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Testing a Psychological Model of Post-Pandemic Academic Cheating

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Abstract
Concerns over students engaging in various forms of academic misconduct persist, especially with the post-COVID19 rise in online learning and assessment. Research has demonstrated a clear role of the personality trait psychopathy in cheating, yet little is known about why this relationship exists. Building on the research by Curtis et al. (*Personality and Individual Differences, 185*, 111277, 2022a), this study tested an extended Theory of Reasoned Action (TRA) model, including psychopathy as a precursor to attitudes and subjective norms, and measures of anticipated moral emotions (shame and guilt), to predict cheating intentions and cheating behaviours. A cross-sectional survey was administered online to university students from around the globe ($n = 257$). Results from a serial mediation analysis revealed that psychopathy predicted academic misconduct behaviours indirectly through attitudes, subjective norms, anticipated guilt (but not anticipated shame), and intentions. These findings indicate that cheating may be reduced by modifying attitudes to cheating, subjective norms regarding cheating, and anticipated feelings of guilt related to engaging in academic misconduct. In addition, the results revealed high rates of several forms of cheating, particularly in unsupervised online tests, which have been used more widely since the COVID-19 pandemic. This finding raises concerns regarding the poor security of such assessments.

Keywords Academic misconduct · Cheating · Attitudes · Psychopathy · Shame · Guilt · Theory of reasoned action · COVID-19

Introduction

Cheating is a substantial problem in higher education because it undermines the validity of academic assessment (Dawson, 2021). For this reason, researchers continue to be interested in the questions of why and how students cheat in higher education assessments. Contemporary research has particularly focused on contract cheating, which involves outsourcing

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of educational assessments by students to others, often for payment (Eaton et al., 2022), with most of the research on contact cheating being published in the past decade (Lancaster, 2022). In addition, researchers have recently become interested in sharing behaviours related to academic misconduct, such as the use of file-sharing websites (Rogerson, 2023), and in cheating in online tests that were employed in response to the COVID-19 pandemic (Comas-Forgas et al., 2021; Newton & Essex, 2023). Combining these questions of "why do students cheat?" and "how are they cheating now?", we sought to test a psychological model of student cheating examining forms of cheating and assessment that are common in the post-pandemic higher education environment. Specifically, we designed a study to improve upon the recent work of Curtis et al. (2022a), who examined the relationship between dispositional psychopathy, attitudes, perceived norms, anticipated guilt and shame, and contract cheating intentions.

The study by Curtis et al. (2022a) provided evidence for a theory-driven model of why student cheat but left a gap in that it lacked a measure of cheating behaviour; we sought to rectify that omission in the study reported in this article. In addition, their study only assessed intentions to engage in two forms of cheating (custom ghost writing and exam impersonation). We substantially expanded on their measures to capture students' intentions to engage in, and their *engagement* in, several forms of cheating and academic misconduct. In particular, we added measures of the kinds of cheating and academic misconduct that are the focus of current research and were possible with assessments that were used more frequently during "emergency online teaching" (e.g., online tests), which occurred as a result of the COVID-19 pandemic (Burkholder & Krauskopf, 2022).

Predicting Cheating: Psychopathy, The Theory of Reasoned Action, and Anticipated Moral Emotions

As Curtis and Clare (2023) have pointed out, research into academic integrity, academic dishonestly, and academic misconduct is often descriptive rather than theory-driven. Still, researchers are increasingly examining theory-based frameworks of student cheating that derive from psychology and criminology (e.g., Curtis et al., 2018; Smith et al., 2021, 2023). Two theories that have received recent attention for their ability to predict academic misconduct are theory of reasoned action (TRA) and the theory of planned behaviour (TPB) (Curtis & Clare, 2023).

The TRA is a conceptual framework that comes from psychology, which describes how attitudes are related to behaviours (Fishbein, 1979). The TRA states that attitudes (i.e., how people evaluate a concept or action) combine with subjective norms (i.e., how common and acceptable people think an action or concept is) to predict their intentions to act in a particular way, and that these intentions then predict their behaviour. The TRA was a forerunner to the theory of planned behaviour (TPB), which added *perceived behavioural control* (i.e., the perception that the behaviour is voluntary) to attitudes and subjective norms as predictors of intentions (Ajzen, 1991).

Both the TRA and the TPB have been studied as models that may predict academic misconduct among students such as plagiarism and cheating. However, Curtis and Tindall (2022) point out that perceived behavioural control is often a variable of little practical or theoretical use in studying causes of serious misconduct such as contract cheating. There is often little or no statistical variation in students' perceived behavioural control related to cheating, because cheating behaviour is often perceived as completely controllable (as

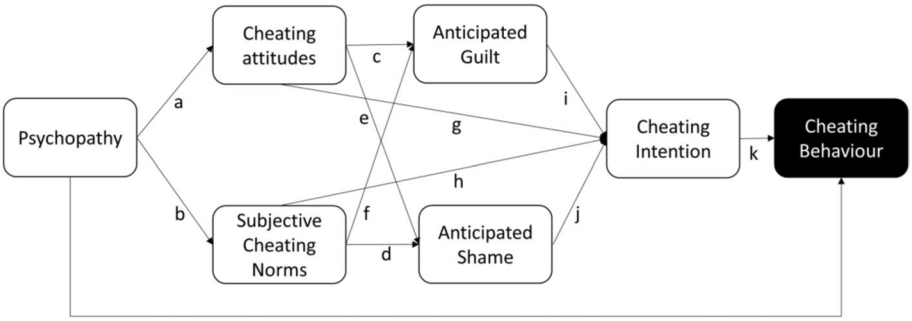

Fig. 1 Extended theory of reasoned action model predicting cheating behaviour from psychopathy mediated by attitudes, subjective norms, anticipated moral emotions and intentions. Notes: 1. Letters below the lines indicate proposed mediation paths (see Table 3). 2. Cheating Behaviour (black-filled box) is a new variable not included in the study by Curtis et al. (2022a)

compared with accidental plagiarism), which means that it does not add additional statistical information to a model of the predictors of cheating. Nonetheless, regardless of whether studies have measured perceived behavioural control, it is clear from numerous studies that attitudes and subjective norms regarding academic misconduct reliably predict students' intentions to engage in academic misconduct (e.g., Uzun & Killis, 2020) and their academic misconduct behaviour (e.g., Tindall et al., 2021).

Because the TRA and TPB have been found to be reliable models for predicting academic misconduct, many studies have examined additional variables within these frameworks that can predict plagiarism or cheating. For example, Stone et al. (2010) found that the personality factors 'prudence' and 'adjustment' predicted students' attitudes and subjective norms regarding academic misconduct. This finding established that personality traits may be antecedents of attitudes and subjective norms. Other researchers have found that a variety of psychological states, traits, or beliefs can be added to the TRA/TPB to enhance prediction of academic misconduct. For example, the following variables have been added to TRA/TPB models predicting academic misconduct: utility and opportunity (Sattler et al., 2013), social identity (Yang et al., 2021), self-control (Curtis et al., 2018), emotionality (Tindall et al., 2021), and moral obligation (Alleyne & Phillips, 2011). Most recently, Curtis et al. (2022a) found that the personality trait psychopathy, which is related to disregard of other people's rights, disregard of rules, and impulsivity (Jones & Paulhus, 2014), predicted attitudes and subjective norms regarding contract cheating. Moreover, their study was the first to find that anticipating negative moral emotions (guilt and shame) mediated the relationship between attitudes, subjective norms, and intentions to engage in contract cheating.

The recent study by Curtis et al. (2022a) is interesting because it concurrently examined both a personality antecedent of attitudes and norms (psychopathy) as well as a mediator between attitudes, norms, and intentions (anticipated guilt and shame), in the same extended TRA model. Their study added to the findings of recent research which showed that psychopathy is related to academic cheating (e.g., Baran & Jonason, 2020; Esteves et al., 2021; Lee et al., 2020; Ternes et al., 2019), by testing a theory-driven explanation of *how* this relationship occurs. Importantly, the relationships tested in their study (see white-filled boxes in Fig. 1), were mostly empirically and statistically supported. This study was notable because it extended the TRA in a new way (including both a personality antecedent

of attitudes and norms, and anticipated moral emotions), thereby making a specific new contribution to understanding why students might intend to engage in cheating.

In sum, Curtis et al. (2022a) found that psychopathy predicted more positive attitudes toward contract cheating and a subjective norm that cheating is more common, which, in turn, predicted anticipating less guilt if a student engaged in cheating undetected, which then predicted students' intention to cheat. Although this provides a description of *how* these psychological variables fit together to predict cheating intentions, it is important to discuss *why* they fit together in this sequential order. Personality psychology proposes that traits, such as psychopathy underlie and precede other situation-specific thoughts, feelings, and actions such as attitudes and subjective norms (Tett et al., 2021). Concretely, because psychopathy is related to disregarding rules (Jones & Paulhus, 2014), it can be expected to predict a more positive or lenient attitude to rule-breaking in the form of academic misconduct. In other words, higher psychopathy would be related to perceiving various cheating behaviours as a less serious breaches of academic integrity. Furthermore, people tend to overestimate how common their own behaviours are (Ross et al., 1977) and as higher psychopathy is related to academic cheating (e.g., Lee et al., 2020), higher psychopathy is expected to be related to an expectation that cheating is more common and acceptable. In other words, higher psychopathy should be related to a higher subjective norm of cheating.

Moral emotions such as guilt and shame are feelings that emerge when people break social rules that they consider to be important (Sznycer et al., 2016), such rules may be internalised as attitudes or subjective norms. Therefore, if a student considers cheating to be harmless (positive attitude) and common/tolerable (subjective norm), they will perceive cheating to be acceptable, which means that they will not expect to feel bad (guilty or ashamed) if they cheat. Thus far, the argument above outlines the processes by which higher psychopathy is expected to be related to more positive attitudes toward cheating, a subjective norm that cheating is more frequent and permissible, and how these norms and attitudes then lead to anticipated lower guilt and shame related to cheating. Next in the model proposed by Curtis et al. (2022a), these anticipated emotions predict academic cheating intentions, and, in Fig. 1, we have expanded this to propose that these intentions will predict cheating behaviour.

People's intentions are often informed by how they anticipate those actions will make them feel (Gilbert, 2007). Specifically, in TRA/TPB models, it has been found that anticipated emotions can predict intended actions (Rivis et al., 2009). Thus, in the model presented in Fig. 1, we expect that anticipated emotions (guilt and shame) related to academic cheating and misconduct would predict intentions to cheat. In research on the TRA/TPB, intentions are typically the strongest predictor of behaviours, but the model separates intentions and behaviours because intentions do not obligatorily lead to behaviours (Alleyne & Phillips, 2011). Rundle et al. (2019, 2023), outlined numerous reasons why students may not engage in contract cheating, and among these are reasons for not engaging in cheating behaviour even when students intend to do so. For example, a student may intend to cheat but not cheat because they cannot find someone who will take a test for them or they cannot afford to pay someone to complete an assignment for them (Rundle et al., 2019, 2023). Taken together, the above series of steps explains why psychopathy is expected to be related, serially, to academic cheating attitudes and norms, then to anticipated moral emotions regarding cheating, then to cheating intentions, and then to cheating behaviour.

As noted, Curtis et al. (2022a) found most of the theoretically expected relationships outlined above, but with three main limitations. First, their study did not include a measure of academic cheating *behaviour*; the outcome variable in the study was cheating *intentions*. The TRA and TPB state that intentions will predict behaviour, but not perfectly so.

As discussed, situations plausibly exist where students may intend to engage in academic cheating but do not do so. Second, Curtis et al. (2022a) found only partial support for their proposed model, in that the relationship between psychopathy and cheating intentions was mediated by anticipated guilt but not by anticipated shame, a further test of the proposed contribution of anticipated shame is warranted. Third, Curtis et al. (2022a) only measured two forms of cheating: submitting a bespoke assignment purchased from someone else (custom ghost writing) and having another person complete an online test in their place (online test impersonation). Therefore, Curtis et al. (2022a) only had two items each in their measure of attitudes, subjective norms, anticipated guilt and shame, and intentions to cheat. A problem of only measuring a psychological concept with two items is that the measurement may lack content validity (Gregory, 1996). Content validity is the idea that to meaningfully encapsulate measurement of any psychological process (such as attitudes and intentions) or any behaviour, a sufficient sample of the psychological process or behaviour is needed (Gregory, 1996). Practically, then, looking at two cheating behaviours is a limited amount of "content" from which to generalize to academic cheating per se.

To address the key limitations of Curtis et al.'s (2022a) study, we extended on their study to include a measure of academic cheating and misconduct behaviours (see black-filled box in Fig. 1), and four times more forms of cheating and academic misconduct (i.e., eight rather than two). As this study was conducted just after the COVID-19 pandemic, we decided to assess additional cheating and cheating-related behaviours (i.e., file-sharing) that were indicated as either more common or more likely because of changes to assessment practices related to "emergency online teaching" (e.g., Carroll, 2023; Lancaster & Cotarlan, 2021). Given the extant theoretical and empirical literature outlined above, adding a measure of cheating behaviour to Curtis et al.'s (2022a) research design (see Fig. 1), we hypothesized:

H1: Psychopathy will positively correlate with cheating behaviour.
H2. The relationship between psychopathy and cheating behaviour will be serially mediated by, in order: attitudes to cheating and subjective cheating norms, then anticipated guilt and anticipated shame related to cheating, and then cheating intentions.

Method

Design

The study employed a cross-sectional correlational design to investigate psychopathy (predictor variable) and academic misconduct behaviour (outcome variable). As shown in Fig. 1, there were five mediators: attitudes and subjective norms, followed by anticipated shame and anticipated guilt, followed by intentions.

Participants and Procedure

An a priori power analysis using MedPower (Kenny, 2017) suggested that a sample size of 214 ($\beta = .19$) participants was needed to detect a significant total effect, $n = 113$ ($\beta = .09$) for an indirect effect, with a power .80, with small-to-medium effect sizes. Given the hypotheses of indirect effects, and to allow for attrition, we aimed to recruit around 300 participants. A total of 316 higher education students were recruited: 200 from the Prolific Academic® participant

recruitment platform and 116 from an Australian University. Data were deleted listwise where participants were not a student ($n = 5$), or they had failed one of two attention checks embedded in the measures ($n = 15$), or they had completed the survey too quickly ($n = 3$), or >10% of their responses/data were missing/incomplete ($n = 39$; Bennett, 2001).

The final sample was 257 participants, consisting of 202 full-time undergraduate students (32 part-time) and 13 full-time post-graduate students (10 part-time). A minimum age of 17 was required for participation under approved ethical protocols. Students' ages ranged from 17 to 62 ($M = 23$, $SD = 5.13$; one missing) with 133 identifying as male, 117 identifying as female, and 7 "other" or "not specified". Most of the final sample ($n = 175$) were from the Prolific® online research participant recruitment platform with the remainder ($n = 82$) from an Australian university. Students studied a range of majors (e.g., health sciences 19.8%, engineering 16.3%, psychology 14.8%) and were from over 20 countries (e.g., Mexico 27.6%, Chile 15.6%, Australia 13.2%). All students spoke English, although most students' first language was not English (70.4%).

Students from the Australian university completed the study in exchange for a partial course credit in an undergraduate psychology class. The participants from Prolific were compensated with £2.25 for completing the study. For both recruitment methods, the participants were directed from an online site to a questionnaire containing the measures described in the next section. The measures took approximately 15 minutes to complete and survey systems allowed credit or payment to be automatically awarded to participants without identifying information being collected and shared with the researchers.

Participation was anonymous and voluntary as per approved ethical protocols from the researchers' university (Project Approval #RA/4/20/5802, 2021). Participants completed the survey in their own time on their own device and they could withdraw from the study at any time by exiting the survey before completion. On completion of the study, participants were presented with debriefing information explaining the purpose of the study.

Measures

The study consisted of a survey that measured attitudes, subjective norms, anticipated shame and anticipated guilt, intentions to engage in eight different academic misconduct behaviours, and a measure of whether participants had engaged in these behaviours. In addition, trait psychopathy and demographic information were also measured.

Academic Misconduct and Mediation Measures

The academic misconduct survey was designed to be consistent with that used by Curtis et al. (2022a) in all respects, except for the inclusion of eight forms of cheating/misconduct instead of two, and a measure of engagement in these behaviours. Their measure was based on a widely used measure of academic misconduct originated by Maxwell et al. (2008), which has been adapted in other TRA and TBP studies (e.g., Curtis et al., 2018; Tindall et al., 2021). This measure included cheating and academic misconduct behaviours that have been the focus of recent interest in contract cheating research, and commonly used post-pandemic assessment modes such as online tests (see Supplementary Materials). The eight behaviours included in the measure are listed here along with citations to studies from which they were drawn: (1) custom ghost writing (Bretag et al., 2018; Curtis et al., 2022a, b), (2) outsourcing to friends and/or family (Awdry, 2021), (3) looking up answers to online test questions (i.e., 'Googling') (Golden & Kohlbeck,

2020), (4) using an impersonator to complete an online test (Curtis et al., 2022a), (5) in-person collusion in an online test (Maryon et al., 2022), (6) using a live online tutor during a test (Lancaster & Cotarlan, 2021), (7) uploading academic files to file-sharing websites (Bretag et al., 2018), and (8) downloading academic files from file-sharing websites (Bretag et al., 2018; Curtis et al., 2022b). Each form of misconduct was accompanied by a definition of the behaviour (e.g., In-person colluding – on online tests/unauthorised collaboration: "when an online test is completed with another student, which should have been completed individually") and an example scenario (e.g., "student A and student B decide to complete an online economics test worth 20% together by sitting on computers side-by-side so they can talk about answers").

For each academic misconduct scenario there was a measure of the respondent's attitudes, intention, subjective norms, anticipated shame, and anticipated guilt surrounding the behaviour, and previous engagement in the behaviour, in that order. Attitudes, intentions, subjective norms and anticipated shame and guilt were assessed on a slider scale ranging from 0—100, with higher scores indicating a higher degree of the construct. For all items, the slider was set at the mid-point, 50, but if it was not moved by the student responding to the survey the response was recorded as "missing" rather than 50. As there were eight forms of academic misconduct in the survey, there were eight items each for attitudes, intentions, subjective norms, anticipated shame, anticipated guilt, and engagement in the misconduct behaviour. Cronbach's α for each measures' set of eight items were all > 0.70, indicating good reliability (Field, 2013).

Attitudes To assess attitudes towards the behaviour, respondents indicated their response to the question "How serious do you think this action is as a breach of academic integrity?" on a scale from 'not at all' (0) to 'extremely serious' (100; $\alpha = 0.86$). This operatisation of attitudes considered more serious breaches of academic integrity to be more negative, as in the original measure by Maxwell et al. (2008) and as adapted by Curtis et al. (2022a).

Subjective Norms Subjective norms were measured by asking participants how acceptable they believed the behaviour to be among their classmates from 'completely unacceptable' (0) to 'it would be ok for everyone to do this' (100; $\alpha = 0.89$).

Anticipated Moral Emotions Guilt is associated with private experiences of feeling bad about performing a behaviour that breaches one's personal moral code (Curtis, 2023). The experience of anticipated guilt was indicated by whether respondents would expect to not feel guilty (0) or would expect to feel extremely guilty (100; $\alpha = 0.91$) if they engaged in each form of academic misconduct undetected. Shame is an emotion associated with self-evaluations when inappropriate behaviour is publicly exposed (Curtis, 2023). Because of this, anticipated shame was measured by asking whether students would expect to experience shame if they were caught by their teacher engaging in each form of academic misconduct; from 'I would not feel ashamed' (0) to 'I would feel extremely ashamed' (100; $\alpha = 0.88$).

Intentions Intentions to engage in each academic misconduct behaviour were indicated by how likely participants believed they were to intentionally engage in the behaviour in the future from 'I would never do this' (0) to 'I am very likely to do this' (100; $\alpha = 0.83$).

Cheating Behaviour Actual cheating behaviour was assessed in a forced-choice format of how often the student had ever engaged in each behaviour with the options: (1) never, (2)

once, (3), two to four times, and (4) four times or more ($\alpha = 0.72$). An aggregate measure was created by averaging students' responses to this question for the eight forms of misconduct.

Psychopathy

Psychopathy was assessed using the psychopathy subscale from the Short Dark Triad (SD3) scale (Jones & Paulhus, 2014); a reliable and valid self-report measure of the Dark Triad constructs of Machiavellianism, narcissism, and psychopathy. The psychopathy subscale consists of 9 items that assess impulsivity, callous manipulation, and antisocial behaviour.

Participants were asked to indicate how much they agree with each statement (e.g., "I like to get revenge on authorities") with responses recorded on a 5-point Likert Scale, ranging from "disagree strongly" (1) to "agree strongly" (5). The subscale had two reverse-scored items. In accordance with Jones and Paulhus (2014), the subscale heading was removed in administering the SD3 and items were kept in the same order.

In previous studies, the SD3 psychopathy scale had an acceptable reliability ($\alpha = 0.77$; Jones & Paulhus, 2014). However, for the current sample, the SD3 initially provided a Cronbach's α of 0.65, below the recommended minimum internal reliability requirement of 0.70 (Field, 2013). Because of this, an analysis of item reliabilities was conducted, whereby the items with the smallest reliabilities were removed (Tavakol & Dennick, 2011). From this, two items (the two reverse-scored items) were removed, subsequently providing a higher reliability of $\alpha = 0.71$.

Attention Checks, Order of Measures, and Demographics

Two attention check items (e.g., "Answer false for this item") were included in the survey to screen for inattentive and random responses (Beach, 1989). The eight forms of cheating and academic misconduct with their accompanying questions, and the psychopathy scale, were automatically presented in a randomised order for each participant. Participants completed demographic questions as the last set of questions in the study.

Results

Data Preparation and Preliminary Analyses

A missing value analysis revealed that 9.18% of the data were missing. Little MCAR's test showed that data were missing completely at random χ^2 (2468) = 2452.17, $p = 0.59$. As less than 10% of the data were missing, the missing values were imputed using expectation maximisation (Bennett, 2001). Scale means were calculated for each of the measures (psychopathy, attitudes, norms, anticipated shame, anticipated guilt, intentions, and academic misconduct behaviour).

The data were normally distributed, with skew and kurtosis were within acceptable limits of $<|2.0|$ and $<|9.0|$ (Schmider et al., 2010). In addition, multicollinearity was within the acceptable limits with tolerance $>|.10|$ and the variance inflation factor $<|10|$ (Hair et al., 2011). Moreover, mediation analysis conducted using the Process macro (Hayes, 2018), as

Table 1 Frequency statistics for each form of academic misconduct

Type of misconduct	Never	Once	Two to four times	For times or more
Custom ghost writing	77.8	6.6	1.9	0.8
Family/friend outsourcing	66.4	12.5	10.1	1.9
Online test Googling	26.5	10.5	27.2	24.9
Online test imposter	82.5	7.0	3.5	0.0
In-person collusion	42.8	14.8	22.2	10.9
Live test tutor	70.4	8.2	6.6	3.9
Online file sharing—uploading	58.0	9.7	10.1	12.5
Online file-sharing—downloading	77.0	5.8	2.7	2.3

$n = 257$, percentages calculated for available data and do not sum to 100% because of missing responses, *n*s range from 224–239

was used in this study, does not make any assumption of normality because bootstrapping is used.

As the present study obtained data from two different sources, analyses were conducted to ensure that the samples were comparable. Consequently, means, standard deviations and Pearson correlations were obtained and compared between the Prolific and Australian university samples of students. Results showed that the correlation patterns were similar across both samples, indicating that it was reasonable to combine the two data sources for analyses (see Supplementary Materials).

Additionally, as the literature has mixed results regarding differences between men and women in psychopathy and academic misconduct levels (Baran & Jonason, 2020), independent samples *t*- tests were conducted to test for any significant gender differences in the data. The analysis found some significant differences between males and females across the variables in question. However, consistently with Curtis et al. (2022a), data for all genders of students were combined as the patterns of correlations across each of the variables was consistent across both genders.[1]

Because of high correlations among variables, principal components analysis with direct oblimin rotation was used to statistically examine potential common methods bias among the questionnaire measures. The largest component accounted for only 29.5% of the variance, suggesting little evidence of such bias (Podsakoff & Organ, 1986). In addition, elements of the methodological design including the randomisation of the order of measures and participant anonymity are protective against common methods bias (Podsakoff et al., 2003).

Descriptive Statistics and Correlation Analyses

Frequencies and descriptive statistics for engagement in each type of academic misconduct are shown in Table 1. The rates of engagement in the various forms of

[1] Significant group differences between males and females in subjective norms ($t(248) = 3.44$, $p < .001$), anticipated moral emotions ($t(248) = -2.87$, $p < .05$), intentions ($t(248) = 3.66$, $p < .001$), academic misconduct ($t(248) = 3.51$, $p < .001$), and psychopathy ($t(248) = 3.45$, $p < .001$).

Table 2 Descriptive statistics for the variables in the extended TRA model and Pearson's correlations

	M (SD)	1	2	3	4	5	6
1. Psychopathy	2.06 (.52)						
2. Attitudes	71.10 (18.14)	-.23*					
3. Subjective norms	38.92 (22.42)	.27*	-.56*				
4. Anticipated guilt	59.16 (25.32)	-.29*	.76*	-.69*			
5. Anticipated shame	79.18 (19.31)	-.22*	.63*	-.51*	.72*		
6. Intentions	26.25 (19.46)	.36*	-.55*	.69*	-.63*	-.51*	
7. Academic misconduct	1.58 (.48)	.28*	-.49*	.59*	-.53*	-.39*	.80*

$n = 257$, $*p < .001$

cheating, out-sourcing, and sharing behaviours in our study are high compared with other studies, which we will discuss in more detail later. Submitting an assignment custom written by another person, for example, was admitted to by 9.3% of students and 12.9% of students did not respond to this item in the survey, therefore only just over three-quarters of students reported *never* engaging in this form of serious contract cheating. Importantly also, a clear majority of student (62.6%) admitted to looking up answers during online tests ("Googling"), most of them (52.1% overall) more than once. Furthermore, a majority of students reported working collaboratively, rather than individually, during online tests that were meant to be completed by alone. Another interesting finding was that except for custom ghost writing (9.3%), over 10% of students admitted to engagement in each form of academic misconduct.

Pearson correlations were calculated between each of the variables in the analysis to examine whether the expected relationships were evident (see Table 2). Supporting H1, psychopathy was significantly positively correlated with academic misconduct behaviour, indicating that higher levels of psychopathy were associated with more engagement in academic misconduct. Additionally, there was a significant negative correlation between psychopathy and attitudes, and a significant positive correlation between psychopathy and subjective norms. The direction of these associations suggests that higher scores in psychopathy are associated with the attitude that violations of academic integrity are not serious and are more accepted among their peers. Psychopathy was found to be significantly negatively related to anticipated moral emotions. Therefore, higher scores on psychopathy were associated with experiencing less anticipated shame and guilt about engaging in academic misconduct. Additionally, psychopathy was significantly positively correlated with intentions, indicating that higher scores on psychopathy were associated with a greater likelihood of engaging in academic misconduct. Using the criteria proposed by Gignac and Szodorai (2016) all correlations between psychopathy and the other variables of interest were medium-to-large in size.

Mediation Analyses

A serial mediation analysis was conducted to test the hypothesis (H2), that the relationship between psychopathy and academic misconduct behaviours would be mediated by attitudes, norms, anticipated guilt, anticipated shame, and intentions. The proposed model (see Fig. 1) was tested using the Process macro version 4.2 beta (Hayes, 2018) in

Table 3 Summary of the serial mediation analysis using Hayes's (2018) Process macro 4.2 beta for SPSS see Fig. 1 for the model. Indirect effects with 95% confidence intervals for 5000 bootstrap resamples

Path	Pathway on Fig. 1	Effect (CI)
Psychopathy → attitudes → intentions → behaviour	agk	.01 (-.11, 0.52)
Psychopathy → norms → intentions → behaviour	bhk	.10 (.05, .17)*
Psychopathy → attitude → guilt → intentions→ behaviour	aejk	.02 (.00, .05)*
Psychopathy → attitudes → shame → intentions → behaviour	acik	.01 (-.01, .03)
Psychopathy → norms → guilt → intentions → behaviour	bdjk	.02 (.00, .04)*
Psychopathy → norm → shame → intentions → behaviour	bfik	.00 (-.01, .15)

$N = 257$, * = 95% confidence interval does not cross zero

SPSS v27. Hayes (2018) did not provide a pre-defined analysis function that fit our proposed model. Therefore, we wrote bespoke syntax to test the model (see Supplementary Materials), with 95% bias-corrected confidence intervals and 5000 bootstrap samples. The syntax specified psychopathy as the predictor variable and academic misconduct as the outcome variable. The first mediators in the model were subjective norms and attitudes, tested in parallel. The second stage mediators were anticipated guilt and anticipated shame tested in parallel, and intention was the fifth mediator. The pathways that were tested in the analysis can be seen in Fig. 1 and Table 3.

Each variable was standardised for the analysis to obtain the standardised beta weights. All five mediators were entered into the analysis as this allowed for the simultaneous examination of all effects (Hayes, 2018). Moreover, a single mediation model holds each mediator constant during the analysis, permitting analysis of the difference between each mediators' indirect effect (Hayes, 2018). In the analysis, mediation is considered significant if the confidence intervals for the indirect effect do not cross zero (Hayes, 2018).

The overall model was found to be significant $F(3, 254) = 222.31$, $p < 0.001$, $R^2 = 0.63$, accounting for 63% of the variance in academic misconduct behaviour. The results and pathways of the tested indirect relationships for the proposed model are shown in Table 3. The serial mediation analysis revealed three significant indirect effects between psychopathy and academic misconduct. First psychopathy predicted academic misconduct mediated by norms and then intentions. Second psychopathy predicted academic misconduct mediated by norms, then anticipated guilt, and then intentions. Third, psychopathy predicted academic misconduct mediated by attitudes, then anticipated guilt, and then intentions. Anticipated shame was not a significant mediator between psychopathy predicted academic misconduct. Interestingly, with the mediators included in the model, the direct effect between psychopathy and academic misconduct was not significant $\beta = -0.02$ (-0.10, 0.06). Thus, as indirect effects were significant and the direct effect was not, the pattern of the results suggests that the relationship between psychopathy and academic misconduct was fully mediated by the variables included in the model.

There is a reasonable argument that because the psychopathy scale was originally validated with all items included, our choice to remove items that lowered the Cronbach's alpha may reduce the validity of this scale (Taber, 2018). Because of this, we also conducted the serial mediation analysis with the full psychopathy scale. The pattern of significant and non-significant mediation paths was identical to the analysis with the modified scale. These results are included in the Supplementary Materials.

Discussion

The Extended TRA Model of Cheating

Previous research has demonstrated that psychopathy is associated with academic dishonesty, however, there is a lack of literature that examines the psychological mechanisms responsible for why this relationship exists, especially within a theoretically driven framework (Ahsan et al., 2021). The study reported in this paper set out to test an extension of the model proposed and tested by Curtis et al. (2022a), and to address three limitations of that study. First, we included a measure of academic misconduct behaviour. Second, we re-examined whether anticipated shame would mediate the relationship between psychopathy and academic misconduct. Finally, we added six further measures of academic misconduct beyond to the two included in Curtis et al.'s (2022a) study.

Curtis et al. (2022a) extended the TRA to include psychopathy as an antecedent of attitudes and norms regarding cheating, and anticipated guilt and shame as mediators between attitudes, norms, and intentions to cheat. They found that psychopathy predicted contract cheating intentions mediated by attitudes, norms, and anticipated guilt, but not by anticipated shame. The results of the present study replicated and extended on these findings. Specifically, we found that psychopathy was related to academic misconduct intentions *and* academic misconduct behaviours, supporting H1. Moreover, the serially mediated relationships from psychopathy to intentions extend to academic misconduct behaviours via attitudes, norms, and anticipated guilt but not anticipated shame, partially supporting H2.

In the context of the broader literature, the finding that psychopathy was positively associated with academic misconduct is consistent with recent previous studies (Baran & Jonason, 2020; Lee et al., 2020; Ternes et al., 2019). In addition, the contribution of attitudes, subjective norms, and intentions to predict academic misconduct are consistent studies that have applied TRA or TPB models to the prediction of academic misconduct (e.g., Curtis et al., 2018; Stone et al., 2010). Furthermore, the finding that anticipating moral emotions may mediate the relationship between academic misconduct attitudes, subjective norms, and intentions is consistent with recent research and theory (e.g., Curtis, 2023; Rivis et al., 2009; Tatum & Curtis, 2023). Importantly, as noted, we tested an extension to the model proposed by Curtis et al. (2022a), which included *both* psychopathy as an antecedent of attitudes and norms, *and* anticipated moral emotions within a single model. Thus, this study and the model it tests provides a more parsimonious explanation of the connection between psychopathy and academic misconduct than previous piecemeal and unitary findings.

To put Curtis et al.'s (2022a) theory and our findings in plain English: students high psychopathy (i.e., students with a dispositional tendency to be impulsive and disregard rules) think that academic misconduct is less serious and more common than do students with lower levels of psychopathy. As a consequence, students higher in psychopathy expect to feel less guilt if they get away with cheating, and this influences their intention to cheat, and this statistically predicts their actual engagement in previous cheating and academic misconduct behaviours.

An important finding to discuss is the replication of Curtis et al.'s (2022a) finding that anticipated guilt but not anticipated shame mediated the relationship between psychopathy and academic misconduct. Recently, Curtis (2023), reported a study in which anticipating guilt was a stronger predictor of academic misconduct intentions than anticipated shame. He offered two explanations for this finding that also fit the results of our study. First, in

general students anticipate a higher level of shame being caught engaging in academic misconduct than the level of guilt they anticipate feeling if they get away with academic misconduct. We found the same in the present study, with the mean anticipated shame being over 20 points higher (on a 100 point scale) than mean anticipated guilt (which was significantly different $t[256] = 15.48$, $p < 0.001$). Therefore, there may be a ceiling effect in the measurement of anticipated shame that reduces its correlation with other variables. Second, "for students with strong internalized moral positions against cheating and plagiarism, the prospective guilt associated with engaging in academic misconduct is particularly determinative of their intention to [cheat]" (Tatum & Curtis, 2023 as cited in Curtis, 2023, p. 9). In other words, all students expect to experience shame if caught cheating, but expectations of guilt are more variable and therefore more determinative of variation in the choice of whether to cheat.

The finding of complete mediation, or the absence of a direct effect of psychopathy on academic misconduct behaviours, indicates that although psychopathy may predispose students to cheating, interventions that affect other factors may mean that cheating is preventable. Specifically, attitudes, subjective norms, anticipated guilt, and intentions related to academic misconduct may be targeted in ways that could break the link between psychopathy and cheating. For example, educators may implement campaigns that attempt to correct false perceptions related to the seriousness and acceptability of academic dishonesty among students, i.e., changing attitudes and subjective norms (Simola, 2017). Furthermore, it may be possible to change the extent to which students anticipate experiencing guilt. Tatum and Curtis (2023) argued that cautioning students about the negative consequences of cheating through syllabus statements and in-class discussions can raise their expectations of negative emotional outcomes from cheating.

Prevalence of Post-Pandemic Academic Misconduct

As a subsidiary finding to the test of the psychological model of cheating, the results from our survey, albeit relatively small in scale, also provide potentially interesting data on the prevalence of cheating behaviours on forms of assessment associated with post-COVID19 "emergency online teaching". The rates of academic misconduct among the students in our study are, in many instances, higher than in previous pre-pandemic research into the same or similar behaviours, and more consistent with post-pandemic research. For example, pre-pandemic, self-reported rates of commercial contract cheating were often estimated to be around 3% of students (e.g., Bretag et al., 2018; Curtis & Clare, 2017; Newton, 2018). We found that nearly 10% of students in the present study admitted to custom ghost writing (outsourcing assessments) at least once. This finding is more consistent with post-pandemic rates of contract cheating (e.g., Curtis et al., 2022b). Similarly, we found that many students engaged in sharing behaviours associated with academic misconduct (i.e., uploading and downloading materials from file-sharing sites), consistent with patterns reported in other studies (e.g., Lancaster & Cotarlan, 2021; Slade et al., 2024; Stoesz et al., 2023).

Most concerningly, however, the rates of engagement in cheating in online tests, both looking up answers and unauthorized collusion, suggested that these were behaviours most students had engaged in, many repeatedly. The finding that most students cheated in some way in unsupervised online tests is consistent with the post-pandemic pattern of behaviour reported by Newton and Essex (2023). Importantly, both our results and those reported by Newton and Essex (2023) are from self-report surveys, where people routinely under-report

socially undesirable behaviours such as cheating (Curtis et al., 2022b; Krásničan et al., 2022). We believe that these findings should remind educators that unsupervised online tests are not only cheatable, but cheated on. Dawson (2021) puts this concern bluntly, describing the use of summative unsupervised online tests as an "obvious assessment design mistake" (p. 133). We agree.

Limitations

There were two main limitations of note in our study: the cross-sectional design using *past* engagement in academic misconduct as the measure of academic misconduct behaviour and the use of self-report measures.

Data on engagement in academic misconduct behaviours was gathered in our study by assessing previous engagement in these behaviours. This allowed us to test a model of whether psychopathy, attitudes, norms, anticipated moral emotions, and intentions *statistically* predicted past academic cheating/academic misconduct. Past behaviours are routinely used in TRA/TPB studies as proxy measures of future behaviours that would result from intentions (e.g., Tindall et al., 2021). Collecting data on past misconduct behaviours is a methodological necessity in a cross-sectional research design, but it means, as stated above, that the model *statistically* predicts past academic cheating/academic misconduct rather than *chronologically* predicting these behaviours in the future. Importantly, past cheating behaviours are one of the strongest correlates of subsequent cheating behaviours (Harding et al., 2007), therefore a model that predicts past behaviours is likely to reliably predict future behaviours. Nonetheless, a stronger test of the model presented in this article (see Fig. 1) would come from longitudinal data collection, where the components of the model that theoretically precede academic misconduct behaviours are collected first, and engagement in academic cheating and misconduct behaviours are assessed subsequently.

As noted in relation to the frequency of engagement in online test cheating, self-report studies can underestimate the prevalence of undesirable behaviours, as people may not disclose various forms of sensitive information even when anonymous (Krásničan et al., 2022). Because of this, the rates of engagement in academic misconduct reported in this study, while higher than in some previous research, should still be viewed as conservative estimates of the prevalence of these behaviours among students.

Conclusion

In this article we reported the results of a study that set out to extend on the study by Curtis et al. (2022a), which examined an extended TRA model of the relationship between trait psychopathy and academic cheating. The study replicated Curtis et al.'s (2022a) findings, demonstrating the relationship between psychopathy, attitudes, norms, anticipated guilt, and cheating intentions, and extending on their study showing, importantly, that this model statistically predicted past engagement in academic misconduct behaviours. This is an interesting and useful finding, which suggests that various methods may be used to break the connection between a psychological predisposition to cheat and engagement in cheating behaviour.

We also attempted in our study to improve upon the content validity of the measurement in Curtis et al.'s (2022a) study by measuring several additional forms of academic misconduct that are associated with post-COVID "emergency online teaching" and assessment

practices. In so doing, we happened upon additional interesting results, namely, that rates of engagement in outsourcing, sharing, and test-cheating behaviours were higher than in many pre-pandemic studies. The finding that most students report cheating on unsupervised online tests leads us to concur with Dawson (2021) that using unsupervised online tests as summative assessments is a wholly avoidable mistake.

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Declarations

Conflict of Interest The authors have no competing interests or funding to declare.

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