# Impulsivity and entrepreneurial perseverance: towards an empirical account and entrepreneurship-prone profile

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**Abstract**

**Purpose**–Although emerging research has linked impulsivity with the decision to start a business, scholars have yet to draw implications for later-stage entrepreneurial outcomes. Furthermore, we have still to derive a parsimonious profile of the multidimensional impulsivity construct which can be positively linked to the entrepreneurial context. This paper proposes and tests a model to explain how impulsivity may relate to entrepreneurial perseverance—a construct typically regarded as a pivotal later-stage entrepreneurial outcome.

**Design/methodology/approach**–Data were collected from 807 owner-managers using an online survey and augmented with the novel use of longitudinal data from the central registrar of companies in South Africa. Covariance-based structural equation modeling and a $D^2$ indexing approach for forming an entrepreneurship-prone impulsivity profile were employed.

**Findings**–Results show that multidimensional impulsivity is significantly, but differentially, related to entrepreneurial perseverance; the perceived desirability of entrepreneurship mediates this effect for two of the four impulsivity dimensions. In particular, we find evidence that insufficiency of deliberation enhances, while urgency hinders, perseverance—reflected behaviorally through the filing of annual returns over a three-year period. Furthermore, we derive a new entrepreneurship-

prone impulsivity profile which begins to suggest an intraindividual profile of impulsivity traits which may be beneficial to the entrepreneurial context.

**Originality/value**–By demonstrating how impulsivity impacts entrepreneurial perseverance over time, this paper advances emerging research on the relationship between impulsivity and entrepreneurship, while contributing to explaining why the perseverance decision is not simply a matter of venture pecuniary benefits and feasibility.

**Keywords:** Decision-making; Start-ups; Psychology; Structural equation modeling

**Article Classification**–Research paper

## Introduction

In the entrepreneurial context, setbacks are inevitable, and the many activities required to start a business are often more costly, challenging and uncertain, as well as less successful, than entrepreneurs initially expect (Van Gelderen, 2012; Van Gelderen *et al.*, 2015). Entrepreneurial perseverance (EP) – sustained entrepreneurial action and effort despite confronting adversity and impediments that obstruct this effort (Van Gelderen, 2012; Zhu *et al.*, 2018) – has therefore been touted as one of the most important attributes of successful entrepreneurs and business start-ups (Holland and Garrett, 2015). This urges scholars to investigate potential predictors of the EP decision. In this regard, trait impulsivity has been suggested as a potentially interesting psychological antecedent of EP (Wiklund *et al.*, 2018b), but remains to be explored.

Notably, a growing stream of research positively relates Attention Deficit/Hyperactivity Disorder (ADHD) – a disorder indicated, in part, by trait impulsivity (Antshel, 2018) – with early-stage entrepreneurial outcomes, such as entrepreneurial preference (Canits *et al.*, 2018),

entrepreneurial intention (Verheul *et al.*, 2015), and the decision to start a business (Lerner *et al.*, 2018d). However, while these results are promising, the initial interest and engagement in business start-up fundamentally differs from the later-stage EP decision (Holland and Garrett, 2015). Perhaps the most notable of these distinctions is that the EP decision is made (often repeatedly) after the start-up decision has occurred and the many challenges of business start-up begin to reveal themselves (Van Gelderen, 2012; Van Gelderen *et al.*, 2015). In the light of this distinction, scholars have called for investigations into the impulsivity-EP relationship (Wiklund *et al.*, 2018b), to derive deeper understanding of the impact of impulsivity in the entrepreneurial setting (Lerner *et al.*, 2018c).

Moeller *et al.* (2001) describe impulsivity as a tendency to react rapidly "to internal or external stimuli" without considering the implications of such actions. Based on this description, it makes sense that research has demonstrated a positive link between impulsivity and one's decision to start a business (Wiklund *et al.*, 2017). However, given the start-up challenges, this same description leads scholars to remain skeptical regarding whether impulsivity translates into follow-through and perseverance in the business start-up process (Lerner *et al.*, 2018c; Wiklund *et al.*, 2018a). For instance, scholars have suggested that the lack of forethought that impulsivity espouses may lead to both atypically quick entrepreneurial entry, and also, exit decisions (i.e., low EP) (Wiklund *et al.*, 2018a). Having said that, an alternative possibility also emerges, based on research positively relating certain impulsivity dimensions with the perceived desirability of entrepreneurship (Wiklund *et al.*, 2017). Since an individual's attraction to vocational environments (i.e., perceived desirability) appears to enhance their perseverance with activities linked to the vocation (Su *et al.*, 2015), impulsivity could actually enhance EP. Therefore, to the extent that the impulsivity-EP relationship remains unexplored, it remains unclear how impulsivity affects EP, and scholars remain unable to draw stronger implications regarding the role of impulsivity in the entrepreneurial context (Wiklund *et al.*, 2018b).

To address the above research dilemma, we develop and test a mediation model which explains how impulsivity affects EP through the perceived desirability of entrepreneurship. Although ADHD-entrepreneurship studies have generally conceptualized ADHD as a behavioral disorder, entrepreneurship research has begun to investigate it more from a cognitive standpoint (Moore *et al.*, 2021), with calls growing to investigate the underlying trait which appears to primarily drive these behavioral tendencies: namely, impulsivity (Antshel, 2018; Wiklund *et al.*, 2018b). Thus, although research has begun to indicate a positive link between ADHD and duration spent on a venture (Greidanus and Liao, 2021), as well as business failure and poor earnings (Rajah *et al.*, 2021), this work has yet to directly explore EP as distinct and important later-stage entrepreneurial outcome and has yet to explore its relation to impulsivity specifically. We thus focus on trait impulsivity and test how impulsivity, through the attraction towards a particular entrepreneurial endeavor (Schlaegel and Koenig, 2014), affects self-reported EP, and a more objective behavioral indicator of EP over time. Behavioral EP was captured over a three-year period through the filing of annual returns. This measure is of direct interest to impulsivity-entrepreneurship research, which predicts that impulsive entrepreneurs will struggle to persevere with the administrative tasks which are vital to their business (Lerner *et al.*, 2018c) and may be attracted to more informal, less legally structured entrepreneurial contexts (Lerner and Hunt, 2012).

Departing from models which view the predicted pecuniary benefits and feasibility of a venture as central to the EP decision (Astebro *et al.*, 2014), our predictions draw on person-environment (P-E) fit theory (Kristof-Brown *et al.*, 2005; Kristof-Brown, 1996), as well as research on impulsivity (Berg *et al.*, 2015), to demonstrate how impulsivity may affect EP via the perceived desirability of entrepreneurship. Despite impulsive individuals lacking forethought and often following an act-first-think-later logic (Hofmann *et al.*, 2009), we propose that, rather than being a cost of impulsivity, this tendency may be beneficial to EP. In contrast to work that considers impulsivity as a unidimensional facet of ADHD (Rajah *et al.*, 2021), we specifically explore trait

impulsivity using Whiteside & Lynam's (2001) established umbrella conceptualization comprising the aggregate of four dimensions: sensation seeking, insufficiency of deliberation, insufficiency of persistence and urgency.

In so doing, this paper makes three notable contributions. First, by testing the impulsivity-EP relationship and using the novel three-year measure of EP, this research contributes towards (1) the hitherto underexplored research domain of how impulsivity impacts on later-stage entrepreneurial outcomes beyond early-stage interest and behavior, and (2) explaining the conundrum of why predicted pecuniary benefits and feasibility of a venture do not fully explain the perseverance decision (Astebro *et al.*, 2014). Second, this paper begins to uncover a mechanism explaining how certain impulsivity dimensions may actually enhance EP rather than diminish it. Recent conceptual arguments suggest that there may be a negative impact of impulsivity on EP (Greidanus and Liao, 2021; Lerner *et al.*, 2018c; Wiklund *et al.*, 2018a). However, our paper's results challenge these core assumptions in that the implications of impulsive individuals' attraction to the novelty and uncertainty of entrepreneurship extends beyond early-stage behaviors to also increase EP.

Finally, we begin to develop an entrepreneurship-prone impulsivity profile which appears suited to the entrepreneurial context in terms of early-stage behavior (Wiklund *et al.*, 2017) and—as this paper found—later-stage EP. A central challenge of research on impulsivity is the variety of traits falling under the umbrella concept (Berg *et al.*, 2015), and the tendency to investigate each trait separately (Wiklund *et al.*, 2018b). Thus, by offering an approach to drawing conclusions for all the impulsivity dimensions concurrently, this research offers a parsimonious approach to drawing implications from the impulsivity dimensions in entrepreneurial, as well as other vocational, contexts.

## Impulsivity within an entrepreneurial context

A body of research is emerging which suggests that impulsivity, and related constructs such as ADHD, are beneficial to certain nascent-stage entrepreneurship outcomes (Lerner *et al.*, 2018c; Wiklund *et al.*, 2018). In particular, research demonstrates that the impulsivity dimensions (sensation seeking, insufficiency of deliberation, urgency, and insufficiency of persistence) explain why individuals with ADHD exhibit a preference for engaging in entrepreneurship (Wiklund *et al.*, 2017). However, while current entrepreneurship research on impulsivity has predominantly focused on nascent-stage interest and engagement, these early-stage phenomena form just the cusp of a long and often tedious entrepreneurial journey (Van Gelderen, 2012). For instance, previous studies have found that it takes several years for nascent entrepreneurs to start a venture, from the initiation of action to the point that the new venture is actually functional (Reynolds and Miller, 1992), and that almost 40 percent of all attempts to start a new venture are abandoned prior to actually getting the business operational (Delmar and Shane, 2003). As a result, scholars have specifically called for investigations into the impact of impulsivity on later-stage entrepreneurial outcomes such as EP (Antshel, 2018). We explore this important impulsivity-EP gap and begin the development of a model where the perceived desirability of entrepreneurship explains our hypothesized effects, with a review of the core concepts that inform our theorizing.

### *Four dimensions of the impulsivity construct*

While an array of conceptualizations exist, impulsivity is widely acknowledged as a multidimensional construct (Berg *et al.*, 2015). Whiteside and Lynam (2001) extensively mapped and clarified the fundamental dimensions of the impulsivity construct, identifying four impulsivity dimensions which represent distinct personality traits: sensation seeking, insufficiency of deliberation, insufficiency of

persistence, and urgency. Each of these traits exist on a continuum ranging from low to high values and are understood to lead to the manifestation of impulsive behaviors (Berg *et al.*, 2015).

Sensation seeking comprises two facets; (1) the inclination to take pleasure from, and pursue exhilarating initiatives, and (2) a willingness to experience new, potentially hazardous endeavors. Insufficiency of deliberation refers to a lack of reflection and reasoned consideration of the consequences prior to acting. Insufficiency of persistence refers to the inability to resist distractions and stay focused on uninteresting or difficult tasks. Lastly, urgency refers to the propensity to experience strong, typically negative, emotions and urges to act on those emotions (Whiteside and Lynam, 2001; Whiteside *et al.*, 2005).

**Impulsivity and entrepreneurial perseverance (EP): A P-E Fit perspective**

While research demonstrates that the sensation seeking and insufficiency of deliberation (urgency) impulsivity dimensions positively (negatively) predict the perceived desirability of engaging in entrepreneurial endeavors (Wiklund *et al.*, 2017), we posit that the directionality of these relationships will similarly apply when considering EP. In particular, by applying P-E fit theory (Kristof-Brown, 1996), our framework explains why these relationships may exist through the perceived desirability of entrepreneurship.

P-E fit theory examines the alignment between an individual's characteristics and their environment, as well as the antecedents and outcomes thereof (Edwards, 2008). To this end, the theory posits that individuals are attracted to work environments which align with their own personalities, desires and competencies (Kristof-Brown *et al.*, 2005). According to P-E fit research (Kristof-Brown, 1996), in the entrepreneurial context, the similarity between an entrepreneur's personality and the requirements of engaging in entrepreneurial endeavors indicates a person-entrepreneur fit. This fit increases individuals' preferences for entrepreneurial careers (Wiklund *et*

*al.*, 2017), their entrepreneurial success (Markman and Baron, 2003), perseverance (Su *et al.*, 2015), as well as their entrepreneurial career longevity (Dawis and Lofquist, 1984). Indeed, research suggests that P-E fit is not only important in motivating entrepreneurial entry, but also EP (c.f., Astebro *et al.*, 2014).

Therefore, we posit that impulsivity may affect EP through the perceived desirability of entrepreneurship. Since individuals are attracted to vocational environments which are perceived to have characteristics which align with their personalities (Kristof-Brown *et al.*, 2005), we suggest that perceived desirability serves as a mediating mechanism explaining the link between facets of the impulsive personality and the more distal EP outcome. Although evidence suggests that entrepreneurial desirability is influenced by a variety of factors, including entrepreneurial self-efficacy (Schlaegel and Koenig, 2014), we specifically focus on how the impulsivity traits drive differences in how individuals perceive and process environmental characteristics external from the self (Mitchell and Shepherd, 2010). In particular the abandonment of start-up attempts can be partly attributed to two central characteristics of venture creation: (1) high uncertainty (Van Gelderen *et al.*, 2015; Wiklund *et al.*, 2018b); and (2) many activities, which are often more costly and challenging, as well as less successful than entrepreneurs initially expect (Van Gelderen, 2012). We build our arguments for the P-E fit of more impulsive individuals based on these key characteristics which ultimately influence the attractiveness by which a specific entrepreneurial endeavor is perceived.

*The impulsivity-EP relationship through perceived desirability*

Judgment regarding the desirability of an entrepreneurial endeavor is inherently tied to the uncertainty of the endeavor (McMullenand Shepherd, 2006; Townsend *et al.*, 2018), as well as the various challenges and setbacks that will inevitably arise (Wiklund *et al.*, 2018b). In particular, once an individual has begun to engage in an entrepreneurial endeavor and is deciding whether to persevere,

performance feedback becomes readily available and the many challenges the endeavor presents begin to reveal themselves (Van Gelderen *et al.*, 2015). It is at this stage that desirability perceptions tend to be tempered and willingness to persevere may begin to subside, since feedback is often significantly more negative than initially expected (Holland and Garrett, 2015; Van Gelderen, 2012).

However, certain impulsivity traits may not follow this route as they appear to fit well with the risky and obstacle-prone entrepreneurial context (Rajah *et al.*, 2021; Wiklund *et al.*, 2018b). In particular, sensation seekers tend to take pleasure from the pursuit of uncertain situations (Eysenck and Zuckerman, 1978), and tend to consider continued engagement in uncertain contexts exciting (Leland *et al.*, 2006). Additionally, these individuals tend to focus on the reward of outcomes rather than any negative feedback that might accrue (Horvath and Zuckerman, 1993), which should heighten the perceptions of the desirability of an entrepreneurial endeavor. Similarly, entrepreneurs with an insufficiency of deliberation are likely to perceive entrepreneurship as highly desirable as they do not consider the potential consequences and are insensitive to their occurrence (DeYoung and Rueter, 2010). Hence, these individuals are likely to lack a sense of vulnerability or fear regarding their current entrepreneurial efforts (Wiklund *et al.*, 2018b), which empirical work suggests will increase the favorability with which these efforts will be viewed, even when the potential returns are comparably low (Mitchell and Shepherd, 2010). An increased tendency to view one's entrepreneurial endeavor as highly desirable has been shown to increase the likelihood that an individual will persevere with their efforts, despite the adversity faced (Holland and Garrett, 2015). Furthermore, since sensation seekers and those with insufficient deliberation tend to focus on the upside rather than the downside of an experience, their desirability perceptions towards specific entrepreneurial endeavors are likely heightened with engagement in these endeavors (Wiklund *et al.*, 2018b), which should encourage them to maintain effort on the endeavor despite alternative entrepreneurial opportunities arising. Thus, individuals high on sensation seeking and insufficiency of deliberation are likely to persevere with their entrepreneurial endeavors regardless of the negative feedback

received and challenges faced (e.g., poor market reception, negative reactions from investors), due to their heightened perceptions of desirability of the endeavor. This leads us to hypothesize that:

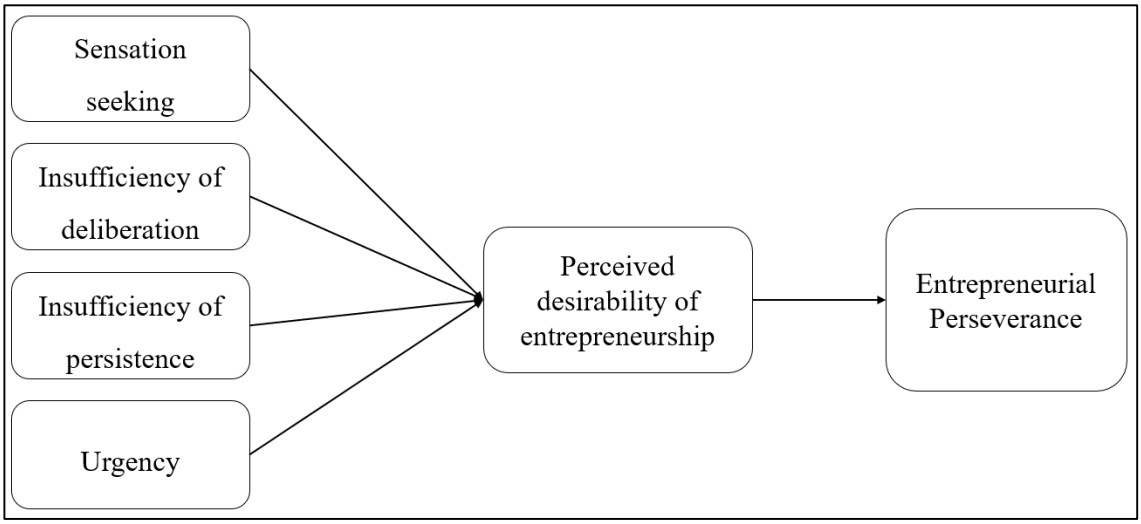
$H_1$: Perceived desirability mediates the positive relationship between (a) sensation seeking and EP, as well as (b) insufficiency of deliberation and EP.

In contrast, individuals with an insufficiency of persistence lack the ability to endure through difficult or boring tasks and resist distractions (Whiteside and Lynam, 2001). Therefore, since entrepreneurship entails many activities which may be considered challenging and tedious (Van Gelderen, 2012), this trait is unlikely to fit the entrepreneurial context well and hence likely leads to lower perceptions of desirability. Similarly, given that those high in urgency are sensitive to negative indicators (Whiteside *et al.*, 2005), these individuals likely focus their attention on potential failure in the uncertain entrepreneurial context, and experience strong negative affect such as fear of failure and pessimism regarding future entrepreneurial success (Wiklund *et al.*, 2018b). Furthermore, it has been shown empirically that individuals low in urgency are attracted to higher risk actions (Berg *et al.*, 2015), suggesting that individuals high on urgency would not perceive a fit with the entrepreneurial context. Therefore, individuals high on urgency and insufficiency of persistence are likely to experience a poor fit with the entrepreneurial context, which lowers their perceived desirability of engaging in the endeavor and, in turn, should hinder their EP (Holland and Garrett, 2015; Su *et al.*, 2015). We therefore hypothesize that:

$H_2$: Perceived desirability mediates the negative relationship between (a) insufficiency of persistence and EP, as well as (b) urgency and EP.

We accordingly illustrate the hypothesized model in Figure 1 below.

**Figure 1: Hypothesized model**




## Methodology

### *Data and sample*

The theorized model was tested among a sample of owner-managers in South Africa, defined as individuals who owned, and were significantly involved in managing, a business. This sample has the notable advantage of significant variation in duration of ownership experience (range of one month to 50 years) which partly reduces the threat of survivorship bias (Delanoë-Gueguen and Fayolle, 2018), while also ensuring a sample with reasonable engagement in the entrepreneurial context to accurately capture their EP.

Data for all constructs presented in the model were collected from a randomly-drawn sampling frame comprising 20 000 owner-managers, stratified on the basis of industry, provincial location, and gender in the formal business sector. An online survey was disseminated through email, with two rounds of follow-up emails. Overall, 842 questionnaires were completed, with 807 being usable. We augmented this self-report data with publicly available, longitudinal data on respondents' businesses from the Companies and Intellectual Property Commission (CIPC). The CIPC is responsible for the

registration and maintenance of all legal companies in South Africa and maintains detailed annual return data in relation to all registered companies (CIPC, 2021). Of the 807 responses to the survey, we were able to track and validate, using director and business names, 197 registered companies on the CIPC database. Since this represented a substantially smaller dataset, throughout the analyses we investigated both the total sample of 807 responses, as well as the subsample with augmented CIPC data.

Both the total- and sub-sample provided a reasonably representative profile of business-owners according to industry, provincial location (Bureau for Economic Research, 2016), and gender (Herrington *et al.*, 2017). The total sample comprised 36.1% female and 63.4% male owner-managers. Forty-three percent (43.1%) of respondents had a postgraduate degree, 19.3% an undergraduate degree, 22.2% vocational training, and 13.1% secondary school level of education. The age of respondents ranged from 20-81 years of age; 13.5% were below 35 years old, 19.1% were 36 to 45 years old, 30.1% were 46 to 55 years old, and 37.2% were over 56 years old (mean=50.4 years; SD=12.34). Respondents' ownership of a business ranged from one month to 50 years (mean=14.3 years; SD=9.74). Apart from the mean ownership duration, which was 19 years (SD=9.73), the remaining demographics were substantively similar for the subsample of 197 respondents.

*Measures*

*Impulsivity*. To measure multidimensional impulsivity, Whiteside and Lynam's (2001) well-established and validated (Whiteside *et al.*, 2005) 45-item UPPS Impulsive Behavior scale was employed. The four subscales comprise 10 to 12 items each and measure a distinct impulsivity dimension on a four-point Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree).

*Perceived desirability of entrepreneurship*. The perceived desirability of entrepreneurship was measured using the three-item scale from Krueger (1993), which reflects the degree to which an individual considers their entrepreneurial pursuit attractive. The scale asked respondents to rate how they feel with regard to the business/es they have started. All three items were on a seven-point, semantic differential scale, ranging from 1 (very enthused) to 7 (very unenthusiastic).

*Entrepreneurial perseverance.* To measure EP, the single-item measure by Zhu *et al.* (2018) was used. This semantic differential scale asked respondents to rate the likelihood that they would continue operating their venture throughout the next 18 months despite obstacles and alternative opportunities, ranging from 1 (very likely to leave the venture) to 11 (very likely to continue the venture). EP was operationalized as the likelihood of persevering with a business venture despite the presence of adversity (i.e., challenges and setbacks) and tempting alternative opportunities. Adversity and alternative opportunities have generally been identified by scholars as being central to the EP decision (Holland and Shepherd, 2013; Zhu *et al.*, 2018), and was thus reflected in the measure. While the value of multi-item measures is acknowledged, recent work suggests single-item scales can be similarly effective, particularly for less abstract constructs (Petrescu, 2013), and we employed a single-item measure with demonstrated validity and reliability (Zhu *et al.*, 2018).

Although scholars have predominantly relied on similar self-report measures of EP (Adomako *et al.*, 2016; Cardon and Kirk, 2015), such self-reports may be subject to self-report bias. Even in experimental designs, the challenge of validly capturing EP has been onerous, given the lack of external and ecological validity (Holland and Garrett, 2015; Zhu *et al.*, 2018). To this end, since perseverance ultimately concerns continued behavior towards a goal, scholars have begun to employ more objective, behavioral indicators of perseverance, such as the time spent working on challenging puzzles; continued effort on tedious, or socially taxing activities (Chauntry *et al.*, 2019); or prolonged

effort on arduous and less enjoyable activities that facilitate goal achievement (Duckworth *et al.*, 2011). Following this work, we employ a novel approach to augment our self-report EP measure.

Specifically, we further assess whether respondents, over a period of three years, filed their annual returns late (three months past the legally required date), on time, or not at all; as a more objective, behavioral indicator of EP. The filing of annual returns represents a tedious, not immediately rewarding, yet potentially highly costly task if not completed (Lerner *et al.*, 2018c). Since two or more consecutive non-filings trigger the legal deregistration of one's company in South Africa (CIPC, 2021), this administrative task can be considered essential to EP. Furthermore, while factors such as business size may affect the filing of annual returns, adversity, such as unfavorable financial performance, has been shown to significantly affect how late these returns are filed (Luypaert *et al.*, 2016). Thus, as EP reflects repeated efforts (perseverance) when confronting adversity (Zhu *et al.*, 2018), our measure reflects whether the entrepreneurs persevere despite the adversity faced. That is, although the filing of annual returns does not necessarily reflect adversity, it is a behavioral indicator of EP which is sensitive to adversity.[1] The list of potential adversity faced in a venture is vast, ranging from poor financial performance to negative customer feedback, uncertainty, and a simple aversion to mundane administrative tasks (Van Gelderen, 2012). Yet, regardless of its origin, research shows that individuals who successfully start a business exhibit higher perceived accountability for bringing their ventures to fruition despite the adversity (Markman *et al.*, 2005).

As a task essential to the continual legal functioning of a business, we thus argue that not filing returns at all would reflect the lowest level of EP, filing on time would reflect higher EP, while filing late would suggest that the respondent persevered with the aim of maintaining the legal status of their business despite adversity which hindered its timely delivery. We construct this measure of EP by employing annual return data from the CIPC over a period of 3 years (2018-2020), with each year forming an item reflecting, over time, whether the individual was not particularly perseverant

(1=not filed), was perseverant (2=filed), or was perseverant in the face of adversity (3=filed late). In sum, as a measure of sustained effort towards a goal (maintenance of one's business) over time, in the face of potential adversity, and despite the fact that such effort is tedious, boring, and not immediately rewarding; we propose that this measure will adequately capture the intended meaning of EP. Furthermore, as a pivotal later-stage administrative activity on which scholars have suggested impulsive individuals struggle to follow-through (Lerner *et al.*, 2018c, we posit this measure is of particular relevance to our research.

*Control variables*. Initially, we controlled for a variety of potential confounds, including business ownership experience, gender, age, and education. Furthermore, we controlled for the potential confounding effect of business size and number of directors of the business on the behavioral indicator of EP (annual returns). However, since none of these variables were statistically significant predictors in our model, we followed best practice recommendations (Schjoedt and Bird, 2014), and removed them. As a robustness test, we compared the model with and without the controls included (Schjoedt and Bird, 2014). Regardless of their inclusion, the results were not substantively affected.

*Validity and reliability*

Confirmatory factor analysis (CFA) was used to validate the scales (Kline, 2016). Apart from a few exceptions for items from the UPPS Impulsive Behavior scale, factor loadings for all multi-item scales exceeded the recommended threshold of 0.70 (Fornell and Larcker, 1981). However, the measurement model for both the full and subsamples showed an unsatisfactory fit. We thus followed the approach of Wiklund *et al.* (2017) and deleted 2 to 3 items with low factor loadings on each impulsivity scale, resulting in 7 to 9 items per scale and a satisfactory measurement model fit (Full sample: CFI=0.913, TLI=0.906, and RMSEA=0.047; Subsample: CFI=0.909, TLI=0.899, and

**Table 1: Descriptive statistics and correlations**

| | CR | M | SD | Sk | K | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Sensation seeking (n=807) | 0.863 | 2.69 | 0.57 | 0.270 | 0.632 | ***0.645*** | | | | | |
| 2. Insufficiency of deliberation (n=807) | 0.868 | 2.01 | 0.47 | 0.153 | 0.069 | 0.150** | ***0.673*** | | | | |
| 3. Insufficiency of persistence (n=807) | 0.847 | 1.77 | 0.43 | 0.032 | -0.113 | -0.102** | 0.256** | ***0.669*** | | | |
| 4. Urgency (n=807) | 0.896 | 2.06 | 0.51 | 0.011 | -0.447 | 0.014 | 0.235** | 0.263** | ***0.723*** | | |
| 5. Perceived desirability (n=804) | 0.758 | 6.03 | 1.33 | -1.539 | 1.742 | 0.121** | 0.061 | -0.077* | -0.017 | ***0.604*** | |
| 6. EP (n=805) | | 9.33 | 2.38 | -1.869 | 3.233 | 0.096** | 0.098** | -0.048 | -0.120** | 0.215** | |
| 7. Behavioral EP (n=197) AVE=0.801 | (0.835) | (1.984) | (0.492) | (-0.379) | (0.551) | (0.033) | (-0.012) | (-0.030) | (-0.038) | (0.155*) | (0.228**) |

Notes: CR = composite reliability, M = mean, SD = standard deviation, Sk = skewness, K = kurtosis, Square root of the AVE values is reported diagonally in bold italics.

* $p<0.05$; ** $p<0.01$ level (2-tailed)

RMSEA=0.049). Additionally, for each construct, the square root of the Average Variance Extracted (AVE) was above, while the Maximum Shared Variance (MSV) was below, the factor correlations, indicating adequate discriminant validity (Nunnally, 1978). Furthermore, composite reliability for each factor was above the recommended 0.70 value, providing evidence of convergent validity and reliability (Fornell and Larcker, 1981). Construct correlations, reliability and validity estimates are presented in Table 1.

*Common Method Bias (CMB)*

Apart from the careful design of our measurement instrument (Podsakoff *et al.*, 2003), ex-post statistical procedures were also employed to examine the potential impact of CMB. Firstly, we conducted an exploratory factor analysis with all measures included. All items split into their intended constructs. Moreover, a single-factor solution only explained 19% of the variance, versus the 55% cumulative variance explained by our theorized measurement structure. Secondly, we conducted a more stringent test by including an unmeasured latent common method factor in our measurement model. Since item loadings and the significance levels of structural coefficients did not differ between this model and our theorized model, it is reasonable to assume that CMB did not significantly alter the results of this paper (Podsakoff *et al.*, 2003).

**Results**

The hypothesized model was tested using covariance-based structural equation modeling (CB-SEM) with maximum likelihood estimation method in the lavaan package (version 0.6-3) (Rosseel, 2012) within R. The SEM approach was employed as it accommodates the comparison of nested models for theory testing (Kline, 2016). Table 2 depicts the series of nested models compared for model fit. In the first step, we tested a full mediation model. The data indicated good fit for the full mediation

model ($\chi^2$(583) =1589.145, CFI=0.910, TLI=0.900, RMSEA=0.046). However, a partial mediation model fitted the data significantly better than the full mediation model ($\Delta\chi^2$=20.225, p<0.005), and also significantly better than alternative models, such as a reverse causality model ($\Delta\chi^2$=12.161, p=0.016). Thus, the partial mediation model was retained for further analyses in both the full- and sub-samples.

**Table 2: Alternative model comparison results**

| **Models** | $\chi^2$ | $df$ | $\chi^2/df$ | **IFI** | ***CFI*** | **RMSEA** | $\Delta\chi^2$ | $\Delta df$ | ***AIC*** |
|---|---|---|---|---|---|---|---|---|---|
| Partial mediation | 1568.915 | 579 | 2.710 | 0.912 | 0.912 | 0.046 | | | 1814.915 |
| Full mediation | 1589.145 | 583 | 2.726 | 0.911 | 0.910 | 0.046 | 20.225*** | 4 | 1827.145 |
| Model 1 | 1575.584 | 580 | 2.717 | 0.912 | 0.911 | 0.046 | 6.665** | 1 | 1831.324 |
| Model 2 | 1570.532 | 580 | 2.708 | 0.912 | 0.912 | 0.046 | 1.615 | 1 | 1814.532 |
| Model 3 | 1572.818 | 580 | 2.711 | 0.912 | 0.911 | 0.046 | 3.903* | 1 | 1816.818 |
| Model 4 | 1569.030 | 580 | 2.705 | 0.912 | 0.912 | 0.046 | 0.115 | 1 | 1813.030 |
| Model 5 | 1584.991 | 583 | 2.719 | 0.911 | 0.911 | 0.046 | 16.075*** | 4 | 1822.991 |
| Model 6 | 1602.809 | 584 | 2.745 | 0.909 | 0.909 | 0.047 | 33.894*** | 5 | 1838.809 |
| Model 7 | 1581.076 | 583 | 2.712 | 0.911 | 0.911 | 0.046 | 12.161* | 4 | 1819.076 |

*p<0.05; **p<0.01; ***p<0.005 (two-tailed)

Notes:

Model 1: The path of hypothesis 1a (sensation seeking → perceived desirability → EP) was removed.

Model 2: The path of hypothesis 1b (insufficiency of deliberation → perceived desirability → EP) was removed.

Model 3: The path of hypothesis 1c (insufficiency of persistence → perceived desirability → EP) was removed.

Model 4: The path of hypothesis 1d (urgency → perceived desirability → EP) was removed.

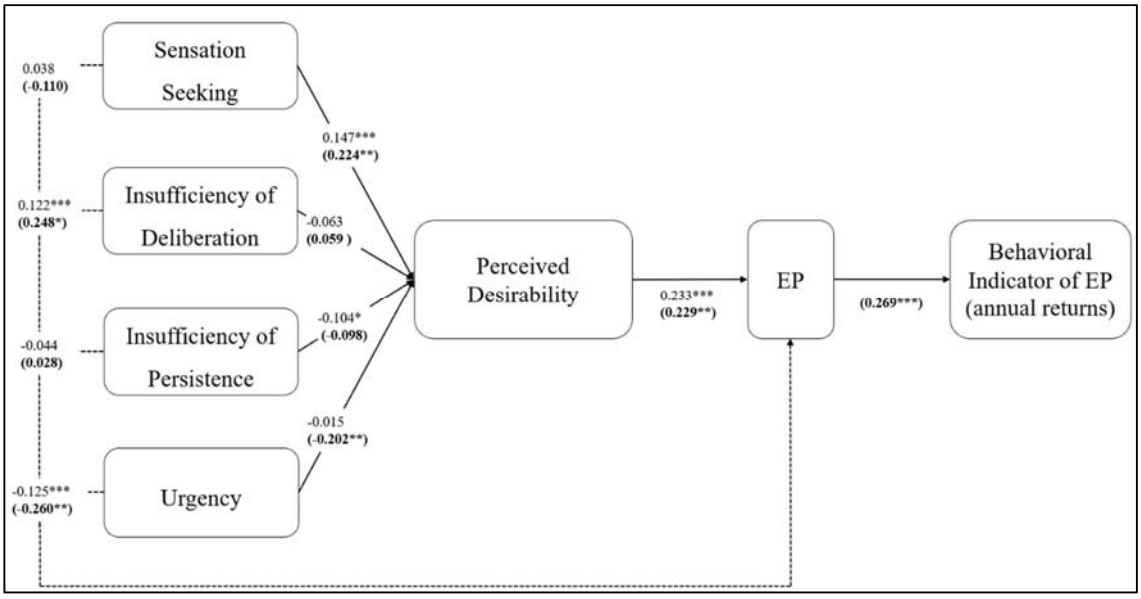
Model 5: Direct effects model (All paths from the impulsivity dimensions to perceived desirability were removed)

Model 6: Non-mediational model (the paths from the impulsivity dimensions to perceived desirability and the path from perceived desirability to EP were removed)

Model 7: Reverse causality model (Impulsivity → EP → Perceived desirability)

In the full sample, the hypothesized mediating variable, perceived desirability, was significantly related to EP (β=0.233, p<0.001). Furthermore, sensation seeking (β=0.147, p=0.003) and insufficiency of persistence (β=-0.103, p=0.042) were significantly related to perceived desirability, thus indicating initial support for a mediated path. On the other hand, insufficiency of deliberation (β=0.063, p = 0.205), and urgency (β=−0.015, p=0.724) were not significantly related to perceived desirability, suggesting that these constructs do not mediate the path to EP. Figure 2 presents the final structural model results. Furthermore, we present the results of the subsample in brackets to assess the predictive validity of our model. The effects of sensation seeking, deliberation, and persistence, relative to the full sample, remained substantively similar. However, most notably, this analysis revealed that EP significantly predicted behavioral EP over a period of three years (β=0.269, p=0.004), suggesting that self-reported EP was a valid predictor of actual behavioral EP and providing initial support for the effect of impulsivity on actual EP.

**Figure 2: Summary of structural model results**




*p<0.05; **p<0.01; ***p<0.005 (two-tailed)

Notes: β = Standardized regression coefficient. Direct paths are illustrated by solid lines while indirect paths are dashed. Bracketed bold values are derived from the subsample (n=197).

Moreover, as our sample comprised relatively experienced business-owners (mean=14.3 years), we assessed the robustness of our model to differences in experience. Conducting a multi-group moderation analysis revealed no significant differences between less (<7years) versus more (>19 years) experienced individuals. At both model, and individual path levels, no significant differences were found based on the Chi-square difference test (p-value>0.05) (Kline, 2016).

As a more rigorous non-parametric approach (Kline, 2016), we further analyzed the indirect effects using 5 000 bootstrap samples with a 95% bias-corrected confidence interval. The results, summarized in Table 3, indicate that the perceived desirability of entrepreneurship significantly explained the mediating effect between sensation seeking ($\beta$=0.034, $p<0.05$), insufficiency of persistence ($\beta$=-0.024, $p<0.05$), and EP only. Therefore, these findings provide evidence in support of mediation hypotheses, H1a and H2a, but not hypotheses H1b and H2b. Finally, we again assessed the predictive validity of our model. Table 3 indicates that self-reported EP significantly mediated the effect of insufficiency of deliberation ($\beta$=0.034, $p<0.05$), and urgency ($\beta$=-0.024, $p<0.05$), on behavioral EP. While we temper these results by acknowledging the smaller sample size (n=197), these results provide strong evidence that impulsivity, at least insufficiency of deliberation and urgency, affect actual EP over time rather than simply some perceived desire to persevere, as may be the case in self-report scales.

**Table 3: Bootstrapped indirect effect estimates**

| Hypothesized indirect effect | Path coefficient | LLCI | ULCI |
|---|---|---|---|
| Sensation seeking → PD → EP | 0.034* | 0.017 | 0.117 |
| Insufficiency of deliberation → PD → EP | 0.015 | -0.055 | 0.041 |
| Insufficiency of persistence → PD → EP | -0.024* | -0.050 | -0.001 |
| Urgency → PD → EP | -0.004 | -0.026 | 0.042 |
| Sensation seeking → PD → EP → BEP | 0.012 | -0.005 | 0.028 |
| Insufficiency of deliberation → PD → EP → BEP | -0.004 | -0.017 | 0.008 |
| Insufficiency of persistence → PD → EP → BEP | -0.006 | -0.018 | 0.006 |
| Urgency → PD → EP → BEP | -0.012 | -0.028 | 0.005 |
| Sensation seeking → EP → BEP | -0.026 | -0.076 | 0.024 |
| Insufficiency of deliberation → EP → BEP | 0.081* | 0.006 | 0.169 |
| Insufficiency of persistence → EP → BEP | 0.008 | -0.046 | 0.062 |
| Urgency → EP → BEP | -0.066* | -0.132 | -0.012 |

*p < 0.05, **p <0.01 (two-tailed)

Note: Based on two-tailed tests. Standardized coefficients reported; LLCI = lower level confidence interval; ULCI = upper level confidence interval; PD = Perceived Desirability; EP = Entrepreneurial Perseverance; Behavioral indicator of EP = BEP.

*Post-hoc analysis: toward an entrepreneurial impulsivity profile*

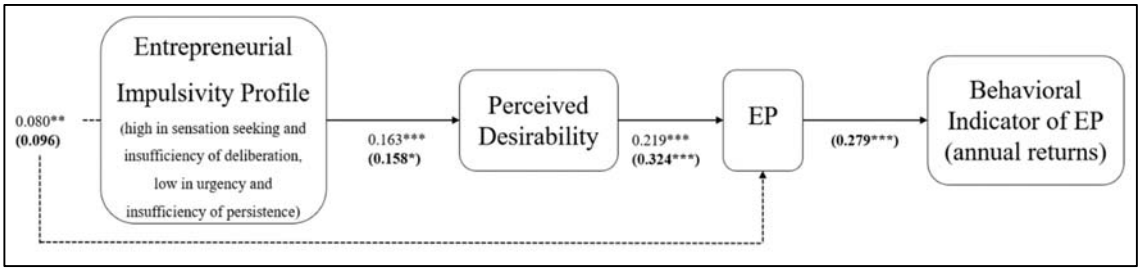
There are two general approaches to investigating links between personality and entrepreneurial outcomes: a variable- or a person-oriented approach (Obschonka and Stuetzer, 2017). To date, impulsivity research, particularly in the entrepreneurial context, has taken a variable-oriented approach. In the preceding analysis we have taken such an approach, by attending to the impact of the isolated impulsivity variables on EP. Yet, research in the domains of psychology (Bergman *et al.*, 2015), entrepreneurship (Obschonka *et al.*, 2018), and P-E fit (Edwards, 2009; Kristof-Brown *et al.*, 2005), has begun to stress the importance of a person-oriented approach, which employs a more

holistic view of personality by considering an "intraindividual entrepreneurial constellation" of personality traits. This intraindividual approach appears to show more robust and consistent results relative to the variable oriented approach (Obschonka and Stuetzer, 2017), and is a natural extension to work employing P-E fit paradigms, given that this work aims to consider the person as a whole (Bergman *et al.*, 2015; Kristof-Brown *et al.*, 2005). Hence, we propose and quantify an entrepreneurship-prone impulsivity profile, consistent with calls by Lerner *et al.* (2018a) to explore impulsive behavior determinants through more simplified comparative ratios. Specifically, following previous entrepreneurship research on the Big Five personality traits (Obschonka *et al.*, 2018; Obschonka and Stuetzer, 2017), we computed a fit index. This index encapsulates the discrete impulsivity dimensions into a single measure which is analogous to the $D^2$ coefficient of Cronbach and Gleser (1953) used to compute profile similarity.

Since the results from our hypothesized model prompted us to examine this entrepreneurship-prone impulsivity profile, we do not offer a hypothesis regarding this relationship, and, following best practice recommendations (Anderson *et al.*, 2019), rather present our results here as an exploratory post-hoc analysis which can offer a fruitful starting point for further research on the profile. What piqued our interest was the fact that the results of our paper challenge suggestions that the suitability of impulsivity to entrepreneurship may be constrained to initial interest and action (Antshel, 2018; Patel *et al.*, 2021; Stappers and Andries 2021). Not only, according to Wiklund *et al.* (2017), do the sensation seeking and insufficiency of deliberation impulsivity dimensions appear to fit well with the entrepreneurial context in terms of early-stage behavior, while urgency and insufficiency of persistence do not; but our theorized results suggest that this 'fit' extends to EP as a pivotal later-stage entrepreneurial outcome. Therefore, our results begin to suggest an intraindividual entrepreneurial constellation of trait impulsivity, exhibited through high values on sensation seeking and insufficiency of deliberation as well as low values on urgency and insufficiency of persistence.

Using this constellation to form a fixed reference profile, we computed an individual's entrepreneurship-prone impulsivity profile by comparing their UPPS impulsivity profile to the theoretical reference profile comprising the endpoints of the distributions (i.e., highest possible score [3] in sensation seeking and insufficiency of deliberation; lowest possible score [0] in urgency and insufficiency of persistence). We recoded the UPPS scores to a 0–3 scale and computed the deviation of each individual's profile compared with the entrepreneurship-prone impulsivity profile by squaring the differences between the two values for all the items of all the sub-scales, summing them per individual, and reversing the algebraic sign. The resulting $D^2$ index (M=-114.21; SD=30.33) represented the entrepreneurship-prone impulsivity profile and indicated how closely an individual resembled the theoretical reference profile (higher scores equaled a closer fit).

**Figure 3: Entrepreneurial impulsivity profile summary of structural model results**




*p<0.05; **p<0.01; ***p<0.005 (two-tailed)

Notes: β = Standardized regression coefficient. Direct paths are illustrated by solid lines while indirect paths are dashed. Bracketed bold values are derived from the subsample (n=197). (Full sample fit: $\chi^2(10)=365.312$, CFI=0.985, RMSEA=0.057; Subsample: $\chi^2(28)=295.436$, CFI=0.985, RMSEA=0.047).

Repeating the CB-SEM analysis for the entrepreneurship-prone impulsivity profile (refer to Figure 3), we find that this construct significantly positively predicted EP (β=0.08, p<0.01), and perceived desirability (β=0.163, p<0.005). Furthermore, since perceived desirability positively predicted EP (β=0.219, p<0.005), and EP positively predicted actual behavioral EP (β=0.279,

$p<0.005$), there is some evidence suggesting the presence of a partial mediation model. We thus provide further support for our predictions–based on P-E fit (Dawis and Lofquist, 1984; Su *et al.*, 2015), and begin to establish a baseline reference profile of impulsivity which fits the entrepreneurial context.

**Discussion**

In this paper, we draw from P-E fit theory (Kristof-Brown, 1996), to develop a model linking impulsivity to EP through the perceived desirability of entrepreneurship. Employing CB-SEM, the results provide critical insight into the mechanism by which impulsivity may drive EP. As predicted in *H1a*, individuals high on sensation seeking demonstrated higher EP, and this relationship occurred through their higher levels of perceived desirability of entrepreneurship. Employing arguments from P-E fit theory, scholars have previously theorized (Wiklund *et al.*, 2018b) and found (Wiklund *et al.*, 2017), that impulsive individuals, particularly those high on sensation seeking, are attracted to the entrepreneurial context and this attraction drives early-stage engagement. The present results specifically extend this P-E fit argument beyond early-stage start-up decisions to demonstrate a positive impact on an entrepreneur's decision to persevere with a venture. Based on similar arguments, perceived desirability also fully mediated the negative relationship between insufficiency of persistence and EP, supporting *H2a*. While Wiklund *et al.* (2017), theorized a positive link between insufficiency of persistence and perceived desirability, they found a negative, albeit non-significant relationship. The present study appears to clarify these results–since entrepreneurship entails a multitude of challenging and tedious activities (Van Gelderen, 2012), insufficiency of persistence has a poor fit with the entrepreneurial context, lowering perceptions of desirability and hence, EP.

While a P-E fit explanation applies to individuals high on sensation seeking as well as insufficiency of persistence, this explanation does not appear to hold for urgency and insufficiency

of deliberation. Perceived desirability was not found to mediate the positive relationship between insufficiency of deliberation and EP, nor the negative relationship between urgency and EP. As a result, H*1b* and H*2b* are not supported.[2] Rather, in both the full- and sub-samples these two impulsivity dimensions were found to be directly related to EP. In sum, while the results reinforce the importance of P-E fit to EP, as well as P-E fit to explanations of links between impulsivity and the entrepreneurial context, they also point to the need to explore and incorporate additional explanations. One explanation is that since individuals lacking deliberation tend to experience a poor fit in traditional, structured work and educational environments, they may have developed resilience in dealing with setbacks and difficulties due to their personality (Antshel, 2018), which may enhance EP. Furthermore, while we assess an impulsivity-perceived desirability link, desirability perceptions, formed through P-E fit, entail a more reasoned top-down process than is typically expected of the impulsivity traits. Indeed, recent work (Pietersen and Botha, 2021) has drawn on bottom-up reward and threat sensitivity mechanisms (Gray, 1994), to better articulate the unreasoned processes underlying the effects of impulsivity on entrepreneurial behavior, and this may be a fruitful line for future EP research. For example, particularly for established owner-managers exhibiting high trait urgency, perhaps it is less a reduction in the attraction to entrepreneurship which affects their EP, but rather their bottom-up threat sensitivity and withdrawal response (Berg *et al.*, 2015). Nevertheless, by establishing both the impulsivity-EP link and the perceived desirability-EP link, we advance the literature beyond viewing the EP decision as purely an economic matter of predicting pecuniary benefits and assessing feasibility. It also involves feelings of attraction (perceived desirability) and trait impulsivity (characterized by a predisposition not to reason).

Overall, the theorized model significantly predicted actual EP over time. In particular, we find compelling evidence that insufficiency of deliberation enhances, and urgency hinders, actual EP, as represented behaviorally through the filing of annual returns over time. This indicates that, despite the general perception that impulsivity is maladaptive and aberrant, certain impulsivity traits can exert

an important and beneficial effect on EP (Antshel, 2018; Wiklund, 2018b), which is essential to successful entrepreneurs and business start-ups (Holland and Garrett, 2015).

As part of a post-hoc analysis, the present investigation also advanced a person-oriented approach (Bergman *et al.*, 2015), to investigating links between multidimensional impulsivity and EP by considering an "intraindividual entrepreneurial constellation" of the impulsivity dimensions. Based on the results of this paper, as well as prior research (Wiklund *et al.*, 2017), an entrepreneurship-prone impulsivity profile was identified which seems suited to the entrepreneurial context in terms of early-stage behavior (Wiklund *et al.*, 2017), as well as later-stage EP (found in this study). This profile, which consists of an intraindividual profile high on sensation seeking and insufficiency of deliberation, but low on urgency and insufficiency of persistence, further supports our predictions–based on P-E fit (Dawis and Lofquist, 1984), that impulsivity is linked to EP through perceived desirability. In so doing, these results begin to answer the calls to take a more holistic and unified view of impulsivity (Edwards, 2009; Kristof-Brown *et al.*, 2005; Lerner *et al.,* 2018a). Overall, this research has several significant implications for entrepreneurship theory as well as practice, which we discuss in turn in more depth.

*Theoretical implications*

When trying to fully understand how impulsivity affects entrepreneurs, it is essential that research goes beyond the initial start-up decision to explore how the trait affects entrepreneurs' ability to persevere in the face of the inevitable setbacks, challenges and uncertainty associated with starting and running a business (Lerner *et al.*, 2018c; Zhu *et al.*, 2018). Following evidence that impulsivity explains the link between ADHD and entrepreneurial preference (Wiklund *et al.*, 2017), we home our focus on impulsivity and draw from P-E fit theory to demonstrate an impulsivity–EP link. From a theoretical perspective, this paper thus provides a novel extension of P-E fit theory beyond ADHD

and initial entrepreneurial interest (Stappers and Andries 2021), to the impulsivity-EP relationship. The impact of the impulsivity dimensions on EP was hitherto unknown, and given the relative lack of forethought and poor tolerance for delayed gratification among more impulsive individuals, has been suggested to likely be harmful (Greidanus and Liao, 2021; Patel *et al.*, 2021). Thus, by clarifying how impulsivity affects entrepreneurs' EP, this paper begins to facilitate broader understanding of the implications of impulsivity in the entrepreneurial process (Wiklund et al., 2018b). Since research has theorized (Antshel, 2018), and found (Wiklund *et al.*, 2017), a close link between ADHD and trait impulsivity in the entrepreneurial context, these results should also hold broader relevance to ADHD-entrepreneurship research.

Additionally, although only applicable to two impulsivity dimensions, we begin to uncover a mechanism driving the impulsivity-EP relationship which explains how these dimensions may actually enhance EP rather than diminish it. The findings of this study thus begin to open up the black box of the impulsivity-EP link by detailing how—in line with the predictions of P-E fit (Su *et al.*, 2015)—an impulsive individual's attraction to the novelty, uncertainty and task characteristics of entrepreneurship drives their choice of whether to discontinue their action or persevere. Thus, this paper contributes towards deepening our insight into the impulsivity-EP relationship and hence the vocational fit of impulsive individuals in the entrepreneurial context. Moreover, we find insufficiency of deliberation and urgency are directly related to EP. We theorize that an acquired resilience mechanism and specific threat and reward sensitivity mechanisms may explain these effects. In so doing, we provide impetus, through our evidence and post-hoc theorizing, for future research efforts aimed at more comprehensively explaining the impulsivity-EP relationship.

Beyond advancing the largely unexamined notion that impulsive entrepreneurs are not only likely to act, but also likely to persevere (refer to Greidanus and Liao, 2021, for an exception), this paper also shows how individuals perceive and process the uncertain entrepreneurial context. The heterogeneous dimensions of impulsivity reflect facets of one's personality and thus are broader, and

tap different constructs from those represented by specific information processing styles such as intuition (Berg *et al.*, 2015). Nevertheless, there remains some conceptual overlap, since these traits ultimately drive differences in how individuals perceive and process environmental stimuli (Moore *et al.*, 2021), and it is this linkage that we employ to hypothesize an impulsivity-entrepreneurship fit. Thus, we begin to answer the call to advance understanding of the impact of individuals' information processing styles on EP (Adomako *et al.*, 2016; Bazzy *et al.*, 2019).

Generally, scholars have believed that EP and sustained effort towards a start-up goal are predicated on predictions of the pecuniary benefits and feasibility of a venture (Astebro *et al.*, 2014). However, the results of this research show that individuals who are known to be impulsive, non-reflective and unperturbed by negative feedback, tend to have higher EP. The notion that impulsive individuals not only engage in greater entrepreneurial behavior (Wiklund *et al.*, 2017), but also increased EP, is a noteworthy contribution as it contributes towards explaining the conundrum of why the EP decision is not merely a matter of pecuniary benefits and feasibility analysis (Astebro *et al.*, 2014).

*Practical implications*

By demonstrating several beneficial, and harmful effects of multidimensional impulsivity on EP, this study highlights the nuanced relationship between impulsivity and EP and how, from a practical perspective, the traits may be effectively utilized in the pursuit of entrepreneurial endeavors. In so doing, these results have vocational choice implications, entrepreneurial training and support intervention implications; and, more broadly, socioeconomic implications.

More specifically, much of the P-E fit literature examines fit in traditional corporate contexts (Markman and Baron, 2003; Verheul *et al.*, 2015), and associates impulsivity with poor fit and performance (Antshel, 2018). Yet, this paper advances an emerging view that, in contrast to typically

negative associations of impulsivity in traditional wage employment (Berg *et al.*, 2015), the entrepreneurial context appears to be a domain where impulsivity, if exhibited at functional levels, could be an asset (Lerner *et al.*, 2018c). In particular, this paper provides nuanced understanding of how impulsivity could be productively harnessed as a way to encourage entrepreneurial desires and EP, by developing understanding of what drives impulsive individuals to persevere in their entrepreneurial endeavors. For example, our findings develop insight into the vocational characteristics which are preferred by individuals high on each impulsivity dimension and how this may result in desirable outcomes (i.e., EP). In so doing, we contribute towards work offering empirical guidance for selecting a career suited to a highly impulsive personality and managing the upsides and downsides of that personality (Canits *et al.*, 2018).

For instance, sensation seekers and those lacking deliberation might be wise to consider the pursuit of an entrepreneurial endeavor as a viable career route. Alternatively, those lacking persistence and high on urgency may be well advised to pursue more structured, imitative opportunities, such as a well-established franchise business, as opposed to more innovative opportunities, as the certainty and structure associated with imitative opportunities should increase the P-E fit for these individuals (Wiklund *et al.*, 2018a), thereby limiting the negative impact on their EP through perceived desirability. These implications may also extend to the amelioration of traditional workplace settings. For instance, our research suggests that a highly flexible, dynamic, and novel workplace will lead to improved outcomes for sensation seekers, while at the same time, a more structured workplace with limited distractions should assist those high on insufficiency of persistence. Ultimately, since prior research has associated impulsivity with detrimental outcomes in traditional workplace contexts (Antshel, 2018), the positive findings of this paper have the potential to significantly advance our understanding of the potential socioeconomic benefits arising from taking advantage of the impulsivity-entrepreneurship fit.

Finally, we begin the development of an entrepreneurship-prone impulsivity profile which appears suited to the entrepreneurial context in terms of early-stage behavior (Wiklund *et al.*, 2017), as well as later-stage EP (found in this study). Wiklund *et al.* (2017) found that the sensation seeking and insufficiency of deliberation impulsivity dimensions appear to fit well with the entrepreneurial context in terms of early-stage behavior, while urgency and insufficiency of persistence do not; and we find that this 'fit' extends to later-stage EP. Therefore, we advance an approach to assessing an intraindividual entrepreneurial constellation of trait impulsivity which may be positively linked to entrepreneurship. This approach, which computes a fit index, may provide much needed parsimony to the well-acknowledged complexity of drawing implications from impulsivity in the entrepreneurial context (Wiklund *et al.*, 2018b). In so doing, we offer an approach to researchers for drawing conclusions regarding all the impulsivity dimensions concurrently, in contrast with the variable-oriented approach currently used (Wiklund *et al.*, 2018b), which may strengthen predictions and understanding of the impulsive entrepreneurial personality as a whole (Bergman *et al.*, 2015).

*Limitations and future research*

The limitations of this study may serve as recommendations for future research. First, hypotheses were tested using survey data. We validated our model with objective, longitudinal EP data and followed recommendations by theoretically grounding and rigorously testing our model against competing theoretical models (Kline, 2016). However, it is important to note that, like EP, perceived desirability of entrepreneurship may change over time with adversity. Thus, entrepreneurship research would profit from more robust longitudinal and experimental research to further strengthen causal understanding (Anderson *et al.*, 2019). Second, while our behavioral EP measure triangulates our results, this measure is also subject to alternative drivers. For example, an individual may still be persevering with their business yet stop filing returns as they aim to move their business into the

informal economy. While our measure would not capture this variation, most business owners prefer to maintain the benefits of a formally registered company. Therefore, as a tedious activity which is sensitive to adversity and is required for the formal maintenance of a business (Luypaert et al., 2016), we argue the filing of annual returns represents a robust indicator of EP for owner-managers and is a particularly stringent test of EP for impulsive entrepreneurs (Lerner and Hunt, 2012; Lerner *et al.*, 2018c). Third, while we proposed a P-E fit theory of the impulsivity-EP link, we only found mediation for two of the four impulsivity dimensions. We conceptualized perceived desirability as the degree to which individuals anticipate their entrepreneurial pursuit to be attractive. Although perceived desirability as an anticipated emotion is less analytically reasoned than pecuniary benefit- and feasibility-analysis, the anticipatory nature of the perceived desirability construct may be inherently better at capturing more reasoned processes, rather than the impulse-driven processes associated with impulsivity traits (Loewenstein *et al*., 2001). Although emerging (Pietersen and Botha, 2021), future research would benefit from more detailed exposition of the reasoning processes underlying the impulsivity-EP link. Finally, as our sample comprised experienced owner-managers, we cannot directly comment on the whether the hypothesized effects will hold among nascent and less experienced entrepreneurs, and this is a fruitful line of future inquiry.

## Conclusion

To the extent that the impulsivity-EP relationship remained unexplored, it remained unclear how impulsivity affects EP, and scholars remained unable to draw stronger implications regarding the effects of impulsivity beyond initial instigation (Wiklund et al., 2018b) and general venture earnings (Rajah *et al.*, 2021). This paper focuses on the EP decision, and in doing so, advances understanding of why the perseverance decision is not simply a matter of venture pecuniary benefits and feasibility. We further derive a new entrepreneurship-prone impulsivity profile which seems suited to the

entrepreneurial context in terms of later-stage EP. By demonstrating the relevance of impulsivity to EP, this paper illustrates the fruitfulness of further investigations in this regard to arrive at a more holistic understanding of the fit between impulsivity and entrepreneurship.

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**Endnotes**

[1] As an additional assessment of the sensitivity of our annual return filing measure to adversity, we performed paired sample t-tests to compare the mean EP from 2018 to 2020. Since 2020 was a particularly challenging year for businesses globally, and in South Africa specifically, given Covid-19 and the associated government-imposed shutdowns of trade activities, we expected to see lower EP levels during this period. Indeed, the mean EP for 2020 (M=1.84), was significantly lower than that of 2019 (M=2.04; $p<0.005$) and 2018 (M=2.06; $p<0.005$), suggesting our measure does capture EP, which is sensitive to real entrepreneurial adversity.

[2] Although a significant mediated effect for urgency was found for the subsample of 197 respondents, suggesting marginal support for H*2b*, we took the more rigorous approach of giving preference to the larger sample results. We relied more on the subsample results to indicate the overall validity of the theorized model in predicting behavioral EP over time.