


RESEARCH ARTICLE

# Bright or dark, vain or villainous? How entrepreneurial fitness, Machiavellianism and narcissism relate to entrepreneurial intention

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## Abstract

This study investigates antecedents of entrepreneurial intentions of young adults, the next generation of entrepreneurs. We determine whether aspiring entrepreneurs' positive and dark traits relate to entrepreneurial intentions. Results indicated that entrepreneurial fitness, a second-order construct comprised of multiple positive and bright traits, positively relates to entrepreneurial intention, while the dark traits of Machiavellianism and narcissism differentially relate to entrepreneurial fitness and intention. Narcissism positively relates to entrepreneurial fitness and intention both directly and indirectly. Though Machiavellianism positively and directly relates to entrepreneurial intention, it also negatively and indirectly relates to intention through a negative relationship with entrepreneurial fitness. However, overall, entrepreneurial fitness positively relates with entrepreneurial intention. Findings extend the core model of entrepreneurial intention by concurrently illuminating the adaptive and maladaptive aspects of the dark side of narcissism and Machiavellianism with the bright, positive antecedents of entrepreneurial intention with entrepreneurial fitness. Theoretical and practical implications are discussed.

**Keywords:** Dark personality traits; entrepreneurial fitness; entrepreneurial intention; entrepreneurial self-efficacy

## Introduction

From prior research, we know that entrepreneurial intention predicts entrepreneurial activity and leads to entrepreneurial behaviour (Zaremohzzabieh, Ahrari, Krauss, Samah, Meng, & Ariffin, 2019). The entrepreneurship literature generally portrays antecedents of entrepreneurial intention such as *proactive personality* (Hu, Wang, Zhang, & Bin, 2018), *improvisational behaviour* (Hmieleski & Corbett, 2006), *entrepreneurial self-efficacy* (Piperopoulos & Dimov, 2015), *resilience* (Bullough, Renko, & Myatt, 2014) and *grit* (Butz, Hanson, Schultz, & Warzynski, 2018) in a positive or 'bright' light. Self-efficacy, resilience and perseverance, vital to entrepreneurial action, are typically portrayed as positive and productive entrepreneurial competencies (Morris, Webb, Fu, & Singhal, 2013).

However, an unresolved issue is the directionality and relative influence of the individual dark traits known as narcissism and Machiavellianism on entrepreneurial intention, and ultimately behaviour. Those with Machiavellian tendencies exert dark traits by manipulating and controlling behaviours and acting in their self-interest in their quest to manipulate situations, including within entrepreneurial ventures, to their advantage. Narcissistic individuals who are preoccupied with image and success may exhibit their traits in both positive and negative ways as they launch new ventures. Their self-confidence may serve them well or be interpreted as overconfidence.

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Dark traits, generally viewed as maladaptive, are sometimes adaptive at subclinical levels and lead to positive outcomes (Campbell & Campbell, 2009). Machiavellian and narcissistic characteristics may foster entrepreneurial intention in relatively small doses. Whether or not there is an adaptive amount of narcissism and Machiavellianism, particularly in nascent entrepreneurs forming their entrepreneurial intentions, is largely unknown, representing a gap in the literature.

Exploring this complex pattern of bright and dark traits is important to better understand antecedents of entrepreneurial intention that lead to entrepreneurial behaviour. The assumption that intention leads to behaviour is based on the theory of planned behaviour (TPB; Ajzen, 1991), a well-established theoretical framework to predict how entrepreneurial intention leads to behaviour (see Schlaegel & Koenig, 2014 for a review). Predominately, existing literature focuses on how those antecedents explain entrepreneurial intention and behaviour in a positive way, rather than exploring the influence of the dark side. There is less literature (McLarty, Skorodzyevskiy, & Muldoon, 2021) relating the dark side of entrepreneurial aspirations and intentions, particularly in emerging adults, with little exploration of the combination of both positive and negative aspects of those antecedents – to the best of our knowledge, only four empirical studies explore both (Furnham, Hyde, & Trickey, 2014; Hirschfeld & Van Scotter, 2019; Jonason, Webster, Schmitt, Li, & Crysel, 2012; LeBreton, Shiverdecker, & Grimaldi, 2018). No studies consider both positive and dark traits associated with the formation of entrepreneurial intention in emerging entrepreneurs, while we focus on both positive and detrimental aspects of these traits.

A recent meta-analysis (Brownell, McMullen, & O'Boyle, 2021) suggests that the relationship between dark traits and entrepreneurial intention are likely more complex than extant literature currently shows. Thus, we address these issues by investigating the degree to which the complex and nuanced relationships of stereotypically negative dark traits (Machiavellianism and narcissism) are associated with positive bright traits (entrepreneurial self-efficacy, proactive personality, improvisational personality, grit and resilience) to influence entrepreneurial intention. Within TPB, attitudes, social norms and perceived behavioural control (PBC) predict intention. While social norms and attitudes are well-established in the entrepreneurial literature, PBC is not as well understood (see Schlaegel & Koenig, 2014). The latter, PBC, is comprised of both (1) self-efficacy and (2) control. Moreover, entrepreneurial self-efficacy functions together with other well-known antecedents of entrepreneurial intention in the literature (see van Gelderen, Brand, van Praag, Bodewes, Poutsma, & van Gils, 2008) needed to launch nascent entrepreneurs.

Specifically, we first utilise the TPB in the entrepreneurial context to predict entrepreneurial intention and consider how entrepreneurial self-efficacy operates together with other positive, bright antecedents of entrepreneurial intentions. Through our structural equation modelling, we capture elements of PBC, specifying a second-order factor that incorporates both entrepreneurial self-efficacy, along with bright traits of proactive personality, grit effort, improvisational behaviour and resilience foundational to building entrepreneurial intention. This work enables us to collectively account for these positive antecedents of entrepreneurial intention, through a novel higher-order construct, coined *entrepreneurial fitness*. Next, we incorporate the influence of 'dark' individual differences while unpacking both the negative and – counterintuitively – positive influences of the dark traits of narcissism and Machiavellianism on both entrepreneurial fitness and entrepreneurial intention. A novel contribution of our study is modelling the simultaneous influence of adaptive and maladaptive manifestations of dark traits in concert with known antecedents of entrepreneurial intention. Our primary theoretical contribution is to extend the core entrepreneurial intention model through the TPB lens (Liñán & Fayolle, 2015) by bringing together established positive, bright variables of entrepreneurial intentions together as a novel second-order construct – entrepreneurial fitness – while simultaneously investigating both the adaptive and maladaptive qualities of narcissism and Machiavellianism. Delving deeper into complex expressions of perceived behavioural control exerted through patterns of dark and bright individual differences expands the application of the TPB in understanding entrepreneurial intention which goes beyond current studies (McLarty, Skorodzyevskiy,

& Muldoon, 2021) that focus either on the dark or the bright side but not a concurrent analysis of these dialectical expression of traits.

## Review of theory and hypothesis development

### *Entrepreneurial intentions*

Numerous studies identify entrepreneurial intention as a key antecedent of entrepreneurial actions (Krueger, Reilly, & Carsrud, 2000; Lee, Wong, Foo, & Leung, 2011), and the relationship between entrepreneurial intention and behaviour is well-documented in various domains from psychology (Hagger & Chatzisarantis, 2005) to entrepreneurship (Bird, 1988, 1992; Kautonen, Gelderen, & Fink, 2015; Krueger, Reilly, & Carsrud, 2000; Schlaegel & Koenig, 2014; Shapero & Sokol, 1982; Zhao, Seibert, & Lumpkin, 2010). Liñán and Fayolle (2015) introduced the core entrepreneurial intention model in a systematic literature review that investigated self-efficacy as a motivational antecedent of entrepreneurial intentions. They identified research that focused on measuring TPB constructs, as well as measurement of entrepreneurial intention (Thompson, 2009) and found that self-efficacy, along with proclivity for improvisation (Hmieleski & Corbett, 2006), results in entrepreneurial intention. Following the core entrepreneurial intention model, we approach our research through the lens of TPB to predict behavioural intentions, an individual's estimate of how likely s/he will achieve a behaviour (Ajzen, 1991; Ajzen & Fishbein, 1977) and utilise improvisational behaviour, grit, proactiveness and resilience as proxies for PBC in line with past research (see van Gelderen et al., 2008).

### *Bright predictors of entrepreneurial intention: towards entrepreneurial fitness*

Fundamental to TPB is an individual's belief system and how perceptions of those beliefs form attitudes towards behaviour, social norms and the control to move from intention to behaviour (Ajzen, 1991). An important assumption is that achieving behaviour depends on both the motivation (intention) and ability to carry out the behaviour (behavioural control). This is consistent with the entrepreneurship literature indicating that *willingness* and *capability* are key to entrepreneurial intention (van Gelderen et al., 2008). From the TPB perspective, essential components are (1) self-efficacy – the specific abilities and capacities to engage in behaviour and (2) perceived controllability – the extent of believed control directed positively towards intention and ultimately behaviour (Ajzen, 2002; Hagger & Chatzisarantis, 2005). Entrepreneurial self-efficacy (Newman, Obschonka, Schwarz, Cohen, & Nielsen, 2019) and PBC (van Gelderen et al., 2008) are core to entrepreneurial intention and PBC considers how *perception* of behavioural control leads to intention and later actions (Ajzen, 1991).

Perceived controllability suggests that individuals possess the ability to achieve a desired behaviour, where some entrepreneurial competencies stem from internal psychological resources that enable individuals to achieve goal-directed behaviour while others are acquired in the entrepreneurial experience (Morris et al., 2013). Collectively, pre-existing internal psychological resources represent human capital stemming from habitual individual characteristics, education and lived experience that grow into competencies. Morris et al. (2013) identified entrepreneurial competencies – fundamental to entrepreneurial action – using a multi-round Delphi study of successful entrepreneurs including self-efficacy in the entrepreneurial context along with proactive opportunity pursuit, tenacity/perseverance, resilience and resourcefulness with the latter traits tapping into control and self-regulatory capabilities needed for successful entrepreneurship. Importantly, these capabilities are viewed as internal resources transferable into entrepreneurship from one's life experiences. Together, entrepreneurial self-efficacy and perceived controllability represent a pool of resources that individuals possess to engender entrepreneurial intention and later behaviour.

*Building on entrepreneurial self-efficacy towards entrepreneurial fitness*

*Entrepreneurial self-efficacy* is a well-established predictor of entrepreneurial intentions (Zhao, Seibert, & Hills, 2005). TPB suggests that self-efficacy is specific towards a behaviour of interest, in this case entrepreneurship. The construct of entrepreneurial self-efficacy refers to belief in the ability to perform entrepreneurial tasks and activities (Chen, Greene, & Crick, 1998; Wilson, Kickul, & Marlino, 2007) and influences the willingness to engage in future entrepreneurial behaviour. Most existing studies demonstrate the positive relationship between entrepreneurial self-efficacy and entrepreneurial intentions (Chen, Greene, & Crick, 1998; Liñán & Chen, 2009; Zhao, Seibert, & Hills, 2005). Though entrepreneurial self-efficacy is a well-established and fundamental predictor of entrepreneurial intention, the results of a meta-analysis show that within TPB, the largest effect size for the relationship between any of the antecedents of entrepreneurial intention is PBC (Schlaegel & Koenig, 2014) warranting further investigation of PBC. Thus, we proceed to examine the proxies for PBC, namely proactiveness, improvisation, resilience and grit in the following sections.

*Proactiveness* as a personality style involves taking initiative towards action while being unfazed by potential challenges. Proactive individuals seize opportunities and act on them causing change in a meaningful way (Crant, 1996). Those with proactive personality styles initiate and maintain actions (Bateman & Crant, 1993) in an entrepreneurial context (Shapero & Sokol, 1982). Further, they overcome challenges posed by situational forces and effect change in their external environment by proactively challenging the status quo (Bateman & Crant, 1993). Proactive personality traits suggest that, if young adults desire to start their own ventures, they will identify opportunities and make the changes necessary in their external environments to facilitate the launch of ventures (Hu et al., 2018).

*Improvisation* is a key component of the entrepreneurial process and is particularly important when entrepreneurs do not control needed resources (Baker, Miner, & Eesley, 2003; Hmieleski & Corbett, 2006, 2008). Entrepreneurship requires improvisational behaviour along the entrepreneurial journey in launching and transforming ventures (Morris, Kuratko, Schindehutte, & Spivack, 2012) beginning with intention. Importantly, improvisation blends both planned and emergent behaviour (Hmieleski & Corbett, 2008).

*Resilience* is the ability to persevere and function in a purposeful manner despite facing challenges (Tedeschi & Calhoun, 2004) and is beneficial in the entrepreneurship context (Bullough, Renko, & Myatt, 2014). Resilient individuals confidently act under uncertainty and adversity in their entrepreneurial action (Bullough & Renko, 2013; Bullough, Renko, & Myatt, 2014). This leads us to expect that individuals with a resilient coping style have the perceived control to move towards their entrepreneurial intention.

*Grit* is conceptually consistent with perseverance, focusing attention and tenacity towards long-term goals (Duckworth & Quinn, 2009; Duckworth, Peterson, Matthews, & Kelly, 2007; c.f., Morris et al., 2013). Individuals with grit pursue intentions and goals by investing consistent effort. Grit represents forward-looking effort and exerts influence on entrepreneurship, as suggested by Nambisan and Baron (2013), as a self-regulatory process while striving towards achieving long-term entrepreneurial goals despite setbacks. Grit predicts entrepreneurial intentions in young adults (Butz et al., 2018) and is closely related to tenacity/perseverance, an entrepreneurial competency (Morris et al., 2013).

In summary, we identified the following individual differences in emerging entrepreneurs that are both supported by existing literature as predictors of entrepreneurial intention (van Gelderen et al., 2008) and align with practical entrepreneurial competencies (Morris et al., 2013). These include entrepreneurial self-efficacy (Piperopoulos & Dimov, 2015; Trevelyan, 2011), proactive personality (Hu et al., 2018), improvisational behaviour (Morris et al., 2012), resilience (Morris et al., 2013) and grit (Butz et al., 2018). Importantly, these individual differences represent perceived controllability. When combined with entrepreneurial self-efficacy, these individual characteristics represent a readiness for entrepreneurship.

Drawing on these PBC components of TPB, we introduce a higher-order construct called ‘entrepreneurial fitness’ comprised of (1) entrepreneurial self-efficacy and (2) individual habitual characteristics (proactive personality, improvisational behaviour, resilient coping and grit). Entrepreneurial fitness is rooted in TPB by capturing the essence of PBC of emerging entrepreneurs in their (1) self-efficacy and (2) perceived control over goal-directed behaviour as individuals develop entrepreneurial intentions. Specifically, we define entrepreneurial fitness as suitability towards entrepreneurial intention comprised of entrepreneurial self-efficacy and bolstered by positive individual attributes towards entrepreneurial action, including proactiveness, improvisation, resiliency and grit. Individuals with entrepreneurial self-efficacy exert control over their entrepreneurial intention tapping into these bright characteristics. These individuals are fit for entrepreneurship as they possess the characteristics to suitably engage in a specific behaviour – entrepreneurship. Functioning together, the elements of entrepreneurial fitness, namely entrepreneurial self-efficacy and perceived controllability (proactive personality, improvisational behaviour, resilient coping style and effortful grit), should positively relate to entrepreneurial intention as stated in the following hypothesis:

**Hypothesis 1:** Entrepreneurial fitness is positively related to entrepreneurial intention.

### ***Dark personality traits as predictors of entrepreneurial fitness and intention***

As we seek to understand both adaptive and maladaptive features of the dark traits, we specifically focus on Machiavellianism and narcissism as the least maladaptive personality styles in the dark triad that also includes psychopathy (c.f., Barry, 2011; McHoskey, 1995). Dark personality styles mould an individual’s attitudes, perceptions of social norms and PBC (Kautonen, Gelderen, & Fink, 2015; McLarty, Skorodziyevskiy, & Muldoon, 2021; Schlaegel & Koenig, 2014). Though generally viewed as negative traits, some dark-side traits at subclinical levels are adaptive in entrepreneurship (Wu, Wang, Zheng, & Wu, 2019). Thus, we explore both the dark and bright side of Machiavellianism and narcissism on entrepreneurial fitness and intention.

#### *Machiavellianism*

The more sinister of the dark personality styles in our study, Machiavellians like to control and manipulate others to their own ends. However, they may lack the personal agency as a brighter prerequisite of entrepreneurial fitness. They may be callous regarding the welfare of others, care little about their well-being, consider the opportunity to manipulate and use others and later discard them (Azizli et al., 2016). Machiavellian traits are related to deviant behaviours such as deception and workplace bullying (Valentine, Hanson, & Fleischman, 2017). Rather than possessing the agency towards a positive behaviour, Machiavellians rely on manipulating and seeking control over others (Dahling, Whitaker, & Levy, 2009). Entrepreneurial fitness requires flexibility, adaptability and improvisational behaviour within their internal resources and interpersonal skills, which may not align with Machiavellianism, notorious for a rigid desire to control others along with low emotional intelligence and empathy (Jones & Paulhus, 2009). Individuals with Machiavellian traits manifest short-term thinking (Jonason et al., 2012) that is antithetical to grit. Taken together, these Machiavellian tendencies stand in the way of entrepreneurial fitness as offered in the following hypothesis:

**Hypothesis 2:** Machiavellianism is negatively related to entrepreneurial fitness.

While the characteristics of Machiavellianism may not lead to entrepreneurial fitness among young adults, these dark traits may spark interest in aspects of entrepreneurship and increase levels of entrepreneurial intention. Individuals exhibiting Machiavellian tendencies are typically cynical and do not believe that others care about their well-being (Zettler & Solga, 2013),

which may not mesh well with a traditional career. There are mixed findings in the literature, as Hmieleski and Lerner (2016) previously found Machiavellianism to be unrelated to entrepreneurial intention, while Wu *et al.* (2019) found Machiavellianism positively correlated with entrepreneurial intentions in a Chinese context. Entrepreneurship provides an opportunity to manipulate others in the quest for wealth and power to achieve personal goals for Machiavellians. Young adults may consider entrepreneurship as a potential career choice with their self-interest at the forefront. Thus, the following hypothesis is presented:

**Hypothesis 3:** Machiavellianism is positively related to entrepreneurial intention.

Machiavellianism is complex and thus we expect complex relationships to emerge related to entrepreneurial fitness and intention. Overall, the characteristics of Machiavellianism are not expected to predispose individuals towards entrepreneurial fitness. As entrepreneurial fitness requires self-efficacy towards behaviour, those with Machiavellian traits may fall short as they rely on manipulating others to execute behaviours. An improvisational style is typified by the ability to adapt and change course to get to a goal. Though Machiavellians develop a plan to manipulate in a sinister way, they may have difficulties improvising and changing course in the moment (Zettler & Solga, 2013). Grit effort is consistent with long-term commitment towards a goal; those with Machiavellian characteristics may be attracted to maximizing personal gain and short-term profits, while entrepreneurship involves self-regulation and delayed gratification. As we look through the theoretical lens of PBC to explain entrepreneurial intention, we expect that self-efficacy may be lacking in relation to a Machiavellian's own agency towards the behaviour. In terms of perceived controllability, it is more complicated, as we would expect that those with Machiavellian traits would exert control towards entrepreneurial behaviour more indirectly by manipulating others. In the short-term, at the stage of emerging entrepreneurial intention, Machiavellianism is expected to be positively related to entrepreneurial intention while functioning indirectly through entrepreneurial fitness in a negative way. The following hypothesis is proposed:

**Hypothesis 4:** Machiavellianism is positively and directly related to entrepreneurial intention, but it is also negatively and indirectly related to intention as it functions through entrepreneurial fitness.

#### *Narcissism*

Entrepreneurs score higher than other vocational groups on narcissism (Mathieu & St-Jean, 2013). Particularly at subclinical levels, narcissism is beneficial when it results in healthy levels of self-confidence and self-efficacy (Barry, Frick, Adler, & Grafeman, 2007). Key features of narcissism are self-centeredness and continually seeking the attention and admiration of others proactively (Twenge, Konrath, Foster, Campbell, & Bushman, 2008), and this proactiveness likely occurs across life domains including entrepreneurship. Narcissistic individuals tend to be charismatic, persuading others to adopt their plans (Levy, 2012) in a way that is associated with proactiveness and being skilled at acquiring resources, which is typified by the improvisational behaviour needed in entrepreneurship. A narcissistic personality style contributes to self-confidence and the perceived entrepreneurial self-efficacy needed to initiate a venture (McLarty, Skorodzievskiy, & Muldoon, 2021). The following hypothesis is therefore presented:

**Hypothesis 5:** Narcissism is positively related to entrepreneurial fitness.

Narcissism is characterised by an attitude of grandiosity, entitlement and superiority over others (Paulhus & Williams, 2002). Entrepreneurship is viewed as a 'sexy' vocational choice (Hmieleski & Lerner, 2016), which is a social normative factor and potentially attractive to those who desire



adoration as successful entrepreneurs. As entrepreneurial leaders, those with narcissistic traits can be liked, admired, respected and complimented, thus feeding their egos (McLarty, Skorodzievskiy, & Muldoon, 2021). Enabling characteristics that build efficacy expectancies are a sense of entitlement, excessive self-esteem and an expectation of success. Intending to launch a new venture is a way to show their superiority and feed their ego (McLarty, Skorodzievskiy, & Muldoon, 2021).

The mystique of entrepreneurship portrays it as a wealth-generating means to rise in societal ranks (Hmieleski & Lerner, 2016), which aligns with the attitude of an entrepreneur. Entrepreneurship may offer a means to express narcissistic personality tendencies (Hmieleski & Lerner, 2016). For some individuals, entrepreneurship is viewed as high-profile and aspirational and research indicates that young adults perceive that launching ventures may result in exciting and desirable work outcomes (Brenner, Pringle, & Greenhaus, 1991). Taken together, these attitudes, social normative factors and control beliefs are expected to prompt entrepreneurial intentions. Consequently, the following hypothesis is presented:

**Hypothesis 6:** Narcissism is positively related to entrepreneurial intentions.

Of the two dark traits we investigated, narcissism is viewed as more adaptive than Machiavellianism (Rauthmann & Kolar, 2012), so we expected individuals with subclinical levels of narcissism to be the most likely of the dark triad to positively influence entrepreneurial fitness and entrepreneurial intention. Individuals with a narcissistic personality style fantasise about fame and power (Raskin & Novacek, 1991), and this attitude may lead them towards entrepreneurial intention. Personality traits enhance the understanding of entrepreneurial intention, and past research has assumed long-standing personality styles are mediated by components of TPB (e.g., entrepreneurial self-efficacy) on entrepreneurial intention (van Gelderen et al., 2008). Thus, entrepreneurship is proposed as congruent with the narcissistic traits of young adults in their entrepreneurial fitness and formation of entrepreneurial intentions. Thus, the following hypothesis is offered:

**Hypothesis 7:** Narcissism is positively and directly related to entrepreneurial intention and positively and indirectly related to intention as it functions through entrepreneurial fitness.

## Method

### Data collection

Data collection was conducted online, and participants were free to complete the questionnaire at a time and place that was convenient for them. Individuals were young adults enrolled at a mid-western university in the USA taking a required prerequisite undergraduate business class for all majors in a college of business. The questionnaire was completed by mostly junior-level/upper-division undergraduate students, but a few graduate students also completed it. Potential participants were offered extra course credit for participation and were informed that the survey was optional. An alternative course activity was made available for those who did not want to participate in the survey but wanted the extra credit.

Overall, 555 participants participated in survey procedures. However, not all respondents completed the full questionnaire, and 24 cases with extensive missing data were removed from the data set, which resulted in a final usable sample of 531 participants. Although not all participants provided a complete response, all cases were retained for analysis whenever possible. Incomplete responses were addressed using pairwise deletion. The sample consisted of 355 males (68.7%), 160 females (30.9%) and two individuals who indicated other (.4%) who had a mean age of 21.93 years. A total of 90.9% of individuals were full-time students, while 9.1% were part-time students. For class rank, three identified as freshmen (.6%), 95 as sophomores (18.3%), 192 as

juniors (36.9%), 213 as seniors (41.0%) and 17 as graduate students (3.3%). The sample was 84.7% White/Caucasian, 7.3% Asian American/Asian, 3.4% African American/Black, 2.6% Mexican American/Chicano and <2% other represented ethnicities. With regard to professional experiences, 69.8% of individuals were currently working with an average of 4.66 years of work experience and an average of 21.78 h per week. A total of 19.9% had start-up business experience and 75.1% personally knew someone in their inner circle (i.e., family and close friends) who started a business.

Since the purpose of this study was to identify individual differences related to the entrepreneurial intentions of aspiring entrepreneurs, gathering opinions of young adults, many of whom had work experience and familiarity with small business, was an appropriate sampling strategy. However, use of a student sample may raise concerns about external validity. Despite this limitation, it is often noted that such convenience samples played a long historical, important and common role in the development of social science research (Compeau, Marcolin, Kelley, & Higgins, 2012; Peterson & Merunka, 2014).

For the current study, concerns about validity are warranted, but we argue that they do not invalidate our findings because student samples are useful and appropriate when such individuals are part of the population of interest and external validity is not a primary research goal (Compeau *et al.*, 2012). Student participants are a direct subset of the individuals of the larger population whose characteristics are estimated. There are examples of this in studies in marketing (Megehee, 2009) and business ethics, where the connection between the sample of students was justified because 'business students are assumed to be tomorrow's business executives' (Ahmed, Chung, & Eichenseher, 2003: 95–96). Similarly, since our study's participants were drawn from a prerequisite class for all business majors in the university, we view the sample as representative of the larger group of individuals who would consider entrepreneurship as a career choice.

Regarding external validity, we recognise that the sample chosen may not be ideal to generalise to established entrepreneurs, but that is also tempered by our study's goal of examining potential effects on entrepreneurial intentions, rather than predicting how any larger population might behave. Mook (1983) argued that broad generalisability may not necessarily be important when the goal of a study is to help build an understanding of a phenomenon of interest (see also Compeau *et al.*, 2012, for discussion of this goal). Interesting examples of this approach to using student samples include research on corporate crime (Piquero, 2012). Going beyond this goal will depend on further study and empirical replication of results (Peterson & Merunka, 2014).

### **Measures**

Numerous measures from past research were used in this investigation. In some cases, measures were revised based on factor analytic findings. In addition, varying Likert-type scales were used to evaluate items given that it is common practice in studies published in high-quality journals to utilize measures with varying scales in the same analysis without standardizing item scores (e.g., the individual difference studies Detert, Treviño, & Sweitzer, 2008; Moore, Detert, Treviño, Baker, & Mayer, 2012; Tasa & Bell, 2017). While standardisation could affect  $\beta$  coefficients, it does not generally affect significance levels/*p* values as part of hypothesis testing, which was the main purpose of this investigation, rather than evaluating effect sizes.

#### *Machiavellianism*

The MACH-IV (Christie & Geis, 1970), a 20-item scale derived from preliminary 71 items, measured Machiavellian tendencies. The scale consists of three subscales: (1) interpersonal tactics; (2) views of human nature; and (3) abstract or generalised morality. A sample item is 'Anyone who completely trusts anyone else is asking for trouble'. Responses were provided on a 6-point scale, ranging from 'strongly disagree' (coded as 1) to 'strongly agree' (coded as 6). An initial factor



analysis<sup>1</sup> produced a five-factor solution with initial eigenvalues above 1.000, variance explained scores >5.000% and varied factor loadings across the different dimensions. Eight items from the interpersonal tactics and views of human nature dimensions that loaded on the first factor with values  $\geq .53$  had an initial eigenvalue of 3.60, and explained 18.01% of variance were retained in the model. This revised model yielded a single-factor solution with an initial eigenvalue of 3.10, 38.75% of explained variance and factor loadings  $\geq .56$ . Item scores were averages so that higher composite values indicated increased Machiavellianism ( $\alpha = .77$ ).

#### *Narcissism*

A 16-item version of the Narcissistic Personality Inventory (NPI-16; Ames, Rose, & Anderson, 2006) measured individual narcissism. Each item presents two opposing statements. A sample item is 'I really like to be the center of attention...It makes me uncomfortable to be the center of attention'. The narcissistic statements were coded as 1, while non-narcissistic statements were coded as 0. Item values were added together with total scores ranging from 0 to 16, with higher scores representing increased narcissism.

#### *Proactive personality*

Proactive personality was measured by a 17-item scale (Bateman & Crant, 1993). A sample item is 'I am constantly on the lookout for new ways to improve my life'. Responses were provided on a 7-point scale ranging from strongly disagree (coded as 1) to strongly agree (coded as 7). An initial factor analysis of items produced a three-factor solution with initial eigenvalues above 1, variance explained scores higher than 6% and varied factor loadings across different dimensions. Six items loaded on the first factor with values above .600, a factor with an initial eigenvalue of 7.84 and explained variance score of 46.14%, were retained in the model. The revised model yielded a single-factor solution with an eigenvalue of 3.53, 58.88% of explained variance and factor loadings  $> .710$ . Consequently, items were averaged, with higher scores indicating increased proactive personality ( $\alpha = .86$ ).

#### *Improvisational behaviour*

A 12-item scale measured improvisational behaviour (Hmieleski & Corbett, 2006). An example item is: 'I improvise solutions to problems'. Respondents rated their level of agreement using a 7-point Likert-type scale ranging from 1 = strongly disagree to 7 = strongly agree. An initial factor analysis of the items resulted in two factors with initial eigenvalues of 6.15 and 1.02, explained variance scores of 51.24% and 8.47%, and multiple cross-loadings across two dimensions. A revised factor model constrained to one factor was specified, yielding an initial eigenvalue of 6.15, 51.24% of explained variance and factor loadings  $> .590$ . These findings suggested that all 12 items be retained, so item scores were averaged with higher overall values indicating increased improvisational behaviour ( $\alpha = .91$ ).

#### *Entrepreneurial self-efficacy*

Entrepreneurial self-efficacy was measured with a six-item scale (Wilson, Kickul, & Marlino, 2007). Respondents were asked to compare themselves 'to relevant peers such as classmates or coworkers' while evaluating competencies related to entrepreneurial success including problem-solving, money management, creativity, garnering agreement from others, leadership and decision-making. An initial factor analysis of the items produced a single-factor solution with an eigenvalue of 2.63 and 43.85% of explained variance, but the second and third items had loadings of .33 and .51, respectively. After deleting these two items, the revised model yielded a single-factor solution with an initial eigenvalue of 2.38, 59.38% of explained variance and factor

<sup>1</sup>All factor analyses used principal components extraction, varimax rotation (information from rotated component matrixes were reported when rotation used) and pairwise deletion.

loadings greater than a value of .700. Scores for the four items were averaged so that higher overall values indicated increased entrepreneurial self-efficacy among subjects ( $\alpha = .77$ ).

#### *Resilient coping*

Resilient coping was measured with four items from the Brief Resilience Coping Scale (Sinclair & Wallston, 2004). A sample item is 'I look for creative ways to alter difficult situations'. Responses were provided on a 5-point scale that ranged from 1 = strongly disagree to 5 = strongly agree. Factor analysis produced a single-factor solution with an initial eigenvalue of 2.27, 56.77% of explained variance and factor loadings higher than .700. Item scores were then averaged so that higher overall values indicated increased resilience ( $\alpha = .74$ ).

#### *Grit effort*

The effort dimension of grit, considered a more appropriate measure of fitness than the interest dimension both conceptually and statistically,<sup>2</sup> was measured using six items taken from a 12-item scale (Duckworth *et al.*, 2007). A sample item is 'I finish whatever I begin'. Responses ranged from strongly disagree (coded as 1) to strongly agree (coded as 5). A factor analysis produced a single-factor solution with an initial eigenvalue of 3.22, 53.73% of explained variance and factor loadings higher than .600. The item scores were averaged so that higher overall values indicated increased grit-based effort ( $\alpha = .82$ ).

#### *Entrepreneurial intention*

A 10-item individual entrepreneurial intention scale (Thompson, 2009) was used to measure an individuals' entrepreneurial intentions, the degree to which they planned to start a business in the future. A sample item is 'Intend to set up a company in the future', and items were rated with a 6-point scale that ranged from very untrue (coded as 1) to very true (coded as 6). An initial factor analysis produced a three-factor solution with eigenvalues above 1.00, variance explained scores higher than 10% and varied factor loadings across the different dimensions. The first factor had an initial eigenvalue of 3.34 and an explained variance score of 33.44%, and three items loaded on this factor (without significant cross-loadings) with values  $\geq .730$ . These items were retained in the model, which yielded a single-factor solution with an initial eigenvalue of 2.06, 68.73% of explained variance and factor loadings  $> .800$ . Scores associated with the three items were averaged so that higher values indicated elevated levels of entrepreneurial intention ( $\alpha = .77$ ).

#### *Controls*

Two demographic controls were included in the analysis, including age and gender (coded as 1 = male, 2 = female, 3 = other). Since only two individuals did not identify as either male or female, these two answers were coded as item nonresponse to avoid additional dummy coding and possible overspecification of the statistical models.<sup>3</sup>

#### *Analysis*

Using full information maximum likelihood estimation procedures to estimate means and intercepts for any missing data, a confirmatory factor analysis (CFA) was specified in AMOS to verify measurement properties of the multi-item/multi-construct variable utilised in this study. After

<sup>2</sup>This determination was made based on existing understanding of the construct and preliminary dimensionality assessments.

<sup>3</sup>A 10-item measure of social desirability with dichotomous scoring ('True' coded as 0, 'False' coded as 1) that was appropriately coded and summed to represent increased impression management (see Crowne & Marlowe, 1960; Fischer & Fick, 1993; Strahan & Gerbasi, 1972) was initially included as a control in the analysis. This measure was only weakly correlated with grit and entrepreneurial intentions, and it was unrelated to the focal variables in the structural models, so the measure was not included. However, these initial findings provide a robustness check of the models including age and gender given that the overall findings were similar.

calculating average scores for focal variables, as well as using pairwise deletion to account for missing data, variable descriptive statistics and correlations were then examined in SPSS. Using AMOS again, structural equation modelling was utilised to test the working hypotheses. Finally, mediation analysis was conducted using the PROCESS macro in SPSS to verify findings of the structural equation modelling with a more granular understanding of the mediated relationships between dark traits and entrepreneurial intentions through entrepreneurial fitness. The following section details the specific findings from this analysis.

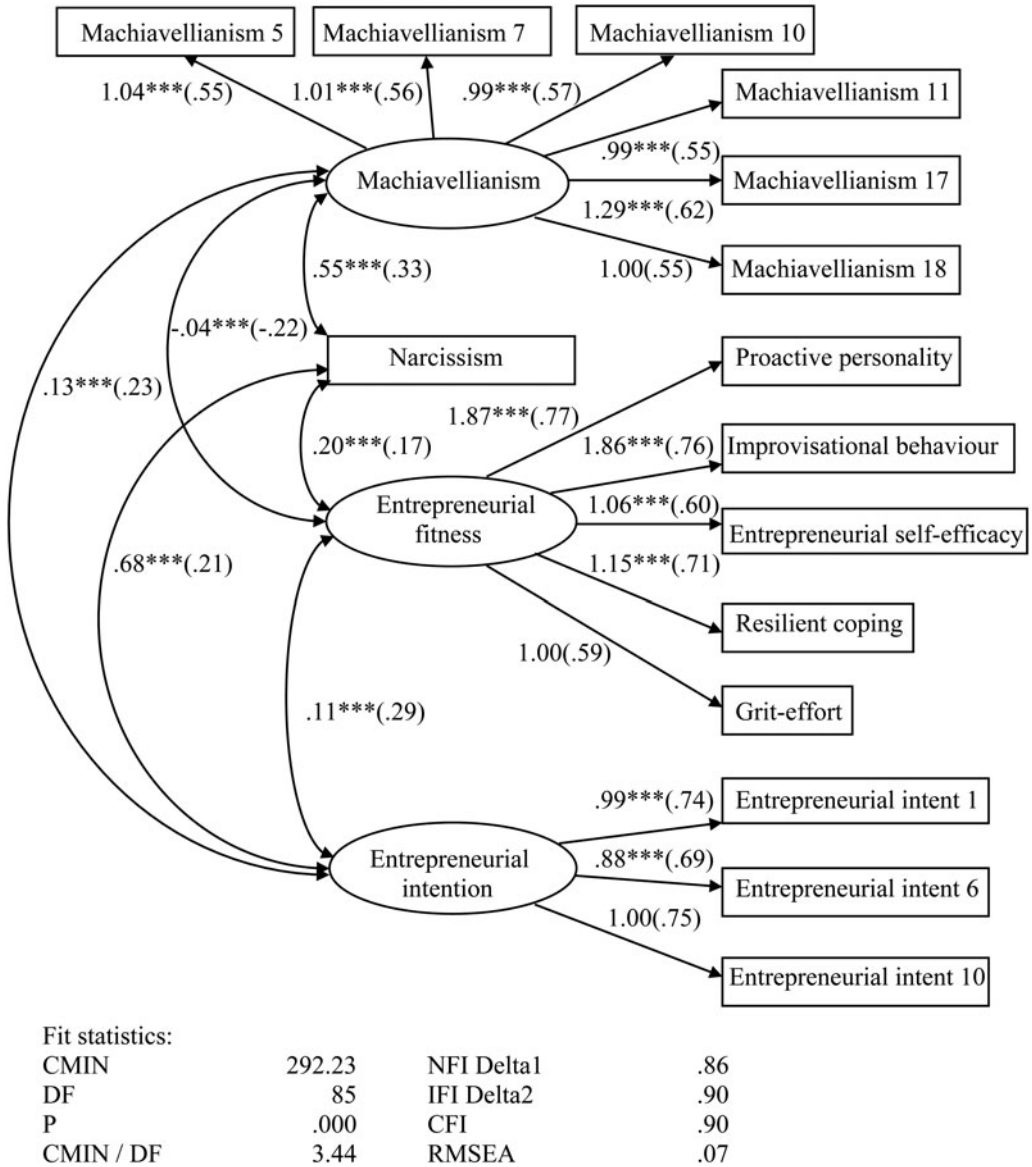
## Results

### Confirmatory factor analysis

An initial CFA was used to determine measurement properties of the scales employed in this investigation. The results indicated that the model had reasonably acceptable but mixed fit statistics: CMIN ( $\text{chi-square}/\chi^2$ ) = 352.09,  $df = 114$ ,  $p < .000$ , CMIN/ $df$  (relative  $\text{chi-square}/\chi^2$ ) = 3.09, NFI Delta1 (normed fit index) = .85, IFI Delta2 (incremental fit index) = .89, CFI (comparative fit index) = .89, RMSEA (root mean square error of approximation) = .06. The observed items/composite variables were positively related to the latent Machiavellianism, entrepreneurial fitness and entrepreneurial intention constructs ( $p < .001$ ), the estimates associated with the means, intercepts and variances were significant ( $p < .001$ ), and the covariances among the focal variables were significant ( $p < .001$  to  $p < .01$ ). However, the first original item of the Machiavellianism scale had a standardised regression weight below .50, so this item was deleted from the model, and a revised CFA was specified.

The results of the revised CFA indicated that the model had slightly improved fit statistics: CMIN = 317.00,  $df = 99$ ,  $p < .001$ , CMIN/ $df$  = 3.20, NFI Delta1 = .86, IFI Delta2 = .90, CFI = .90, RMSEA = .06. Once again, the observed items/composite variables were positively related to the latent focal constructs ( $p < .001$ ), the estimates associated with the means, intercepts and variances were significant ( $p < .001$ ), and the covariances among the focal variables were significant ( $p < .001$  to  $p < .01$ ). However, the third original Machiavellianism item had a standardised regression weight below .50, so this item was deleted, and a second revised CFA was specified.

A summary of the second revised CFA is presented in Figure 1. This model produced acceptable fit statistics, the observed items/composite variables were positively related to the latent Machiavellianism, entrepreneurial fitness and entrepreneurial intention constructs ( $p < .001$ ), and the standardised regression weights were above .50; these findings demonstrated acceptable convergent validity. In addition, all estimates associated with means, intercepts and variances were significant ( $p < .001$ ). The covariances (and correlations) indicated that Machiavellianism and narcissism were positively related ( $p < .001$ ), Machiavellianism was negatively related to entrepreneurial fitness ( $p < .001$ ) and positively related to entrepreneurial intention ( $p < .001$ ), narcissism was positively related to both entrepreneurial fitness ( $p < .001$ ) and intention ( $p < .001$ ), and fitness was positively related to intention ( $p < .001$ ). Using standardised regression weights, the calculated composite reliability estimates for Machiavellianism, entrepreneurial fitness and entrepreneurial intention latent constructs were .74, .82 and .77 respectively, while the variance extracted scores were .32, .48 and .53. Using procedures similar to those recommended by Fornell and Larcker (1981), all correlations among the various pairs of focal variables were squared and compared to the variance extracted scores. Comparisons indicated that squared correlations were all lower than the variance extracted scores, which indicated acceptable discriminant validity. Finally, a single-factor test was specified by loading the items and composite scores on one latent factor (error terms were added to the narcissism and social desirability composite measures), and the results indicated poor fit statistics for the model (CMIN = 1,438.60,  $df = 90$ ,  $p < .001$ , CMIN/ $df$  = 15.98, NFI Delta1 = .32, IFI Delta2 = .33, CFI = .32, RMSEA = .17), despite having significant regression weights ( $p < .05$ ). Common method bias was therefore unlikely to be a concern in this investigation.



**Figure 1.** Second revised CFA; \*\*\* $p < .001$ ,  $N = 531$ ; regression weights/covariances presented, standardised regression weights/correlations presented in parentheses; means, intercepts and variances not shown ( $p < .001$ ); CMIN, chi-square/ $\chi^2$ ; CMIN/df, relative chi-square/ $\chi^2$ ; NFI Delta1, normed fit index; IFI Delta2, incremental fit index; CFI, comparative fit index; RMSEA, root mean square error of approximation.

**Variable descriptive statistics and correlations**

Table 1 summarises the descriptive statistics and correlations associated with the focal variables. The mean scores for the dark personality traits suggested that subjects exhibited lower levels of Machiavellianism and narcissism, the mean values for the entrepreneurial fitness variables indicated that individuals scored moderately high in proactive personality, improvisational behaviour, entrepreneurial self-efficacy, resilient coping and grit effort, and the mean score for entrepreneurial intention indicated that individuals had only modest intentions to start a business venture.

Table 1. Variable descriptive statistics and correlations

Variable	M	SD	N	1	2	3	4	5	6	7	8	9
1. Machiavellianism	2.60	.66	508	-								
2. Narcissism	5.84	3.10	504	.28***	-							
3. Proactive personality	5.27	.90	507	-.23***	.02	-						
4. Improvisational behaviour	5.02	.89	488	-.08^	.21***	.56***	-					
5. Entrepreneurial self-efficacy	3.83	.65	517	-.02	.35***	.38***	.50***	-				
6. Resilient coping	3.82	.60	510	-.14**	.02	.65***	.50***	.35***	-			
7. Grit effort	3.89	.63	515	-.15**	.13**	.40***	.46***	.48***	.35***	-		
8. Entrepreneurial intention	3.21	1.15	528	.20***	.19***	.17***	.25***	.19***	.16***	.11*	-	
9. Age	21.93	3.81	514	-.07	-.02	.05	.01	.06	.03	.05	.12**	-
10. Gender	1.31	.46	515	-.16***	-.13**	.07	-.04	-.08^	.02	-.02	-.22***	-.18***

\*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ ; ^ $p < .10$ .

Machiavellianism was negatively related to various measures of entrepreneurial fitness and gender ( $p < .001$  to  $p < .10$ ) and positively related to intention ( $p < .001$ ), while narcissism was negatively related to gender ( $p < .01$ ) and positively related to different measures of entrepreneurial fitness and intention ( $p < .001$  to  $p < .01$ ). The entrepreneurial fitness measures were also positively related to entrepreneurial intention ( $p < .001$  to  $p < .05$ ). Finally, age was positively related to entrepreneurial intention ( $p < .01$ ), and gender was negatively related to entrepreneurial self-efficacy ( $p < .10$ ), entrepreneurial intention ( $p < .001$ ) and age ( $p < .001$ ).

### Structural equation modelling

Figure 2 presents the results associated with the structural equation modelling. The full mediation structural model produced some marginal, but reasonably acceptable, fit statistics. Machiavellianism was negatively related to entrepreneurial fitness ( $p < .001$ ), and narcissism was positively related to fitness ( $p < .001$ ), which provides statistical support for hypotheses 2 and 5. Entrepreneurial fitness was also positively related to entrepreneurial intention ( $p < .001$ ), which supports hypothesis 1. Age and gender were positively related ( $p < .001$ ), and age was negatively related to Machiavellianism ( $p < .01$ ), while gender was negatively related to narcissism ( $p < .01$ ), Machiavellianism ( $p < .001$ ) and entrepreneurial intention ( $p < .001$ ). The partial mediation structural model, which specified two additional constraints between the dark personality traits and entrepreneurial intention, produced improved fit statistics based on a chi-square difference test ( $\chi^2$  difference = 25.66,  $df$  difference = 2,  $p < .001$ ). Once again, Machiavellianism was negatively related to entrepreneurial fitness ( $p < .001$ ), narcissism was positively related to fitness ( $p < .001$ ) and fitness was positively related to entrepreneurial intention ( $p < .001$ ), satisfying hypotheses 1, 2 and 5. In addition, Machiavellianism was positively related to entrepreneurial intention ( $p < .001$ ), which indicated that entrepreneurial fitness partially mediated the positive relationship between Machiavellianism and intention. Adequate statistical support was therefore provided for hypotheses 3 and 4. Narcissism was unrelated to entrepreneurial intention. Once again, age and gender were positively related ( $p < .001$ ), and age was negatively related to Machiavellianism ( $p < .01$ ) and positively related to entrepreneurial intention ( $p < .05$ ), while gender was negatively related to narcissism ( $p < .01$ ), Machiavellianism ( $p < .001$ ) and entrepreneurial intention ( $p < .001$ ). These findings indicate overall that Machiavellianism is positively and directly related to entrepreneurial intention, but it is also negatively and indirectly related to intention through its negative relationship with fitness, as well as the positive relationship fitness shares with intention.

Table 2 highlights the results of the mediation analysis for Machiavellianism. Despite the modest model  $R^2$  values, Machiavellianism was negatively related to entrepreneurial fitness ( $p < .001$ ), and Machiavellianism and entrepreneurial fitness were both positively related to entrepreneurial intention ( $p < .001$ ). These findings provided statistical support for hypotheses 1, 2 and 3. Based on the negative boot lower and upper confidence intervals, Machiavellianism was also indirectly and negatively related to entrepreneurial intention by functioning through entrepreneurial fitness, which provided support for hypothesis 4.

Table 3 highlights the results of the mediation analysis involving narcissism. The model  $R^2$  values were modest, but narcissism was positively related to entrepreneurial fitness ( $p < .001$ ), and both narcissism ( $p < .01$ ) and entrepreneurial fitness ( $p < .001$ ) were positively related to entrepreneurial intention. These findings provided statistical support for hypotheses 1, 5 and 6. Based on positive boot lower and upper confidence intervals, narcissism was also indirectly and positively related to entrepreneurial intention through entrepreneurial fitness, which provided support for hypothesis 7.



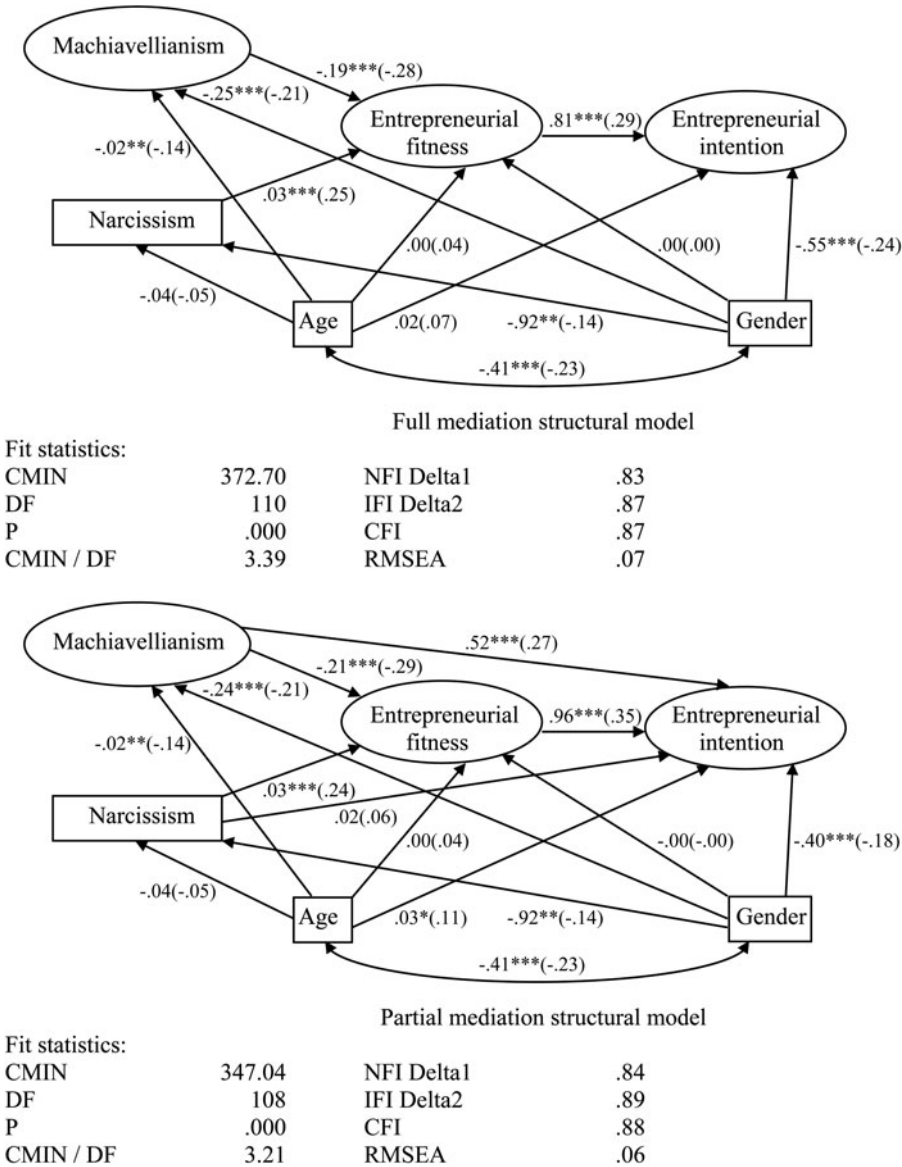


Figure 2. Structural equation modelling; \*\*\* $p < .001$ , \*\* $p < .01$ ,  $N = 531$ ; structural models presented with regression weights/covariance, standardised regression weights/correlation presented in parentheses; measurement models not shown (all loadings/correlations above .50); means, intercepts and variances not shown ( $p < .001$ ); CMI, chi-square/ $\chi^2$ ; CMIN/df, relative chi-square/ $\chi^2$ ; NFI Delta1, normed fit index; IFI Delta2, incremental fit index; CFI, comparative fit index; RMSEA, root mean square error of approximation.

### Discussion

As shown by our results, both ‘bright’ and ‘dark’ characteristics of individuals are associated with entrepreneurial intentions, represented by entrepreneurial self-efficacy, proactiveness, improvisation, resilience and grit for the former, and with Machiavellianism and narcissism for the latter. The bright characteristics hold together in tested models as a second-order construct that we labelled ‘entrepreneurial fitness’. The results indicate that two dark personality traits,

**Table 2.** Mediation analysis (Machiavellianism → entrepreneurial fitness → entrepreneurial intention)

Outcome						
Model (independent variables)	Coefficient	SE	<i>t</i>	<i>p</i>	LLCI	ULCI
Entrepreneurial fitness (M)						
Constant	4.53	.25	18.15	.000	4.04	5.02
Machiavellianism (X)	-.14	.04	-3.57	.000	-.22	-.06
Age (control)	.01	.01	1.45	.148	-.00	.03
Gender (control)	-.03	.06	-.55	.584	-.14	.08
<i>R</i> = .19	MSE = .29		<i>df</i> <sub>1</sub> = 3		<i>p</i> = .0008	
<i>R</i> <sup>2</sup> = .04	<i>F</i> = 5.65		<i>df</i> <sub>2</sub> = 443			
Entrepreneurial intention (Y)						
Constant	-.18	.67	-.27	.788	-1.49	1.13
Machiavellianism (X)	.38	.08	4.70	.000	.22	.54
Entrepreneurial fitness (M)	.57	.10	5.93	.000	.38	.76
Age (control)	.02	.02	1.33	.185	-.01	.05
Gender (control)	-.42	.11	-3.62	.0003	-.64	-.19
<i>R</i> = .38	MSE = 1.18		<i>df</i> <sub>1</sub> = 4		<i>p</i> = .000	
<i>R</i> <sup>2</sup> = .14	<i>F</i> = 18.37		<i>df</i> <sub>2</sub> = 442			
Direct effect of Machiavellianism (X)	Effect	SE	<i>t</i>	<i>p</i>	LLCI	ULCI
on entrepreneurial intention (Y)	.38	.08	4.70	.000	.22	.54
Indirect effect of Machiavellianism (X)			Effect	Boot SE	LLCI	ULCI
on entrepreneurial intention (Y)	Entrepreneurial fitness (M)		-.08	.03	-.15	-.03

*N* = 447; Y, dependent variable; X, independent variable; M, mediator variable(s); control, control variable.

Machiavellianism and narcissism, differentially relate to entrepreneurial fitness and entrepreneurial intention, suggesting that these characteristics can influence individuals’ entrepreneurial pursuits in varying ways. On the one hand, Machiavellianism positively and directly relates to entrepreneurial intention, yet negatively relates through entrepreneurial fitness, which challenges current understanding of this trait when considering individuals’ entrepreneurial intentions. On the other hand, narcissism seems to enhance both entrepreneurial fitness and intention, which aligns with prior research. Overall, the findings suggest that a dark personality, at subclinical levels, might precipitate some positive results for entrepreneurs. These results generate numerous important theoretical and practical implications.

**Theoretical implications**

A significant amount of attention in entrepreneurship research is directed at understanding entrepreneurial intentions. Extant literature has shown small-to-moderate effect sizes in the relationship between dark traits and entrepreneurial intention and ultimately behaviour (Brownell, McMullen, & O’Boyle, 2021). The TPB (Ajzen, 1991) indicates that intentions reliably predict actual behaviour, but it also suggests that various individual factors predict intentions. Building upon that foundation, the field showed the strong association that various entrepreneurial traits have with entrepreneurial intention (see Bird, 1988, 1992; Fayolle & Liñán, 2014;

**Table 3.** Mediation analysis (narcissism → entrepreneurial fitness → entrepreneurial intention)

Outcome						
Model (independent variables)	Coefficient	SE	<i>t</i>	<i>p</i>	LLCI	ULCI
<b>Entrepreneurial fitness (M)</b>						
Constant	3.64	.23	16.07	.000	3.20	4.09
Narcissism (X)	.04	.01	4.77	.000	.02	.06
Age (control)	.02	.01	2.43	.015	.00	.04
Gender (control)	.05	.06	.84	.402	-.06	.16
<i>R</i> = .24	MSE = .28		<i>df</i> 1 = 3		<i>p</i> = .000	
<i>R</i> <sup>2</sup> = .06	<i>F</i> = 9.07		<i>df</i> 2 = 436			
<b>Entrepreneurial intention (Y)</b>						
Constant	1.38	.59	2.33	.020	.22	2.54
Narcissism (X)	.06	.02	3.20	.0015	.02	.09
Entrepreneurial fitness (M)	.42	.10	4.28	.000	.23	.62
Age (control)	.01	.02	.52	.606	-.03	.04
Gender (control)	-.43	.12	-3.65	.000	-.66	-.20
<i>R</i> = .34	MSE = 1.21		<i>df</i> 1 = 4		<i>p</i> = .000	
<i>R</i> <sup>2</sup> = .11	<i>F</i> = 14.06		<i>df</i> 2 = 435			
Direct effect of narcissism (X) on entrepreneurial intention (Y)	Effect	SE	<i>t</i>	<i>p</i>	LLCI	ULCI
	.06	.02	3.20	.0015	.02	.09
					Boot	Boot
Indirect effect of narcissism (X) on entrepreneurial intention (Y)			Effect	Boot SE	LLCI	ULCI
	Entrepreneurial fitness (M)		.02	.01	.01	.03

*N* = 440; *Y*, dependent variable; *X*, independent variable; *M*, mediator variable; control, control variable.

Krueger, 2007; Krueger, Reilly, & Carsrud, 2000; Shapero & Sokol, 1982; van Gelderen et al., 2008). To extend the core entrepreneurial intention model through the TPB, we build on four of those traits together as a second-order construct – entrepreneurial fitness – while concurrently considering both the adaptive and maladaptive qualities of narcissism and Machiavellianism. Our investigation of perceived behavioural control manifested through complex patterns of dark and bright traits expands the application of the TPB in understanding entrepreneurial intention by including both adaptive and maladaptive characteristics of dark traits, which shows that the relationships between variables are complex. These findings extend the core model of entrepreneurial intention with a simultaneous demonstration of the adaptive and maladaptive features of both narcissism and Machiavellianism with the known antecedents of entrepreneurial intention found in entrepreneurial fitness.

Though the literature establishes that entrepreneurial self-efficacy predicts entrepreneurial intentions, we build upon what is known about entrepreneurial self-efficacy by integrating four correlated constructs that are also associated with regulatory efficacy (Bandura, 2012), as entrepreneurial fitness, portraying a cohesive image of the likely emerging entrepreneur. Individuals high in proactiveness exhibit a propensity towards action that ultimately translates into intentions to launch ventures. Entrepreneurs must progress beyond planning and work towards executing their visions of new enterprises. Improvisational individuals are attracted to novelty, driving

creative thinking and innovation responses in entrepreneurship. Entrepreneurial fitness is enhanced when individuals have the proactiveness to notice opportunities and improvisational behaviour to adapt and act on them. Resilience provides the persistence to endure despite setbacks and stressors as entrepreneurs establish new ventures; such businesses may not demonstrate success in the short term, so entrepreneurs must be capable of overcoming hardship. This study establishes the relationship between grit and entrepreneurial intentions that began with Butz *et al.* (2018), especially through the effort component of grit. This study showed that the effort aspect of grit enhances entrepreneurial intentions, particularly when combined with other constructs that measure overall entrepreneurial fitness. Grit effort contributes to an individual's tendency towards entrepreneurial fitness by focusing attention on achieving long-term goals, building a startup over time and persevering despite setbacks.

However, entrepreneurial fitness only captures individual features that could be viewed as positive or perhaps attractive characteristics of the entrepreneur. The character of entrepreneurial fitness is a counterpoint to potentially less attractive and 'dark' factors that may nonetheless be implicated in the intention to become an entrepreneur, and this addition contributes to the development of a more comprehensive model of entrepreneurial intentions. Individuals exhibiting a narcissistic personality style, but not necessarily at levels representing a disorder, positively relate to both entrepreneurial fitness and entrepreneurial intentions. Results suggest that narcissism may play a role in affecting an individual's perception of their entrepreneurial ability, leading them to see themselves as capable as, and perhaps superior to, others in establishing a new venture. This may also impact the initiative and tenacity that the individual shows towards moving forward with a new venture, building confidence from others and convincing them of the legitimacy of a start-up. To the degree that some levels of narcissism help to develop these aspects of a prospective entrepreneur, these traits may be particularly well-suited for entrepreneurship.

Alternatively, since results indicated that Machiavellianism negatively relates to entrepreneurial fitness and positively relates to entrepreneurial intentions, those with Machiavellian tendencies may have proclivities towards entrepreneurship in their intention; however, they may exhibit less entrepreneurial fitness. Consequently, high levels of Machiavellianism, expressed as a lack of welfare of others and self-centeredness, do not necessarily characterise the prospective entrepreneur, and suggest that an image of an entrepreneur as motivated overwhelmingly by personal gain may not lead to positive outcomes. An emerging entrepreneur lacking care for others may lead to reduced entrepreneurial fitness, which may manifest as an absence of concern about customers, employees and other vital constituencies within and around a venture. This contention is supported by the negative *indirect* relationship identified between Machiavellianism and entrepreneurial intention in the mediation analysis. Disregard for others may also result in a shorter-term perspective on the entrepreneurial process, rather than a longer-term outlook and pattern of actions to enhance success.

### **Practical implications**

Findings from this research may translate into educational content, and the hope is that this research will spur development of training, education and consulting resources that will positively influence entrepreneurship. As identified in a recent literature review (Lindahl Thomassen, Williams Middleton, Breum Ramsgaard, Neergaard, & Warren, 2020), the context of entrepreneurial education influences outcomes as well. Faculty in traditional higher education institutions can develop and offer programmes with content and experiences that help individuals both recognise and develop elements of entrepreneurial fitness (for instance, see the work of Morris *et al.* (2013) on identifying and developing entrepreneurial competencies). Further, they can help emerging entrepreneurs recognise and manage the bright and dark characteristics of narcissism and Machiavellianism with ethics training. Entrepreneurship is often viewed as a lifetime developmental process and it is not uncommon for entrepreneurs to take a traditional career path and

later launch into an entrepreneurial venture or manage both simultaneously. Informing students of the connections between entrepreneurial intentions and behaviours may prepare them well for later steps transitioning from traditional careers to entrepreneurial ones. Training programmes from entities like small business and/or economic development agencies and consulting and/or training firms can also work towards focusing more on these factors (c.f., Maddi, Harvey, Khoshaba, Fazel, & Resurreccion, 2009, on resilience training in undergraduates).

For prospective entrepreneurs, it is beneficial to assess their own strengths and weaknesses on various psychological factors present in entrepreneurial fitness and narcissism/Machiavellianism. Moreover, as people design entrepreneur development programmes, they may inform students how subclinical narcissistic traits may be adaptive, while Machiavellian tendencies are less adaptive in developing entrepreneurial fitness. This has implications for individuals evaluating their career options, particularly in the short-term. In their examination of an entrepreneurial development programme, Morris et al. (2013) argued that such programmes should focus on building skills and competencies. These include factors such as opportunity recognition, perseverance, resilience and self-confidence, among others, characteristics that are closely consistent with entrepreneurial fitness. However, Morris and his colleagues noted that much emphasis in entrepreneurial development programmes is placed on functional business skills, rather than on social or personal attributes. Clearly, there is value in developing a wider variety of competencies and characteristics, while such programmes should also take caution to avoid overly reinforcing Machiavellianism and narcissism to a lesser degree.

Knowledge of these individual differences may be helpful from an ethical perspective as well. College students may be taught how both the bright and dark aspects of personality influence their entrepreneurial fitness and intentions. Further, they may learn how their personality traits may inform the manner in which they manage their own careers, not only in terms of their initial career choices, but also how a constellation of dark and bright traits may influence their ethical reasoning as they launch and develop their own ventures.

### **Limitations**

Despite the findings of this study, we must acknowledge several study limitations. First, as mentioned earlier, the use of a convenience sample of students is not ideal when considering generalisability. It does not invalidate this study given its purpose in identifying potential relationships between features of the participants and entrepreneurial intentions, and it is consistent with much work in social sciences broadly and in work on entrepreneurial intentions specifically that also use such samples (for instance, see Krueger, Reilly, & Carsrud, 2000; van Gelderen et al., 2008). However, it is important to recognise the boundaries that such samples impose on research findings, and it is the role of subsequent studies and empirical replication of results to help more fully develop generalisability (Payne & Chappell, 2008). Second, self-report questionnaires increase the possibility of common method bias. However, results of a single-factor test and inclusion of a social desirability measure as a control assuage some concern. Third, in this study, our model constructs did not directly test the full TPB model and thus we did not include all the TPB constructs (attitudes, social norms and PBC) in our model. Rather, we focused on the two components of PBC and though we did utilise a direct measure of (entrepreneurial) self-efficacy, we utilised proxy measures representing perceived controllability. Finally, the cross-sectional design greatly limits causal interpretation of the findings. Though TPB connects intention to behaviour, some scholars suggest that intentions may not always lead to entrepreneurial behaviour (Douglas & Shepherd, 2002), and in this study the model constructs were not tested directly except for entrepreneurial self-efficacy. Consequently, our knowledge of the subsequent entrepreneurial behaviours of the sample is limited. Longitudinal research measuring entrepreneurial behaviour would build upon the current model.

### **Future research directions**

Several future research opportunities are evident following this study's findings. First, more future research might account for both bright and dark traits and their interaction in leading to entrepreneurial intention. Further, though entrepreneurial intention is highly correlated with entrepreneurial behaviour, research could investigate the developmental trajectories and behaviour of aspiring entrepreneurs longitudinally, as well as investigate their developmental trajectories over time from aspirational to serial entrepreneurs. The constellation of bright and dark traits may manifest in different ways and inform the research community about the outcomes of career choices over the long-term. It may also provide topical ideas for incorporating human resource development and management into entrepreneurship education, an area of need identified by Hubner and Baum (2018).

Second, future research may delve further into the positive antecedents of entrepreneurial intentions and behaviour to build on our measure of entrepreneurial fitness, a form of psychological capital but in an entrepreneurial context, as a comprehensive inventory. Importantly, Brownell, McMullen, and O'Boyle (2021) indicate evidence of nonlinear relationships between dark traits and outcome measures, as well as called for potential mediators and moderators to explain relationships between dark traits and both entrepreneurial intention and performance. We introduced the idea of entrepreneurial fitness to bundle several constructs related to entrepreneurial intentions. By including elements that highlight self-regulation, entrepreneurial fitness contrasts with dark traits of narcissism and Machiavellianism. Indeed, there is increasing interest in examining the role of self-regulatory processes in entrepreneurship (e.g., Baron, Hmieleski, & Henry, 2012; Nambisan & Baron, 2013). One element of self-regulation, grit, was found to influence intentions. While grit effort was a significant factor in this study, an unexpected finding was that grit interest was not significant due mainly to dimensionality issues. One explanation is that grit effort is the dominant dimension, and another is that other aspects of the entrepreneurial fitness construct might account for the tenacity and focus of interest that grit interest seeks to identify. Still another explanation is that individuals with high grit interest exhibit a single-mindedness regarding their long-term objectives while overlooking other opportunities. Given the utility of the grit concept in entrepreneurship, future research may focus on its effects and relationships with other constructs. Ideally, future work on samples of both current and aspiring entrepreneurs would investigate relationships between the components of entrepreneurial fitness, explain more of the variability in entrepreneurial fitness and validate that construct for diverse demographics.

Third, following the suggestion of Fayolle and Liñán (2014), future research should better connect entrepreneurial intention and entrepreneurial behaviour. The results of this current study suggest that the role of narcissism and Machiavellianism is also relevant. We expect that the combination of proactive personality, improvisational behaviour, resilient coping and grit effort is a mix of traits ideally suited for emerging entrepreneurs to predict intention. Following the TPB, we expect that young adults exhibiting entrepreneurial intention will enact that intention into entrepreneurial activity. To test this hypothesis, we suggest longitudinal research to elucidate how dark traits influence entrepreneurial behaviour and performance. Future research opportunities include further understanding the connections among dark personality traits, entrepreneurial fitness and ultimately the launch and performance of new ventures.

Fourth, future research can examine the degree to which higher levels of narcissism and Machiavellianism affect entrepreneurship and explore the boundaries of adaptive effects (Denisi, 2015; Miller, 2015). Brownell, McMullen, and O'Boyle's (2021) analysis of 39 samples found narcissism positively relates to both entrepreneurial intention and performance with small and decreasing effects sizes across these two potential outcomes. We found similar overall modest effects for narcissism. While narcissism is positively associated with entrepreneurial fitness and intention, curvilinear relationships may exist where increased clinical levels of



narcissism may lead to negative outcomes. Higher levels of over-confidence, and seeking praise or admiration from others, may result in different patterns of effect on entrepreneurial fitness, intention and performance. Machiavellianism positively relates to entrepreneurial intention while it negatively relates to performance (Brownell, McMullen, & O'Boyle, 2021). However, a novel finding of our study is that the relationship between Machiavellianism and entrepreneurial fitness is negative. This relationship may provide a clue to young entrepreneurs and their mentors about the suitability of these individuals for entrepreneurship, given Machiavellian tendencies, as well as foreshadow a subsequent negative relationship between Machiavellianism and entrepreneurial performance. This also has implications for the practice of entrepreneurship by suggesting that, although there may be some evidence of entrepreneurial intention, both entrepreneurial fitness and presumably entrepreneurial performance may be harmed. Beyond intentions, narcissism and Machiavellianism may partially guide the behaviour of entrepreneurs as they progress towards the actual launch of a startup and influence performance. Factors like grit, associated conceptually with long-term effort and attention, may also affect the longer-term relationship of narcissism and Machiavellianism with performance.

Fifth, future research might consider the influence of psychopathy on entrepreneurial fitness and intentions. As the darkest of the triad, we would expect negative influences from psychopathy; however, there may be something bright in subclinical levels. There is growing interest in the role of dark personality traits in entrepreneurship (Hmieleski & Lerner, 2016; Mullins-Sweatt, Glover, Derefinco, Miller, & Widiger, 2010). Though callousness and exploitation might not be readily associated with entrepreneurial fitness, unexpected connections to other constructs, such as creativity (Kapoor, 2015), might be identified in the entrepreneurial context and some level of psychopathy may be adaptive (see Mullins-Sweatt et al., 2010, for discussion of a 'successful psychopath'). Future research may uncover a more complete picture of positive and darker aspects underlying entrepreneurial intention.

Finally, future research can examine the generalisability and capacity for extension of these findings for entrepreneurial intentions. For instance, the relationships among entrepreneurial fitness and dark characteristics may be different in other circumstances; for instance, different age levels or different countries may shed some light on features of the model that are not evident due to the homogeneity of our sample. There may also be other aspects of intentions that may be of interest to entrepreneurs beyond just intention to form a business. Interesting examples of this sort of extension can be found in the work of Kozan, Öksoy, and Özsoy (2006) that examined the intention to grow a small business, and in Quan (2012) that looked at impulsive versus deliberate entrepreneurial intentions.

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