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# Why students *do not* engage in contract cheating: a closer look

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## Abstract

Contract cheating – students outsourcing assignments to ghost-writers and submitting it as their own – is an issue facing tertiary education institutions globally. Approximately 3% to 11% of higher education students may engage on contract cheating. Understanding why nearly 90% of students do *not* engage in contract cheating is as important as understanding why other students *do*, as it can aid in the development of effective interventions and policies. This study addressed limitations in previous research and built upon a measure of Reasons for Not Contract Cheating (RNCC). In this study, 403 university students participated in an online survey consisting of a revised version of the Reasons for Not Contract Cheating measure (RNCC-R) and measures of psychological individual differences, such as the dark triad personality traits, self-control, and autonomy. Two higher-order factors and six sub-factors were identified in the RNCC-R, which included some similarities to the original RNCC. The findings from this study demonstrate the importance of psychological individual differences, such as satisfaction of the need for autonomy, grit (perseverance of effort), and Machiavellianism, in predicting the reasons why students do *not* engage in contract cheating. Consistent with previous research, this study provides support for the importance of students' motivation for learning, and their perceived morals and norms, as reasons for not engaging in contract cheating. It additionally provides evidence of the importance of the academic environment, such as respect for academic staff, as a reason why students do *not* engage in contract cheating.

**Keywords:** Contract cheating, Reasons, Personality, Individual differences, Autonomy, Grit, Machiavellianism, Psychopathy, Norms, Motivation

## Introduction

University assessments are used as a measurement of student learning. By outsourcing their work, a behaviour termed *contract cheating* (Clarke and Lancaster 2006), students violate the integrity of this measurement of learning. This paper focuses on commercial contract cheating, which is where a financial transaction occurs between a student and third party, such as an online service, essay mill, friend, family member, or other (Curtis et al. 2022c; Newton 2018). It is likely that students who engage in contract cheating will fail to learn from the assessed task, leading to a knowledge deficit. This knowledge deficit is of concern in fields where a lack of adequate knowledge may place lives at risk, for

example, psychology, medicine, and engineering. While self-report estimates of student engagement in contract cheating are relatively low, around 2–4% of students (see Bretag et al. 2019; Curtis and Clare 2017; Newton 2018), new research using advanced methodology suggests the true prevalence of contract cheating to be two to four times higher (Curtis et al. 2022c). Curtis et al. (2022c) suggest that the prevalence of contract cheating may be as high as 11.44%, and those who do cheat in this way tend to do so repeatedly (Curtis and Clare 2017). Nonetheless, the evidence continues to suggest that most students do not engage in contract cheating and understanding why this is the case may help develop effective interventions and institution policies.

There are three key studies that have explored why students do not engage in cheating behaviours (see Kolb et al. 2015; Miller et al. 2011; Rundle et al. 2019). Miller et al. (2011), using an online survey, presented student participants with a vignette describing a scenario in which they would have an opportunity to cheat on an assessment. Students were then asked the reasons why they would not cheat, through open-ended questions (Miller et al. 2011). Participants' responses for not cheating centred on themes of learning, character and moral standards, and that cheating is "not right" (Miller et al. 2011, p. 181). To address the limitation of focusing on a hypothetical scenario, Kolb et al. (2015) interviewed 34 students regarding real experiences where they had the opportunity to cheat, identifying six categories of reasons why students do not cheat: "(1) barriers to consideration, (2) limited beliefs, (3) fear of consequences, (4) written policies, (5) learning goals, (6) internalized beliefs" (p. 6). Although both studies identified three consistent themes (learning goals, morals or ethics, and punishment and consequences), Kolb et al.'s (2015) study provided a more holistic understanding of the reasons students do not engage in cheating behaviours compared to Miller et al.'s (2011).

While Miller et al.'s (2011) and Kolb et al.'s (2015) studies provide insight to why students refrain from engaging in general cheating behaviours, Rundle et al.'s (2019) study focused specifically on why students do not engage in contract cheating. Rundle et al. (2019) conducted an online survey of 1204 university students. They developed the 21-item "Reasons for Not Engaging in Contract Cheating" (RNCC) measure that asked students to indicate how much each item corresponds to a reason they do not engage in commercial contract cheating. In their study, students were first presented with a definition of contract cheating and asked whether they had engaged in it. Next, students who had not engaged in contract cheating were directed to the RNCC measure, followed by measures of psychological individual differences. The items in the RNCC measure were drawn from qualitative analysis of literature, focus groups, and subject-matter expert input. Each item in the RNCC measure stated a specific reason for not engaging in contract cheating, for example, "I am studying to learn rather than to get a qualification/degree" (Rundle et al. 2019, p.5). Students rated each item on a 5-point scale indicating the extent to which the item was a reason for them *not* engaging in contract cheating.

Rundle et al. identified five factors from the RNCC: (1) "morals and norms", (2) "motivation for learning", (3) "fear of detection and punishment", (4) "self-efficacy and (mis) trust", and (5) "lack of opportunity". Their factors pertaining to morality, learning, and punishment as reasons why students do not engage in contract cheating were consistent with Miller et al.'s (2011) and Kolb et al.'s (2015) work. Rundle et al. (2019) examined how the individual differences of self-control, grit, competence, and personality predicted

the factors of the RNCC. They found that the dark triad personality traits – Machiavellianism (i.e., manipulative and cynical), narcissism (i.e., superiority and self-centredness), and non-clinical psychopathy (i.e., callous and impulsive; Jonason et al. 2018), along with self-control, were the most effective at predicting the reasons why students do not engage in contract cheating. Rundle et al.'s (2019) research was the first to combine individual differences with explanations for why students do not engage in contract cheating. Thus, further exploration in this area is necessary, both in terms of addressing limitations and extending upon Rundle et al.'s (2019) research.

Rundle et al. (2019) identified several limitations to their study. There was a lack of social desirability bias checks (i.e., when participants attempt to present themselves in the best light when answering self-report questions; Tourangeau and Yan 2007). Additionally, the Dark Triad Dirty Dozen (Dirty Dozen; Jonason and Webster 2010), used by Rundle et al. (2019), has been criticised as a measure of the dark triad personality traits (Lee et al. 2013; Miller et al. 2012). These critiques include limited content validity of the Dirty Dozen, which consists of only 12-items that measure three personality traits (Jonason and Webster 2010); use of repetitive language (Jones and Paulhus 2014); and concern regarding the Dirty Dozen's construct validity, specifically regarding psychopathy (Miller et al. 2012).

Rundle et al. (2019) also did not consider the potential role of academic self-efficacy in influencing students' reasons to not engage in contract cheating. Academic self-efficacy refers to an individual's confidence and ability in performing academic tasks (Gore 2006; Solberg et al. 1993), while autonomy refers to the sense of choice and control individuals have over their actions (Longo et al. 2016; Vieira and Grantham 2011). Low self-efficacy has been found to predict engagement in plagiarism behaviours (du Rocher 2018; Ogilvie and Stewart 2010). Thus, high self-efficacy may help to explain why students do not engage in contract cheating. Self-efficacy and autonomy have been found to strongly associate, particularly in relation to goal-related task engagement (Vieira and Grantham 2011). Vieira and Grantham (2011) found that having a sense of choice (feeling autonomous) helps students to feel more confident (self-efficacious) in their ability to accomplish university assessments. While there is still sparse research on the relationship between autonomy and academic misconduct behaviours, it can be assumed, based on the relationship between self-efficacy and autonomy, that students who have high autonomy, particularly in terms of satisfaction of the psychological need for autonomy, are less likely to engage in contract cheating.

The RNCC, developed in early 2017, was constrained by the available literature. Since 2017, there has been a surge in publications on contract cheating (Eaton et al. 2022; Lancaster 2022), providing new insight into contract cheating. This recent literature and the open-ended responses to Rundle et al.'s (2019) measure were used to further develop items for the RNCC. New themes that were identified included: the ability to get an extension (extending assessment due dates), placing someone's life at risk because of a knowledge deficit, religion, and satisfaction with the learning and teaching environment (Awdry and Newton 2019; Bretag et al. 2019; Nelson et al. 2017; Yussof and Ismail 2018).

### The current study

The current study aimed to expand on Rundle et al.'s (2019) study of the reasons why students do not engage in contract cheating in two main ways. First, the RNCC measure was revised to include new items based on the open-ended question responses and the recent literature. Second, the aim of the current study, was to address some of the limitations present in Rundle et al.'s (2019) study and to explore some of the future directions they proposed.

Stage One of this study built upon the original RNCC measure (Rundle et al. 2019) by including new items based on the themes outlined above (e.g. the ability to get an extended assignment deadline), in order to develop a revised version of this measure (RNCC-R). The new measure was analysed using a Bayesian exploratory factor analysis (BEFA) to assess the underlying structure of the RNCC scores. This was followed by a confirmatory factor analysis (CFA) to determine the validity of this structure.

Stage Two of this study explored the same psychological constructs as those examined by Rundle et al. (2019) and additionally included measures of social desirability, academic self-efficacy, and autonomy. Furthermore, it addressed the limitations of using the Dark Triad Dirty Dozen by using a more valid and reliable measure of the dark triad personality traits, the Short Dark Triad (SD3; Jones and Paulhus 2014). Stage Two analyses Rundle et al.'s (2019) hypotheses (H1-H4, outlined below) to determine the replicability of their findings. Stage Two additionally tested hypotheses relating to the new measures, as outlined by H5-H6.

*H1. Self-control negatively predicts students' reasons for not engaging in contract cheating that are related to a Lack of Opportunity.*
*H2. Self-control, satisfaction of the psychological need of competence, and perseverance of effort (grit) will positively predict students' reasons for not cheating that are related to Motivation for Learning.*
*H3. The dark triad personality traits of Machiavellianism and psychopathy will negatively predict reasons for not cheating that are related to Morals and Norms.*
*H4. The dark triad personality traits of Machiavellianism and narcissism will positively predict students' reasons for not cheating that are related to a Fear of Detection and Punishment.*
*H5. Academic self-efficacy will positively predict reasons for not cheating related to the RNCC factor of Self-Efficacy.*
*H6. Satisfaction of the psychological need for autonomy will positively predict students' reasons for not cheating that relate to Self-Efficacy and Motivation for Learning.*

## Method

### Participants and design

This study was not pre-registered. A sample of 548 university students were recruited online through a Western Australian University's Research Participation Portal,[1]

[1] The Western Australian University's online management system for student participation in psychology studies. Credit from this system is a requirement in three units for undergraduate psychology students.

SurveyCircle (an online survey sharing website), and social media – principally through university student Facebook groups. Participants were excluded for the following reasons: unrealistically short completion times (under 2 min, $n=26$), not currently enrolled in a university degree ($n=20$), were under 18 years of age ($n=28$), and who reported having previously engaged in contract cheating ($n=12, \sim 2\%$). Three attention checking items were included in the survey to ensure participants were attending to the survey; 59 participants were excluded for failing attention checks. The final sample consisted of 403 university students (see Table 1 for participant demographics). Ethics approval was obtained through the Murdoch University's Human Ethics Committee.

## Measures

Cronbach's alpha and omega reliability values are provided in Table 2. Values of Cronbach's alpha or McDonald's omega above 0.70 are generally considered to indicate good internal consistency (McNeish 2018).

### *Reasons for Not Contract Cheating – Revised measure (RNCC-R)*

The reasons for why students do not engage in contract cheating was measured using a revised version of Rundle et al.'s (2019) 21-item RNCC measure. An additional 13 items were added to the original RNCC based on recent literature and qualitative responses collected by Rundle et al.'s (2019) initial study. This resulted in a total of 34 quantitative items and one qualitative item, "Please provide any other reason you have for not engaging in contract cheating". The new items included: ability to get an extension, opportunity to learn, religion, respect for the academic staff, and relevance of content. The following definition of contract cheating was provided at the start of the RNCC-R, "Contract cheating is the process of paying a third party, such as a friend, family member, or online service, to complete a university assessment and submitting the work as your own. This may include: written assignments, exams, online tests, and other university assessment items". Participants responded to the RNCC-R on a 5-point Likert scale, where 1 = *not a reason at all* and 5 = *this is the main reason I do not*. All items for this measure are presented in the Supplementary Online Materials, new items are denoted with an asterisk.

### *Brief self-control scale*

Self-control was measured using the Brief Self-Control Scale (Tangney et al. 2004). Participants were asked to respond how representative each item was of them using a 5-point Likert scale, where 1 = *not at all* and 5 = *very much*. The 13-item measure included four items, such as "I am good at resisting temptation", and nine reversed items.

### *Need satisfaction and frustration scale– autonomy and competence subscales*

The satisfaction and frustration of participants' psychological need for competence and autonomy in their education were measured using their respective subscales from the Need Satisfaction and Frustration Scale (Longo et al. 2016). Participants were asked to respond to each subscale's 6-items in relation to their studies using a 7-point Likert scale, where 1 = *strongly disagree* and 7 = *strongly agree*. Each subscale includes three 'satisfaction' and three 'frustration' items. All items were prefaced with the statement "In my

**Table 1** Demographic characteristics of sample

| **Demographic Variables** | | **Whole Sample** | |
|---|---|---|---|
| | | ***M*** | ***SD*** |
| Age | | 24.14 | 8.36 |
| | | ***n*** | **%** |
| Gender | Male | 59 | 14.9 |
| | Female | 334 | 84.1 |
| | Not Specified | 4 | 1.0 |
| Country | Australia | 288 | 72.5 |
| | Other | 107 | 27.0 |
| University | Western Australian university | 343 | 86.4 |
| | Other | 47 | 11.8 |
| Degree | Psychology | 225 | 56.7 |
| | Psychology and Other Major | 96 | 24.2 |
| | Other | 73 | 18.4 |
| Year | 1st year undergraduate | 185 | 46.6 |
| | 2nd year undergraduate | 86 | 21.7 |
| | 3rd year undergraduate | 73 | 18.4 |
| | 4th year undergraduate | 18 | 4.5 |
| | Postgraduate | 35 | 8.8 |
| Average grade | Below 50% | 0 | 0.0 |
| | 50–59% | 30 | 7.6 |
| | 60–69% | 137 | 34.5 |
| | 70–79% | 160 | 40.3 |
| | 80–100% | 67 | 16.9 |
| Student status | International | 22 | 5.5 |
| | Domestic | 374 | 94.2 |
| | Internal | 381 | 96.0 |
| | External | 13 | 3.3 |
| | Full-Time | 307 | 77.3 |
| | Part-Time | 45 | 11.3 |
| | Some Full-Time, Some Part-Time | 44 | 11.1 |
| Afford tuition | Parents pay | 52 | 13.1 |
| | Personal savings | 32 | 8.1 |
| | Work | 72 | 18.1 |
| | Government funding (e.g. HECS or HELP) | 339 | 85.4 |
| | Other | 13 | 3.3 |
| Honor codes used by institution | Yes | 238 | 59.9 |
| | No | 153 | 38.5 |
| Language spoken at home | English | 350 | 88.2 |
| | English and Other | 16 | 4.0 |
| | Other | 29 | 7.3 |
| Confidence writing and reading English | Not confident at all | 2 | 0.5 |
| | A little confident | 6 | 1.5 |
| | Somewhat confident | 8 | 2.0 |
| | Moderately confident | 51 | 12.8 |
| | Very confident | 330 | 83.1 |

*Note.* Percentage totals may not add to 100% due to missing data

**Table 2** Reliability statistics for the measures of individual differences used in this study

| Measures | Omega $\omega_h$ | Cronbach's $\alpha$ | Confidence Interval | |
|---|---|---|---|---|
| | | | Lower | Upper |
| Brief Self-Control Scale | 0.55 | 0.83 | 0.81 | 0.85 |
| Need Satisfaction and Frustration | | | | |
| Autonomy Satisfaction | - | 0.87 | 0.84 | 0.89 |
| Autonomy Frustration | - | 0.72 | 0.68 | 0.77 |
| Competence Satisfaction | - | 0.87 | 0.84 | 0.89 |
| Competence Frustration | - | 0.76 | 0.71 | 0.80 |
| Short Grit Scale | | | | |
| Consistency of Interest | * | 0.85 | 0.83 | 0.87 |
| Perseverance of Effort | 0.68 | 0.70 | 0.66 | 0.75 |
| Short Dark Triad | | | | |
| Machiavellianism | 0.48 | 0.71 | 0.66 | 0.75 |
| Narcissism | 0.57 | 0.70 | 0.66 | 0.74 |
| Psychopathy | † | 0.71 | 0.66 | 0.75 |
| College Self-Efficacy Instrument | 0.66 | 0.86 | 0.84 | 0.89 |
| Social Desirability Scale | 0.47 | 0.70 | 0.66 | 0.74 |

Omega cannot be calculated on three or fewer items. *Omega unable to converge. †Ultra-Heywood case detected

studies…". Items include: "I feel I am very good at the things I do" and "I doubt whether I am able to carry out my tasks properly" for competence satisfaction and frustration respectively, and "I feel I'm given a lot of freedom in deciding how I do things" and "I feel I am prevented from choosing the way I carry out tasks" for autonomy satisfaction and frustration respectively.

#### *Short grit scale*

Grit was measured using the Short Grit Scale (Duckworth and Quinn 2009). The measure has two subscales: consistency of interest and perseverance of effort. Each subscale consists of 4-items, including: "I often set a goal but later choose to pursue a different one" for consistency of interest, and "I finish whatever I begin" for perseverance of effort. Participants were asked to indicate how like them each statement is on a 5-point Likert scale, where 1 = *not at all like me* and 5 = *very much like me*.

#### *Short dark triad*

Personality was assessed using the Short Dark Triad, a 27-item measure of Machiavellianism, narcissism, and psychopathy, consisting of 9-items per trait subscale (Jones and Paulhus 2014). Machiavellianism items included, "It's not wise to tell your secrets"; narcissism items included, "Many group activities tend to be dull without me"; and psychopathy items included, "People often say I'm out of control".[2] Participants responded to the measure on a 5-point Likert scale, where 1 = *strongly disagree* and 5 = *strongly agree*.

[2] Due to an error, the items "I like to use clever manipulation to get my way" and "I enjoy having sex with people I hardly know" from the Machiavellian and psychopathy subscales respectively were replaced with "Generally speaking, people won't work hard unless they have to" and "I like to pick on losers". As the Cronbach's alphas for both subscales ($\alpha = 0.71$ for both) were still acceptable and the removal of these items would result in a decrease in alpha levels, the items were left.

#### *College self-efficacy instrument*

The "course" subscale of the College Self-Efficacy Instrument (Solberg et al. 1993) was used to measure academic self-efficacy. Participants were asked to report how confident they feel completing the tasks listed in the 7-items (e.g. how confident they feel writing a course paper) using an 11-point Likert scale, where 0 = *not at all confident* and 10 = *extremely confident*.

#### *Social desirability scale*

The Social Desirability Scale (SDS-17) was used to assess whether participants were responding honestly (Stöber 2001). Participants were asked to indicate whether each of the 16-items describes them or not, using a binary true or false response. Seven items, including "I sometimes litter", are reverse keyed.

#### *Attention checking items*

Attention checking items, e.g. "Select 'Slightly Disagree' for this item", were used to assess whether participants were paying attention to the items or selecting response options without attending to the item. Three attention checking items were included in the study, spread among the RNCC-R, Short Dark Triad, and autonomy satisfaction and frustration items.

### Demographics

Participants were asked to respond to 14 demographic questions. Nine items related to university, e.g. "Are you an international or domestic student, and five items related to the individual, e.g. "How old are you?".

### Procedure

The first page of the online survey was a consent and information letter. Consent was implied by progressing past this page. Participants were then asked if they were currently enrolled in a university degree or course, "no" responses were then asked if they had ever been enrolled in a university degree/course, a second "no" response was directed to the end of the survey. "Yes" respondents were then asked three questions: "What year did you last attend university?", "Did you graduate from your degree/course?", and "What is the highest qualification you have received?" All participants were then presented with the definition of contract cheating (see Reasons for Not Contract Cheating – Revised) and asked "Have ever engaged in contract cheating?", "Have you ever purchased an assignment but then submitted your own work instead?", and "Have you ever been contracted to complete an assignment for another student?". Participants who responded "yes" to having engaged in contract cheating were redirected to a measure of reasons for engaging in contract cheating, these responses will not be discussed in this paper.

Participants who reported never having engaged in contract cheating were directed to the RNCC-R measure. After completing the RNCC-R, participants were given each of the psychological measures. The order of these measures was randomised between participants to account for potential order effects and biases. All participants were presented with the demographic items after the last psychological measure.

Responses to all items were voluntary, except for: "Are you currently enrolled in a university degree/course?", "Have you previously been enrolled in a university degree/course?" and "Have you ever engaged in contract cheating?", which were all mandatory. The survey took approximately 30 min to complete and had to be completed in a single sitting. Responders were thanked for participating and offered one of three incentives[3] for completing the survey.

## Results

Data analysis was conducted in two stages. First, the RNCC-R scale was subjected to exploratory and confirmatory factor analyses. Second, the factors identified in the RNCC-R were correlated with the measured psychological individual differences variables and two-step regressions were calculated where the factors were regressed on gender and social desirability at step one and the individual differences variables at step two. For interested readers, detailed analytic information for this study is provided in the Supplementary Online Materials.

### Stage one: factor analysis of the RNCC-R

The Bayesian exploratory factor analysis (BEFA) identified six factors (see Supplementary Online Information for full details of these findings). Five of these factors resembled Rundle et al.'s (2019) findings and were thus labelled consistently as with those as: Morals and Norms, Fear of Detection and Punishment, Self-Efficacy and (Mis)Trust, Lack of Opportunity, and Motivation for Learning. The sixth factor identified in this study consisted of new items and was labelled Academic Environment, per Divaris et al.'s (2008) definition of the term. The confirmatory factor analysis (CFA; described in the Supplementary Online Information) suggested a suboptimal fit of the factors identified in the BEFA. To address this, two higher-order factors were included due to high correlations among factors, these grouped the factors Morals and Norms, Motivation for Learning, and Academic Environment into the higher-order factor of Moral Alignment, and the factors Fear of Detection and Punishment, Self-Efficacy and (Mis)Trust, and Lack of Opportunity into the higher-order factor of Barriers to Consideration. Twelve items were additionally removed (see Supplementary Online Information).

Cronbach's alpha and omega values were calculated based on the CFA results for each latent factor and its indicators, see Table 3 for descriptive statistics and Cronbach's alpha and omega values. Omega values can only be computed for factors with more than three items, and therefore could not be provided for Morals and Norms, Self-Efficacy and (Mis)Trust, or Lack of Opportunity. Removal of "I feel I could do better than someone I paid" from Self-Efficacy and (Mis)Trust would increase alpha to 0.82, however, this would also reduce this factor to two-items. Item removals from other factors would not result in substantial change to the alpha levels.

An additional result in Table 3 that is worthy of comment is the relative means of the six sub-factors, as these indicate how strongly students, on average, endorsed these factors as reasons for not engaging in contract cheating. Each factor mean was significantly

[3] Participants were rewarded with a choice of: Research Participation Portal credit (0.5) from the Western Australian University, SurveyCircle points, or the chance to win one of five $50AUD Amazon gift card.

**Table 3** Descriptive statistics and Cronbach's alpha and omega values for CFA factors

| Factor | M | SD | Omega $\omega_h$ | Cronbach's $\alpha$ | Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower | Upper |
| Moral Alignment | 3.54 | 0.75 | 0.68 | 0.86 | 0.84 | 0.88 |
| Morals and Norms | $3.70_b$ | 0.90 | - | 0.59 | 0.52 | 0.66 |
| Motivation for Learning | $3.84_a$ | 0.85 | 0.77 | 0.82 | 0.80 | 0.85 |
| Academic Environment | $3.09_c$ | 1.06 | 0.82 | 0.84 | 0.82 | 0.87 |
| Barriers to Consideration | 2.38 | 0.82 | 0.63 | 0.83 | 0.81 | 0.85 |
| Self-Efficacy and (Mis)Trust | $2.53_e$ | 1.16 | - | 0.73 | 0.69 | 0.78 |
| Lack of Opportunity | $1.65_f$ | 0.88 | - | 0.71 | 0.67 | 0.76 |
| Fear of Detection and Punishment | $2.97_d$ | 1.17 | 0.81 | 0.81 | 0.78 | 0.84 |

Subscript a > b > c > d > e > f at $p < 0.01$

different from the other factor means, and, hierarchically, Motivation for Learning was the most strongly endorsed reason for not engaging in contract cheating, followed by Morals and Norms, Academic Environment, Fear of Detection and Punishment, Self-Efficacy and (Mis)Trust, and Lack of Opportunity.

### Stage two: correlation and multiple regression analyses

Most of the Kendall's correlations between factors were significant at $\alpha = 0.001$ (see Tables 4 and 5). Approximately half of the correlations between the factors and the psychological constructs were significant at $\alpha = 0.05$.

The results from the robust multiple regression analyses are presented in the Supplementary Online Information. Gender was only identified as a significant predictor in step one for Morals and Norms but was not a significant predictor in step two and did not predict any of the other factors at either step one or two. Social desirability was a significant predictor at steps one and two for Motivation for Learning, Academic Environment, and Moral Alignment. These results are discussed in more detail below. Findings for step one are only reported where a significant result was found.

#### *Morals and norms regression*

The regression analysis for Morals and Norms identified gender as a significant predictor at the first step ($\beta = 0.40$, $p = 0.005$), but not at the second step. Step two accounted for 10.4% variance, $F(13, 379) = 3.39$, $p < 0.001$, and identified two significant predictors, one positive, satisfaction of the need for autonomy, and one negative, psychopathy. This suggests that students who scored higher on satisfaction of autonomy and students who scored lower on psychopathy endorsed reasons that pertain to morals and norms for why students do not engage in contract cheating more than students who scored lower and higher on the respective measures. Of the two predictors in step two, psychopathy had the strongest effect ($\beta = -0.16$, $p = 0.01$).

#### *Fear of detection and punishment regression*

The second step of the regression analysis on Fear of Detection and Punishment accounted for 17% of the variance, $F(13, 379) = 5.98$, $p < 0.001$. This regression also

**Table 4** Kendall's correlations between RNCC-R factors and psychological individual differences

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Factors** | | | | | | | | | | |
| (1) Morals and Norms | (0.59) | | | | | | | | | |
| (2) Fear of Detection and Punishment | 0.17* | (0.81) | | | | | | | | |
| (3) Motivation for Learning | 0.30* | -0.01 | (0.82) | | | | | | | |
| (4) Self-Efficacy and (Mis)Trust | 0.19* | 0.29* | 0.17* | (0.73) | | | | | | |
| (5) Lack of Opportunity | 0.03 | 0.35* | -0.05 | 0.28* | (0.71) | | | | | |
| (6) Academic Environment | 0.31* | 0.18* | 0.42* | 0.25* | 0.08 | (0.84) | | | | |
| (7) Moral Alignment | 0.56* | 0.15* | 0.61* | 0.27* | 0.04 | 0.69* | (0.86) | | | |
| (8) Barriers to Consideration | 0.18* | 0.63* | 0.05 | 0.61* | 0.55* | 0.23* | 0.20* | (0.83) | | |
| **Psychological Constructs** | | | | | | | | | | |
| (9) Self-Control | 0.12* | -0.03 | 0.21* | -0.01 | -0.14* | 0.12* | 0.18* | -0.09 | (0.83) | |
| (10) Machiavellianism | -0.06 | 0.22* | -0.07 | 0.18* | 0.13* | -0.03 | -0.06 | 0.22* | -0.16* | (0.71) |
| (11) Narcissism | -0.06 | -0.04 | 0.03 | 0.07 | -0.05 | 0.01 | -0.03 | -0.00 | 0.03 | 0.14* |
| (12) Psychopathy | -0.16* | 0.01 | -0.11 | 0.06 | 0.04 | -0.10 | -0.15* | 0.05 | -0.23* | 0.33* |
| (13) Autonomy Satisfaction | 0.09 | -0.02 | 0.20* | 0.04 | -0.02 | 0.17* | 0.17* | 0.00 | 0.15* | -0.02 |
| (14) Autonomy Frustration | 0.04 | 0.10 | -0.07 | 0.07 | 0.07 | -0.04 | -0.02 | 0.10 | -0.14* | 0.09 |
| (15) Competence Satisfaction | 0.01 | -0.11 | 0.11 | 0.15* | -0.08 | 0.05 | 0.05 | -0.02 | 0.20* | 0.04 |
| (16) Competence Frustration | 0.04 | 0.07 | -0.02 | -0.03 | 0.07 | -0.01 | 0.01 | 0.04 | -0.19* | 0.03 |
| (17) Consistency Interest | -0.03 | 0.11 | -0.12* | 0.06 | 0.13* | -0.05 | -0.08 | 0.12* | -0.39* | 0.15* |
| (18) Perseverance of Effort | 0.11 | -0.05 | 0.22* | 0.10 | -0.10 | 0.16* | 0.19* | -0.01 | 0.34* | -0.08 |
| (19) Academic Self-Efficacy: Course | 0.07 | -0.08 | 0.08 | 0.11* | -0.09 | 0.01 | 0.06 | -0.02 | 0.27* | -0.06 |
| (20) Social Desirability | 0.04 | -0.07 | 0.17* | 0.01 | -0.06 | 0.14* | 0.14* | -0.05 | 0.28* | -0.09 |

* $p \leq 0.001$. Cronbach's alpha in parentheses on the diagonal. $N = 397$

**Table 5** Kendall's correlations between RNCC-R factors and psychological individual differences continued

| | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|
| (11) Narcissism | (0.70) | | | | | | | | | |
| (12) Psychopathy | 0.22* | (0.71) | | | | | | | | |
| (13) Autonomy Satisfaction | 0.08 | -0.03 | (0.87) | | | | | | | |
| (14) Autonomy Frustration | -0.08 | 0.01 | -0.45* | (0.72) | | | | | | |
| (15) Competence Satisfaction | 0.31* | 0.01 | 0.21* | -0.17* | (0.87) | | | | | |
| (16) Competence Frustration | -0.23* | -0.03 | -0.09 | 0.23* | -0.39* | (0.76) | | | | |
| (17) Consistency Interest | -0.03 | 0.12* | -0.07 | 0.13* | -0.19* | 0.21* | (0.85) | | | |
| (18) Perseverance of Effort | 0.14* | -0.12* | 0.18* | -0.13* | 0.40* | -0.26* | -0.37* | (0.70) | | |
| (19) Academic Self-Efficacy: Course | 0.09 | -0.09 | 0.18* | -0.13* | 0.37* | -0.28* | -0.23* | 0.35* | (0.86) | |
| (20) Social Desirability | 0.05 | -0.18* | 0.05 | -0.05 | 0.09 | -0.14* | -0.15* | 0.20* | 0.10 | (0.67) |

*$p \leq 0.001$. Cronbach's alpha in parentheses on the diagonal. $N = 397$

identified four significant predictors, two positive: Machiavellianism and frustration of the need for autonomy; and two negative: psychopathy and frustration of the need for competence. These results suggest that higher levels of Machiavellianism and frustration of autonomy, and lower levels of psychopathy and competence frustration predict greater student endorsement of reasons for not engaging in contract cheating relating to a fear of being caught and punished for not contract cheating. Of these four variables, Machiavellianism was the strongest predictor ($\beta = 0.42$, $p < 0.001$).

#### *Motivation for learning regression*

The regression analysis for Motivation for Learning identified social desirability as a significant positive predictor at the first step ($\beta = 0.19$, $p < 0.001$) and at the second step ($p = 0.013$). Step two accounted for 18.7% of the variance, $F(13, 379) = 6.73$, $p < 0.001$, five significant predictors, including social desirability, were identified in step two. The other four predictors were: self-control, satisfaction of autonomy, the grit subscale of perseverance of effort, and academic self-efficacy. Academic self-efficacy was the only negative predictor. These results suggest that higher scores on self-control, autonomy satisfaction, perseverance of effort, and low scores of academic self-efficacy predicts students' endorsement of reasons for not cheating which pertain to their motivation to learn. More socially desirable responding, as indicated by a higher SDS-17 score, positively predicted students' reasons relating to motivation for learning for not cheating. This suggests that motivation for learning may be perceived as a socially desirable reason for not engaging in contract cheating. Autonomy satisfaction ($\beta = 0.19$, $p < 0.001$) and perseverance of effort ($\beta = 0.19$, $p < 0.001$) were the strongest predictors of Motivation for Learning.

#### *Self-efficacy and (Mis)trust regression*

The second step of the regression analysis on Self-Efficacy and (Mis)Trust accounted for 13.9% of the variance, $F(13, 379) = 4.69$, $p < 0.001$, and identified three positive significant predictors: Machiavellianism, and the grit subscales of consistency of interest and perseverance of effort. No negative predictors were identified. These results suggest that students who scored higher on Machiavellianism and grit more strongly endorsed reasons that relate to self-efficacy and their mistrust in the ability of others to do the work for them as to why they do not engage in contract cheating. Machiavellianism, once again, proved a better predictor than the other variables ($\beta = 0.21$, $p < 0.001$).

#### *Lack of opportunity regression*

Step two of the regression analysis on Lack of Opportunity accounted for 7.2% of the variance, $F(13, 379) = 2.27$, $p = 0.007$, and identified only one significant predictor, Machiavellianism ($\beta = 0.10$, $p = 0.04$). As a positive predictor, this finding suggests that higher levels of Machiavellianism predict greater endorsement of students' reasons that pertain to a lack of opportunity for why they do not engage in contract cheating.

#### *Academic environment regression*

The regression analysis for Academic Environment identified social desirability as a significant positive predictor at the first ($\beta = 0.21$, $p < 0.001$) and second steps ($\beta = 0.15$, $p = 0.01$). Step two accounted for 16.4% of the variance, $F(13, 379) = 5.72$, $p < 0.001$. In addition to social desirability, three other significant predictors were identified. Satisfaction of autonomy and perseverance of effort positively predicted Academic Environment, while academic self-efficacy was a negative predictor. These findings suggest that higher scores on satisfaction of the need for autonomy and perseverance of effort, and lower scores on academic self-efficacy, predicted stronger endorsement of reasons for not engaging in contract cheating that pertain to the academic environment. More socially desirable responding positively predicted students' reasons relating to academic environment for not engaging in contract cheating. This suggests that the academic environment may be perceived as a socially desirable reason for not cheating. Autonomy satisfaction provided the strongest prediction for Academic Environment ($\beta = 0.31$, $p < 0.001$).

#### *Moral alignment regression*

The regression analysis for the higher-order factor Moral Alignment identified social desirability as a significant positive predictor at the first step ($\beta = 0.16$, $p < 0.001$) and at the second step ($\beta = 0.08$, $p = 0.028$). Step two accounted for 19.1% of the variance, $F(13, 379) = 6.87$, $p < 0.001$. In addition to social desirability, three significant predictors were identified. Two were positive predictors, autonomy satisfaction and perseverance of effort, and one was negative, academic self-efficacy. These findings are consistent with Motivation for Learning and Academic Environment but differ slightly from Morals and Norms. The results suggest that higher levels of autonomy satisfaction and perseverance of effort, and lower levels of academic self-efficacy predict overall endorsement of reasons pertaining to moral alignment for not engaging in contract cheating. More socially desirable responding positively predicted students' reasons relating to moral alignment

for not engaging in contract cheating. This finding is consistent with Motivation for Learning and Academic Environment. Autonomy satisfaction was the strongest predictor ($\beta = 0.21$, $p < 0.001$).

#### *Barriers to consideration regression*

Step two of the final regression analysis, conducted on the higher-order factor Barriers to Consideration, accounted for 14.6% of the variance, $F(13, 379) = 4.99$, $p < 0.001$. Four positive predictors were identified, these were: Machiavellianism; frustration of autonomy; and the two grit subscales, consistency of interest and perseverance of effort. These findings demonstrate some consistency with Fear of Detection and Punishment, Self-Efficacy and (Mis)Trust, and Lack of Opportunity. The results suggest that higher levels of Machiavellianism, autonomy frustration, and grit predict students' endorsement of reasons that pertain to barriers to consideration for not engaging in contract cheating. Machiavellianism was once again the strongest predictor ($\beta = 0.25$, $p < 0.001$).

#### *Summary of regression results*

In summary, satisfaction of the psychological need for autonomy, perseverance of effort (the grit subscale), and Machiavellianism were predictive variables in the regression analyses across the most reasons for not contract cheating. Autonomy satisfaction and Machiavellianism predicted each of the factors in Moral Alignment and Barriers to Consideration respectively, including the respective higher-order factor. Perseverance of effort predicted Motivation for Learning, Academic Environment, Self-Efficacy and (Mis)Trust, and both higher-order factors. Narcissism was the only dark triad trait that was not a significant predictor of any factors; psychopathy negatively predicted two factors. Self-control was only a predictor of Motivation for Learning. The grit subscale of perseverance of effort predicted five factors, including the two higher-order factors, demonstrating a greater relevance to reasons why students do not engage in contract cheating compared to the other subscale of consistency of interest. Competence frustration did not predict any of the factors, but competence satisfaction was a negative predictor Fear of Detection and Punishment, and autonomy frustration positively predicted Fear of Detection and Punishment and the higher-order factor of Barriers to Consideration. Gender was not a significant predictor at step two in any of the regression analyses. Social desirability was a significant predictor only on the Moral Alignment factors of Motivation for Learning and Academic Environment, and Moral Alignment overall.

## Discussion

This study aimed to expand upon Rundle et al.'s (2019) exploratory study of the reasons why students do not engage in contract cheating in two ways. First, a revised version of Rundle et al.'s (2019) RNCC was developed and tested. To remind readers, the revisions included some modification of items in the original scale and new items covering new themes such as satisfaction with the learning and teaching environment (based on Bretag et al.'s 2019 study). The BEFA and the CFA produced factors for the RNCC-R that were fairly consistent with Rundle et al.'s (2019) factor structure. Consequently, the factors were labelled using the same terms as in Rundle et al. (2019) with the addition of Academic Environment, which represented a new factor made of entirely new items

in the RNCC-R. The development of the new items that related to the themes of morality, norms, self-efficacy, trust, and opportunity were beneficial for developing the related factors of Morality and Norms, Self-Efficacy and (Mis)Trust, and Lack of Opportunity within the RNCC-R measure. The similarities between the RNCC-R from this study and Rundle et al.'s (2019) RNCC were expected due to this study testing a revised version of the same measure that simply added new items..

Rundle et al.'s (2019) factors, and subsequently the matching factors identified in this study, of morality, learning, and punishment as reasons students do *not* engage in contract cheating are consistent with Miller et al.'s (2011) and Kolb et al.'s (2015) research. Furthermore, the Barriers to Consideration higher-order factor identified in this study was labelled such due to its consistency with Kolb et al.'s (2015) Barriers to Consideration (see Supplementary Online Information for more discussion of this). Interestingly, the addition of the new sub-factor of Academic Environment and higher-order factor produced some new insights into the relative importance of students' reasons for not engaging in contract cheating. In Rundle et al.'s (2019) study, the most strongly endorsed reasons for not engaging in contract cheating were Morality and Norms, followed by Motivation for Learning, with Fear of Punishment and Detection third. In the present study, the top three reasons for not engaging in contract cheating were the factors that loaded onto the Moral Alignment higher order factor, which included both Motivation for Learning and Morality and Norms. Importantly, Academic Environment (the third sub-factor of Moral Alignment) was rated on average as a more important reason for not cheating than Fear of Detection and Punishment.

The second way this study aimed to expand upon Rundle et al.'s (2019) research was by addressing some of the limitations and by exploring the additional constructs of autonomy (satisfaction and frustration of this psychological need), academic self-efficacy, and social desirability, in addition to self-control, competence, grit, and the dark triad personality traits as predictors of the factors identified in the RNCC-R. Hypotheses 1–4 predicted the same outcomes as in Rundle et al.'s (2019) research. Hypothesis 1, that self-control would negatively predict reasons for not engaging in contract cheating related to Lack of Opportunity, was not supported. In other words, it might be expected that self-control would prevent students from taking the opportunity to cheat, but we did not find a relationship between self-control and the extent to which students consider opportunity (or lack thereof) as a reason for not cheating. This result did not support Rundle et al.'s (2019) finding and its support for the use of the General Theory of Crime, which proposes self-control as the underlying cause of crime (Gottfredson and Hirschi 1990). However, this may, at least in part, be due to the difference in factor structure between the Lack of Opportunity factor identified in this study compared to Rundle et al.'s (2019) Lack of Opportunity factor.

Hypothesis 2: that self-control, satisfaction of the need for competence, and perseverance of effort (grit) would positively predict students' reasons for not engaging in contract cheating related to Motivation for Learning, was partially supported. Both self-control and perseverance of effort were significant predictors of Motivation for Learning, however, competence satisfaction was not. This finding is partially consistent with Rundle et al.'s (2019) results, who identified satisfaction of psychological competence needs as a significant positive predictor. The finding that competence satisfaction was not

significant is surprising, as incompetence has been associated with a lack of motivation, whilst the presence of competence supports motivation (Ryan and Deci 2000). The other two results, regarding self-control and perseverance of effort predicting Motivation for Learning, however, are consistent with the literature, including Rundle et al. (2019). Self-control plays an important role in how students allocate their time between studying and leisure activities (Duckworth et al. 2019). Motivation to learn is thus essential, as a lack of motivation will render students' self-control ineffective when it comes to studying (Duckworth et al. 2019). Consistent with this, Weisskirch (2018) found that students' attitudes towards learning predicted perseverance of effort. Within the context of contract cheating, it is logical that the ability to maintain focus, aided by self-control, and to persevere through their studies, in combination with their motivation to learn, explains why students do not engage in contract cheating.

Hypothesis 3: that Machiavellianism and psychopathy would negatively predict reasons for not engaging in contract cheating related to Morals and Norms, was partially supported. Psychopathy was a significant negative predictor of Morals and Norms; however, Machiavellianism was not a significant predictor. This partially supports Rundle et al.'s (2019) results, which identified Machiavellianism as a significant predictor. A potential explanation for this difference is the use of the Dirty Dozen measure by Rundle et al. (2019) compared to the Short Dark Triad used in this study. The Dirty Dozen has been critiqued as a measure of the dark triad personality traits (Jonason and Webster 2010). It is possible that the results identified by Rundle et al. (2019) may have been imprecise due to their use of the Dirty Dozen. The finding that psychopathy negatively predicted Morals and Norms is unsurprising, given a willingness to engage in immoral behaviours is often ascribed to psychopathy (Glenn et al. 2009). Moreover, recent studies of psychological predictors of academic misconduct identified psychopathy as among the strongest and most consistent predictors of intentions to cheat and cheating behaviour (Curtis et al. 2022a, 2022b; Lee et al. 2020).

Hypothesis 4: that Machiavellianism and narcissism would positively predict reasons for not engaging in contract cheating related to Fear of Detection and Punishment, was partially supported. Narcissism was not a significant predictor of Fear of Detection and Punishment; however, Machiavellianism was. This is partially consistent with Rundle et al.'s (2019) results, which identified narcissism as a significant predictor. As mentioned previously, Rundle et al.'s (2019) use of the Dirty Dozen measure of the dark triad personality traits may explain the difference between their work and the current study's results related to the Dark Triad traits. In contrast to the finding that Machiavellianism positively predicted Fear of Detection and Punishment as a reason why students do not engage in contract cheating, Birkás et al. (2015) found that Machiavellians tend to respond less to punishment cues. Machiavellianism is characterised by manipulative behaviours, and this personality trait has been found to predict engagement in academic cheating (Barbaranelli et al. 2018). It is possible that the desire to attain a specific goal, such as completing a university assessment, using as little effort as possible, i.e., by engaging in contract cheating, may be disrupted by the risk of being caught and punished. Whilst this conflicts with Birkás et al.'s (2015) finding, it is consistent with rational choice perspective (Cornish and Clarke 1987). Rational choice perspective proposes that individuals act in a manner that is rational to them within the bounds of the time and

place in which the behaviour occurs and with the limited information available to them (Cornish and Clarke 1987). Further research is necessary to explore this explanation.

Hypothesis 5: that academic self-efficacy would positively predict reasons for not engaging in contract cheating related to Self-Efficacy, was not supported. The Self-Efficacy and (Mis)Trust factor consists of three items, only one of which pertains to self-efficacy, "I feel I could do better than someone I paid", while the other two concern trust. It is possible that H5 was not supported because the content validity of self-efficacy in the Self-Efficacy and (Mis)Trust factor is low, being only captured by one item.

Hypothesis 6: that satisfaction of the psychological need for autonomy would positively predict reasons for not engaging in contract cheating related to Self-Efficacy and Motivation for Learning, was partially supported. Autonomy satisfaction assesses the extent to which students are happy with the amount of control over and choice they have in what they study. Autonomy satisfaction was a significant predictor of Motivation for Learning, but not Self-Efficacy and (Mis)Trust. Similarly to the point made for academic self-efficacy above, the limitation of the Self-Efficacy and (Mis)Trust factor containing only one item that pertains to self-efficacy, may account for its lack of significant relationship with autonomy. The relationship between academic self-efficacy and autonomy satisfaction can, however, be observed through the significant correlations identified in Tables 4 and 5. Ryan and Deci (2000) note that autonomy satisfaction, like competence satisfaction, is associated with intrinsic motivation. The finding that autonomy satisfaction predicted Motivation for Learning as a reason for not cheating is of particular significance due to the lack of research examining the explicit connection between autonomy satisfaction and academic misconduct. Beyond Motivation for Learning as a reason for not cheating, autonomy satisfaction was also a significant positive predictor of Morals and Norms, Academic Environment, and Moral Alignment as reasons for not engaging in contract cheating. In addition, autonomy frustration was a significant positive predictor of Fear of Detection and Punishment and Barriers to Consideration as reasons for not engaging in contract cheating. These findings support the inclusion of a measure of the satisfaction and frustration of autonomy in future research on contract cheating.

The new Academic Environment factor suggests that perceptions of the academic environment as being fair and generally positive, e.g. the marking is fair and students are able to get an extension if they need one, contribute to the reasons why students do not engage in contract cheating. This result supports Bretag et al.'s (2019) finding that students who cheat are likely dissatisfied with the teaching and learning environment by implying that students who do not cheat are likely satisfied with the teaching and learning environment. The results from the regression analyses suggest that students who have high autonomy satisfaction and students who have low academic self-efficacy are more likely to report reasons that relate to the academic environment as why they do not engage in contract cheating. This suggests that students who do not feel confident in their academic ability are not engaging in contract cheating due to the support they receive in the academic environment.

### Practical implications

There is not a silver bullet to slay to contract cheating monster, but instead a range of approaches in required (Rundle et al. 2020). The findings of the present study

re-emphasise this point by demonstrating that different students have different reasons for not cheating. For example, for students who are higher in Machiavellianism, the potential to be detected engaging in contract cheating and disciplined for doing so is an important impediment. Thus, at an institutional level, ensuring that staff are trained in detecting contract cheating and consequences are enforced is particularly important. In contrast, students whose need for autonomy is satisfied are more likely to not cheat for moral reasons, thus institutions should educate students about the morality of engaging in academic integrity practices and ensure they have flexibility and choice within their curriculum and assessments.

The findings in our study related to the Academic Environment clearly suggest a further set of measures that educators and institutions can enact to reduce engagement in contract cheating. Students endorsed items in the RNCC-R measure as reasons for not cheating indicating that it was helpful to have supportive teachers and processes that allowed them deal with problems, e.g. extensions for assessments when they were unwell. Moreover, the results suggested that such support within the academic environment may be protective against contract cheating for students who do not have positive academic self-efficacy. In other words, struggling students may be dissuaded from cheating by receiving care and encouragement from their academic institution and teachers. Thus, institutions and teachers may help to reduce contract cheating by providing good quality education and supportive pastoral services.

Finally, the item, "I have not completed any assignments, so I have not had the chance or need", was excluded in the final CFA model. Practically, in research into reasons why students do not engage in contact cheating in the future, this item may be best suited to use as a screening tool to ensure that students have had the opportunity to cheat or not cheat, as opposed to being posed as a reason why students do not cheat.

### Strengths and limitations

This study helps to address the gap in the literature, identified by Rundle et al. (2019), on the reasons why most students do not engage in contract cheating. The current study's findings support the explanations offered by Rundle et al. (2019) and further expand on these by including new reasons why students do not engage in contract cheating. This study has also demonstrated that individual differences predict reasons for not engaging in contract cheating when controlling for social desirability.

There are two key limitations present in this study. One prominent limitation was the gender imbalance (84.1% women). This limitation was also present in Rundle et al.'s (2019) research. Men have been found to score higher on the dark triad personality traits (see Jonason and Webster 2010; Paulhus and Williams 2002; Roeser et al. 2016) and lower on grit (e.g. Kannangara et al. 2018) and moral values (e.g. Ivert et al. 2018) compared with women. Additionally, some research suggests that men are more likely to engage in contract cheating (Hensley et al. 2013; Kuntz and Butler 2014; Newton 2018; Selwyn 2008) compared with women. Consistent with Rundle et al.'s study, the use of SurveyCircle and social media may have contributed to the gender imbalance, as women may be more inclined to participate in research (Foltýnek and Králíková 2018). Additionally, a large portion of the sample were studying psychology (80.9%), which may have

contributed to the gender imbalance (see Yu et al. 2020). In order to address this limitation, gender was controlled for in the regression analyses. Nevertheless, future research would benefit from a more balanced sample.

A second limitation was that a 'good' model fit was not obtained for this study due to concerns regarding the validity and reliability of two-item factors. As noted, future development of the RNCC-R is necessary to address this limitation.

### Future directions

Future research should aim to recruit a more balanced sample, as discussed in the limitations. This may be achieved by utilising alternative sampling methods. Future research may also explore the reasons why students *do* engage in contract cheating, potentially using the RNCC-R as a starting point to identify the opposing reasons.

Based on the findings of this study, satisfaction of the need for autonomy plays a significant role in the reasons why students do not engage in contract cheating. Consequently, future research on contract cheating, and academic misconduct more generally, would benefit from including a measure of satisfaction and frustration of students' psychological need for autonomy. Further examination of the role of Machiavellianism on a fear of detection and punishment generally, as well as in relation to contract cheating, would also be beneficial in future research.

## Conclusion

Contract cheating is a serious problem facing tertiary institutions around the world. This study aimed to build upon Rundle et al.'s (2019) study by developing the RNCC-R measure and exploring new psychological individual differences. The findings from this study point to the importance of satisfaction of the psychological need for autonomy, perseverance of effort (grit), and Machiavellianism as predictors of why students do not engage in contract cheating. However, further development of the RNCC-R is necessary to establish a valid and reliable measure of why students do not engage in contract cheating.

**Abbreviations**

| | |
|---|---|
| BEFA | Bayesian exploratory factor analysis |
| CFA | Confirmatory factor analysis |
| RNCC | Reasons for Not Engaging in Contract Cheating |
| RNCC-R | Reasons for Not Engaging in Contract Cheating – Revised |
| SDS-17 | Social Desirability Scale |

## Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1007/s40979-023-00132-5.

**Additional file 1.**

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**Authors' contributions**

All authors conceptualized the study, KR collected data, conducted analyses, and drafted the manuscript. All authors reviewed and revised the draft manuscript. The author(s) read and approved the final manuscript.

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**Availability of data and materials**
The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Declarations

**Competing interests**
The authors have no competing interests to declare in relation to the research reported in this paper.

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