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Risk-Seeking Industrialists: Bad People or Good Businesspeople?

An Analysis on How Psychopathy Relates to Students' Entrepreneurial Intentions during the COVID-19 Pandemic

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Abstract

The COVID-19 pandemic has not only led to adverse ramifications to the lives of individuals but also businesses. With a large number of enterprises facing closure all around the world as well as the worsening business environment, economic recovery may primarily rely on those who possess traits that suit entrepreneurship – fearless risk-seekers who are insensible toward failure and able to operate under hectic situations. These are traits commonly found among subclinical psychopaths. This study explores the association between psychopathy traits of university students and their entrepreneurial intentions during the COVID-19 pandemic. Higher levels of psychopathy traits are expected to be associated with higher general entrepreneurial intentions and a generally positive entrepreneurial attitude in reaction to the COVID-19 pandemic. This includes similar to stronger entrepreneurial intentions, lower to similar risk perception, and similar to higher opportunity perception during the COVID-19 pandemic. Ordinary least-square regressions and (multinomial) logit models are used to analyse data of 1,123 university students from the Netherlands, Belgium, and Portugal. The study confirms the priorly studied positive association between psychopathy levels and entrepreneurial intention and finds that the COVID-19 pandemic similarly affects all students' entrepreneurial intentions regardless of their psychopathy levels.

Keywords: psychopathy, the dark triad, entrepreneurship, entrepreneurial intentions, COVID-19, crisis

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1. Introduction

Given the unknown duration of the COVID-19 pandemic, there remains a great deal of uncertainty in many life domains. With numerous small and medium-sized enterprises (SMEs) facing the dire risk of closure, it is questionable how new enterprises will be formed in the near future. Millions of entrepreneurs around the world have suffered from the economic fallout caused by the COVID-19 pandemic (Stephan et al., 2021). Globally, bankruptcies are expected to rise by 26% in 2021 despite the rapid distribution of vaccines and the upward growth trajectory of countries (Gerryn, 2021). One may perceive that entrepreneurs' capacity to react to crises through being adaptive makes them an increasingly influential group on a global scale (Liguori & Winkler, 2020). However, changes prompted by the COVID-19 pandemic may discourage prospective entrepreneurs to start a business, while few of them may use this as a learning opportunity (Brown & Rocha, 2020). As such, entrepreneurs with specific traits, like fearlessness and risk-seeking tendencies, may be less discouraged by the uncertainty emerging from the pandemic and thus may be the driver of business formation in this uncertain time.

Prior to the COVID-19 pandemic, it was already shown that the dark triad personalities positively relate to entrepreneurial entry (Wu et al., 2019). Being a profession that entails high uncertainty and necessitates high self-confidence, leadership, and agentic behaviour (Mathieu & St-Jean, 2013), entrepreneurship is overrepresented by those with a dark triad personality. The dark triad pertains to three personalities that are counterproductive, subclinical, and have dysfunctional inclinations – narcissism, psychopathy, and Machiavellianism (Paulhus & Williams, 2002). These personalities overlap in their inclinations for selfish, insensitive, and manipulative conducts (Jonason & Webster, 2010). Moreover, these personalities relate to the orientation for achievement (McClelland, 1961) as well as competence in exerting dominance and extracting resources from their surroundings (Jonason, Li, & Teicher, 2010).

The most prevalent dark triad personality in entrepreneurship is psychopathy, which is a personality disorder that relates to apathy, manipulation, and insensitivity (Hare & Neumann, 2006). Such personality is common among corporate managers and entrepreneurs, with many of those in high-level corporate positions abusing their status and engaging in activities that inflict damage toward people in their workplace (Boddy, 2011). In addition, successful entrepreneurs have been associated with traits like ambition, focus, and apathy (Jones & Paulhus, 2009). These traits are suitable for entrepreneurial success (Kets de Vries, 1985), but may also deter long-run performance and social well-being (Hogan & Hogan, 2001). On the one hand, psychopathy positively correlates with positive peer ratings of communication skills, strategic thinking, and creativity (Babiak et al., 2010). On the other hand, psychopathic behaviour like aggressiveness and impulsivity may alienate co-workers and weaken access to resources required to exploit opportunities (Hogan & Kaiser, 2005).

With the uncertainty that emerges from the COVID-19 pandemic, business entry deterrence is likely to increase due to the general population's risk aversion and fear of failure. The likelihood of one starting a business may be measured through their entrepreneurial intentions, which is the first step in

an entrepreneurial process (Lee & Wong, 2004). The positive relationship between self-efficacy and entrepreneurial intentions is diminished when one faces the fear of failure (Ng & Jenkins, 2018). Further, a survey from August 2020 shows that 39% of SMEs fear that they will go bankrupt by September 2021 even if the pandemic condition recovers and they have a revenue increase of 10-30% (Dimson et al., 2020). As those with high psychopathy traits are more fearless and risk-seeking amongst others, this implies that the economy's future may depend on the pursuit of entrepreneurship by this group. The research question that this study will try to answer is:

"How do psychopathy traits relate to entrepreneurial intentions during the COVID-19 pandemic?"

Exploration of this question allows for scientific contribution in the field of entrepreneurship and psychology. Given the novelty of the COVID-19 pandemic, most current research focuses on exploring matters that directly aid in the recovery process of all life domains during the pandemic. This leaves research gaps in the realm of how psychopathy relates to entrepreneurial intentions, which is indirectly linked with economic recovery. In addition, with the COVID-19 pandemic slowing down economies, recovery may depend on entrepreneurs as they are indispensable drivers of economic growth through developing innovative goods and services as well as rendering novel job openings (Liu et al., 2020). However, given that the uncertainty posed by the pandemic is likely to discourage future entrepreneurs from carrying out their business plans, the global economy's recovery may rely on those possessing high levels of psychopathy traits. Hence, analysing how psychopathy traits relate to entrepreneurial intentions may help policymakers become aware of the right target groups to incentivise in developing a country's entrepreneurship level post-pandemic. This does not suggest the encouragement of the cultivation of psychopathy traits, but rather the entrepreneurial spirits of individuals who have what it takes to form a business during such an uncertain time as the COVID-19 pandemic.

Following this chapter, the paper proceeds with a discussion relating to entrepreneurship during crises in general and the COVID-19 pandemic, psychopathic tendencies during the COVID-19 pandemic, and how psychopathy relates to entrepreneurship. Subsequently, the hypotheses are developed, followed by a description of the sample, variables, and methodology. Further, the results are presented and discussed, and a conclusion follows at the end of this paper.

2. Theoretical Framework

This chapter starts with a literature review on entrepreneurship. Entrepreneurship in times of crisis is discussed, followed by a discussion of entrepreneurship specific to the COVID-19 pandemic. Further, psychopathic tendencies during the COVID-19 pandemic are explained, and a discussion on how psychopathy relates to entrepreneurship is presented. Finally, the hypotheses are developed based on the literature review.

2.1 Literature Review

2.1.1 Entrepreneurship

An entrepreneur is an originator of a novel enterprise (Gartner, 1985) or an innovator who pursues creative undertakings (Schumpeter & Backhaus, 1934). Entrepreneurial activities entail the identification and exploitation of opportunities (Peterson, 1985), the creation of a novel market segment, or strategy development in satisfying some needs (Garfield, 1986). Entrepreneurs are typically associated with a high inclination to take risks, the ambition for success, and personal principles like accountability and trustworthiness (Cunningham & Lischeron, 1991).

Entrepreneurship covers various phases, also known as the entrepreneurial ladder, ranging from merely having entrepreneurial intentions to running an established business (Van der Zwan et al., 2010). Being the first step in the entrepreneurial process (Lee & Wong, 2004), several studies measure entrepreneurship using individuals' entrepreneurial intentions given the ease of observation for certain groups in the population, such as students. Intentionality itself refers to the mindset that guides one's experience, focus, and pursuits to a certain objective (Bird, 1988). This implies that one's entrepreneurial intention can be categorised as a predictor of planned entrepreneurial behaviour (Krueger, 1993). However, having intentions of establishing an enterprise does not guarantee that the intentions will be realized. Ajzen (1991) introduced the Theory of Planned Behaviour (TPB) as a framework to understand how intentions translate to behaviour. According to the TPB, intentions capture the extent to which people are willing to work for performing the behaviour, implying that stronger intentions would lead to a higher likelihood of the behaviour being performed. The TPB suggests that intentions are a function of one's attitude toward the behaviour, subjective norm about the behaviour, and the perceived difficulty or ease in performing the behaviour, also known as the perceived behavioural control (PBC). When the TPB is applied to entrepreneurship, it is found that attitude, subjective norm, and PBC predicts entrepreneurial intention well and that the PBC and the intention itself significantly predicts entrepreneurial behaviour (Kautonen et al., 2013). Hence, measuring entrepreneurship with entrepreneurial intention has been proven to significantly forecast the establishment of future enterprises.

The creation of businesses from entrepreneurship typically leads to new job openings, which could potentially help to lower the unemployment rate of countries. Entrepreneurial enterprises contribute to approximately 8% of gross job formation in the Danish economy (Malchow-Møller et al.,

2011). In the U.S. manufacturing sector, enterprises averaging fewer than 100 workers generated around a third of gross job formation from 1973 to 1988 (Davis et al., 1996). Globally, the same type of enterprise contributed to 70% of job creation from 1992 to 2002, while those employing fewer than 20 workers contributed to nearly 50% of gross job formation (Neumark et al., 2011). Further, new enterprise formation highly correlates with opportunities for innovation, with SMEs being faster in fostering innovations and bringing them into markets (Herbig et al., 1994). The positive association between entrepreneurship and innovation works well in aiding enterprises to thrive (Zhao, 2005).

2.1.2 Entrepreneurship in times of crisis

Studies on prior crises have not reached a clear conclusion on whether entrepreneurship is negatively or positively impacted by crises. On one hand, stunted growth or slump in GDP may lead to the exploration of novel opportunities and innovation (Filippetti & Archibugi, 2010). On the other hand, economic stagnation has negative repercussions on entrepreneurship, where investments in innovation and the identification of new business opportunities become restricted (Klapper & Love, 2011).

During recessions, many establishments are typically put out of business (Fairlie, 2013). However, a study on Spain's 2008 economic cycle found that entrepreneurs may perform better during recessions relative to boom periods (Devece et al., 2016). In particular, the study found that start-ups with decent abilities to recognise opportunities may grow rapidly and produce decent jobs amidst a recession. Further, a U.S. study found that during times of hardship, entrepreneurs are more able to deal with uncertain circumstances if they possess decent self-efficacy and resilience (Bulough & Renko, 2013).

Finally, looking at entrepreneurial intention in times of economic crises, students' likelihood to form an enterprise in the future is strongly diminished, while their willingness to do so is not impacted by the crisis (Arrighetti et al., 2016). Furthermore, entrepreneurship becomes less attractive during crises as students tend to perceive lower rates of entrepreneurial opportunities, greater entry barriers, and reduced profitability of current enterprises (Arrighetti et al., 2016).

2.1.3 Entrepreneurship during the COVID-19 pandemic

Globally, the COVID-19 pandemic has affected not only people's lives on a personal level, but it has also impacted entrepreneurship (Liguori & Winkler, 2020). The pandemic has led to a global structural change that causes the exit of many established enterprises (Nicola et al., 2020). A significant number of enterprises had to fire their employees due to the COVID-19 pandemic (Stephan et al., 2021). Further, nationwide preventive measures have led small enterprises to be the most unprotected group during the pandemic (Ratten, 2020), which enhances competition between novel start-ups and incumbents (Sedláček & Sterk, 2020).

Besides, familial or job pressures caused by the COVID-19 pandemic have imposed mental stress on workers, deteriorating their productivity (Boyon, 2020). An international survey focusing on entrepreneurs shows that 58% are concerned about their own and their family's health, while their well-being dropped by 12% on average since the pandemic started (Stephan et al., 2021). Moreover, the

COVID-19 pandemic has imposed higher unemployment and work absence risks for the self-employed relative to full-time workers, with young, non-white, self-employed females facing the highest unemployment risk (Grashuis, 2021). The risk of unemployment imposes harsh psychological repercussions for the self-employed due to financial uncertainty (Patel & Rietveld, 2020). Furthermore, innovative pursuits in entrepreneurship are reported to have decreased due to the COVID-19 pandemic, though habitual entrepreneurs remain active during the pandemic (Kuckertz, 2021).

Overall, these changes have decreased entrepreneurial activities and contribute to economic recession. In 2020, the world GDP was predicted to decrease by 5.2%, which would be the worst recession after World War II (World Bank, 2020). Nonetheless, there is potential for such a crisis to be transformed into an opportunity. By continuously supporting entrepreneurs and novel enterprise formation, job openings may increase, thus reducing unemployment (Ioannides & Gyimóthy, 2020). Besides, this crisis may be a chance for unproductive firms to exit the market, which may ultimately boost economic growth in the long run (Padilla & Petit, 2020).

2.1.4 Psychopathy and entrepreneurship

Psychopathy is a personality disorder associated with a high inclination toward impulsive actions, lack of empathy, and superficial emotional reactions (Cleckley, 1941). Psychopathy may be explored on a subclinical level, which differs from clinical psychopathy in the level, frequency, or intensity of conduct patterns, with these factors being lower for subclinical psychopathy (Gustafson & Ritzer, 1995). A three-factor model that conceptualises subclinical psychopathy includes three dimensions: conceited and dishonest interpersonal style, scarce emotional experience, as well as impulsive and reckless behavioural style (Cooke & Michie, 2001). Individuals exhibiting high psychopathy traits are often drawn to sensation-seeking undertakings and feel boredom easily (Hunt et al., 2005), and they tend to detest social norms and the status quo (Mathieu et al., 2013).

Although psychopathic tendencies are commonly associated with antisocial behaviour that may lead to social exclusion, many of those with high levels of psychopathy traits turn out to be successful. For instance, individuals possessing high levels of psychopathy traits are more prevalent in business relative to the overall population, with about 3-4% holding superior positions (Babiak et al., 2007). A study shows that 5.76% of Australian white-collar managers are psychopathic by definition, while another 10.42% exhibit psychopathy traits (Saft, 2017). Additionally, psychopathy is positively associated with entrepreneurial intention and taking concrete steps to form new enterprises (Kramer et al., 2011). The psychopathy trait of disinhibition may not only lead to disorderly conduct but also higher entrepreneurial intentions (Walker et al., 2020). In fact, the occupation that has the greatest proportion of psychopaths is that of CEO (Dutton, 2012). What leads individuals with psychopathic tendencies to be well-functioning citizens that have successful careers is their ability to control their antisocial impulses (Lasko & Chester, 2020).

Entrepreneurship appeals to people characterised by high psychopathy traits as the profession suits the traits that they possess, including self-confidence, fearlessness, preference for agentic

behaviour, disdain toward authority, and ease when operating in dynamic environments (Jonason, Li, & Teicher, 2010). Those exhibiting high psychopathy traits thrive to focus and perform well in very hectic and ambiguous circumstances, whereas others typically break down (Dutton, 2012). With entrepreneurial entry being negatively associated with the fear of failure (Morgan & Sisak, 2016), their concerns on high start-up mortality should be diminished through their insensitivity and low fear of failure (Blair et al., 2005). Moreover, psychopathy's prominence in entrepreneurship may relate to the life history theory, which posits that individuals maximise their survival by strategically choosing their behaviour according to their environment's demands (Roff, 2001). The theory suggests that a fast-life strategy is most ideal when facing a tough and uncertain environment, focusing on short-term prerequisites and relations. The exhibition of dark triad traits is often perceived as a fast-life strategy, where individuals might pursue risky actions like creating a new venture without having essential experience, networks, or capitals (Jonason, Koenig, & Tost, 2010).

2.1.5 Psychopathy traits during the COVID-19 pandemic

Psychopathy traits like boldness, meanness, and disinhibition could predict particular behavioural tendencies in facing the COVID-19 pandemic (Blagov, 2020). Boldness may lead to diminished threat sensitivity and anxiety (Paiva et al., 2020) as well as overvaluation of reward-related behaviours (Hiatt & Newman, 2006), which potentially lowers perceptions of risk and protective tendencies during the pandemic (Pasion et al., 2020). These behaviours determine risk-related conducts (Blais & Weber, 2009), where individuals characterized by psychopathy traits may exhibit diminished reactivity to the COVID-19 pandemic through lower risk perceptions and overestimation of the benefits from engaging in risky behaviours. Furthermore, meanness is associated with a diminished sense of empathy and greater negligence for authority (Paiva et al., 2020), while disinhibition relates to antisocial behaviour (Patrick et al., 2009). This relates to engagement in risky conducts during the pandemic, with those having higher levels of psychopathy traits projecting lower compliance toward containment measures like social distancing (Blagov, 2020). A negative relationship has been established between impulsivity and compliance toward measures relating to COVID-19, including hygiene behaviours (Wismans et al., 2021). Not only are individuals with high levels of dark triad traits less likely to pursue preventive measures pertaining to the COVID-19 pandemic, but they are also more prone to exhibit hoarding behaviour (Nowak et al., 2020). Beyond that, psychopaths externalise vulnerability, which is linked to inadequate inhibitory control and hostile behaviours (Patrick & Bernat, 2010) and may lead to risk-taking and poor decision-making.

2.2 Hypothesis Development

This section describes four hypotheses that are used to answer the research question: "How do psychopathy traits relate to entrepreneurial intentions during the COVID-19 pandemic?" based on the literature review.

2.2.1 Hypothesis 1

As discussed in the literature review, the traits of a psychopath fit very well with prerequisite skills and traits of successful entrepreneurs. People with higher levels of psychopathy traits tend to be confident risk-seekers who prefer autonomy and can easily work in uncertain situations (Jonason, Li, & Teicher, 2010). They also tend to have a diminished fear of failure relative to people with lower psychopathy levels (Blair et al., 2005). Given that most occupations exist within a hierarchical system, entrepreneurship would stand out for individuals who dislike authority figures, with a positive relationship being established between entrepreneurial entry and the dark triad personalities (Wu et al., 2019). A positive association is indeed found between psychopathy and entrepreneurial intention as well as steps in starting a business (Kramer et al., 2011). Besides, risky challenges would prevail less in 'safer' careers, where risk and uncertainty are minimised by the structured system surrounding the salary and work-related policies. Hence, the first hypothesis is:

H1: Individuals that exhibit higher levels of psychopathy traits are more likely to have stronger intentions of establishing an enterprise in the future.

2.2.2 Hypothesis 2

Building on the first hypothesis, individuals with higher levels of psychopathy traits may alter their behaviour and preferences given specific situations like the COVID-19 pandemic. The psychopathic tendency to externalise vulnerability relates to poor inhibitory control (Patrick & Bernat, 2010), which may prompt these individuals to make decisions recklessly and pursue risky actions. Generally, the entrepreneurial intention of students is negatively inflicted by economic crises (Arrighetti et al., 2016). However, despite the increased uncertainty during the COVID-19 pandemic, individuals with higher levels of psychopathy traits could be less likely to get discouraged by such conditions. These people may even derive utility from the riskiness of starting an enterprise in these uncertain circumstances. Thus, the second hypothesis is:

H2: Individuals that exhibit higher levels of psychopathy traits are more likely to have similar or stronger intentions of establishing an enterprise in the future during the COVID-19 pandemic relative to before the pandemic.

2.2.3 Hypothesis 3

Entrepreneurship is less appealing in times of economic crisis due to the higher likelihood of students perceiving worse entrepreneurial opportunities and profitability (Arrighetti et al., 2016). However, as mentioned in the literature review, the psychopathy trait of boldness may lead to the diminished perception of risk during the COVID-19 pandemic (Pasion et al., 2020). This trait relates to lower sensitivity toward external threats and anxiety as well as the tendency to overvalue reward-related behaviours (Paiva et al., 2020; Hiatt & Newman, 2006). Therefore, psychopaths are likely to overestimate the value that can be derived from starting a business during an uncertain time like the COVID-19 pandemic. As such, those with levels of higher psychopathy traits are likely to be less

affected by the perils imposed by the COVID-19 pandemic, thus having lower perceptions of risk compared to those with lower psychopathy levels. Hence, the third hypothesis is:

H3: Individuals that exhibit higher levels of psychopathy traits are more likely to perceive the risks of establishing a new enterprise during the COVID-19 pandemic to be similar or lower compared to before the pandemic.

2.2.4 Hypothesis 4

Relating to the third hypothesis, psychopaths' diminished sensitivity toward risk and tendency to overvalue reward-related actions, combined with the appeal of entrepreneurship for psychopaths, suggest that those with higher levels of psychopathy traits are more likely to perceive good opportunities in starting a business amidst the COVID-19 pandemic. In addition, the fact that many established businesses have exited the market since the start of the COVID-19 pandemic (Nicola et al., 2020) may be identified by psychopaths as an opportunity to fill market gaps through entrepreneurship. Moreover, with more workers experiencing a drop in their productivity due to the pandemic (Boyon, 2020), psychopaths have a competitive edge in being comfortable with working in chaotic circumstances (Dutton, 2012). Therefore, the fourth hypothesis is:

H4: Individuals that exhibit higher levels of psychopathy traits are more likely to perceive opportunities to pursue entrepreneurship during the COVID-19 pandemic.

3. Data & Methodology

In this chapter, information on the sample and the data collection process are defined. Subsequently, the main and control variables are elaborated. Finally, the methodology section covers the methods that are used in the analysis.

3.1 Sample

Two surveys were used to gather the data utilised in this study, with the surveys being a part of the Erasmus University Rotterdam International COVID-19 Student Survey (EURICSS). Data pertaining to indicators of psychopathy derives from a survey that was conducted in 2020 from week 17 to 19. Meanwhile, data on entrepreneurial intentions and other entrepreneurship-related variables are from a follow-up survey, where data was gathered in week 50 to 52 of 2020. The surveys were shared through university student systems and university emails. In total, there are 1,123 respondents, who are all university students from the Netherlands, Belgium, and Portugal.

3.2 Dependent Variables

The dependent variables include several variables related to entrepreneurship as described in Table 1. Indicator (1) measures an individual's intention to establish an enterprise someday, rated from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). Changes in entrepreneurial intention during the COVID-19 pandemic are measured by indicator (2), ranging from 1 (*Much Lower*) to 5 (*Much Higher*). Moreover, indicator (3) measures the change in one's perception of risk associated with establishing an enterprise during the COVID-19 pandemic, from 1 (*Much Lower*) to 5 (*Much Higher*). Finally, indicator (4) pertains to the individual perceiving opportunities in establishing an enterprise during the COVID-19 pandemic, with answers ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). The response frequency of each category can be found in Appendix A.

3.3 Independent Variables

The main independent variable that this paper focuses on is the individual level of psychopathy traits. This is assessed using the psychopathy subscale from the Short Dark Triad (SD3) (Jones & Paulhus, 2014). The scale consists of 8 items denoted in Table 2; each item is scored on a scale ranging from 1 to 5. The scores of all 8 indicators are summed up to create the psychopathy index, with the highest psychopathy level scoring 40 points and the lowest scoring 8 points. Looking at the internal consistency, the SD3's psychopathy subscale seems quite reliable based on the Cronbach's alpha (α=0.64), where a score above 0.6 is considered acceptable (George & Mallery, 2003). Regarding the reliability and validity of the SD3, multiple studies on its cross-language applicability found the scale to have good psychometrics and recommended it for further research (Özsoy et al., 2017; Atari & Chegeni, 2016; Dinić et al., 2018; Zhang et al., 2020; Pineda et al., 2018; Malesza et al., 2019).

Table 1

Entrepreneurship indicators

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
(1) *"I have the strong intention to start a firm someday"*	1	2	3	4	5	6	7
			Much Lower	Lower	Equal	Higher	Much Higher
(2) *"During the past two months, did your intention of starting your own firm change in a positive or negative way?"*			1	2	3	4	5
			Much Lower	Lower	About the Same	Higher	Much Higher
(3) *"During the past months, did your perception of the risks associated with starting your own firm change in a positive or negative way? I perceive the risk to be:"*			1	2	3	4	5
	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
(4) "*During the current coronavirus crisis, I perceived opportunities to launch my own project or start my own business, now or after I graduate"*	1	2	3	4	5	6	7

Control variables

Control variables included in the analysis relate to age and gender. As individuals age, they tend to experience diminishing traits related to social deviance and a declining prevalence of antisocial personality disorder (Harpur & Hare, 1994). To control for non-linear relationships stemming from age,

the respondent's age (squared) is included. Moreover, the exhibition of certain genes can explain 30–92% of the variance of psychopathic symptoms (Tiihonen et al., 2020). Given the varying genes present for different genders, the respondent's gender is controlled for. Finally, the interaction term between gender and the psychopathy index is included to observe how different psychopathy levels impact entrepreneurial intentions differently for men and women. In studying the total effect of psychopathy traits on entrepreneurship indicators, a full model without the interaction term will be included for all four hypotheses. The list of controls is rather limited given the primarily internal origin of psychopathy, being genetics. Other causes of psychopathy may include environmental factors like familial or childhood situations (Patrick, 2005). However, the strong evidence of psychopathy's heritability hinders the determination of the extent to which environmental factors instigate psychopathy (Wallisch, 2014). Finally, the country where the respondents studied is controlled for, which includes the Netherlands, Belgium, and Portugal.

Table 2

Items of the psychopathy subscale of the Short Dark Triad (SD3)

Items of the psychopathy subscale	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
(1) *I like to get revenge on authorities*	1	2	3	4	5
(2) *I avoid dangerous situations*	5	4	3	2	1
(3) *Payback needs to be quick and nasty*	1	2	3	4	5
(4) *People often say I'm out of control*	1	2	3	4	5
(5) *It's true that I can be mean to others*	1	2	3	4	5
(6) *People who mess with me always regret it*	1	2	3	4	5
(7) *I have never gotten into trouble with the law*	5	4	3	2	1
(8) *I'll say anything to get what I want*	1	2	3	4	5

3.4 Methodology

In this section, the statistical methods utilised to answer the hypotheses are explained. The used methods include the ordinary least square (OLS) regression and (multinomial) logistic regression.

3.4.1 Hypothesis 1

H1: Individuals that exhibit higher levels of psychopathy traits are more likely to have stronger intentions of establishing an enterprise in the future.

To answer the first hypothesis, the respondent's entrepreneurial intention (see indicator (1) in Table 1) is treated as a continuous variable and regressed on the psychopathy index and control variables using an OLS regression. The regression equation is:

$$\begin{aligned}&\text{EntrepreneurialIntention}_i \\ &= \alpha + \beta_1 \text{Psychopathy}_i + \beta_2 \text{Gender}_i + \beta_3 \text{Age}_i + \beta_4 \text{Age}_i^2 \\ &+ \beta_5 (\text{Psychopathy} \times \text{Gender})_i + \beta_6 \text{Belgium}_i + \beta_7 \text{Portugal}_i + \varepsilon_i\end{aligned} \quad (1)$$

3.4.2 Hypothesis 2

H2: Individuals that exhibit higher levels of psychopathy traits are more likely to have similar to stronger intentions of establishing an enterprise in the future during the COVID-19 pandemic relative to before the pandemic.

Upon analysing how psychopathy levels relate to one's general entrepreneurial intention, further analysis will be done on how this relationship changes during the COVID-19 pandemic. This hypothesis will be tested using a logit model, focusing on the change in entrepreneurial intention (see indicator (2) in Table 1). This indicator is recoded into a binary variable which would have the value 0 for the choices *Much Lower* and *Lower*, while the value 1 pertains to the choices *Equal, Higher*, and *Much Higher*. The logit model to predict the probability of such indicators having the value of 1 is:

$$\begin{aligned}&\Pr(\text{ChangesIntent} = 1) \\ &= \frac{1}{1 + e^{-(\alpha + \beta_1 \text{Psychopathy}_i + \beta_2 \text{Gender}_i + \beta_3 \text{Age}_i + \beta_4 (\text{Psychopathy} \times \text{Gender})_i + \beta_5 \text{Belgium}_i + \beta_6 \text{Portugal}_i)}}\end{aligned} \quad (2)$$

3.4.3 Hypothesis 3

H3: Individuals that exhibit higher levels of psychopathy traits are more likely to perceive similar or lower risks in establishing a new enterprise during the COVID-19 pandemic.

The third hypothesis relates to changes in one's risk perception of establishing an enterprise during the pandemic (see indicator (3) in Table 1) and will be tested with a logit model. This indicator is recoded into a binary variable; the value 0 includes the choices *Higher* and *Much Higher*, while the value 1 comprises the choices *Much Lower, Lower*, and *About the Same*. To predict the probability of these indicators having the value of 1, the logit model is:

$$\begin{aligned}&\Pr(\text{ChangesRisk} = 1) \\ &= \frac{1}{1 + e^{-(\alpha + \beta_1 \text{Psychopathy}_i + \beta_2 \text{Gender}_i + \beta_3 \text{Age}_i + \beta_4 (\text{Psychopathy} \times \text{Gender})_i + \beta_5 \text{Belgium}_i + \beta_6 \text{Portugal}_i)}}\end{aligned} \quad (3)$$

3.4.4 Hypothesis 4

H4: Individuals that exhibit higher levels of psychopathy traits are more likely to perceive opportunities to pursue entrepreneurship during the COVID-19 pandemic.

The fourth hypothesis is explored using the multinomial logit model by regressing the perceived opportunities of starting a business during the pandemic (see indicator (4) in Table 1) on the independent variables. This indicator is recoded into a categorical variable, with the value 0 pertaining to the outcomes *Strongly Disagree, Disagree*, and *Somewhat Disagree*. The value 1 relates to *Neither Agree nor Disagree,* while the value 2 represents *Somewhat Agree, Agree* and *Strongly Agree*. Executing a multinomial logit model would allow for comparison between the potential outcomes. The base outcome will be *Strongly Disagree, Disagree*, and *Somewhat Disagree*, or those denoted by the value 0, which is compared with the other two outcomes (values 1 and 2). Two equations that are used for the comparisons include:

$$\ln\left(\frac{(\Pr(\text{Opportunity} = 1))}{(\Pr(\text{Opportunity} = 0))}\right) = \alpha + \beta_1 \text{Psychopathy}_i + \beta_2 \text{Gender}_i + \beta_3 \text{Age}_i + \beta_4 (\text{Psychopathy} \times \text{Gender})_i + \beta_5 \text{Belgium}_i + \beta_6 \text{Portugal}_i \quad (4)$$

$$\ln\left(\frac{(\Pr(\text{Opportunity} = 2))}{(\Pr(\text{Opportunity} = 0))}\right) = \alpha + \beta_1 \text{Psychopathy}_i + \beta_2 \text{Gender}_i + \beta_3 \text{Age}_i + \beta_4 (\text{Psychopathy} \times \text{Gender})_i + \beta_5 \text{Belgium}_i + \beta_6 \text{Portugal}_i \quad (5)$$

3.5 Descriptive Statistics

As seen in Table 3, 182 (16.21%) respondents come from the Netherlands, 650 (57.88%) from Belgium, and 291 (25.91%) from Portugal. The average rating for the SD3 psychopathy subscale items ranges from 1.44 to 2.65, with a minimum score of 1 and a maximum of 5. Meanwhile, the average psychopathy index score is 15.07, with the scale ranging from 8 to 40. The average entrepreneurial intention level is 3.18 out of 5. For the change in entrepreneurial intentions during the COVID-19 pandemic, 225 (20.04%) of the respondents rated *Lower* to *Much Lower*, while 898 (79.96%) rated *Equal, Higher*, and *Much Higher*. Concerning their risk perception related to entrepreneurship during the pandemic, 597 (53.16%) rated *Much Lower, Lower*, and *About the Same*, while 526 (46.84%) rated *Higher* and *Much Higher*. Further, regarding whether the respondents perceive good opportunities during the pandemic, 548 (48.80%) said *Strongly Disagree, Disagree*, and *Somewhat Disagree*, 427 (38.02%) said *Neither Agree nor Disagree*, and 148 (13.18%) said *Somewhat Agree, Agree*, and *Strongly Agree*. Additionally, the average respondent age is 22.87, 456 (40.61%) of the respondents are men, and 667 (59.39%) are women.

Table 3

Descriptive statistics of the variables

Binary and categorical variables	N	%
Countries		
Netherlands	182	0.16
Belgium	650	0.58
Portugal	291	0.26
Intention Change		
Much Lower, Lower	225	20.04%
Equal, Higher, Much Higher	898	79.96%
Risk Perception		
Much Lower, Lower, About the Same	597	0.53
Higher, Much Higher	526	0.47
Opportunity Perception		
Strongly Disagree, Disagree, and Somewhat Disagree	548	0.49
Neither Agree nor Disagree	427	0.38
Somewhat Agree, Agree, Strongly Agree	148	0.13
Gender		
Male	456	0.41
Female	667	0.59
Continuous variables	**Mean**	**SD**
Psychopathy Indicators		
(1) I like to get revenge on authorities	1.59	0.87
(2) I avoid dangerous situations	1.94	0.88
(3) Payback needs to be quick and nasty	1.81	0.96
(4) People often say I'm out of control	1.6	0.89
(5) It's true that I can be mean to others	2.65	1.19
(6) People who mess with me always regret it	2.16	1.05
(7) I have never gotten into trouble with the law	1.44	0.94
(8) I'll say anything to get what I want	1.89	0.94
Psychopathy Index	15.07	4.12
Entrepreneurship Intention	3.18	1.86
Age	22.87	5.85

Note. The binary and categorical variables are described in terms of the number of observations (N) and percentage (%), whereas the continuous variables are described by the mean and standard deviation (SD).

4. Results

This chapter covers the results of the statistical analysis on the four hypotheses presented in Chapter 3. All four hypotheses are tested using three models. Model 1 regresses the dependent variable only on the psychopathy index, while Model 2 includes all control variables except for the interaction term between the psychopathy index and gender. This interaction term is controlled for in Model 3. Hence, in capturing the complete effect of the psychopathy index, all hypotheses are answered based on the results of Model 2. The correlation between the variables is shown in Table 4. The psychopathy index significantly correlates with gender, which has a significant correlation with all variables except for age. Additionally, opportunity perception significantly correlates with the other three entrepreneurship indicators, while risk perception also correlates significantly with entrepreneurial intention change.

Table 4

Matrix of correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Psychopathy Index	1.00						
(2) Age	-0.04	1.00					
(3) Gender	-0.11***	-0.02	1.00				
(4) Entrep. Intention	0.07**	0.04	-0.15***	1.00			
(5) Entrep. Intention Change	-0.04	-0.05*	-0.08***	-0.02	1.00		
(6) Risk Perception	0.03	0.04	-0.07**	-0.02	0.32***	1.00	
(7) Opportunity Perception	-0.01	0.01	-0.08***	0.27***	0.18***	0.13***	1.00

Note. *$p \leq 0.10$, **$p \leq 0.05$, ***$p \leq 0.01$.

4.1 Hypothesis 1

H1: Individuals that exhibit higher levels of psychopathy traits are more likely to have stronger intentions of establishing an enterprise in the future.

In examining whether those with higher levels of psychopathy traits are more likely to have stronger intentions of starting a business in the future, two OLS regressions are conducted, with the results presented in Table 5. For Model 1, entrepreneurial intention is regressed on the psychopathy index without including any controls. The coefficient of the psychopathy index is significant at a 5% significance level (B=0.03, SE=0.01, p=0.03), which implies that the psychopathy index is positively and significantly related to entrepreneurial intention. On average, an increase of one point in the psychopathy index increases entrepreneurial intention by 0.03 points out of 5.

Model 2 builds on Model 1, controlling for age, age (squared), gender, and country. The psychopathy index appears to have a significant influence on entrepreneurial intention (B=0.04, SE=0.01, p=0.07). All controls are significant besides Portugal (B=-0.05, SE=0.17, p=0.78).

On average, female students score 0.49 points less than males on their entrepreneurial intention level. Furthermore, an increase of 1 year of age increases entrepreneurial intention by on average 0.09 points. Meanwhile, students from Belgium on average score 0.33 points less on their entrepreneurial intention level compared to those from the Netherlands.

Model 3 is the full model, which controls for the interaction term between gender and age on top of the controls included in Model 2. An insignificant coefficient is found for the psychopathy index (B=0.02, SE=0.02, p=0.24). All of the control variables are not significant except for age (B=0.09, SE=0.04, p=0.04) and Belgium (B=-0.34, SE=0.15, p=0.03). This shows that on average, an increase of one year of age increases the sample's entrepreneurial intention by 0.09 points out of 5. Furthermore, students coming from Belgium would have a lower entrepreneurial intention by on average 0.34 points compared to those from the Netherlands.

Observing the adjusted R^2, Model 2 scores the highest compared to Model 1 and Model 3, scoring 0.029, 0.003, 0.028, respectively. Given the significant coefficient of the psychopathy index in Model 2, the hypothesis that students exhibiting higher levels of psychopathy traits are more likely to have stronger intentions of starting a business in the future cannot be rejected.

Table 5

OLS regression results

	Unstandardized Coefficients					
	Model 1		Model 2		Model 3	
Entrepreneurial Intention	*B*	*SE*	*B*	*SE*	*B*	*SE*
Psychopathy Index	0.03**	0.01	0.03*	0.01	0.02	0.02
Gender			-0.49***	0.12	-0.59	0.45
Age			0.09**	0.04	0.09**	0.04
Age^2			0.00*	0.00	0.00*	0.00
Belgium			-0.33**	0.15	-0.34**	0.15
Portugal			-0.05	0.17	-0.05	0.17
Psychopathy Index*Gender					0.01	0.03
Intercept	2.73	0.22	1.82	0.72	1.87	0.74
R^2	0.00		0.03		0.03	
Adjusted R^2	0.00		0.03		0.03	
No. of observations	1,123		1,123		1,123	

Note. The table presents OLS regression results to answer the first hypothesis, comprising the unstandardized beta (B) and standard errors (SE). For Model 1, entrepreneurial intention is the dependent variable, while the psychopathy index is the independent variable. For Model 2, entrepreneurial intention is the dependent variable, whereas the independent variables include the psychopathy index, gender (representing female; male is the reference category), age, age^2, as well as the countries (the Netherlands is the reference category, while Belgium and Portugal are dummy variables). Model 3 builds on Model 2, controlling for the interaction term between gender and the psychopathy index. *$p \leq 0.10$, **$p \leq 0.05$, ***$p \leq 0.01$.

4.2 Hypothesis 2

H2: Individuals that exhibit higher levels of psychopathy traits are more likely to have similar to stronger intentions of establishing an enterprise in the future during the COVID-19 pandemic relative to before the pandemic.

Three logistic regression models are utilised to analyse if those with higher levels of psychopathy traits are more likely to have similar or stronger intentions to start a business during the COVID-19 pandemic. Results from the logistic regressions are presented in Table 6. Model 1 regresses entrepreneurial intention changes (*Equal, Higher*, and *Much Higher*) on the psychopathy index without including any controls. The overall model is insignificant ($\chi^2(1)=1.78$, $p=0.18$), with the psychopathy index also being insignificant ($B=-0.02$, $SE=0.02$, $p=0.18$).

Table 6

Logistic regression results

	Unstandardized Coefficients											
	Model 1				Model 2				Model 3			
Entrep. Intention Change	*B*	*SE*	*OR*	*SE*	*B*	*SE*	*OR*	*SE*	*B*	*SE*	*OR*	*SE*
Psychopathy Index	-0.02	0.02	0.98	0.02	-0.03	0.02	0.97	0.02	-0.04	0.03	0.97	0.03
Gender					-0.47***	0.16	0.63***	0.10	-0.64	0.59	0.53	0.31
Age					-0.02**	0.01	0.98**	0.01	-0.02**	0.01	0.98**	0.01
Belgium					0.35*	0.20	1.41*	0.29	0.34*	0.20	1.41*	0.28
Portugal					0.34	0.24	1.41	0.33	0.34	0.24	1.41	0.33
Psychopathy Index*Gender									0.01	0.04	1.01	0.04
Intercept	1.74	0.28	5.70	1.60	2.40	0.43	10.97	4.77	2.50	0.54	12.19	6.61
χ^2	1.78				18.05***				18.05***			
No. of observations	1,123				1,123				1,123			

Note. The table presents logit results comprising the unstandardized beta (*B*), the odds ratio (*OR*), and the pertaining standard errors (*SE*). For Model 1, entrepreneurial intention is the dependent variable, while the psychopathy index is the independent variable. For Model 2, entrepreneurial intention is the dependent variable, whereas the independent variables include the psychopathy index, gender (representing female; male is the reference category), age, as well as the countries (the Netherlands is the reference category, while Belgium and Portugal are dummy variables). Model 3 builds on Model 2, controlling for the interaction term between gender and the psychopathy index. *$p \leq 0.10$, **$p \leq 0.05$, ***$p \leq 0.01$.

In Model 2, entrepreneurial intention change (*Equal, Higher*, and *Much Higher*) is regressed on the psychopathy index as well as the control variables, including age, gender, and country. The overall

model is significant ($\chi^2(5)=18.05, p=0.00$), while the psychopathy index is insignificant (B=-0.03, SE=0.02, p=0.11). The only control variables that does not have a significant influence on the likelihood of changes in entrepreneurial intention is Portugal (B=0.34, SE=0.24, p=0.14). Being a female and having an increase in age decreases the likelihood of entrepreneurial intentions to stay equal, become higher, or much higher. Moreover, relative to students from the Netherlands, those from Belgium are more likely to have their entrepreneurial intentions remain equal, become higher, or much higher.

The full model is depicted in Model 3, which controls for the interaction term between gender and the psychopathy index on top of the controls included in Model 2. Like the previous model, the psychopathy index is insignificant (B=-0.04, SE=0.03, p=0.20), but the overall model is significant ($\chi^2(6)=18.05, p=0.01$). The only significant control variables in this model are age (B=-0.02, SE=0.01, p=0.03) and Belgium (B=0.34, SE=0.20, p=0.09). The likelihood of entrepreneurial intentions to stay equal, become higher, or much higher decreases with age, and is higher for those studying in Belgium relative to the Netherlands.

The psychopathy index is not significant in all three models, including Model 2. This leads to the rejection of the hypothesis that individuals who exhibit higher levels of psychopathy traits are more likely to have similar to stronger intentions of establishing an enterprise in the future during the COVID-19 pandemic compared to before the pandemic.

4.3 Hypothesis 3

H3: Individuals that exhibit higher levels of psychopathy traits are more likely to perceive similar or lower risks in establishing a new enterprise during the COVID-19 pandemic.

In looking at whether higher levels of psychopathy traits relate to a higher likelihood of perceiving similar to lower risks of starting a business during the COVID-19 pandemic, three logistic regression models are used. The results are presented in Table 7. For Model 1, change in risk perception (*Much Lower, Lower*, and *About the* Same) is regressed on the psychopathy index, excluding all control variables. The results show insignificance of the overall model ($\chi^2(1)=1.20$, p=0.27) and the psychopathy index (B=0.02, SE=0.01, p=0.27).

Model 2 regresses the change in risk perception (*Much Lower, Lower*, and *About the Same*) on the psychopathy index and the controls, which are age, gender, and country. The results show significance for the overall model ($\chi^2(5)=28.97, p=0.00$) and insignificance for the psychopathy index (B=0.01, SE=0.02, p=0.32). Belgium (B=0.62, SE=0.17, p=0.00) and gender (B=-0.34, SE=0.13, p=0.01) are the only significant control variables. More specifically, being a female reduces the likelihood of one's risk perception to become much lower, lower, or about the same, while the likelihood increases for those studying in Belgium compared to the Netherlands.

Finally, Model 3 pertains to the full model, which builds on Model 2 and controls for the interaction term between gender and the psychopathy index. The psychopathy index remains

insignificant (B=0.02, SE=0.02, p=0.42), while the overall model is significant ($\chi^2(6)$=28.99, p=0.00). In this model, Belgium is the only significant control variable (B=0.63, SE=0.17, p=0.00), implying that students in Belgium have a higher likelihood that their risk perception becomes much lower, lower, or about the same compared to students in the Netherlands.

With the psychopathy index being insignificant in Model 2, the hypothesis that individuals who exhibit higher levels of psychopathy traits are more likely to perceive similar or lower risks in establishing a new enterprise during the COVID-19 pandemic compared to before the pandemic is rejected.

Table 7

Logistic regression results

	Unstandardized Coefficients											
	Model 1				Model 2				Model 3			
Risk Perception	*B*	*SE*	*OR*	*SE*	*B*	*SE*	*OR*	*SE*	*B*	*SE*	*OR*	*SE*
Psychopathy Index	0.02	0.01	1.02	0.01	0.01	0.02	1.01	0.02	0.02	0.02	1.02	0.02
Gender					-0.34***	0.13	0.71***	0.09	-0.25	0.47	0.78	0.37
Age					0.01	0.01	1.01	0.01	0.01	0.01	1.01	0.01
Belgium					0.62***	0.17	1.87***	0.32	0.63***	0.17	1.87***	0.32
Portugal					0.08	0.19	1.08	0.21	0.08	0.19	1.08	0.21
Psychopathy Index*Gender									-0.01	0.03	0.99	0.03
Intercept	-0.11	0.23	0.89	0.20	-0.47	0.39	0.62	0.24	-0.52	0.47	0.59	0.28
χ^2	1.20				28.97***				28.99***			
No. of observations	1,123				1,123				1,123			

Note. The table presents logit results comprising the unstandardized beta (B), the odds ratio (OR), and the pertaining standard errors (SE). For Model 1, entrepreneurial intention is the dependent variable, while the psychopathy index is the independent variable. For Model 2, entrepreneurial intention is the dependent variable, whereas the independent variables include the psychopathy index, gender (representing female; male is the reference category), age, as well as the countries (the Netherlands is the reference category, while Belgium and Portugal are dummy variables). Model 3 builds on Model 2, controlling for the interaction term between gender and the psychopathy index. *$p \leq 0.10$, **$p \leq 0.05$, ***$p \leq 0.01$.

4.4 Hypothesis 4

H4: Individuals that exhibit higher levels of psychopathy traits are more likely to perceive opportunities to pursue entrepreneurship during the COVID-19 pandemic.

Three multinomial logit models are used in analysing if those with higher levels of psychopathy traits are more likely to perceive opportunities in starting a business during the COVID-19 pandemic. The

reference category of this analysis includes the outcomes *Strongly Disagree, Disagree*, and *Somewhat Disagree*. As can be seen in Table 8, Model 1 regresses opportunity perception on the psychopathy index without including any controls. The overall model is insignificant ($\chi^2(2)$=3.52, p=0.17). The psychopathy index is significant at a 10% significance level for the outcome *Neither Agree nor Disagree* (B=-0.03, SE=0.02, p=0.09). This suggests that an increase in the level of psychopathy traits significantly decreases the likelihood of one answering *Neither Agree nor Disagree* toward perceiving business opportunities during the COVID-19 pandemic compared to answering *Strongly Disagree*, *Disagree*, and *Somewhat Disagree.*

Model 2 regresses opportunity perception on the psychopathy index as well as controls such as gender, age, and country. Although the overall model is significant ($\chi^2(10)$=29.90, p=0.00), the psychopathy index is insignificant for the outcomes *Neither Agree nor Disagree* (B=-0.03, SE=0.02, p=0.11) and *Somewhat Agree*, *Agree* and *Strongly Agree* (B=0.01, SE=0.03, p=0.82). For the outcome *Neither Agree nor Disagree*, all control variables are insignificant except for Belgium (B=0.31, SE=0.19, p=0.10). This implies that studying in Belgium, compared to studying in the Netherlands, increases the likelihood of answering *Neither Agree nor Disagree* toward perceiving business opportunities during the COVID-19 pandemic relative to answering *Strongly Disagree, Disagree*, and *Somewhat Disagree*. Meanwhile, the outcome *Somewhat Agree, Agree* and *Strongly Agree* has two significant controls, which are gender (B=-0.42, SE=0.19, p=0.03) and Portugal (B=0.49, SE=0.27, p=0.08). Compared to answering *Strongly Disagree, Disagree*, and *Somewhat Disagree*, the likelihood of answering *Somewhat Agree, Agree* and *Strongly Agree* decreases with being a female and increases with studying in Portugal relative to studying in the Netherlands.

Finally, Model 3 regresses opportunity perception on the psychopathy index and all controls, including the interaction term between gender and the psychopathy index. The results are significant for the overall model ($\chi^2(12)$=35.12, p=0.00). For the outcome *Neither Agree nor Disagree*, the psychopathy index is significant at a 5% significance level (B=-0.07, SE=0.02, p=0.01), as well as gender (B=-1.21, SE=0.50, p=0.02) and the interaction term between gender and the psychopathy index (B=0.07, SE=0.03, p=0.02). Compared to answering *Strongly Disagree, Disagree*, and *Somewhat Disagree*, having high levels of psychopathy traits and being a female increase the likelihood of answering *Neither Agree nor Disagree* toward perceiving business opportunities during the COVID-19 pandemic. Relative to males, an increase in the psychopathy index yields a greater increase for females' likelihood of answering *Neither Agree nor Disagree* compared to *Strongly Disagree, Disagree*, and *Somewhat Disagree*. In contrast, the psychopathy index is insignificant for the outcome *Somewhat Agree, Agree* and *Strongly Agree* (B=-0.00, SE=0.03, p=0.98), with Portugal as the only significant control (B=0.48, SE=0.27, p=0.08). Compared to answering *Strongly Disagree, Disagree*, and *Somewhat Disagree*, studying in Portugal increases the likelihood of answering *Somewhat Agree, Agree* and *Strongly Agree* to perceive business opportunities amidst the COVID-19 pandemic compared to studying in the Netherlands.

Based on the results of Model 2, high levels of psychopathy traits have no significant impact on the likelihood of answering *Neither Agree nor Disagree* as well as *Somewhat Agree, Agree* and *Strongly Agree* relative to answering *Strongly Disagree, Disagree,* and *Somewhat Disagree*. Therefore, the hypothesis that individuals who exhibit higher levels of psychopathy traits are more likely to perceive opportunities to pursue entrepreneurship during the COVID-19 pandemic is rejected.

Table 8

Multinomial logistic regression results

	Unstandardized Coefficients											
	Model 1				Model 2				Model 3			
Opportunity Perception	*B*	*SE*	*RRR*	*SE*	*B*	*SE*	*RRR*	*SE*	*B*	*SE*	*RRR*	*SE*
Neither Agree nor Disagree												
Psychopathy Index	-0.03*	0.02	0.97*	0.01	-0.03	0.02	0.98	0.02	-0.07***	0.02	0.93***	0.02
Gender					-0.11	0.14	0.89	0.12	-1.21**	0.50	0.3**	0.15
Age					0.00	0.01	1.00	0.01	0.00	0.01	1.00	0.01
Belgium					0.31*	0.19	1.36*	0.25	0.29	0.19	1.34	0.25
Portugal					0.19	0.22	1.21	0.26	0.19	0.22	1.20	0.26
Psychopathy Index*Gender									0.07**	0.03	1.08**	0.03
Intercept	0.14	0.24	1.15	0.27	-0.04	0.41	0.96	0.40	0.59	0.50	1.81	0.90
Somewhat Agree, Agree and Strongly Agree												
Psychopathy Index	0.01	0.02	1.01	0.03	0.01	0.03	1.01	0.03	0.00	0.03	1.00	0.03
Gender					-0.42**	0.19	0.66**	0.13	-0.46	0.82	0.63	0.52
Age					0.01	0.01	1.01	0.01	0.01	0.01	1.01	0.01
Belgium					-0.25	0.26	0.78	0.21	-0.25	0.26	0.78	0.21
Portugal					0.49*	0.27	1.63*	0.45	0.48*	0.27	1.62*	0.45
Psychopathy Index*Gender									0.00	0.05	1.00	0.05
Intercept	-1.44	0.39	0.24	0.09	-1.38	0.56	0.25	0.14	-1.30	0.68	0.27	0.18
χ^2		3.52				29.9***				35.12***		
No. of observations		1,123				1,123				1,123		

Note. The table presents logit results comprising the unstandardized beta (*B*), relative risk ratios (*RRR*), and the pertaining standard errors (*SE*). The reference group in this analysis pertains to the outcomes *Strongly Disagree, Disagree*, and *Somewhat Disagree*. For Model 1, entrepreneurial intention is the dependent variable, while the psychopathy index is the independent variable. For Model 2, entrepreneurial intention is the dependent variable, whereas the independent variables include the psychopathy index, gender (representing female; male is the reference category), age, as well as the countries (the Netherlands is the reference category, while Belgium and Portugal are dummy variables). Model 3 builds on Model 2, controlling for the interaction term between gender and the psychopathy index. *$p \leq 0.10$, **$p \leq 0.05$, ***$p \leq 0.01$.

5. Discussion & Conclusion

In this section, the results of the study will be discussed and linked to the hypotheses, followed by an overview of the limitations and suggestions for future research, and closed by a conclusion of the study.

5.1 Discussion

This study aims to explore the extent to which the different levels of psychopathy traits relate to students' entrepreneurial intention during the COVID-19 pandemic. Data were used from two surveys of the EURICCS, containing data of 1,123 university students from the Netherlands, Belgium, and Portugal. The surveys included items from the psychopathy subscale derived from the SD3 as well as questions concerning the respondents' entrepreneurial intention during the COVID-19 pandemic. Unexpectedly, three out of the four predetermined hypotheses are rejected.

A positive association is sustained between the level of psychopathy traits and the general entrepreneurial intention of the surveyed university students. The association may stem from the psychopathy trait of disinhibition, which is found to prompt higher entrepreneurial intentions (Walker et al., 2020). This confirms prior findings on how people with higher levels of psychopathy traits are found to have higher entrepreneurial intentions (Kramer et al., 2011), although their study only observes students who were participating in entrepreneurship education modules. The current study includes students from non-entrepreneurship programmes, which shows that the positive association between psychopathy traits and entrepreneurial intention can also be observed for students with other educational backgrounds. Hence, it can be sustained that university students who exhibit higher levels of psychopathy traits are more likely to have higher entrepreneurial intentions.

Meanwhile, there is no association between the level of psychopathy traits and the direction to which entrepreneurial intention changes during the COVID-19 pandemic. On average, those with higher levels of psychopathy traits are not affected differently by the pandemic than those with lower psychopathy traits regarding their entrepreneurial intention. In fact, around 80% of the respondents reported that their entrepreneurial intentions remained equal or grew higher during the COVID-19 pandemic. Such statistics contradict the findings of Arrighetti et al. (2016), which suggest an adverse effect of economic crises on students' entrepreneurial intention. A potential explanation may stem from the evident growth of the ICT industry throughout the COVID-19 pandemic, for example, the development of movie streaming and gaming companies (Alexander, 2020). Such growth may have inspired students to pursue innovative ideas in the future, especially given the high technological efficacy level of the young population nowadays. In 2019, more than 80% of individuals aged 16-29 from the EU used the internet for such activities as emailing, streaming shows, listening to music, and social networking (Eurostat, 2019). Nevertheless, the study shows that on average, the COVID-19 pandemic equally affects university students' intention to start a business in the future, irrespective of their psychopathy level. This is not in line with the expectations formulated in this study, in which

students with higher levels of psychopathy traits are more likely to have similar to stronger intentions in starting a business during the COVID-19 pandemic.

Moreover, there is no relationship between the students' level of psychopathy traits and their perception of the risks associated with starting a business during the COVID-19 pandemic. 53% of the respondents perceive similar to lower risks, while 47% perceive higher risks. The formation of enterprises is commonly associated with such risks as the lack of financial support or dire competition from incumbents, which may lead to bankruptcy (Hayes, 2021). Given that the subjects are university students that do not particularly come from a business background, they may not have sufficient knowledge of the various risks that entrepreneurs face when starting a business. Additionally, the students who were not majoring in business-related majors may have undergone prior entrepreneurship education, but this may only apply to a fraction of the sample. As such, students without adequate entrepreneurship knowledge might not be able to make informed judgments regarding the types and magnitude of risks that they may face when forming a business amidst the pandemic. Assuming that all students possess the same information regarding entrepreneurial risks and were fully rational when filling in the surveys, the results might have inferred a different conclusion. Evidently, early entrepreneurship education is found to increase non-cognitive entrepreneurial skills and reduce entrepreneurial intentions (Huber et al., 2014). Contrastingly, at a university level, students majoring in entrepreneurship tend to have higher entrepreneurial intentions and are more likely to form a business relative to students from other majors (Kolvereid & Moen, 1997). Thus, controlling for the students' study programme at a university level as well as whether they undergo entrepreneurship education at a young age might have increased the validity of the results. Nonetheless, the current study suggests no association between the level of psychopathy traits and the perception of risks when starting a business. This does not align with the study's formulated expectation that students with higher levels of psychopathy traits are more likely to perceive similar to lower risks in starting a business during the COVID-19 pandemic.

Furthermore, the students' psychopathy trait levels are not associated with the differing levels of perceived opportunities to build a business during the COVID-19 pandemic. Arrighetti et al. (2016) found a decline in entrepreneurship's appeal for students during economic crises due to the worsening perception of entrepreneurial opportunities. This aligns with the lower perceived business opportunities during the COVID-19 pandemic, with only 13% of the respondents agreeing to perceive such opportunities amidst the pandemic. However, it appears that the students' diverse psychopathy levels do not explain any variance in their business opportunity perception. Although students with higher levels of psychopathy traits comply less toward COVID-19 measures given their impulsive nature (Wismans et al., 2020; Nowak et al., 2020), the high severity of the economic crisis caused by the pandemic that has led to many businesses going bankrupt (Stephan et al., 2021) may have outpowered their insensibility toward risk and failure (Blair et al., 2005). Besides, the downfall of many businesses is openly evident to everyone, including university students with different levels of psychopathy traits.

Despite their reckless, risk-taking nature, those possessing higher levels of psychopathy traits may still use their logic as those with lower levels of psychopathy traits would in processing the same information available to everyone. Hence, it is sensible that students with varying psychopathy levels arrive at the same conclusion, which is that the general business environment has worsened due to the COVID-19 pandemic, thus lowering business opportunities during the pandemic. However, this is not in line with the study's formulated expectation, in which students with higher levels of psychopathy traits are more likely to perceive opportunities to start a business during the COVID-19 pandemic.

Additionally, the interaction term between gender and the psychopathy index is included in each hypothesis' Model 3 to observe the effect of different genders on how different psychopathy levels impact entrepreneurial intentions. Interestingly, higher levels of psychopathy traits affect women more in terms of their likelihood to perceive opportunities in establishing an enterprise during the COVID-19 pandemic relative to men. Beyond that, gender seems to affect entrepreneurial intentions in general, with females being more likely to have lower entrepreneurial intentions. They are also more likely to experience a decline in entrepreneurial intentions, have an increase in the perceived business risk, and a drop in the perceived business opportunities during the COVID-19 pandemic. This is an important additional finding of the current study as it confirms prior findings on the gender gap in entrepreneurship. Men are more likely to be entrepreneurs than women. This gap may stem from disadvantages that women face more in entrepreneurship, such as the lack of access to financial resources, training, information, and social support (Vossenberg, 2013). Besides, women tend to face discrimination that roots back to the traditional view of gender roles, with women being responsible for taking care of their family and household while men provide for the family through external work (Vinnicombe & Singh, 2002). The current study shows that the gender gap in entrepreneurship can already be identified as early as university-level, which is evident in female students' lower entrepreneurial intentions and more adverse reaction toward the COVID-19 pandemic concerning entrepreneurship relative to male students.

5.2 Limitations & Suggestions

The limitations of this study lie in its external validity. Firstly, the respondents are all university students, which implies that the findings may not apply to non-students or students pursuing lower education levels. Moreover, the data only covers the Netherlands, Belgium, and Portugal, which means that students from other countries, especially those with highly different country-level characteristics, may not exhibit the same tendencies as this study's respondents. Further, the scope of the study is limited to subclinical psychopathy, meaning that students are not clinically diagnosed with psychopathy but merely show more or fewer psychopathy traits, whereas other similar disorders may provide useful insights like clinical psychopathy, narcissism, and Machiavellianism. Finally, due to the lack of data on genetic and environmental factors, the controls included in this study are very limited, only including gender, age, and country. Meanwhile, differing psychopathy levels may be driven by other genetic factors that are not captured by age and gender (Tiihonen et al., 2020), or other environmental factors

aside from one's country of study (Patrick, 2005). Entrepreneurial intentions may also depend on factors like early education or university major in entrepreneurship (Huber et al., 2014; Kolvereid & Moen, 1997).

For future research, it may be useful to look into the entrepreneurial intention of students from other countries, which may serve as a comparison point to this study. For instance, future studies could observe students in countries that undergo worse COVID-19 circumstances than the countries included in this study, where financial support in sustaining businesses may be less available. Another group of subjects to observe may be non-students with differing occupations or industries, which would allow for comparisons between the occupation groups or industries. Other extreme personality disorders may also be explored relating to this topic, with which the outcomes of this study can be contrasted. For example, future studies can look into clinical psychopathy, Machiavellianism, or narcissism. In addition, future studies may design the data collection to include more genetic characteristics and educational background, such that the unknown covariates incorporated in this study can be controlled for in the upcoming studies.

5.3 Conclusion

The study confirms that generally, students with higher levels of psychopathy traits have higher intentions of starting a business in the future. However, there is no evidence of an association between psychopathy levels and entrepreneurial intention change, business risk perception, and business opportunity perception during the COVID-19 pandemic. It appears that the COVID-19 pandemic similarly affects students with higher and lower levels of psychopathy traits concerning their entrepreneurial attitudes, although the inclusion of more control variables might have shifted the results of the study. Therefore, it is imperative that future studies with improved data collection procedures and statistical methods are conducted on this particular topic.

6. Appendices

Appendix A

Frequency of responses for the entrepreneurship indicators

Figure A1

Responses to the statement "I have a strong intention to start a firm someday"

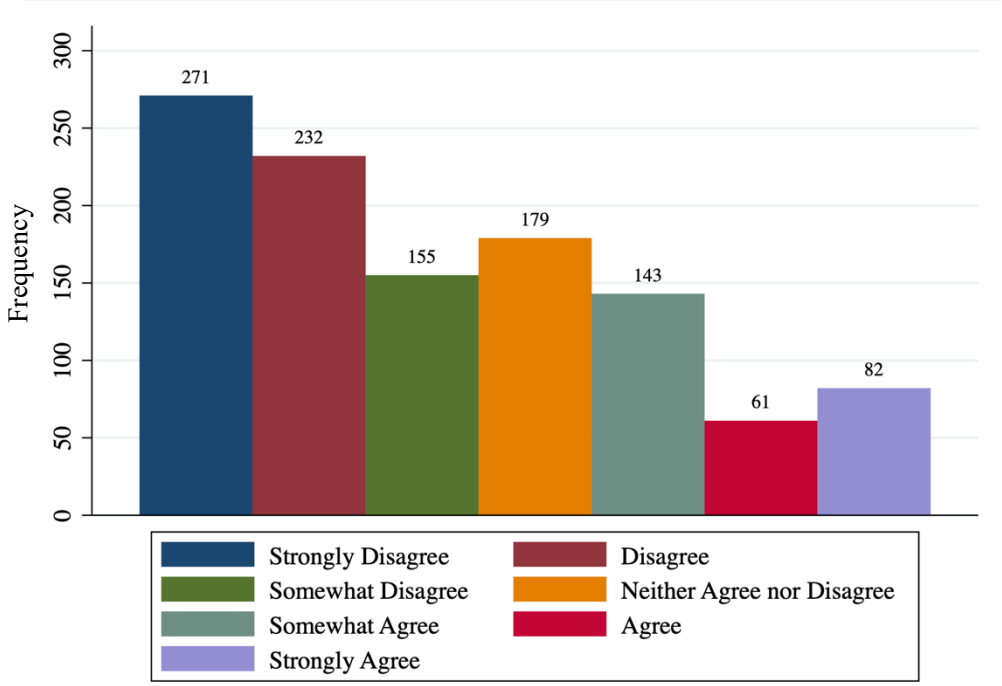


Figure A2

Responses to the question "During the past two months, did your intention of starting your own firm change in a positive or negative way?"

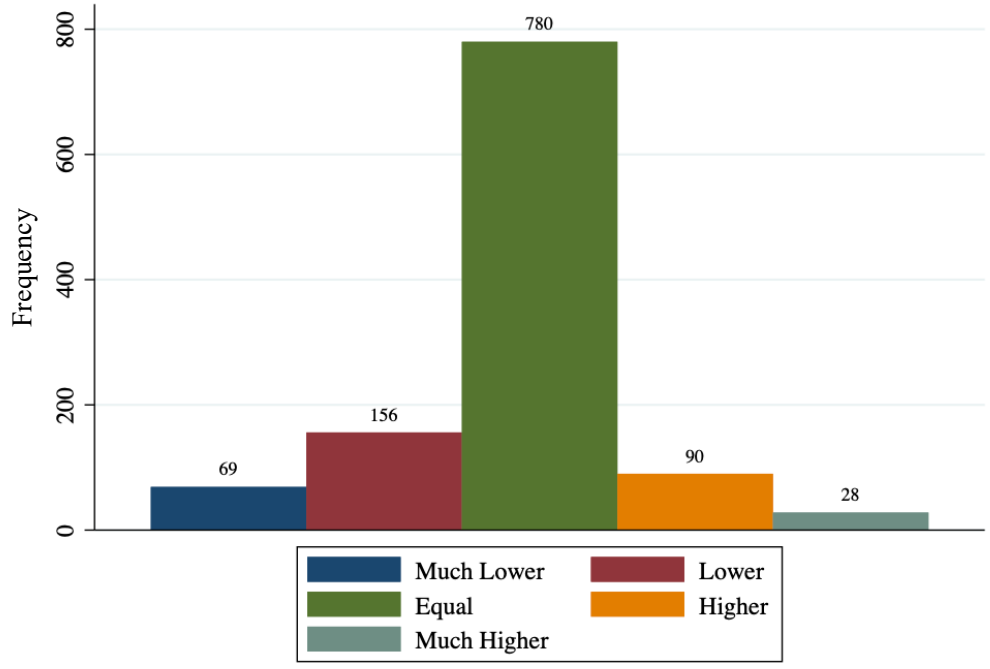


Figure A3

Responses to the question "During the past months, did your perception of the risks associated with starting your own firm change in a positive or negative way? I perceive the risk to be:"

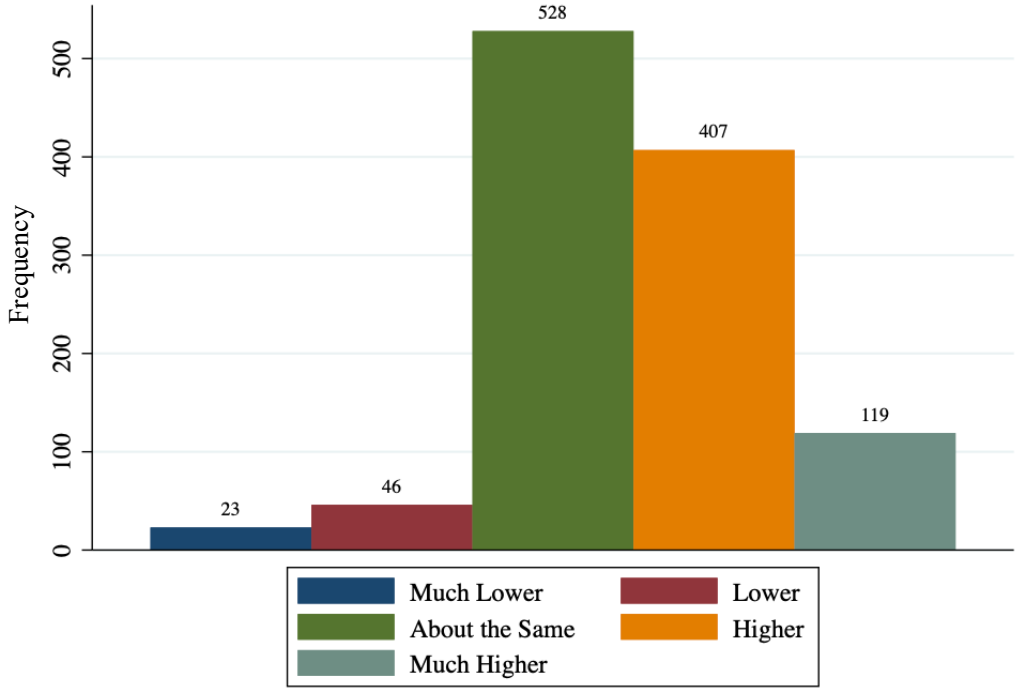
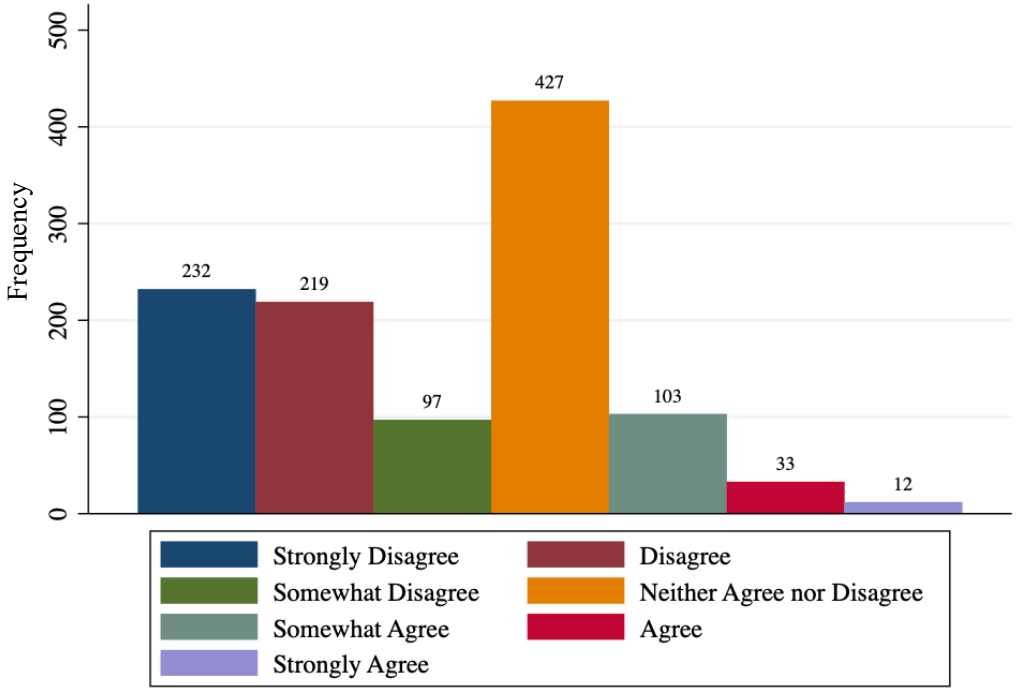


Figure A4

Responses to the statement "During the current coronavirus crisis, I perceived opportunities to launch my own project or start my own business, now or after I graduate"



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