingshead's, it is evident that participants' socio-economic standing is largely centred in the middle-income range. As such, there are fewer participants falling into either high- or low-income SES brackets. This alignment is reflected in the SSS scores, indicating a prevalent self-perception of individuals positioning themselves within the middle-income SES bracket. The SES measures align with the type of schools attended by participants, with the majority enrolled in institutions categorized as quintile 4 or 5, indicative of middle to high-income groups. The lowest quintile grouping observed was a 3 as no participants attended quintile 1 or 2 schools.

Similarly, responses on the Asset Questionnaire exhibited limited variation, indicating a high degree of homogeneity among participants in their reported assets and possessions. Responses to the CHAT were not reported on as none of the participants reported head injuries.

Table 1
*Sample Characteristics (n = 44)*

| Variable | | *n*= | Percentage (%) |
|---|---|---|---|
| Gender | | | |
| | Female | 20 | 45 |
| | Male | 23 | 52 |
| | Non-binary | 1 | 3 |
| Age (years) | | | |
| | M(*SD*) | 16 (*1.27*) | |
| | Range | 13 - 18 | |
| Grade | | | |
| | 8 | 6 | 14 |
| | 9 | 14 | 32 |
| | 10 | 13 | 29 |
| | 11 | 6 | 14 |
| | 12 | 5 | 11 |
| Living arrangements[a] | | | |
| | Parents | 29 | 69 |
| | Mother | 10 | 24 |
| | Father | 1 | 2 |
| | Guardian | 2 | 5 |
| BDI-II | | | |
| | M(*SD*) | 12.6 (*9.50*) | |
| | Range | 0 - 38 | |
| Substance exposure | | | |
| | Alcohol | 12 | 27 |
| | Tobacco | 15 | 34 |
| | Cannabis | 11 | 25 |
| | Illegal Drugs | 3 | 7 |
| Hollingshead Status Score[b] | | | |
| | M(*SD*) | 45.1 (*11.5*) | |
| | Range | 8 - 66 | |
| | Major business and professional | 5 | 11 |
| | Medium business, minor professional, technical | 22 | 52 |
| | Skilled craftsman, clerical, sales workers | 13 | 31 |
| | Machine operators, semiskilled workers | 1 | 3 |
| | Unskilled labourers, menial service workers | 1 | 3 |
| Subjective Social Status | | | |
| | M(*SD*) | 5.7 (*1.26*) | |
| | Range | 1 - 8 | |
| Quintile | | | |
| | M(*SD*) | 4.8 (*.44*) | |
| | Range | 3 - 5 | |
| | 3 | | 3 |
| | 4 | | 11 |
| | 5 | | 86 |

| Variable | | *n*= | Percentage (%) |
|---|---|---|---|
| Assets | | | |
| | M(*SD*) | 4 (*1.02*) | |
| | Range | 0 - 5 | |

*Note.* Means are presented with standard deviations in parentheses. BDI-II = Beck's Depression Inventory – Second Edition. BDI-II scores ranged from minimal depression to severe depression. [a]Two participants did not specify their living arrangements. Illegal drugs = cocaine, amphetamine-type stimulants, inhalants, sedatives or sleeping pills, hallucinogens, opioids. [b]Two participants did not specify their living arrangements. Hollingshead Status Score reported objective SES; Subjective Social Status reported subjective SES; Quintile reported participants' school classification in relation to the school's economic status; Assets reported participants' basic amenities and home appliances.

Table 2 illustrates the ICU and PTM descriptive outcomes by gender. The overall sample mean for ICU is 26.6, with a standard deviation of 8.48, suggesting a moderate level of variability within the total sample. The range, spanning from 5 to 43, indicates a diverse distribution of scores. For the ICU measure, males exhibit the highest mean score (*M*=29.9), and females with the lowest (*M*=22.8).

The overall sample mean for PTM is 55.3, with a standard deviation of 16.8, suggesting a notable degree of variability within the total sample. The range for PTM scores extends from 23 to 115, indicating considerable diversity in trait measures. For the PTM measure, females had the highest mean (*M*=62.0) and males with the lowest mean (*M*=49.7). These findings highlight gender-related variations in both ICU and PTM scores within the studied sample.

Table 2
*ICU and PTM Scores by Gender (n=43)*

| Measure | Female (*n= 20*) | Male (*n=23*) | Total[c] (*n*=44) | |
|---|---|---|---|---|
| | M | M | M(*SD*) | Range |
| ICU | 22.8 | 29.9 | 26.6 (*8.48*) | 5 - 43 |
| PTM | 62.0 | 49.7 | 55.3 (*16.8*) | 23 - 115 |

Note. Means are presented with standard deviations in parentheses. ICU = Inventory of Callous-Unemotional Traits; PTM = Prosocial Tendencies Measure. [c]Non-binary response was included in this total but not reported on as it is a singular response.

**Inferential statistics**

Table 3 summarises the variance inflation factor (VIF) values for the predictor variables in the regression model which were examined to assess multicollinearity. As indicated, all VIF values were well below the commonly accepted threshold of 5, suggesting that multicollinearity was not a significant concern in the present analysis. The predictor variables demonstrated VIF values ranging from 1.10 to 1.52. These results indicate that the predictor variables were not highly correlated with each other, supporting the assumption of independence among predictors in the multiple linear regression model. Overall, the low VIF values suggest that the inclusion of these variables in the model was appropriate, and that multicollinearity did not unduly influence the interpretation of the regression coefficients.

Table 3
*Variance Inflation Factor Values for Predictor Variables*

| Predictor Variable | VIF |
|---|---|
| Hollingshead Scale | 1.17 |
| BDI-II | 1.28 |
| Tobacco | 1.52 |
| Alcohol | 1.35 |
| Cannabis | 1.48 |
| Age | 1.11 |
| Gender | 1.23 |
| Illegal Drugs | 1.10 |

*Note.* VIF = Variance Inflation Factor; BDI-II = Beck's Depression Inventory – Second Edition; Illegal drugs = cocaine, amphetamine-type stimulants, inhalants, sedatives or sleeping pills, hallucinogens, opioids.

Table 4 provides a summary of the multiple linear regression analysis models aimed at predicting antisocial and prosocial outcomes based on two SES measures, the Hollingshead Scale and SSS, without observing the effect of controls on that data.

For the Hollingshead Scale, it is shown that there is a positive linear relationship with ICU scores but that is not statistically significant at conventional significance levels ($p$=.186). Conversely, the Hollingshead scale has a negative linear relationship with PTM scores ($p$=.05003). This means that higher SES trended towards significantly predicting lower prosocial behaviours. To note, the R-squared value showed that the model only explained 4%

of the variance in the ICU scores. However, it explained 9% of the variances in the PTM scores with an adjusted R-squared of 0.068, which suggests a relatively modest improvement in model fit. Overall, while the relationships between the variables are not statistically significant, the low R-squared values suggest that other factors not included in the models may contribute to the variation in the dependent variables.

For the SSS, the modelling of ICU scores and PTM scores had weak model fits, achieving low R-squared values of 0.0055 and 0.0095, respectively, along with negative adjusted R-squared values. Moreover, both models lacked statistical significance.

Table 4
*Summary of Multiple Linear Regression Analysis Predicting the Antisocial and Prosocial Outcomes from the SES Measures*

| | Outcomes | | | | | |
|---|---|---|---|---|---|---|
| | ICU | | | PTM | | |
| SES Measures | B | S.E | α | B | S.E | α |
| Hollingshead Scale | 2.110 | 1.569 | .186 | -6.191 | 3.066 | .05003 |
| SSS | -.655 | 1.033 | .529 | -.992 | 2.052 | .631 |

*Note.* SSS = Subjective Social Status; ICU = Inventory of Callous-Unemotional Traits; PTM = Prosocial Tendencies Measure. B = Un-standardised Coefficient, SE = Standard Error, α = significance. *$p$<.05.

Table 5 provides a summary of the multiple linear regression models aimed at predicting antisocial and prosocial outcomes based on the Hollingshead Scale, with observing the effect of controls, namely, BDI-II scores, substance use, age, and gender. As with the models presented in Table 7, the Hollingshead Scale did not significantly predict either ICU or PTM scores. The variable that had significant impacts on both ICU and PTM scores was gender. In the ICU model, it is shown that males were significantly more likely to score high ICU scores than other gender groups ($p$ <.001). Similarly, in the PTM model, males were significantly more likely to have lower PTM scores than other gender groups ($p$ <.001). In both models no other variable achieved statistical significance. However, in the ICU model, the variables of age and BDI-II showed trends towards significance. Additionally, in the PTM model, the variables Hollingshead Scale, Tobacco, Alcohol, and BDI-II, also showed trends

towards significance. Both models were statistically significant (ICU: $p$=.03; PTM: $p$=.04); however, it is evident that the significance can be explained by gender. Based on the adjusted R-squared values of both models, each explains 24.09% (ICU) and 22.22% (PTM) of the variance, respectively, which implies a moderate fit.

Table 5

*Summary of Multiple Linear Regression Analysis Predicting the Antisocial and Prosocial Outcomes from Covariates*

| | Outcomes | | | | | |
|---|---|---|---|---|---|---|
| | ICU | | | PTM | | |
| Covariates | B | S.E | α | B | S.E | α |
| Intercept | 7.683 | 9.056 | 0.402 | 37.444 | 30.640 | 0.230 |
| Hollingshead Scale | 1.939 | 1.654 | 0.250 | -5.712 | 3.328 | 0.096. |
| BDI-II | 0.272 | 0.151 | 0.082. | -0.468 | 0.304 | 0.134 |
| Tobacco | 0.858 | 3.666 | 0.816 | 13.462 | 7.377 | 0.077. |
| Alcohol | 1.297 | 3.495 | 0.713 | -12.251 | 7.033 | 0.091. |
| Cannabis | -0.626 | 3.959 | 0.875 | 0.649 | 7.967 | 0.936 |
| Illegal Drugs | 5.363 | 4.853 | 0.277 | 4.157 | 9.766 | 0.673 |
| Age | -1.701 | 0.977 | 0.091. | 2.842 | 1.967 | 0.158 |
| Gender (male) | 10.713 | 2.760 | 0.000** | -16.056 | 5.556 | 0.007** |
| Gender (non-binary) | 3.070 | 9.385 | 0.746 | 5.524 | 18.888 | 0.772 |
| Model Fit Statistics | | | | | | |
| Residual Standard Error | 7.366 | | | 14.82 | | |
| Multiple R-squared | 0.407 | | | 0.3929 | | |
| Adjusted R-squared | 0.241 | | | 0.2222 | | |
| F-statistic[c] | 2.446 | | .030 | 2.301 | | .040 |
| Degrees of Freedom | 9, 32 | | | 9, 32 | | |

*Note.* ICU = Inventory of Callous-Unemotional Traits; PTM = Prosocial Tendencies Measure. B = Un-standardised Coefficient, SE = Standard Error, α = significance. ***$p$<.001, **$p$<.01, *$p$<.05, .$p$<.1. [c]Two observations were removed from the analysis due to missing data.

Table 6 is included for the sake of completeness, as it has been previously demonstrated that the SSS poorly models the outcome measures. Table 9 provides a summary of the multiple linear regression models aimed at predicting antisocial and prosocial outcomes based on the SSS scores, with observing the effect of controls, namely, BDI-II scores, substance use, age, and gender. As with the models presented in Table 7, the SSS did not significantly predict either ICU or PTM scores. As anticipated, based on the previous model, the analysis revealed that gender significantly predicted higher ICU and lower PTM scores, with *p*-values of <.001and <.01, respectively. Notably, the BDI-II exhibited a significant association with both ICU and PTM scores ($p$ <.05). This indicates that high BDI-II scores were significantly linked to higher ICU scores and, conversely, significantly associated with lower PTM scores. Additionally, age demonstrated a marginally significant negative relationship with ICU ($p$ =.07), implying that older individuals appear to report lower ICU traits. Consistent with this outcome, age showed a positive relationship with PTM scores, but was not statistically significant ($p$ =.10).

Other covariates included did not reach conventional significance levels. For the ICU model, the overall fit was moderate (Multiple R-squared = 0.39), indicating that approximately 39% of the variance can be explained by the included covariates. Moreover, the model demonstrated statistical significance with a *p*-value of 0.036. Likewise, for the PTM model, the overall fit was modest (Multiple R-squared = 0.34), suggesting that approximately 34% of the variance can be explained by the included covariates. However, the adjusted R-squared is relatively low (Adjusted R-squared = 0.16), indicating that the model's predictive power is limited. Moreover, the PTM model was not statistically significant ($p$ = .09).

Table 6

*Summary of Multiple Linear Regression Analysis Predicting the Antisocial and Prosocial Outcomes from Covariates*

| | Outcomes | | | | | |
|---|---|---|---|---|---|---|
| | ICU | | | PTM | | |
| Covariates | B | S.E | α | B | S.E | α |
| Intercept | 42.916 | 15.48 | .009 ** | 25.454 | 31.675 | .427 |
| SSS | .188 | .995 | .851 | -1.098 | 2.036 | .593 |
| BDI-II | .334 | .147 | .029* | -.626 | .301 | .045* |
| Tobacco | .981 | 3.809 | .798 | 11.985 | 7.791 | .133 |
| Alcohol | 1.100 | 3.654 | .765 | -11.890 | 7.475 | .121 |
| Cannabis | 1.137 | 3.776 | .765 | -4.729 | 7.724 | .544 |
| Illegal Drugs | 5.561 | 4.918 | .266 | 2.637 | 10.061 | .794 |
| Age | -1.831 | .988 | .072. | 3.414 | 2.021 | .100 |
| Gender (male) | 11.480 | 2.801 | .0002*** | -17.292 | 5.730 | .004** |
| Gender (non-binary) | 2.002 | 9.554 | .835 | 7.390 | 19.543 | .707 |
| Model Fit Statistics | | | | | | |
| Residual Standard Error | 7.448 | | | 15.23 | | |
| Multiple R-squared | 0.3897 | | | 0.3388 | | |
| Adjusted R-squared | 0.2232 | | | 0.1585 | | |
| F-statistic | 2.341 | | .036 | 1.879 | | .09 |
| Degrees of Freedom | 9, 33 | | | 9, 33 | | |

*Note.* ICU = Inventory of Callous-Unemotional Traits; PTM = Prosocial Tendencies Measure. B = Un-standardised Coefficient, SE = Standard Error, SSS = Subjective Social Status. α = significance. ***$p$<.001, **$p$<.01, *$p$<.05, .$p$<.1.

As noted before, the current study not only aimed to assess the predictive capacity of SES but also to explore potential connections between the subcategories of the scales, ICU and PTM and the outcome measures: gender, age, substance use, and depression. However, upon analysing the model results, it became evident that gender emerged as the only significant factor. Consequently, we proceeded to model gender as the predictor, removing other non-significant covariates from the model. Tables 10 and 11 illustrate these findings.

In Table 7, gender showed statistically significant association with only one subcategory of the ICU, Uncaring traits ($p$=.003). The result suggests that males in the study sample are significantly more likely to exhibit antisocial traits associated with being uncaring. Moreover, there was a trend towards significance for the subcategory, Callousness ($p$=.076), suggesting that males in the sample were also more inclined to exhibit antisocial traits associated with callousness. The Unemotional subcategory did not show a statistically significant association with gender ($p$=.264). During the initial analysis of the subcategories, age emerged as a significant variable linked to the Callousness category of the ICU, leading to its inclusion in the model with that specific category. However, it is apparent that its significance was likely influenced by the contribution of another variable as it is no longer within conventional standards of significance ($p$=.785).

In Table 8, gender showed statistically significant associations across four of the six subcategories of the PTM. Specifically, the analysis revealed a significant association between male gender and reduced engagement in prosocial behaviours characterized as anonymous, emotional, public, and complaint oriented, within the study sample. During the initial analysis of the subcategories, tobacco emerged as a significant variable linked to the anonymous PTM category, leading to its inclusion in the model with that specific category. However, it is apparent that its significance was likely influenced by the contribution of another variable as it is no longer within conventional standards of significance ($p$=.300).

Table 7

*Summary of Multiple Linear Regression Analysis Predicting Subcategories of Inventory of Callous-Unemotional Traits from Significant Covariates*

| | ICU | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Callousness | | | Uncaring | | | Unemotional | | |
| Covariates | B | S.E | α | B | S.E | α | B | S.E | α |
| Gender (male) | 2.31 | 1.26 | .07. | 3.90 | 1.24 | .003** | 1.04 | .91 | .26 |
| Age | .13 | .49 | .78 | | | | | | |

*Note.* ICU = Inventory of Callous-Unemotional Traits, B = Un-standardised Coefficient, SE = Standard Error, α = significance. ****p*<.001, ***p*<.01, **p*<.05, *.p*<.1.

Table 8

*Summary of Multiple Linear Regression Analysis Predicting Subcategories of Prosocial Tendency Measure from Significant Covariates*

| | PTM | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Anonymous | | | Emotional | | | Public | | | Altruism | | | Complaint | | | Dire | | |
| Covariate | B | S.E | α | B | S.E | α | B | S.E | α | B | S.E | α | B | S.E | α | B | S.E | α |
| Gender (male) | -2.54 | 1.15 | .03* | -2.12 | .97 | .04* | -3.06 | 1.16 | .01* | -2.18 | 1.17 | .07. | -1.00 | .61 | 0.25 | -1.59 | .94 | .10. |
| Tobacco | 1.27 | 1.21 | .30 | | | | | | | | | | | | | | | |

*Note.* PTM = Prosocial Tendencies Measure, B = Un-standardised Coefficient, SE = Standard Error, α = significance. ****p*<.001, ***p*<.01, **p*<.05, *.p*<.1.

## Discussion

This study aimed to explore the predictive impact of socioeconomic backgrounds on both antisocial and prosocial traits in a sample of SA adolescents. The existing studies are primarily concentrated in higher-income countries; this investigation sought to examine the dynamics of these factors within the SA context. This is because SA has notably high global crime rates (World Population Review, 2023), which adolescents contribute a notable portion to (Statistics SA., 2018). Thus, understanding the interplay between SES and the manifestations of antisocial and prosocial traits during adolescence becomes significant. Existing literature underscores adolescence as a critical period where antisocial traits peak, potentially contributing to heightened susceptibility to criminal activities (Manasse & Rebellon, 2023). Conversely, prosocial traits have been identified as pivotal factors mitigating antisocial behaviours (Carlo et al., 2014). SES emerges as a significant determinant within the SA context, given the economic disparities within the country. Moreover, SES has been consistently implicated in predicting both antisocial and prosocial traits, although the exact nature of this relationship remains debated (Moffitt, 1993; Piotrowska et al., 2015; Zhang et al., 2022).

There were two main hypotheses in the current study. First, that adolescents from low to middle SES backgrounds would report significantly higher levels of antisocial traits than adolescents from high SES backgrounds. Second, that there would be no significant differences in prosocial traits across various SES subgroups in the study. This theoretical framework was rooted in the understanding that SES backgrounds might either intensify or alleviate susceptibility to antisocial traits, a phenomenon potentially influenced by the unique stressors experienced by adolescents from diverse SES backgrounds. Moreover, different SES backgrounds may report different types of prosocial behaviours. Consequently, there might not be discernible variations in reported prosocial behaviours across these groups.

The discussion will be structured by firstly examining the effect of SES on antisocial and prosocial traits by discussing the outcomes of the hypotheses, secondly, exploring the significant impact of gender on these traits evident in the results, and lastly, acknowledging the limitations of the study as well as proposing directions for future research.

**Antisocial Traits and SES**

The findings of the current study indicate that SES did not serve as a reliable predictor of antisocial traits within the sample. Both the Hollingshead Scale and SSS demonstrated poor predictive power for ICU scores. In essence, our results suggest that SES does not have a discernible impact on the presence of antisocial traits among adolescents. Thus, the initial hypothesis proposing that middle-low SES would predict higher antisocial traits is not supported by the current study's results. It is important to note, however, that this finding is not consistent with existing literature on the subject.

For instance, in a meta-analysis conducted by Piotrowska et al. (2015), they reported a significant link between lower SES and heightened levels of antisocial behaviour. It is noteworthy that, similar to our study, they specifically included research employing composite measures of SES, such as the Hollingshead's Index. However, our study's findings do not align with theirs. In their meta-analysis, Piotrowska et al. (2015) emphasised that the association between SES and antisocial behaviour was significantly influenced by the type of informant. They reported that stronger relationships were observed when reports were provided by parents or teachers, as the mean effect size tended to be larger compared to studies relying on youth self-report, as was the case in our study. The implications of this are that the findings within our sample may have been different, had we used a different informant method, such as relying on reports from parents or teachers, as suggested by Piotrowska et al. (2015). The observed lack of congruence with their findings underscores the potential impact of informant choice on investigating the relationship between SES and

antisocial behaviour. Therefore, it is important to acknowledge that our results may have varied had we opted for a different reporting source, shedding light on the importance of considering informant dynamics in future studies exploring these associations.

Another factor to remember is that antisocial behaviour is a varied and multifaceted concept, encompassing a range of diverse behaviours. Consequently, studies in the literature frequently employ varying measurement approaches to capture its complexity. For instance, Anderson et al. (2022) utilised the Child Behaviour Checklist (CBCL) Youth Self Report, which assesses both internalising and externalising behaviour symptoms. The latter includes the evaluation of aggressive behaviours and rule-breaking, which are examples of antisocial behaviours according to Brazil et al. (2018). In Anderson et al. (2022), they reported that lower income exacerbates the impact of harsh parenting. In turn, harsh parenting has been linked to antisocial behaviours (Leibbrant et al., 2012; Ward et al., 2015). In the current study, we used a single measure, the ICU as a cursory indication of antisocial traits, acknowledging the limitations in the proposed association between the measure (ICU) and outcome (antisocial traits). This illustrates how the measurement tools and specific behaviours considered within the broader concept of antisocial behaviour can vary across studies, contributing to the complexity of understanding its associations with factors like income.

Interestingly, Celik (2022) reported a positive relationship between SES and antisocial behaviours. In their study, they used data collected from a national data collection scheme to model predictors of antisocial behaviour in a Norwegian high school sample ($n$=13326). The results indicated that higher SES groups were linked to elevated antisocial behaviours, including activities such as stealing, substance use, vandalism, cheating on tests, and engaging in fights. However, it is important to note that the sample might not have been entirely representative, as two-thirds of the participants reported being financially well-off.

Another factor to consider, which may help explain why the findings of this study do not align with the existing literature, is by Piotrowska et al. (2015) who found that the predictive influence of SES on antisocial behaviours is non-linear. This non-linear relationship suggests that the impact of SES on antisocial behaviours may be nuanced and not consistently linear across the entire spectrum of SES. For example, it may only be observable within smaller ranges of SES, such as between low and middle or high and middle and may not necessarily be prominent between the extremes of low and high SES.

In the current study, the SES measures were predominantly focused on the middle-income group, with limited representation of both low and high SES groups. As a result, the study may lack the diversity necessary to capture potential non-linear relationships, as observed in the findings reported by Piotrowska et al. (2015).

**Prosocial Traits and SES**

The study results indicated that SES failed to predict prosocial traits within the sample, as evidenced by the poor predictive performance of both the Hollingshead Scale and SSS for PTM scores. In essence, the findings suggest that SES did not have any influence on the manifestation of prosocial traits in the sample of adolescents included in the current study. This outcome supports the second hypothesis, which posited that SES would not have a significant impact in terms of predicting prosocial behaviours. However, this finding diverges from the prevailing literature, which commonly suggests that SES influences prosocial behaviours (Silke et al., 2018; Zhang et al., 2022). Nevertheless, there is no consensus on the specific direction of this relationship as studies tend to diverge in their findings, and these discrepancies can be attributed to the variations in measurement methods, and general methodology, employed across different research endeavours (Silke et al., 2018).

For instance, the study by Macchia and Whillans (2022), mentioned earlier, revealed that individuals with higher incomes were more likely to provide monetary donations and

volunteer their time, compared to their lower-income counterparts. However, it is important to note that their study primarily focused on financial contributions and time volunteering, excluding other methods that might be more commonly employed by individuals from lower SES groups. In contrast, Piff et al. (2010) conducted a series of four social experiments and found that individuals with greater socioeconomic disadvantage were more likely to exhibit generosity, charity, trust, and helpfulness compared to higher SES individuals. Their studies involved university students and utilised a mix of "games" and experimental conditions. Thus, the different methodologies, self-report versus experimental produced differing results for similar aspects of prosocial behaviour. Perhaps the manner in which these different aspects of prosocial behaviour is operationalised differs across these studies or that different subcategories of prosocial behaviours are reported on.

Following from this, another aspect to be considered is that SES can be linked to specific categories of prosocial behaviours. In the current study, the rationale was that the PTM measure comprehensively encompassed all prosocial behaviours. Consequently, it was hypothesised that there would not be a significant association with SES, except when analysing specific subcategories. However, the current study did not find a significant link when examining the relationship between SES and the specific subcategories of the PTM measure.

This finding is in contrast to Davis et al. (2018) as they found in their sample ($n$=307) of adolescents that participants who were under economic stress were more likely to engage in altruistic behaviours than public prosocial behaviours based on their responses on the PTM. Similarly, in their experimental design, Kraus and Callaghan (2016) reported that individuals with lower SES gave significantly more in private compared to public settings. The opposite trend was observed for individuals from higher SES backgrounds, although this finding did not reach statistical significance.

## Gender

As noted, according to the reported results, SES did not emerge as a significant predictor for either antisocial or prosocial traits across the various models examined. In contrast, the inclusion of covariates highlighted a notable influence of gender on both antisocial and prosocial traits for the study sample. Specifically, males demonstrated a higher likelihood of reporting elevated antisocial traits and lower levels of prosocial traits compared to females and the non-binary individual in the sample. Further exploration into specific areas of the ICU categories revealed that, among males, there was a significant tendency to display uncaring traits, followed by callousness, although the latter did not reach statistical significance. No statistically significant gender differences were observed in the unemotional subcategory, indicating a lack of gender-associated distinctions in this regard. Concerning prosocial traits, males were found to engage significantly less in behaviours characterised as anonymous (e.g., privately donating money), emotional (e.g., comforting a friend), public (e.g., volunteering at a local soup kitchen), or complaint (e.g., helping someone when requested to). Notably, there were no gendered differences in altruistic and dire-oriented prosocial behaviours. While these findings on antisocial and prosocial traits were not initially hypothesised, they are supported in the existing literature.

### *Gender Differences in Callous and Unemotional Traits*

Regarding antisocial behaviours and gender, Carvalho et al. (2017) reported in their Portuguese sample ($n$=1011) of children and adolescents using the ICU as their measurement of antisocial traits, that males had significantly higher scores, both for the total and for subscale scores on the measure. Jiang et al. (2020) similarly reported that males in their study were significantly more likely to display antisocial behaviours. This is consistent with our study's findings which suggested that being male significantly predicted higher ICU scores as well as had significant associations with the uncaring subscale. In a separate study, Nwafor et

al. (2015) found that in their Nigerian sample ($n$=295) of high school participants that there was no significant correlation between ICU totals and gender, however, similar to our findings, they found a significant link between being male and the uncaring subscale.

Interestingly, Pihet et al. (2014) reported contrasting results, as gender did not emerge as a significant factor influencing ICU scores in their study with 397 Swiss adolescents. Instead, they asserted that the utility of the ICU in the adolescent population is commendable, as it effectively eliminates the impact of demographic information, suggesting its robustness as a measure of callous-unemotional traits in this age group. However, this finding does not take away that gender differences are evident across various antisocial measures in a number of other studies.

For instance, Leahy, O'Neill, and Hammond (2010) observed a notable gender difference in their study involving 607 participants, utilising the Leahy Antisocial Personality Scale (LAPS). Their research indicated that males scored significantly higher than females on the LAPS. Leahy et al. (2010) further underscored this gender disparity by identifying certain scale items that exhibited significant bias toward gender. Specifically, their analysis revealed that males were more prone to be less conforming and more impulsive and deceitful compared to their female counterparts. Moreover, in a separate study, Begum (2019) investigated gender differences among 191 high school students, utilising the Bangla version of the How I Think Questionnaire to assess all four categories of antisocial behaviour in the DSM-I V (Oppositional defiance, Physical aggression, Lying, and Stealing). Contrary to our study's findings and others mentioned, Begum's (2019) results indicated that, while males tended to display more antisocial behaviours than females, the overall difference lacked statistical significance. However, Begum (2019) had identified a significant gender distinction in physical aggression, where males scored higher than females ($p$<0.01). Once

again, although this specific outcome does not directly align with our research, it highlights the intricate nature of gender differences in diverse antisocial behaviours.

To understand our study's findings, we can look at Falcon et al.'s (2021) findings. In a sample (*n*=199) of young adults in the United States of America they found that CU traits were underscored by emotion regulation difficulties in relation to antisocial behaviour. Furthermore, they found that for males specifically, emotion dysregulation was significantly linked to greater antisocial behaviour. Hence, it is plausible to suggest that emotion regulation difficulties might be a potential contributing factor in the current study; however, since emotional regulation strategies were not assessed in our study, this assertion remains speculative.

Nonetheless, our study's findings suggest a heightened propensity among males to demonstrate a lack of concern for others' feelings or well-being as they reported scores which were significantly higher on the Uncaring domain of the ICU than females. Research has suggested that individuals exhibiting ICU traits may be more prone to engaging in antisocial behaviours, such as aggression, deceitfulness, and rule-breaking conduct (Viding & Kimonis, 2018). Moreover, there is growing evidence linking CU traits to an increased risk of progressing towards more severe forms of antisocial behaviour and thus potentially culminating in criminal activity (Viding & Kimonis, 2018). Thus, this disposition carries potential adverse consequences for societal progress, possibly predisposing individuals to engage in criminal activities (see e.g., Moffitt, 2018). What is disconcerting about this potential pathway is the existing trend of male overrepresentation in crime statistics across all age groups in SA, and specifically considering GBV in our context (Kempen, 2023; Govender, 2023). However, such considerations also underscore the critical need to focus interventions specifically on males especially in contexts crime statistics skewed in terms of gender, and where antisocial behaviours are reported to be high.

### *Gender Differences in Prosocial Traits*

Regarding prosocial traits and gender, the findings that males tend to be less prosocial is consistent with the literature. For instance, Jiang et al. (2020) reported in their Chinese sample ($n$=1280) that males displayed less prosocial behaviour compared to females. A previous study using a Chinese population ($n$=458) also reported that females scored significantly higher than males on the PTM. Both these studies lend support to our findings, which is that in the current study's SA adolescent sample, males tended to report less prosocial behaviours than their female counterparts. Neither of these studies reported on gender differences within the subscales of the PTM. Nevertheless, there are several papers whose findings align with those of the current study (see, e.g., Kındap-Tepe & Aktaş, 2019; Feng & Zhang, 2021).

In a separate study, Malinauskas and Saulius (2019), using a Lithuanian sample of primary school and high school participants, reported no significant differences in gender in their overall PTM scores, except that females reported that they were significantly more likely to engage in altruistic and dire forms of prosocial behaviours. Conversely, the findings of the current study showed no gender differences for these particular forms of prosocial behaviour. Instead, the results showed that males tend to report significantly less in anonymous, public, emotional, and compliant behaviours. Similarly, Kındap-Tepe and Aktaş (2019) found support that males were significantly less likely to report compliant and anonymous prosocial behaviours. However, in another study, using Chinese adults, they found that males are significantly more likely to report public forms of prosocial behaviour (Feng & Zhang, 2021). Considering the range of populations being studied, it is possible that the apparent gender differences may be due to cultural differences in terms of expectations for each gender (Xiao et al., 2019). For instance, Jiang et al. (2020) noted that in Chinese culture, females are expected to engage in feminine traits, such as being empathetic, a trait

which is closely associated with prosocial behaviour. Thus, cultures which maintain traditional gender values may demonstrate more gender differences with regards to prosocial behaviour. Another consideration is perhaps the context in which these behaviours are being studied. For instance, Acar et al.'s (2022) findings suggest that gender differences may also differ depending on the environment being studied. That is, in their study of Turkish football athletes, they found the inverse to be true; that males tended to report more prosocial behaviours and less antisocial behaviours in general when these behaviours or traits were considered in the context of sport. Thus, other factors may be at play that could explain these gender disparities.

Currently, there does not seem to be a consensus on the gender differences of prosocial behaviour within the literature as other factors, such as how the data was collected (e.g., self-report vs observational) needs to be considered (Xiao et al., 2019). Nevertheless, Xiao et al. (2019) argues that reported gender differences, including those related to antisocial behaviours, may be attributable to socialisation and gender stereotypes. For example, Jiang et al. (2020) explained that in many contexts, males need to conform to perceived masculine characteristics, such as aggression, and females need to meet expectations of femininity or what is perceived to be, such as empathy, to gain social acceptance. These characteristics can be associated with specific traits, the former being associated with antisocial behaviours and the latter with prosocial behaviours (Jiang et al., 2020). This understanding can be applied to our context in SA, as there remains evidence of patriarchal practices and gender norms in various settings across the population (Bassey & Bubu, 2019). Such considerations are also important when considering the results of the current study and the potential explanations and driving factors that may underpin these and other similar results.

**Limitations and Directions for Future Research**

One notable limitation of this research is its relatively small sample size. In the broader landscape of studies exploring the relationship between SES and these traits, larger sample sizes are generally recruited. This is to ensure that the sample is representational across SES groups and to ensure that a high statistical power is achieved as to confirm that the study is powered statistically, so that meaningful associations are being made and that the findings are generalisable. Consequently, the small effect size due to the smaller sample size necessitates caution in the interpretation of our statistical results. Further, it highlights the need for future research to consider employing larger and more diverse samples for a more comprehensive understanding of SES, gender, and antisocial and prosocial traits.

Another limitation of this research is the reliance on self-report questionnaires. Firstly, it has previously been noted that Xiao et al. (2019) reported that gender differences are reduced when other forms of data collection (e.g., experimental game designs) are utilised as opposed to just self-report measures. It is thus important to acknowledge that the gender differences observed in this study may be a result of the reliance only on self-report measures. That being said, future research should consider a mix of experimental and self-report measures to provide a more comprehensive and robust view of the data. Secondly, in our context, literacy levels are comparatively low and there is a heightened risk of poor comprehension, particularly amongst the younger participants. This limitation could result in participants potentially misunderstanding certain terms or nuances within the questionnaire, potentially leading to responses that are not reflective of them.

A third limitation is the reliance on English as the only medium of instruction for the study materials may act as a barrier in achieving a truly representative sample, considering the linguistic diversity in SA. Future research should consider employing alternative data collection methods and translating instruments to local languages to mitigate these limitations

and enhance the inclusivity of the study. Additionally, it is important to note that access to online forms may be limited, particularly in rural areas or smaller towns. Therefore, future research designs should take this into account to ensure broader accessibility and participation.

A fourth limitation was that participation in surveys may be considered a prosocial behaviour, which may have led to a selection bias in terms of the focus of the study. Further, participants were also provided with an incentive to complete the study and that may have influenced their participation as well.

Lastly, a limitation in the existing literature on antisocial and prosocial traits lies in the poor operationalization of these constructs. The definitions and measurement methods used across studies lack consistency, contributing to challenges in establishing a unified understanding of antisocial and prosocial behaviours. Additionally, the use of diverse assessment tools and scales further complicates efforts to draw meaningful comparisons between studies. This limitation underscores the need for a more standardised and universally accepted operationalization of antisocial and prosocial traits in future research, facilitating a more coherent and comprehensive understanding of these complex behavioural constructs.

## Conclusion

The aim of this study was to investigate the predictive impact of socioeconomic backgrounds on antisocial and prosocial traits in a sample of SA adolescents. While definitive conclusions cannot be drawn from the findings due to the study's size and sample limitations, significant insights have been gained. It is evident, in line with other studies, that gender emerged as a significant predictor of antisocial and prosocial traits. This underscores the importance of considering gender dynamics in understanding behavioural tendencies, in terms of those investigated here, among adolescents.

Despite the study's limitations, including sample size and methodological constraints, these preliminary findings lay the groundwork for future research endeavours. Larger-scale studies with diverse and representative samples, incorporating multiple data collection methods and measures, are essential to further elucidate the complex interplay between SES, gender, and antisocial and prosocial behavioural traits. Such studies hold particular significance in the SA context, given the potential links between CU traits and antisocial behaviours, and their further potential associations with criminality. Additionally, exploring the potential protective effects of prosocial traits is critical for informing targeted interventions aimed at promoting positive social development and reducing the risk of antisocial behaviours among adolescents.

In conclusion, while this study provides valuable insights into the associations between socioeconomic backgrounds, gender, and behavioural tendencies among SA adolescents, further research is warranted to validate and expand upon these preliminary findings. By addressing methodological limitations and conducting larger-scale studies, researchers can contribute to a more comprehensive understanding of the factors influencing adolescent behaviour, ultimately informing evidence-based interventions tailored to the needs of the local community.

## References

Acar, K., Mor, H., Karakaş, F., Yilmaz, A., Arslanoğlu, C., & Mor, A. (2022). Prosocial and antisocial behaviors in Turkish female and male football players. *JOURNAL OF MENS HEALTH*, *18*(2).

Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, White women. Health psychology, 19(6), 586.

Agincourt. (2020). Household Asset Status Form. Retrieved from https://www.agincourt.co.za/wp-content/uploads/2018/02/AGN-HHAST_Asset.pdf

Anderson, A. S., Siciliano, R. E., Henry, L. M., Watson, K. H., Gruhn, M. A., Kuhn, T. M., ... & Compas, B. E. (2022). Adverse childhood experiences, parenting, and socioeconomic status: Associations with internalizing and externalizing symptoms in adolescence. *Child Abuse & Neglect*, *125*, 105493.

Andreoni, J., Nikiforakis, N., & Stoop, J. (2021). Higher socioeconomic status does not predict decreased prosocial behavior in a field experiment. *Nature communications*, *12*(1), 4266.

Bacchini, D., Affuso, G., & Aquilar, S. (2015). Multiple forms and settings of exposure to violence and values: Unique and interactive relationships with antisocial behavior in adolescence. *Journal of interpersonal violence*, *30*(17), 3065-3088.

Bassey, S. A., & Bubu, N. G. (2019). Gender inequality in Africa: a re-examination of cultural values. *Cogito*, *11*(3), 21-36.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). Beck Depression Inventory Manual (2nd Ed.). San Antonio: Psychological Corporation.

Begum, T. (2019). Prevalence of Cognitive Distortion and Antisocial Behavior among Bangladeshi Adolescent in Higher Secondary School. *Universal Journal of Psychology*, *7*(3), 49-65.

Brazil, I. A., van Dongen, J. D., Maes, J. H., Mars, R. B., & Baskin-Sommers, A. R. (2018). Classification and treatment of antisocial individuals: From behavior to biocognition. *Neuroscience & Biobehavioral Reviews*, *91*, 259-277.

Breetzke, G. D. (2012). Understanding the magnitude and extent of crime in post-apartheid South Africa. *Social Identities*, *18*(3), 299-315.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard university press.

CAPS 123. (2023). Understanding School Fees and Quintiles in South African Public Schools. Retrieved from https://caps123.co.za/understanding-school-fees-and-quintiles-in-south-african-public-schools/#:~:text=The%20quintile%20system%20in%20South,that%20may%20not%20charge%20fees.

Carlo, G., & Randall, B. A. (2002). The development of a measure of prosocial behaviors for late adolescents. *Journal of youth and adolescence*, *31*(1), 31-44.

Carlo, G., Mestre, M. V., McGinley, M. M., Tur-Porcar, A., Samper, P., & Opal, D. (2014). The protective role of prosocial behaviors on antisocial behaviors: The mediating effects of deviant peer affiliation. *Journal of Adolescence*, *37*(4), 359-366.

Carvalho, M., Faria, M., Conceição, A., de Matos, M. G., & Essau, C. A. (2017). Callous-unemotional traits in children and adolescents. *European Journal of Psychological Assessment*.

Celik, I. (2022). Revisiting general strain theory: Studying the predictors of adolescents' antisocial behavior in Vestland county, Norway. *Children and youth services review*, *139*, 106556.

Chávez, D. V., Salmivalli, C., Garandeau, C. F., Berger, C., & Kanacri, B. P. L. (2022). Bidirectional associations of prosocial behavior with peer acceptance and rejection in adolescence. *Journal of Youth and Adolescence*, *51*(12), 2355-2367.

Chinchilla, M. A., & Kosson, D. S. (2016). Psychopathic traits moderate relationships between parental warmth and adolescent antisocial and other high-risk behaviors. *Criminal Justice and Behavior*, *43*(6), 722-738.

Chitsabesan, P., Lennox, C., Theodosiou, L., Law, H., Bailey, S., & Shaw, J. (2014). The development of the comprehensive health assessment tool for young offenders within the secure estate. *The Journal of Forensic Psychiatry & Psychology*, *25*(1), 1-25.

Cirino, P. T., Chin, C. E., Sevcik, R. A., Wolf, M., Lovett, M., & Morris, R. D. (2002). Measuring socioeconomic status: reliability and preliminary validity for different approaches. *Assessment*, *9*(2), 145-155.

Conger, R. D., Conger, K. J., & Martin, M. J. (2010). Socioeconomic status, family processes, and individual development. *Journal of marriage and family*, *72*(3), 685-704.

Crone, E. A., & Achterberg, M. (2022). Prosocial development in adolescence. *Current opinion in psychology*, *44*, 220-225.

Cruywagen, V. (2023). 'I know I'm sinning, but it's for my kids' – hunger and poverty driving the spike in shoplifting in SA. *Daily Maverick*. Retrieved from

https://www.dailymaverick.co.za/article/2023-07-10-i-know-im-sinning-but-its-for-my-kids-hunger-and-poverty-driving-the-spike-in-shoplifting-in-sa/

Davis, A. N., Carlo, G., Streit, C., & Crockett, L. J. (2018). Considering economic stress and empathic traits in predicting prosocial behaviors among US Latino adolescents. *Social Development*, *27*(1), 58-72.

Devenish, B., Hooley, M., & Mellor, D. (2017). The pathways between socioeconomic status and adolescent outcomes: A systematic review. *American journal of community psychology*, *59*(1-2), 219-238.

Duran-Bonavila, S., Vigil-Colet, A., Cosi, S., & Morales-Vives, F. (2017). How individual and contextual factors affects antisocial and delinquent behaviors: A comparison between young offenders, adolescents at risk of social exclusion, and a community sample. *Frontiers in psychology*, *8*, 1825.

Ekpo, T. E., & Ajake, U. E. (2013). Family socio-economic status and delinquency among senior secondary school students in calabar south, cross river state, Nigeria. *American International Journal of Contemporary Research*, *3*(4), 83-88.

Essau, C. A., Sasagawa, S., & Frick, P. J. (2006). Callous-unemotional traits in a community sample of adolescents. *Assessment*, *13*(4), 454-469.

Falcón, A. K., Dobbins, A. E., & Stickle, T. R. (2021). Gendered associations among callous-unemotional traits, emotion regulation, and antisocial behavior. *Personality and Individual Differences*, *179*, 110944.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G* Power 3.1: Tests for correlation and regression analyses. Behavior research methods, 41(4), 1149-1160. doi:10.3758/brm.41.4.1149

Feng, L., & Zhang, L. (2021). Prosocial tendencies and subjective well-being: the mediating role of basic psychological needs satisfaction. *Social Behavior and Personality: an international journal*, *49*(5), 1-10.

Ferguson, C. J., & Meehan, D. C. (2010). Saturday night's alright for fighting: Antisocial traits, fighting, and weapons carrying in a large sample of youth. *Psychiatric quarterly*, *81*(4), 293-302.

Forde, S., Kappler, S., & Björkdahl, A. (2021). Peacebuilding, structural violence and spatial reparations in post-colonial South Africa. *Journal of Intervention and Statebuilding*, *15*(3), 327-346.

Gerhold, M. M., Jacobson, S. W., Jacobson, J. L., Molteno, C. D., Meintjes, E. M., & Andrew, C. M. (2017). An ERP study of response inhibition in the auditory domain in

children with fetal alcohol spectrum disorders. *Alcoholism: Clinical and Experimental Research*, *41*(1), 96-106.

Govender I. Gender-based violence – An increasing epidemic in South Africa. *S Afr Fam Pract.* 2023;65(1), a5729.

Hollingshead, A. B. (1975). Four factor index of social status.

Hoosen, P., Adams, S., Tiliouine, H., & Savahl, S. (2022). Youth and Adolescents' Perceptions of Violence in Post-Apartheid South Africa: A Systematic Review of the Literature. *Child indicators research*, *15*(3), 885-911.

Jiang, S., Dong, L., & Jiang, C. (2020). Examining the link between economic strain and adolescent social behavior: Roles of social bonds and empathy. *Journal of Adolescence*, *84*, 1-10.

Kempen, A. (2023). Is it Time for Provinces/Municipalities to Get More Policing Powers?. *Servamus Community-based Safety and Security Magazine*, *116*(3), 14-17.

Khaliq, A., & Rasool, S. (2019). CAUSES OF STUDENTSâ€™ ANTISOCIAL BEHAVIOR AT SECONDARY LEVEL SCHOOLS. *THE SPARK" A HEC Recognized Journal"*, *4*, 116-148.

Kimonis, E. R., Frick, P. J., Skeem, J. L., Marsee, M. A., Cruise, K., Munoz, L. C., ... & Morris, A. S. (2008). Assessing callous–unemotional traits in adolescent offenders: Validation of the Inventory of Callous–Unemotional Traits. *International journal of law and psychiatry*, *31*(3), 241-252.

Kındap-Tepe, Y., & Aktaş, V. (2021). The mediating role of needs satisfaction for prosocial behavior and autonomy support. *Current Psychology*, *40*, 5212-5224.

Kraus, M. W., & Callaghan, B. (2016). Social class and prosocial behavior: The moderating role of public versus private contexts. *Social Psychological and Personality Science*, *7*(8), 769-777.

Leahy, D., O'Neill, D., & Hammond, S. (2010). An examination of gender differences in antisocial personality. *Personality and Mental Health*, *4*(2), 133-145.

Leibbrandt, M., Finn, A., & Woolard, I. (2012). Describing and decomposing post-apartheid income inequality in South Africa. *Development Southern Africa*, *29*(1), 19-34.

Leoschut, L., & Kafaar, Z. (2017). The frequency and predictors of poly-victimisation of South African children and the role of schools in its prevention. *Psychology, Health & Medicine*, *22*(sup1), 81-93.

Macchia, L., & Whillans, A. V. (2022). The link between income, income inequality, and prosocial behavior around the world. *Social Psychology*.

Mak, H. W., Russell, M. A., Lanza, S. T., Feinberg, M. E., & Fosco, G. M. (2019). Age-varying associations of parental knowledge and antisocial peer behavior with adolescent substance use. *Developmental psychology*.

Makhubela, M. S., & Mashegoane, S. (2016). Validation of the Beck Depression Inventory–II in South Africa: factorial validity and longitudinal measurement invariance in university students. *South African Journal of Psychology*, *46*(2), 203-217.

Malinauskas, R. K., & Saulius, T. (2019). Social self-efficacy and prosocial behaviour among students of high and youth schools. *European journal of contemporary education*, *8*(3), 542-549.

Manasse, M. E., & Rebellon, C. J. (2023). 11 Risky and Antisocial Behavior in Adolescence. *The Oxford Handbook of Developmental Psychology and the Law*, 209.

Miller, J. D., Watts, A., & Jones, S. E. (2011). Does psychopathy manifest divergent relations with components of its nomological network depending on gender?. *Personality and individual differences*, *50*(5), 564-569.

Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, *100*(4), 674-701.

Moffitt, T. E. (2018). Male antisocial behaviour in adolescence and beyond. *Nature Human Behaviour*, *2*(3), 177-186.

Moore, A. A., Silberg, J. L., Roberson-Nay, R., & Mezuk, B. (2017). Life course persistent and adolescence limited conduct disorder in a nationally representative US sample: prevalence, predictors, and outcomes. *Social psychiatry and psychiatric epidemiology*, *52*(4), 435-443.

Mutyambizi, C., Booysen, F., Stornes, P., & Eikemo, T. A. (2019). Subjective social status and inequalities in depressive symptoms: a gender-specific decomposition analysis for South Africa. *International journal for equity in health*, *18*(1), 87.

National Institute for Crime Prevention and the Reintegration of Offenders (2023). Turning Lives Around [Online]. Retrieved from https://www.nicro.org.za/images/PDFs/NICRO%20Annual%20Report%202022-2023_compressed.pdf

North, A., Donenberg, G., Vermaak, R., Kendall, A., Mackesy-Amiti, M. E., Simbayi, L., ... & Naidoo, P. (2020). Pathways from witnessing community violence to mental health problems among South African adolescents. *South African Medical Journal*, *110*(2), 145-153.

Notshulwana, V. (2012). Rehabilitation of youth offenders in South Africa: the relevance of ecological model and graduated sanctions. *Africa Insight*, *41*(4), 139-158.

Nwafor, C. E., Onyeizugbo, E. U., & Anazonwu, C. O. (2015). Does gender moderate the relationship between callous-unemotional traits and physical aggression?. *The Spanish Journal of Psychology*, *18*, E82.

Offender Health Research Network. (2013). Manual for the Comprehensive Health Assessment Tool (CHAT): Young people in the Secure Estate. Retrieved from http://www.ohrn.nhs.uk/OHRNResearch/CHATManualV32013.pdf

Padilla-Walker, L. M., Carlo, G., & Memmott-Elison, M. K. (2018). Longitudinal change in adolescents' prosocial behavior toward strangers, friends, and family. *Journal of Research on Adolescence*, *28*(3), 698-710.

Parashar, S. (2019). Colonial legacies, armed revolts and state violence: the Maoist movement in India. *Third World Quarterly*, *40*(2), 337-354.

Paruk, S., Jhazbhay, K., Singh, K., Sartorius, B., & Burns, J. K. (2015). Clinical correlates of first episode early onset psychosis in KwaZulu-Natal, South Africa. *Journal of Child & Adolescent Mental Health*, *27*(2), 103-111.

Piff, P. K., Kraus, M. W., Côté, S., Cheng, B. H., & Keltner, D. (2010). Having less, giving more: The influence of social class on prosocial behavior. *Journal of personality and social psychology*, *99*(5), 771-784.

Pihet, S., Etter, S., Schmid, M., & Kimonis, E. R. (2015). Assessing callous-unemotional traits in adolescents: Validity of the inventory of callous-unemotional traits across gender, age, and community/institutionalized status. *Journal of Psychopathology and Behavioral Assessment*, *37*, 407-421.

Piotrowska, P. J., Stride, C. B., Croft, S. E., & Rowe, R. (2015). Socioeconomic status and antisocial behaviour among children and adolescents: A systematic review and meta-analysis. *Clinical psychology review*, *35*, 47-55.

Piotrowska, P. J., Stride, C. B., Maughan, B., Goodman, R., McCaw, L., & Rowe, R. (2015). Income gradients within child and adolescent antisocial behaviours. *The British Journal of Psychiatry*, *207*(5), 385-391.

RStudio Team. (2023). RStudio: Integrated Development Environment for R.Boston, MA: RStudio, PBC.

Schwär, G., & Mahony, A. (2012). Birth Order Position and Prosocial Tendencies. *Journal of Psychology in Africa*, *22*(1), 56-60.

Scorgie, F., Baron, D., Stadler, J., Venables, E., Brahmbhatt, H., Mmari, K., & Delany-Moretlwe, S. (2017). From fear to resilience: adolescents' experiences of violence in inner-city Johannesburg, South Africa. *BMC Public Health*, *17*(3), 51-64.

Sijtsema, J. J., & Lindenberg, S. M. (2018). Peer influence in the development of adolescent antisocial behavior: Advances from dynamic social network studies. *Developmental Review*, *50*, 140-154.

Silber, G., & Geffen, N. (2009). Race, class and violent crime in South Africa: Dispelling the'Huntley thesis'. *SA Crime Quarterly*, *2009*(30), 35-43.

Silke, C., Brady, B., Boylan, C., & Dolan, P. (2018). Factors influencing the development of empathy and pro-social behaviour among adolescents: A systematic review. *Children and Youth Services Review*, *94*, 421-436.

Silva, T. C., & Stattin, H. (2016). The moderating role of parenting on the relationship between psychopathy and antisocial behavior in adolescence. *Development and psychopathology*, *28*(2), 505-515.

Statistics SA. (2018). Vulnerable groups series III report: The social profile of children aged 7-17 years, 2002-2016 [Online document]. Retrieved from www.statssa.gov.za/publications/Report%2003-19-04/Report%2003-19-042016.pdf

Staub, E., & Vollhardt, J. (2008). Altruism born of suffering: The roots of caring and helping after victimization and other trauma. *American Journal of Orthopsychiatry*, *78*(3), 267-280.

Sui, X., Massar, K., Kessels, L. T., Reddy, P. S., Ruiter, R. A., & Sanders-Phillips, K. (2021). Violence exposure in South African adolescents: Differential and cumulative effects on psychological functioning. *Journal of interpersonal violence*, *36*(9-10), 4084-4110.

Tolan, P., Lovegrove, P., & Clark, E. (2013). Stress mitigation to promote development of prosocial values and school engagement of inner-city urban African American and Latino youth. *American Journal of Orthopsychiatry*, *83*(2-3), 289.

Tredoux, A., Phillander, N., Williams, H., Ward, C. L., & Schrieff-Brown, L. (2023). Investigating parenting factors, traumatic brain injury and callous and unemotional traits among high school students in a South African setting. *South African Journal of Psychology*, *53*(2), 225-239.

Tsang, S. (2018). Troubled or traumatized youth? The relations between psychopathy, violence exposure, posttraumatic stress disorder, and antisocial behavior among juvenile offenders. *Journal of aggression, maltreatment & trauma*, *27*(2), 164-178.

Viding, E. S. S. I., & Kimonis, E. R. (2018). Callous-unemotional traits. *Handbook of psychopathy*, 144-164.

Vollhardt, J. R., & Staub, E. (2011). Inclusive altruism born of suffering: the relationship between adversity and prosocial attitudes and behavior toward disadvantaged outgroups. *American Journal of Orthopsychiatry*, *81*(3), 307.

Wang, Y. P., & Gorenstein, C. (2013). Psychometric properties of the Beck Depression Inventory-II: a comprehensive review. *Brazilian Journal of Psychiatry*, *35*(4), 416-431.

Ward, C. L., Gould, C., Kelly, J., & Mauff, K. (2015). Spare the rod and save the child: Assessing the impact of parenting on child behaviour and mental health. *South African Crime Quarterly*, *51*, 9-22.

Western Cape Education Department (2013). Background to the national quintile system. [Online document]. Retrieved from: https://wcedonline.westerncape.gov.za/comms/press/2013/74_14oct.html

Whyman, T., Murrup-Stewart, C., Young, M., Carter, A., & Jobson, L. (2023). 'Lateral violence stems from the colonial system': settler-colonialism and lateral violence in Aboriginal Australians. *Postcolonial Studies*, *26*(2), 183-201.

Williams, W., Cordan, G., Mewse, A. J., Tonks, J., & Burgess, C. N. (2010). Self-reported traumatic brain injury in male young offenders: a risk factor for re-offending, poor mental health and violence?. *Neuropsychological rehabilitation*, *20*(6), 801-812.

Wood, W., & Eagly, A. H. (2015). Two traditions of research on gender identity. *Sex Roles*, *73*, 461-473.

World Health Organisation ASSIST Working Group (2002). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility, Addiction, 97(9), 1183-1194.

World Health Organisation. (2010). The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): Guidelines for Use in Primary Care [Online document]. Retrieved from: https://www.who.int/management-of-substance-use/assist

World Population Review (2023). Crime rate by country 2022 [Online]. Retrieved from https://worldpopulationreview.com/countries/crime-rate-by-country/

Xiao, S. X., Hashi, E. C., Korous, K. M., & Eisenberg, N. (2019). Gender differences across multiple types of prosocial behavior in adolescence: A meta-analysis of the prosocial tendency measure-revised (PTM-R). *Journal of Adolescence*, *77*, 41-58.

Zhang, Y., Sun, Q., & Liu, Y. (2022). Social capital mediates the effect of socio-economic status on prosocial practices: Evidence from the CGSS 2012 survey. *Journal of Community & Applied Social Psychology*, *32*(2), 198-211.

Zhu, N., Lu, H. J., & Chang, L. (2020, October). Effects of peer influences and life-history strategy on Chinese junior high school students' prosocial and antisocial behaviors. In *Frontiers in Education* (Vol. 5, p. 593744). Frontiers Media SA.

# Appendices

## Appendix A: Demographic information

| | |
|---|---|
| Full Name (Parent): | |
| Contact details | Cell: |
| | Home: |
| | Email: |
| Full Name (Learner): | |
| Home Language | |
| Gender | |
| Date of Birth | |
| School | |
| Grade | |

**Appendix B: Household Assets**

| Questions | Yes | No |
|---|---|---|
| Do you have a stove? | | |
| Do you have a fridge? | | |
| Do you have a TV? | | |
| Do you have a hifi/stereo? | | |
| Do you have a DVD player? | | |

**Appendix C: Hollingshead's Scale**

| Level of School Completed | Mother | Father | Guardian |
|---|---|---|---|
| Less than 7th grade | | | |
| 9th grade | | | |
| 10th or 11th grade | | | |
| High school graduate | | | |
| Partial college (at least one year) or specialised training | | | |
| Standard college or university graduation | | | |
| Graduate professional training | | | |

| Occupation | Mother | Father | Guardian |
|---|---|---|---|
| Higher executives, major professionals, owners of large businesses | | | |
| Business managers of medium sized businesses, lesser professions (e.g. nurses, opticians, pharmacists, social workers, teachers) | | | |
| 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) | | | |
| Clerical and sales, technicians, small businesses (e.g. bank teller, bookkeeper, clerk, draftsperson, timekeeper, secretary) | | | |
| Skilled manual – usually having had training (e.g. baker, barber, chef, electrician, fireman, machinist, mechanic, painter, welder, police, plumber, electrician) | | | |
| Semi-skilled (e.g. hospital aide, painter, bartender, bus driver, cook, garage guard, checker, waiter, machine operator) | | | |
| Unskilled (e.g. attendant, janitor, construction helper, unspecified labour, porter, unemployed) | | | |

| | | | |
|---|---|---|---|
| Homemaker | | | |
| Student, disabled, no occupation | | | |

**Appendix D: Subjective Social Status**

Imagine that this ladder pictures how South African society is set up. At the top of the ladder are the people who are the best off — they have the most money, the highest amount of schooling, and the jobs that bring the most respect. At the bottom are people who are the worst off — they have the least money, little or no education, no job, or jobs that no one wants or respects. Now think about your family. Please tell us where you think your family would be on this ladder. Select the rung that best represents where your family would be on this ladder. Rung 10 is the top of the ladder and Rung 1 is the bottom of the ladder.

**Appendix E: Beck Depression Index-II**

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.

**Appendix F: CHAT : Traumatic Brain Injury**

1. 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.
2. How many times have you been knocked out and/or dazed and confused? For each occasion how did it happen? [answer N/A if it does not apply]
3. When was the last time you were knocked out and/or dazed and confused? [answer N/A if it does not apply]
4. Did you seek any medical attention after being knocked out and/or dazed and confused? What treatment did you receive? Did you have to stay in hospital? [answer N/A if it does not apply]
5. Describe the worst time you have 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 < 24 hrs | Unconscious >24hrs | N/A |
|---|---|---|---|---|---|---|
| Road accident | | | | | | |
| Fall when sober | | | | | | |
| Fall when under the influence of drink/ drug | | | | | | |
| Sports injury e.g. boxing | | | | | | |
| Fight | | | | | | |
| Other | | | | | | |

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

| | Not experienced at all | No more of a problem | A mild problem | A moderate problem | A severe problem | N/A |
|---|---|---|---|---|---|---|
| Headaches | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Feelings of dizziness | | | | | | |
| Nausea and/or vomiting | | | | | | |
| Forgetfulness, poor memory | | | | | | |
| Poor concentration | | | | | | |
| Confusion | | | | | | |
| Fogginess | | | | | | |
| Difficulties recalling everyday events | | | | | | |

**Appendix G: ASSIST**

1. In your life, which of the following substances have you ever used (non-medical use only)?
    a. Tobacco products
    b. Alcoholic beverages
    c. Marijuana
    d. Cocaine or Crack
    e. Amphetamines or Stimulants
    f. Inhalants
    g. Sedatives or Sleeping Pills
    h. Hallucinogens
    i. Heroin, Morphine, Pain Medication
    j. Other, specify:
2. In the past three months, how often have you used the substances mentioned? If *Never* to all items in Question 2, skip to Question 6. If any substance in Question 2 was used in the previous 3 months, continue with Question 3, for each substance used.
3. During the past three months, how often have you had a strong desire or urge to use?
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?
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 |
|---|---|---|---|---|---|
| Tobacco products | | | | | |
| Alcohol | | | | | |
| Marijuana | | | | | |
| Cocaine or Crack | | | | | |
| Amphetamines | | | | | |
| Inhalants | | | | | |
| Sedatives or sleeping pills | | | | | |
| Hallucinogens | | | | | |
| Heroin, Morphine, Pain Medication | | | | | |
| Other | | | | | |

6. Has a friend or relative or anyone else ever expressed concern about your use of (first drug, second drug, etc.)?
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 |
|---|---|---|---|
| Tobacco products | | | |
| Alcohol | | | |
| Marijuana | | | |
| Cocaine or Crack | | | |
| Amphetamines | | | |
| Inhalants | | | |
| Sedatives or sleeping pills | | | |
| Hallucinogens | | | |
| Heroin, Morphine, Pain Medication | | | |
| Other | | | |

8. Have you ever used any drug by injection? (non-medical use only)

| No, never | Yes, in the past 3 months | Yes, but not in the past 3 months |
|---|---|---|

**Appendix H: Inventory Callousness-Unemotional Traits**

Please read each statement and decide how well it describes you. Options: “Not at all true”, “Somewhat true”, “Very true", "Definitely true".

1. I express my feelings openly.
2. What I think is “right” and “wrong” is different from what other people think.
3. I care about how well I do at school or work.
4. I do not care who I hurt to get what I want.
5. I feel bad or guilty when I do something wrong.
6. I do not show my emotions to others.
7. I do not care about being on time.
8. I am concerned about the feelings of others.
9. I do not care if I get into trouble.
10. I do not let my feelings control me.
11. I do not care about doing things well.
12. I seem very cold and uncaring to others.
13. I easily admit to being wrong.
14. It is easy for others to tell how I am feeling.
15. I always try my best.
16. I apologize (“say I am sorry”) to persons I hurt.
17. I try not to hurt others’ feelings.
18. I do not feel remorseful when I do something wrong.
19. I am very expressive and emotional.
20. I do not like to put the time into doing things well.
21. The feelings of others are unimportant to me.
22. I hide my feelings from others.
23. I work hard on everything I do.
24. I do things to make others feel good.

**Appendix I: Prosocial Tendencies Measures**

Below are a number of statements that may or may not describe you. Please indicate HOW MUCH EACH STATEMENT DESCRIBES YOU by using the following scale: (Does not describe me at all), (Describes me a little), (Somewhat Describes me), (Describes me well), and (Describes me greatly).

1. I can help others best when people are watching me.

2. It is most fulfilling to me when I can comfort someone who is very distressed.

3. When other people are around, it is easier for me to help needy others.

4. I think that one of the best things about helping others is that it makes me look good.

5. I get the most out of helping others when it is done in front of others.

6. I tend to help people who are in a real crisis or need.

7. When people ask me to help them, I don't hesitate.

8. I prefer to donate money anonymously.

9. I tend to help people who hurt themselves badly.

10. I believe that donating goods or money works best when it is tax-deductible.

11. I tend to help needy others most when they do not know who helped them.

12. I tend to help others particularly when they are emotionally distressed.

13. Helping others when I am in the spotlight is when I work best.

14. It is easy for me to help others when they are in a dire situation.

15. Most of the time, I help others when they do not know who helped them.

16. I believe I should receive more recognition for the time and energy I spend on charity work.

17. I respond to helping others best when the situation is highly emotional.

18. I never hesitate to help others when they ask for it.

19. I think that helping others without them knowing is the best type of situation.

20. One of the best things about doing charity work is that it looks good on my resume.

21. Emotional situations make me want to help needy others.

22. I often make anonymous donations because they make me feel good.

23. I feel that if I help someone, they should help me in the future.

**Appendix J: Participant Assent Form**


**UCT Department of Psychology**

The following sections must be completed by the participant (LEARNER).

PERMISSION TO PARTICIPATE IN RESEARCH

You are invited to participate in this research study. The study is investigating the prevalence of antisocial and prosocial traits in adolescents across different socioeconomic status groups. For this reason, adolescents with varying socioeconomic backgrounds will be assessed on questions relating to their antisocial and prosocial tendencies.

If you agree to participate in this study, you will be asked to complete a questionnaire. The questionnaire should take you approximately 10 minutes. These questions may cause some discomfort as they are personal questions relating to your emotional well-being and personality traits. After completing the questionnaire, your participation in the study will be complete.

There are no direct benefits to participating in this research, however, the data may be used to further understand how socioeconomic status affects the antisocial and prosocial traits adolescents develop. There will be no consequences if you choose not to participate in this study or choose to withdraw during the study.

Your identity and any information you share will be kept confidential. You will not be identifiable in the thesis or any publications or reports arising from this work. Only the researcher and supervisor have the right to review these research records. The information you share will solely be used for academic research purposes.

If you click accept, it means that you would like to participate in this study. If you choose to not participate in this study, you can close the web page.

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the researcher or research supervisor:

Researcher's Name: Candice Knipe
Email: KNPCAN002@myuct.ac.za

Supervisor: Dr. Leigh Schrieff
Email: leigh.schrieff-brown@uct.ac.za

If you have any questions regarding your rights in this research, you may phone the Psychology Department and get into contact with Rosalind Adams.

Email address: rosalind.adams@uct.ac.za
Telephone: 021 650 3417

## Appendix K: Consent Form

### Parent Consent Form


**UCT Department of Psychology**

This section must be completed by the participant's parent or legal guardian.

**What is the purpose of this research study?**
The aim of this study is to investigate the prevalence of antisocial and prosocial traits in adolescents across different socioeconomic status groups.

**What will I be asked to do if I agree to participate?**
Participants will be asked to complete a questionnaire relating to questions about their socioeconomic status, substance use, emotional well-being, antisocial and prosocial tendencies.

**If you choose to participate in this study, how long will you be expected to participate in the research?** The duration of the study is approximately 10 minutes and consists of completing the questionnaire only.

**What are the possible discomforts and risks?** Some questions are of a personal nature, and might make participants feel uncomfortable, for example questions relating to their emotional well-being.

**What benefits are associated with the study?** There are no direct benefits to participating in this research, however, the data may be used to further understand the effect of socioeconomic status on antisocial and prosocial traits in adolescents.

**If you choose to take part in this research study, will it cost you anything?** There are no costs associated with this study, however, it is online so participants will need internet access.

**Can you withdraw from this research study?** Participation in this research is completely voluntary. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, there will be no effect on your relationship with your high school, or on your relationship with the UCT Department of Psychology or UCT as a whole.

**If you withdraw, can information about you still be used and/or collected?** If you withdraw from the study, any information you provided will not be used or collected for the study.

**Once personal and performance information is collected, how will it be kept secret (confidential) in order to protect your privacy?** All the participants' identities and any information you disclose will be kept confidential. Participants will not be identifiable in the thesis or any publications or reports arising from this work. Only the researcher and supervisor have the right to review these research records.

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the researcher or research supervisor:

Researcher's Name: Candice Knipe
Email: KNPCAN002@myuct.ac.za

Supervisor: Dr. Leigh Schrieff
Email: leigh.schrieff-brown@uct.ac.za

If you have any questions regarding your child's rights in this research, you may phone the Psychology Department and get into contact with Rosalind Adams.
Email address: rosalind.adams@uct.ac.za

**Appendix L: Debriefing Form**

**Participant Debriefing Letter**


**UCT Department of Psychology**

Thank you for taking part in this study. I appreciate your participation and responses to the questionnaires.

The purpose of this research was to investigate the effect of socioeconomic status on antisocial and prosocial traits in adolescents. Participants were asked to complete questionnaires regarding their socioeconomic background, emotional well-being, substance use, and antisocial and prosocial traits.

Should you have any questions regarding this study or wish to report any problems you have experienced related to this study, please contact the researcher or their supervisor.

**Researcher**: Candice Knipe Email: KNPCAN002@myuct.ac.za

**Supervisor**: Dr Leigh Schrieff Email: leigh.schrieff-brown@uct.ac.za

***Alternatively, if you have any concerns about your rights as a research participant, please contact:***

Rosalind Adams

Tel: 021 650 3417
Email: rosalind.adams@uct.ac.za

**Appendix M: UCT Department of Psychology 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

15 October 2020

Candice Knipe
Department of Psychology
University of Cape Town
Rondebosch 7701

Dear Candice

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, *Prevalence of Antisocial and Prosocial Traits in Adolescents Across Socioeconomic Status Groups.*

The reference number is PSY2020-044.

I wish you all the best for your study.

Yours sincerely

Signed by candidate

Catherine Ward
Professor
Chair: Ethics Review Committee

## Appendix N: WCED Approval Letters for 2021, 2022, 2023

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:** 20210415-2238
**ENQUIRIES:** Dr A T Wyngaard

Ms Candice Knipe
114 Kipling Street
Observatory
7925

**Dear Ms Candice Knipe**

**RESEARCH PROPOSAL: PREVALENCE OF ANTISOCIAL AND PROSOCIAL TRAITS IN ADOLESCENTS ACROSS SOCIOECONOMIC STATUS GROUPS**

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 **03 May 2021 till 30 September 2021.**
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: 16 April 2021**

Western Cape Government
Education

**Directorate: Research**

meshack.kanzi@westerncape.gov.za
Tel: +27 021 467 2350
Fax: 086 590 2282
Private Bag x9114, Cape Town, 8000
wced.wcape.gov.za

**REFERENCE:** 20210415-2238
**ENQUIRIES:** Mr M Kanzi

Ms Candice Knipe
114 Kipling Street
Observatory
7925

**Dear Ms Candice Knipe,**

**RESEARCH PROPOSAL:** PREVALENCE OF ANTISOCIAL AND PROSOCIAL TRAITS IN ADOLESCENTS ACROSS SOCIOECONOMIC STATUS GROUPS.

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 **3 March 2022 till 30 September 2022.**
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 Mr M Kanzi 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,
Meshack Kanzi
**Directorate: Research**
**DATE: 3 March 2022**

Signed by candidate

Western Cape Government
Education

**Directorate: Research**

meshack.kanzi@westerncape.gov.za
Tel: +27 021 467 2350
Fax: 086 590 2282
Private Bag x9114, Cape Town, 8000
wced.wcape.gov.za

**REFERENCE:** 20210415-2238
**ENQUIRIES:** Mr M Kanzi

Ms Candice Knipe
114 Kipling Street
Observatory
7925

**Dear Ms Candice Knipe,**

**RESEARCH PROPOSAL:** PREVALENCE OF ANTISOCIAL AND PROSOCIAL TRAITS IN ADOLESCENTS ACROSS SOCIOECONOMIC STATUS GROUPS.

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 **9 June 2023 till 30 September 2023.**
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 Mr M Kanzi 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,
Meshack Kanzi
**Directorate: Research**
**DATE: 9 June 2023**

Signed by candidate

**Appendix O: R code**

```
test= lm (PTM_Total~total_household_code, Neuropsych_Candy)
summary(test)
test= lm (PTM_Total~total_household_code + BDI_Total_Score+Tobacco + Alcohol +
Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (PTM_Anonymous_Total~total_household_code + BDI_Total_Score+Tobacco +
Alcohol +  Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (PTM_Anonymous_Total~Tobacco + Gender, Neuropsych_Candy)
summary(test)
test= lm (PTM_Emotional~total_household_code + BDI_Total_Score+Tobacco + Alcohol +
Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (PTM_Emotional~Gender, Neuropsych_Candy)
summary(test)
test= lm (PTM_Public_Total~total_household_code + BDI_Total_Score+Tobacco + Alcohol
+  Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (PTM_Public_Total~Gender, Neuropsych_Candy)
summary(test)
test= lm (PTM_Altruism_Total~total_household_code + BDI_Total_Score+Tobacco +
Alcohol +  Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (PTM_Altruism_Total~Gender, Neuropsych_Candy)
```

```
summary(test)
test= lm (PTM_Complaint_Total~total_household_code + BDI_Total_Score+Tobacco +
Alcohol +  Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (PTM_Complaint_Total~Gender, Neuropsych_Candy)
summary(test)
test= lm (PTM_Dire_Total~total_household_code + BDI_Total_Score+Tobacco + Alcohol +
Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (PTM_Dire_Total~Gender, Neuropsych_Candy)
summary(test)
test= lm (PTM_Total~Ladder_Total + BDI_Total_Score+Tobacco + Alcohol + Cannabis +
Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (PTM_Total~Ladder_Total, Neuropsych_Candy)
summary(test)
test= lm (ICU_Youth_Total~total_household_code , Neuropsych_Candy)
summary(test)
test= lm (ICU_Youth_Total~total_household_code + BDI_Total_Score+Tobacco + Alcohol
+  Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (ICU_Callousness_Total~total_household_code + BDI_Total_Score+Tobacco +
Alcohol +  Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (ICU_Callousness_Total~Age + Gender, Neuropsych_Candy)
```

```
summary(test)
test= lm (ICU_Uncaring_Total~total_household_code + BDI_Total_Score+Tobacco +
Alcohol +  Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (ICU_Uncaring_Total~Gender, Neuropsych_Candy)
summary(test)
test= lm (ICU_Unemotional_Total~total_household_code + BDI_Total_Score+Tobacco +
Alcohol +  Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (ICU_Unemotional_Total~Gender, Neuropsych_Candy)
summary(test)
test= lm (ICU_Youth_Total~Ladder_Total + BDI_Total_Score+Tobacco + Alcohol +
Cannabis + Age + Gender + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (ICU_Youth_Total~Ladder_Total , Neuropsych_Candy)
summary(test)
test= lm (PTM_Total~Ladder_Total + BDI_Total_Score+Tobacco + Alcohol + Cannabis +
Age + Gender + + Hard_Drugs_Total, Neuropsych_Candy)
summary(test)
test= lm (PTM_Total~Ladder_Total , Neuropsych_Candy)
summary(test)
model <- lm(PTM_Total ~ total_household_code + BDI_Total_Score +
              Tobacco + Alcohol + Cannabis + Age + Gender + Hard_Drugs_Total,
            data = Neuropsych_Candy)
model1 <- lm(ICU_Youth_Total ~ total_household_code + BDI_Total_Score +
```

```
            Tobacco + Alcohol + Cannabis + Age + Gender + Hard_Drugs_Total,
          data = Neuropsych_Candy)
vif_values <- vif(model1)
print(vif_values)
gender_means <- Neuropsych_Candy %>%
  group_by(Gender) %>%
  summarize(mean_outcome = mean(PTM_Total, na.rm = TRUE))
print(gender_means)
gender_means <- Neuropsych_Candy %>%
  group_by(Gender) %>%
  summarize(mean_outcome = mean(ICU_Youth_Total, na.rm = TRUE))
print(gender_means)
standard_deviation <- Neuropsych_Candy %>%
  summarize(sd_your_variable = sd(gender_means, na.rm = TRUE))
print(standard_deviation)
standard_deviation <- Neuropsych_Candy %>%
  summarize(sd_your_variable = sd(PTM_Total, na.rm = TRUE))
print(standard_deviation)
standard_deviation <- Neuropsych_Candy %>%
  summarize(sd_your_variable = sd(ICU_Youth_Total, na.rm = TRUE))
print(standard_deviation)
standard_deviation <- Neuropsych_Candy %>%
  summarize(sd_your_variable = sd(ASSET, na.rm = TRUE))
print(standard_deviation)
```

```
variables_of_interest <- Neuropsych_Candy[c("PTM_Total","Ladder_Total",
"total_household",
                                           "BDI_Total_Score", "Tobacco", "Alcohol",
                                           "Cannabis", "Age", "Gender_codes",
                                           "Hard_Drugs_Total")]
Neuropsych_Candy$total_household[is.na(Neuropsych_Candy$total_household)] <- 0
Neuropsych_Candy$Age[is.na(Neuropsych_Candy$Age)] <- 0
variables_of_interest[] <- lapply(variables_of_interest, as.numeric)
cor_matrix <- cor(variables_of_interest)
print(cor_matrix)
variables_of_interest <- Neuropsych_Candy[c("ICU_Youth_Total","Ladder_Total",
"total_household",
                                           "BDI_Total_Score", "Tobacco", "Alcohol",
                                           "Cannabis", "Age", "Gender_codes",
                                           "Hard_Drugs_Total")]
Neuropsych_Candy$total_household[is.na(Neuropsych_Candy$total_household)] <- 0
Neuropsych_Candy$Age[is.na(Neuropsych_Candy$Age)] <- 0
variables_of_interest[] <- lapply(variables_of_interest, as.numeric)
cor_matrix <- cor(variables_of_interest)
print(cor_matrix)
cor.test(variables_of_interest$PTM_Total, variables_of_interest$ICU_Youth_Total)
print(cor_test_results)
cor_matrix <- matrix(NA, nrow = ncol(variables_of_interest), ncol =
ncol(variables_of_interest))
for (i in 1:(ncol(variables_of_interest) - 1)) {
```

```
  for (j in (i + 1):ncol(variables_of_interest)) {
    correlation_test <- cor.test(variables_of_interest[, i], variables_of_interest[, j])
    cor_matrix[i, j] <- correlation_test$estimate
    cor_matrix[j, i] <- correlation_test$estimate }}
variables_of_interest[] <- lapply(variables_of_interest, as.numeric)
if (any(is.na(variables_of_interest))) {  warning("Missing values found. Consider handling or
imputing them.")}
```