

Entrepreneurial success: the 'push', 'pull' or personality factor?

The mediating effect of personality on the relationship between opportunity entrepreneurship versus necessity entrepreneurship and entrepreneurial success

Name: Elisabeth S. Besselse

Student number: 432186

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Supervisor: P. W. van der Zwan

Abstract

Previous research found a relationship between opportunity and necessity entrepreneurship and entrepreneurial success. Additionally, a relationship between personality and entrepreneurial success is found. In this research the mediating effect of personality on the relationship between nascent opportunity versus nascent necessity entrepreneurship and nascent entrepreneurial success is researched. The traits that are researched are the traits *need for achievement, need for autonomy, self-efficacy, endurance* and *need for approval*. Data from the PSED II cohort are used that tracks the startup efforts in 'real time' for a period of six years. The competing risks model and KHB method are used to find a mediating effect of personality on the relationship between nascent opportunity versus necessity entrepreneurship and nascent entrepreneurial success. Evidence presented in this research suggests that nascent opportunity entrepreneurs are more successful in setting up a business than nascent necessity entrepreneurs. Additionally, nascent entrepreneurs with higher levels of self-efficacy and endurance are more likely to achieve nascent entrepreneurial success, while nascent entrepreneurs with higher levels of need for achievement, need for autonomy and need for approval are more likely to fail. Lastly, self-efficacy significantly mediates the relationship between nascent opportunity entrepreneurship and nascent entrepreneurial success. This could implicate that training focused on strengthening the self-efficacy of nascent necessity entrepreneurs could increase their chances of nascent entrepreneurial success.

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1. Introduction

When during the 1980s and 1990s five million people lost their jobs in the United States, many turned to entrepreneurship. In the end, this contributed more to the economy than the big corporations that laid them off in the first place (Baron, 2000). Entrepreneurs are therefore regarded as essential for wealth creation, innovation and economic development (Schumpeter, 1947). Since entrepreneurs are regarded to contribute to the economy, it is not unexpected that much research is dedicated to this field.

Entrepreneurs in the early stages of starting up a business are nascent entrepreneurs (NEs) (Arenius & Minniti, 2005). In this research I discuss nascent entrepreneurship exclusively. Therefore, whenever entrepreneurs or entrepreneurship is mentioned, nascent entrepreneurs or nascent entrepreneurship is meant.

Not all nascent entrepreneurs bring economic growth. There are two kinds of entrepreneurs who are differentiated by their motivation to start a business. Some entrepreneurs are ‘pushed’ into entrepreneurship, because there is no better option at hand. These entrepreneurs are called necessity entrepreneurs. Others are ‘pulled’ into entrepreneurship because they saw a valuable opportunity they want to exploit. These entrepreneurs are called opportunity entrepreneurs (Reynolds et al., 2002).

Opportunity entrepreneurs are expected to be more successful than necessity entrepreneurs (Acs, 2006; Block & Sandner, 2009). However, the reason for this difference is not entirely clear. On the one hand, opportunity entrepreneurs are expected to be more successful because necessity entrepreneurs have less time to prepare and set up a social network (Block & Wagner, 2010). On the other hand, it is expected because the two groups differ in personality (Tyszka et al. 2011; Holmquist & Sundin, 1989).

This research investigates whether nascent opportunity entrepreneurs are more successful in setting up a business than nascent necessity entrepreneurs. Up until now, the difference in success of these two groups of nascent entrepreneurs is not researched much and most research lacks longitudinal data where the nascent entrepreneurs are tracked over a longer period of time (Wagner, 2005). This research contributes here, as longitudinal data is used, tracking 1,124 nascent entrepreneurs over a period of six years after beginning their startup efforts. This allows me to investigate whether nascent opportunity entrepreneurs have a

higher probability to succeed in starting up a business in this period of time, compared to nascent necessity entrepreneurs.

Apart from investigating whether nascent opportunity entrepreneurs are more successful than nascent necessity entrepreneurs, this research also investigates whether this difference is mediated by personality differences between these two groups.

There has been extensive research on the entrepreneurial personality (Baum & Locke, 2004; Ciavarella et al., 2004; Rauch & Frese, 2007b). Most researchers find a relationship between personality and entrepreneurial intentions. Nevertheless, the relationship between personality traits and their influence on entrepreneurial success is disputed. Where first the relationship was seen as weak or not found at all (Gartner, 1985; Mischel, 1968; Begley & Boyd 1987), this field made a recent comeback when significant results were found between personality and entrepreneurial success (Baron, 2000; Rauch & Frese, 2000).

However, apart from the research of Tyszka et al. (2011), the relationship between personality and entrepreneurial success that distinguishes opportunity and necessity entrepreneurs has not been researched so far. Tyszka et al. (2011) research the difference in self-efficacy and risk attitudes of necessity and opportunity entrepreneurs and non-entrepreneurs in Poland that already set up a firm. Their findings are that opportunity entrepreneurs show higher levels of self-efficacy compared to the other two groups. However, to the best of my knowledge, the difference in personality traits between nascent opportunity and necessity entrepreneurship is not investigated so far. This research attempts to fill that gap.

Traits often mentioned in research on personality and entrepreneurial success are need for achievement (Davidsson, 1991; McClelland, 1961; Rauch & Frese, 2000), self-efficacy (Rauch & Frese, 2007b; Hechavarría et al., 2012), endurance (Gatewood et al., 1995; Hoang & Gimeno, 2010; Wu et al., 2007), need for autonomy (Rauch & Frese, 2007a; Oosterbeek et al., 2010) and need for approval (Hayter, 2011; Bruton et al., 2010). These are also the traits that are researched in this study.

In previous research, the traits need for achievement, need for autonomy, self-efficacy, endurance and need for approval are positively linked to entrepreneurial success (Busenitz & Barney, 1997; Devries, 2008; D'Intino et al., 2007; Gatewood et al., 1995; Hayter, 2011; Parasuman et al., 1996). Therefore I expect to find similar results for nascent entrepreneurs.

Moreover, opportunity entrepreneurs are expected to have higher levels of need for achievement, self-efficacy and need for autonomy (Holmquist & Sundin, 1989; Tyszka et al., 2011). Opportunity entrepreneurs are expected to have lower levels of endurance and need for approval than necessity entrepreneurs (Anokhim et al., 2008; Casrud & Brännback, 2011; Jyoti et al., 2011).

The afore mentioned traits are expected to be positively related to nascent entrepreneurial success, and the traits need for achievement, self-efficacy and need for autonomy are expected to be more prevalent among opportunity entrepreneurs. Therefore I expect that the relationship between nascent opportunity and nascent necessity entrepreneurship and nascent entrepreneurial success is mediated by the traits need for achievement, self-efficacy and need for autonomy. The mediating effect of personality on nascent opportunity and nascent necessity entrepreneurship has not been researched, to my knowledge. Therefore this research fills that gap.

Understanding if personality has a mediating effect on the probability to succeed as a nascent necessity entrepreneur or nascent opportunity entrepreneur is important. The recent high failure rate of startups is costly for the economy in terms of job loss and bankruptcy (Decker et al., 2014). Therefore, understanding possible causes of the high failure rate could have important policy implications. First of all, policy could focus on aiding the group of nascent entrepreneurs who struggle the most in setting up a business. Second of all, understanding whether personality traits play a mediating role in the probability for success, has important implications as some of these traits can be trained (Henry et al., 2005).

This research uses data of cohort II of the Panel Study of Entrepreneurial Dynamics (PSED), University of Michigan. The PSED is a large-scale dataset tracking 1,124 NEs in the United States (U.S.) for six years. NEs are identified using random number dialing of 31,845 households. The NEs are selected when they are trying to set up a business, alone or with others. Information about the NEs and their startup efforts is gathered quarterly for six years, starting in 2005 (Reynolds & Curtin, 2007). The data set contains information on business formation, its financials, the founders and the reason to become an entrepreneur. The detailed information allows this research to look into the different characteristics and startup success. This dataset is particularly suited for this research as it overcomes hindsight and survival bias because it collects information ‘real time’ (Parker & Belghitar, 2006). The PSED database is unique as it is the first dataset that tracks NEs for a longer period of time during the same time

they are starting up a business. After the PSED, studies on entrepreneurship in The Netherlands, Sweden, Norway, Argentina, Canada and Greece were set up in the same manner (Reynolds et al., 2005).

Important findings of this research are that nascent opportunity entrepreneurs are significantly more likely to succeed in setting up a business than nascent necessity entrepreneurs. Additionally, only self-efficacy and endurance are significantly positively related to nascent entrepreneurial success, while need for achievement, need for autonomy and need for approval are significantly negatively related to nascent entrepreneurial success. Lastly, evidence suggests that self-efficacy positively mediates the relationship between opportunity entrepreneurship and nascent entrepreneurial success. It is found that the statement "*I am confident I can put in the effort needed to start this new business*", that is used to construct the variable of self-efficacy, has a significant mediating effect on the relationship between nascent opportunity entrepreneurship and nascent entrepreneurial success.

The outline of this research is as follows. First, the theoretical framework is developed in section 2. Section 3 discusses the PSED and the variables selected. Section 4 discusses the methodology used to test the hypotheses. Section 5 discusses the results of the regressions. Section 6 concludes and discusses the outcomes and possibilities for future research. All tables can be found in the appendix.

2. Theoretical Framework

2.1.1 Entrepreneurship

As soon as the term ‘entrepreneur’ was coined, there has been contradiction about its definition. In the 18th century, Richard Cantillon defines an entrepreneur as a risk bearer, by calculating the costs of uncertainty or by avoiding uncertainty if the costs cannot be calculated (Fiet, 1996). Schumpeter (1947) defines the entrepreneur as someone who innovates by introducing a new product or process. Moreover, he sees the entrepreneur as someone who can withstand the resistance of the market and cope with the difficulties of introducing an innovation. By doing that, the entrepreneur creatively destroys the existing equilibrium. Kirzner (1999) contradicts Schumpeter by stating that the entrepreneur is not in any way an innovator nor does he produce, but is someone who is alert for profitable opportunities in the market and exploits them for personal gain. According to Casson (1982) entrepreneurs hold a personal quality, which enables them to make decisions that prove to be successful. By doing so, they alter the normal way of doing things.

Regardless of the true definition of entrepreneurship, it is agreed upon that its contribution to the economy is indispensable. Entrepreneurship creates jobs (Decker et al., 2014; Malchow-Møller et al., 2011), increases competition (Carree & Thurik, 2006; Jacobs (1969), increases productivity (Foster et al., 2006) and is a source of innovation (Audretsch & Feldman, 2004). Therefore it is no surprise that much research is dedicated to entrepreneurship and the entrepreneur.

2.1.2 Nascent entrepreneurship

This research focuses on NEs, individuals who are involved in the process of setting up a business (Arenius & Minniti, 2005). More specifically, in the PSED data, NEs are those who consider themselves to be part of a startup process, have engaged in this process in the last 12 months, expect to be at least partially owning the new firm but have not progressed to having an operating business (Reynolds & Curtin, 2007). Since this research uses the PSED database, this is also the definition used in this research.

2.2 Entrepreneurial success

As for the definition of entrepreneurship, there are multiple measures for successful entrepreneurship. One way is to view entrepreneurial success as the launching of a new firm into the market (Markman & Baron, 2003). One can measure the added value to society by looking at job, wealth and new product creation as the outcome of a successful entrepreneurial process (Stevenson and Jarillo, 1990). Or one can look at sales, profit and growth to define entrepreneurial success (Haranda, 2001; Rauch & Frese 2007b; Baum & Locke, 2004).

In this research, the definition of successful nascent entrepreneurship combines the above-mentioned views. An NE is successful when he/she moves from being an NE to being an entrepreneur. This stage is accomplished when the NE successfully registered his/her firm, and the new firm has had positive revenue for at least six of the last twelve months (Reynolds & Curtin, 2007).

Firm registration is needed to receive revenues and to become a legal entity. However, not all registered firms become 'real businesses' (Brüderl & Preisendörfer, 1998). Therefore financial performance is also included in the measure for entrepreneurial success. Financial performance is a good indicator for entrepreneurial success, because entrepreneurs want to be compensated financially for their investments (Unger et al., 2011). Looking at positive revenue has three advantages as it measures acceptance in the market, implies quality and distinguishes the product from other products (Unger et al., 2011). This objectively shows the market gains of the company (Baum & Locke, 2004).

There are three outcomes for NEs who devote time to setting up a business. The NE can give up and quit the startup efforts, in which case the NE is unsuccessful. Another option is that the NE sets up a new firm, in which case the NE is regarded to be successful. Lastly, it can happen that the NE neither succeeds to set up a business nor quits, but continues the startup efforts and therefore remains an NE (Reynolds & Curtin, 2007). Following the rationale of the PSED, the NE is regarded to have entrepreneurial success when the NE sets up a new firm and has positive revenue for at least six out of the last twelve months (Reynolds & Curtin, 2007).

2.3.1 *Motivation*

Within the group of NEs, there are those who are ‘pushed’ into entrepreneurship out of dissatisfaction with the current situation, and those who are ‘pulled’ into entrepreneurship, because they see a valuable opportunity they want to exploit (Amit & Muller, 1995). These two types of entrepreneurs are coined as ‘necessity entrepreneurs’ for those who are pushed into entrepreneurship, because there is no better option, and ‘opportunity entrepreneurs’, who actively chooses to become an entrepreneur (Reynolds et al., 2002). The economic value of entrepreneurs varies greatly between opportunity and necessity entrepreneurs, where value added is greater for the first group and the latter barely has an influence on economic development (Acs, 2006).

2.3.2 *Necessity versus opportunity entrepreneurship and success*

Block and Wagner (2010) investigate the differences in earnings between opportunity and necessity entrepreneurs. Block and Wagner (2010) find that opportunity entrepreneurs have higher earnings than necessity entrepreneurs. This may be because opportunity entrepreneurs have more time for preparations (Block & Wagner, 2010). Additionally, in the tradeoff between leaving the current job and starting a new business, one must expect higher returns in terms of monetary and non-monetary benefits. Therefore one must be confident of their skills and preparations to be sufficient to set up and lead a business. Otherwise the payoff would be too low and one will stick to their job.

Necessity entrepreneurs face another tradeoff, as they only face the tradeoff between unemployment benefits and benefits for setting up their business (Amit et al., 1995). Necessity entrepreneurs are therefore more likely to pursue less valuable opportunities (Shane, 2003; Shane & Venkatamaran, 2000). Lastly, necessity entrepreneurs are in the survival-mode and more concerned with avoiding failure, as they have no better option at hand. This is why they may ignore opportunities with a longer payback period (Casrud & Brännback, 2011).

Therefore, I predict that

H1. Opportunity entrepreneurs have a higher probability of succeeding as an NE, compared to necessity entrepreneurs

2.4 Personality characteristics

‘The startup process starts with the first actions of the nascent entrepreneur’ (Korunka et al. 2003, p. 23). Therefore the future of the startup depends heavily on the actions and decisions the entrepreneur made. These actions and decisions taken by the entrepreneur depend on the entrepreneur’s personality characteristics (Herron & Robinson, 1993).

The entrepreneurial personality is a much-researched topic. Ones and Viswesvaran (2003) find homogeneity in personality profiles in occupations. Critics do not see the advantage of researching the entrepreneurial personality, arguing that there is heterogeneity in both entrepreneurs and their ventures (Gartner, 1985; Mischel, 1968), that the linkage between financial performance and personality in an entrepreneurial firm is weak (Begley & Boyd, 1987), and that there is only a weak relation between personality and venture growth (Lee & Tsang, 2001).

On the contrary, Shaver and Scott (1991) argue that the personal factor of the entrepreneur is very important, as not everyone in the same situation will create a valuable business on its own. The way the business is set up and shaped depends on the personality. According to Frank et al. (2007), the field made a comeback when multiple scholars found a relation between personality traits and firm performance. Rauch and Frese (2000) found a small but significant relationship between need for achievement, locus of control and entrepreneurial intention. Additionally, a connection between overconfidence and social capabilities and firm success was found (Baron, 2000). This gave the research on the entrepreneurial personality a boost.

2.4.1 Entrepreneurial intentions

Most research looks into the link between entrepreneurial intentions and personality, without researching the effect of personality on the quality of this entrepreneur. Among others, need for achievement (McClelland, 1961), self-efficacy (Chen et al., 1998), need for autonomy (Cromie, 1987), need for approval (Kolvereid, 1996) and endurance (Oosterbeek et al., 2010) are found to be personality traits of people with entrepreneurial intentions. These traits are also prevalent among successful individuals and not exclusively among people with entrepreneurial intentions (Brockhaus, 1982). Nevertheless, they seem to be prevalent in a greater extent among people with entrepreneurial intentions (Collins et al., 2004)

2.4.2 *The Big Five personalities*

Most traits that influence the entrepreneurial intentions also influence the probability of entrepreneurial success (Zhao et al., 2010; Collins et al., 2004). The “Big Five” personalities dimensions can be used to predict job performance (Barrick & Mount, 1991). The Big Five personalities are extraversion, emotional stability, agreeableness, conscientiousness and openness to experience. Selection based on the broad Big Five predicts job performance better than measuring narrow traits, because narrow traits are more easily erroneous (Ones & Viswesvaran, 1996). A positive relation between conscientiousness and venture survival is found, while the relation between openness to experience and firm survival was negative and the other dimensions did not show significant results (Ciavarella et al., 2004). Zhao and Seibert (2006) researched personality traits and entrepreneurship using both the Big Five dimensions as well as specific traits. Their findings were that entrepreneurs differ from managers in four out of five dimensions.

One problem with the Big Five dimensions is that the broad categories contain variables that may have an opposite effect on performance. Therefore the relation between a trait and job performance may come out as insignificant while in fact, it contains two traits with opposing effects (Rauch & Frese, 2007b).

2.4.3 *Other measures*

To overcome the problem posed by using the Big Five, Rauch and Frese (2007b) use a matched trait approach. First, the personality traits are matched to the tasks of an entrepreneur, using expert opinion. They argue that Zhao and Seibert (2006) may have underestimated the effect of the traits by not matching them to the tasks.

Rauch and Frese (2007b) find that among others self-efficacy, need for achievement, autonomy and endurance are matched to entrepreneurship. The probability of becoming an entrepreneur and having entrepreneurial success is larger for traits matched to entrepreneurship compared to traits not matched to entrepreneurial tasks. Because this research first matched specific traits to the tasks of an entrepreneur, it found higher correlations than previous research.

2.5 *The relation between entrepreneurial traits and success*

Following the rationale of Rauch and Frese (2007b), this research uses specific traits rather than the Big Five. Moreover, it investigates the effect of personality traits that are found to have an influence on the probability of entrepreneurial success. The traits need for achievement, self-efficacy, endurance, need for autonomy and need for approval are investigated in this research:

2.5.1 *Need for achievement*

The relationship between *need for achievement* and entrepreneurship is one of the most popular concepts in entrepreneurial research (Davidsson, 1991). McClelland (1961) found this relationship between need for achievement and entrepreneurial success after which researchers confirmed this (Davidsson, 1991; Rauch & Frese, 2000; Lee & Tsang, 2001). People with high need for achievement are likely to engage in activities where they are individually responsible, which is prominent in entrepreneurship (Devries, 2008). Begley and Boyd (1987) find that need for achievement mostly results in higher liquidity, but does not influence growth significantly. Overall, most research report a positive relationship between need for achievement and entrepreneurial success.

2.5.2 *Self-efficacy*

Rauch & Frese (2007b) use *self-efficacy* as a personality trait. Other researches mention locus of control, which is regarded to be a broader description of self-efficacy (Frank et al., 2007). According to Chen et al. (1998) locus of control does not only have a behavioral component, but also an outcome component. Because self-efficacy is more task-specific, it is a better measure for entrepreneurship. Self-efficacy means that someone expects he/she can complete a task (Chen et al., 1998). This is linked to (over)confidence, which is a favorable trait to have when setting up a business in uncertainty (Busenitz & Barney, 1997). According to the authors, entrepreneurs often make decisions based on a couple observations, without extensive market research. Believing in your abilities and skills is therefore extremely important. Self-efficacy can be measured using entrepreneurial self-efficacy or general self-efficacy (McGee et al., 2009). Self-efficacy can be measured using the judgment about the

quality of their past experiences and their skills (Hmieleski & Corbett, 2008), the ability and motivation to invest effort (Hechavarria et al., 2012). Self-efficacy is linked to entrepreneurial success, as entrepreneurs with high self-efficacy are less likely to quit (Hechavarria et al. 2012). Entrepreneurial self-efficacy can be increased when entrepreneurial education is received (Zhao et al., 2005).

2.5.3 *Endurance*

Endurance is the ability to do whatever it takes to set up the business, despite setbacks (Oosterbeek et al., 2010). Entrepreneurs have greater endurance than managers (Mescon & Montanari, 1981). Additionally, higher levels of endurance increase the probability of successful business creation (Gatewood et al., 1995). Endurance helps the entrepreneur when negative feedback is received in the startup phase (Hoang & Gimeno, 2010). Since NEs have to deal with constant setbacks and uncertainty, being persistent is of vital importance (Wu et al., 2007). Therefore I expect the effect of endurance to be positive on the probability of nascent entrepreneurial success.

2.5.4 *Need for autonomy*

Need for autonomy is known as one of the primary reasons to become an entrepreneur (Parasuraman et al., 1996). Moreover, autonomy is related to firm survival as it reflects the ability of independent decision-making and problem solving (Rauch & Frese, 2007a; Oosterbeek et al., (2010). Also, it reflects the need for independent actions, ideas and visions (Lumpkin & Dess, 1996).

Need for autonomy may have a negative impact on venture growth, as the entrepreneur may have problems cooperating with others (Rauch & Frese, 2007a). Nevertheless, autonomy is positively related to effort and time commitment (Parasuman et al., 1996). People with a low need for autonomy can become successful entrepreneurs, although they would have to learn self-leadership (D'Intino et al., 2007). Therefore I expect that need for autonomy has a positive effect on the probability of entrepreneurial success.

2.5.5 *Need for approval*

Entrepreneurs focused on external approval for their ideas have a strong *need for approval* (Birley & Westhead, 1994). People with the need for approval are more likely to become an entrepreneur (Sinclair, 2008). The relationship between need for approval and entrepreneurial success can be either positive or negative. On the one hand, feeling a strong need for approval can influence the entrepreneur's performance negatively, as it increases stress and loneliness (Alstete, 2008; Buttner, 1992). On the other hand, peer effects can influence performance positively as entrepreneurs with a high need for approval look for guidance and sources of experience which has a positive effect on their performance (Hayter, 2011). Moreover, founders that seek external approval are expected to use strategies approved by their surroundings (Bruton et al., 2010). Therefore I expect the effect of need for approval to be positive.

All the traits mentioned in section 2.5 are expected to be positively related to entrepreneurial success. Following the rationale, I predict that

H2: NEs with the traits need for achievement, self-efficacy, endurance, need for autonomy, and need for approval have a higher probability of succeeding as an NE, compared to those who do not have these traits.

2.6 *Motivation and personality*

As mentioned before, opportunity entrepreneurs are expected to be more successful than necessity entrepreneurs. Moreover, successful entrepreneurs have relatively homogeneous personalities (Korunka et al., 2003). Apart from the poor resources and unfavorable circumstances from being unemployed, necessity entrepreneurs are likely to hold the personality characteristics related to entrepreneurial success to a lesser extent (Korunka et al., 2003).

There is little literature to build upon when looking at the differences in personality traits between opportunity and necessity entrepreneurs. Frank et al. (2007) research both the influence of personality as well as the influence of being a necessity or opportunity entrepreneur on entrepreneurial success. The authors do not investigate the mediating effect and it is unclear how these variables influence one another. Tyszka et al. (2011) investigate

the difference in need for achievement, need for autonomy, self-efficacy and risk-taking for opportunity and necessity entrepreneurs in Poland. According to Tyszka et al. (2011), opportunity entrepreneurs show higher levels of these traits than necessity entrepreneurs.

Below, I hypothesize the expected relationship between necessity/opportunity entrepreneurs and the personality traits as mentioned in section 2.5, using the little amount of research there is.

2.6.1 Need for achievement

As mentioned before, opportunity entrepreneurs become entrepreneur because they see a valuable opportunity in the market and want to pursue it. Additionally, these NEs are driven by non-pecuniary benefits to entrepreneurship like being your own boss and setting your own goals (Hamilton, 2000). Necessity entrepreneurs on the other hand become entrepreneurs because there are no better options at hand, often these entrepreneurs were unemployed before becoming self-employed. Following the rationale of Tyszka et al. (2011), opportunity entrepreneurs are therefore more likely to be motivated by the need for independence and need for achievement than necessity entrepreneurs. Necessity entrepreneurs are more motivated by job security.

2.6.2 Self-efficacy

A person's self-efficacy is increased by the experience of success (Bandura, 1994). It is therefore likely that an opportunity entrepreneur has a higher level of self-efficacy than a necessity entrepreneur, the latter usually coming from unemployment. Tyszka et al. (2011) find higher levels of self-efficacy among Polish opportunity entrepreneurs compared to necessity entrepreneurs and employees.

2.6.3 Endurance

Opportunity entrepreneurs remain self-employed longer than necessity entrepreneurs (Block & Sandner, 2009). Though, necessity entrepreneurs are more committed to their startup, hinting at higher persistence than opportunity entrepreneurs (Verheul et al., 2010).

Additionally, both types of entrepreneurs have a different motivation to endure. Necessity entrepreneurs have to endure as setting up a business is the only source of income at hand, while opportunity entrepreneurs has other options if he/she quits the startup process (Casrud & Brännback, 2011). Because necessity entrepreneurs are more dependent of their startup, I expect them to have higher levels of endurance.

2.6.6 *Need for autonomy*

Autonomy is one of the most important pull factors to become an entrepreneur (Apospori et al., 2005). The need for autonomy is most prevalent among opportunity entrepreneurs, while it is to a lesser extent prevalent among necessity entrepreneurs (Holmquist & Sundin, 1989) This is also recently found among Polish opportunity entrepreneurs, showing a higher need for autonomy than necessity entrepreneurs (Tyszka et al., 2011).

2.6.7 *Need for approval*

There is little research on opportunity and necessity entrepreneurship and their need for approval. Though research on countries with high levels of necessity entrepreneurship may suggest that necessity entrepreneurs have higher levels of approval. In Africa, women usually become entrepreneurs to provide the family of its basic needs, while African men become entrepreneurs because of pull factors (Mitchell, 2004). According to the author, these women were more than men motivated by family status, recognition and being respected by friends and their society. Moreover, entrepreneurs in rural Africa are motivated by the encouragement and support from their family (Jyoti et al., 2011). This could be due to gender differences, but it can also indicate that necessity entrepreneurs, need approval. The same is shown in the research of Anokhim et al. (2008), investigating the difference between the motivations of Chinese and German entrepreneurs. Chinese entrepreneurs are more concerned with recognition and approval compared to German entrepreneurs. The number of necessity entrepreneurs is much higher in China then in Germany (Global Entrepreneurship Monitor Association, 2016).

From the above, I predict that

H3: Opportunity entrepreneurs have a higher probability of holding the traits need for achievement, self-efficacy and need for autonomy, and a lower probability for endurance and need for approval than necessity entrepreneurs

2.7 Personality as a mediator

As mentioned in section 2.5, I expect NEs with the traits ‘need for achievement, self-efficacy, endurance, need for autonomy and need for approval’ are more likely to achieve entrepreneurial success. Additionally, as mentioned in section 2.6, I expect that opportunity entrepreneurs have higher levels of need for achievement, self-efficacy and need for autonomy.

Therefore I hypothesize that

H4: The positive relationship between opportunity and necessity entrepreneurship and nascent entrepreneurial success is mediated by the traits need for achievement, self-efficacy and need for autonomy.

INSERT TABLE I ABOUT HERE

Table I shows the hypothesized effect of personality on entrepreneurial success and the expectancy as to among which group, necessity or opportunity entrepreneurs, this trait is more prevalent.

3. Data

3.1 Dataset

For this analysis, data from the Panel Study of Entrepreneurial Dynamics II (PSED II) is used. The PSED II is the second cohort of a longitudinal study of 1,214 NEs in the U.S conducted by researchers of the University of Michigan. The PSED I cohort was selected in 1999-2000. PSED II is identified in 2005-2006, which can be regarded as a more representative time period (Reynolds & Curtin, 2007). Also, in PSED II, more NEs are selected to increase the reliability of multivariate analyses (Reynolds & Curtin, 2007).

In 2005, the NEs were selected through random number dialing of 31,845 individuals (Reynolds & Curtin, 2008). To be selected, the person had to expect to have some ownership in a new firm, be engaged in a startup process and this new firm could not have positive monthly profits for six out of 12 months last year (Renko, 2013). The first wave, Wave A, was conducted in 2005. The NEs were followed up on yearly in five waves (B-F).

The questionnaires give insight in startup efforts, financial information of the startup and of the NE, as well as personal motivations and characteristics of the NE. The dataset contains startup outcomes as well as personal information about the entrepreneur and its personality. Therefore, it is particularly suited for this research.

The PSED overcomes hindsight bias, as the survey is conducted at the moment the NE is setting up a business.

3.2 Variables

The following variables are used to examine the hypotheses as presented in section 2.

3.2.1 Dependent variable

The dataset distinguished between three startup outcomes. The firm can remain in the startup process, become a new firm or quit the startup process. The dataset contains a categorical variable measuring this entrepreneurial outcome quarterly until 72 months of entering the startup process. The startup efforts are registered as a “New Firm” when the NE

met two of the three conditions of firm registration, six out of 12 months positive revenue or profits in six out of 12 months (Reynolds et al., 2016). The efforts are registered as “Quit” when the “entrepreneur worked less than 160 hours in the last year, expected to work less than 80 hours in the next 60 months or agreeing that that this start-up was part of their current career plans” (Reynolds et al., 2016, p. 9). The startup remains in the startup phase when the conditions for becoming a new firm or quitting are not met. This variable is registered every three months after entering the startup phase, with the final assessment in the 72nd month after entering the survey.

3.2.2 *Independent variable*

Opportunity entrepreneur is a self-assessed measure, where the entrepreneur indicates the motivation to enter the startup process, either out of opportunity or out of necessity. As mentioned before, opportunity entrepreneurs are those who are ‘pulled’ into entrepreneurship, while necessity entrepreneurs are ‘pushed’ or forced into entrepreneurship. The term was coined in Reynolds et al. (2001), asking the respondents whether he was taking ‘advantage of a unique market opportunity’ or because ‘it was the best option available’ (Reynolds et al., 2001, p. 4). This measure is afterwards used in many researches (see Acs, 2006; Block & Wagner, 2010; Henderson, 2002)

In this dataset, the entrepreneur was asked the same question to determine whether he/she is an opportunity or necessity entrepreneur (Reynolds & Curtin, 2011).

3.2.3 *Personality variables*

To measure the personality variables, the entrepreneurs are asked to give a rating as for how much certain statements apply to them on a five-point Likert scale from “no extent”, “a little”, “some”, “a great” or “a very great extent”. The personality variables are constructed by combining the means of the variables. Cronbach’s alpha, used to measure the reliability of the scale, can take on a value between 0 and 1. As the value of alpha is closer to 1, the variables are internal consistent. A Cronbach’s alpha above 0.7 is acceptable, between 0.6 and 0.7 are questionable, but not unacceptable. A Cronbach’s alpha below 0.5 is unacceptable (George & Mallery, 2003).

The PSED II data contains seven personality characteristics that can be distinguished: *need for autonomy* ($\alpha = 0.65$), *self-efficacy* ($\alpha = 0.71$), *endurance* ($\alpha = 0.70$), *need for achievement* ($\alpha = 0.72$), *need for approval* ($\alpha = 0.71$), *social capability* ($\alpha = 0.35$), and *coping with uncertainty*.

All variables above 0.6 are included in this research. The four variables for *self-efficacy*, *endurance*, *need for achievement* and *need for approval* are above 0.7, which makes their reliability acceptable. Since an alpha above 0.6 is questionable but not unacceptable, the construct for *need for autonomy* is also included in this research.

The two constructs for *social capability* and *coping with uncertainty* (contains of one question, so Cronbach's alpha does not apply) are unreliable and therefore excluded in this research.

Previous research on the PSED database is used to determine which statements should be used to construct a personality variable. The following sections explain how the personality variables are constructed.

3.2.3.1 *Need for achievement*

This variable measures the need for achievement of the NE. According to Reynolds and Curtin (2008), the three statements used to construct this variable are: “Establishing this business is important for me - *to achieve a higher position in society, to achieve something and get recognition for it, and to have the power to greatly influence an organization*” These variables are also used by Hopp (2012) to construct a variable for need for achievement. The alpha of this measure is equal to 0.72.

3.2.3.2 *Self-efficacy*

The two statements that belong to the self-efficacy variable are “*Overall, my skills and abilities will help me start this new business*” and “*I am confident I can put in the effort needed to start this new business*” (Trevelyan, 2009). Additionally, “*My past experience will*

be very valuable in starting this new business” is added, as self-efficacy reflects the belief in one’s skills (Hopp, 2012). The alpha of the variable is 0.71.

3.2.3.3 *Endurance*

This variable measures the self-rated endurance of the entrepreneur. It reflects the willingness to do whatever it takes to set up the business (Oosterbeek et al., 2010). According to Reynolds and Curtin (2008), the two statements that belong to this variable are: “*There is no limit as to how long I would give maximum effort to establish this new business*” and “*My personal philosophy is to ‘do whatever it takes’ to establish my own business*”. This variable has an alpha of 0.70.

3.2.3.4 *Need for autonomy*

This variable measures the need for autonomy of the entrepreneur. The need for autonomy reflects the need to make independent decisions and freedom to develop their own actions (Rauch & Frese, 2007b). According to Reynolds and Curtin (2008), the two statements used to construct this variable are: “*Establishing this business is important for me – to have considerable freedom to adapt your own approach to work, and to have greater flexibility for your personal and family life.*” The alpha for this variable is 0.65.

3.2.3.5 *Need for approval*

This construct is focused on the need for approval of friends, family and society (Sinclair, 2008). According to Reynolds and Curtin (2008) who coin this variable as ‘respect’, this variable is constructed using the following four statements: “*Establishing this business is important for me - to continue a family tradition, to be respected by your friends, to follow the example of a person you admire* (Alänge & Scheinberg, 1988), and *to build a business your children can inherit*” as it increases the family status (Sinclair, 2008). The alpha of this construct is equal to 0.71.

3.2.4 *Control variables*

The control variables added to the regressions are divided in four subgroups: entrepreneurial variables, economic variables, demographic variables and a time variable. The usage of the variables is motivated in this section.

3.2.4.1 *Entrepreneurial control variables*

Entrepreneurial experience is a dummy variable indicating whether the NE has previous entrepreneurial experience or not. The dummy variable takes the value of 1 if the NE has experience in setting up a business or being self-employed. I expect the effect to be positive. Experience in setting up a business and managing this business is highly correlated with entrepreneurial performance, which makes sense as it provides the entrepreneur with valuable know-how (Stuart & Abetti, 1990). However, it is not linked to advancing through the startup process more rapidly (Davidsson & Honig, 2003). Also previous experience of self-employment is positively related to the survival rate of a new firm (Watson et al, 1998). On the other hand, being a small-business owner or self-employed may also have a negative effect on the probability of success for the new firm.

A continuous variable for the *number of owners* is included as it is found that NEs are more likely to achieve success when they are part of a startup team (Mezies et al., 2006).

The variable *knowing entrepreneurs* is included, indicating whether the respondent knows someone who set up a business in the last two years. This variable is included as role models and the social network of the NE helps them advance through the startup process and has a positive effect on its success (Davidsson & Honig, 2003).

3.2.4.2 *Economic control variables*

Own house is a dummy variable indicating whether the NE owns the house he/she lives in or not. Owning a house is positively related to entrepreneurial success (Parker & Belghitar, 2006). One explanation could be that having a mortgage increases the selectivity of the NE for ideas to exploit, as there is less room for failure.

Income is included as a logarithmic function. One can expect the level of household income influences the startup process, how long the NE can last and how much money the NE can invest. Higher levels of income increase the likelihood to become an entrepreneur (Arenius & Minniti, 2005). Furthermore, access to money increases the likelihood of the respondent to stay in business rather than to quit and become a wage worker (Holtz-Eakin et al., 1993).

With the same reasoning, a dummy for *dual income* is added, indicating whether there is a dual income or the NE is the only one earning income. On the one hand, dual income is likely to increase the start-up capital. On the other hand, Aldrich et al. (1998) point out that this may also have negative implications for the start-up, as it cannot rely on the human capital that could otherwise be provided by the spouse.

3.2.4.3 *Demographic control variables*

In the regressions, the following control variables are included:

Male is included in the analyses as a dummy indicating whether the entrepreneur is female or male. It is expected that being male increases the chance of entrepreneurial success, relative to being female, as women may face gender discrimination (Merrett & Gruidl, 2000).

College degree is included as a dummy, indicating whether the individual obtained at least a college degree, or dropped out before that level was reached. Higher levels of education have a positive effect on the probability of entrepreneurial success (Dickson et al., 2008)

Age is included as a categorical variable indicating the age of the NE. Kristiansen et al. (2003) find evidence that entrepreneurs above 25 are more profitable than those younger of age. Increasing years of age is expected to have a positive effect on entrepreneurial success, as it also captures work experience, which is expected to have a positive effect on the probability of success.

A variable *white* is included, indicating whether the respondent is white or of another ethnicity. Non-white respondents face discrimination that decreases the chance of entrepreneurial success as well as uneven barriers to enter entrepreneurship (Koellinger & Minniti, 2006).

3.2.4.4 *Time variable*

Lastly, data for the dependent variable is collected at three-months intervals, therefore a time variable *month* is included, indicating the time from entering the startup process (Reynolds & Curtin, 2011). As the time from entering the startup process increases, the likelihood to either quit or start a new firm increases simultaneously (Parker & Belghitar, 2006).

INSERT TABLE II ABOUT HERE

Table II shows the definitions and summary statistics of the variables included in the regressions.

4. Methods

4.1 Indirect effect

In order to test the effect of personality characteristics on the probability of entrepreneurial success for opportunity and necessity nascent entrepreneurs, I will look for a mediating effect of the personality variables on the opportunity entrepreneurship variable.

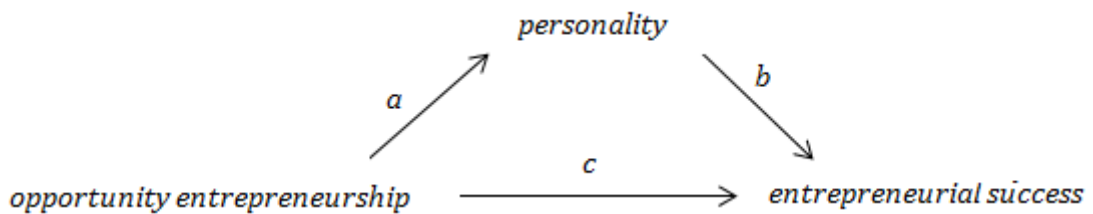


Figure 1. Mediator model (Baron & Kenny, 1986)

In order to find the indirect effect of the personality variables between opportunity entrepreneurship and entrepreneurial success, first relationships *a*, *b* and *c* are estimated. To estimate the mediating effect of the personality variables, the effect of the opportunity entrepreneurship variable on the dependent variable, in this case entrepreneurial outcome, is compared before and after adding the personality variables (MacKinnon et al., 2002). The mediation effect can be estimated using multiple different tests. In this case, the KHB method is used to determine whether the mediating effect is significant. The KHB method is explained in section 4.2.3.

If the opportunity entrepreneurship variable becomes insignificant when the mediator, in this case the personality traits, is added to the regression, full mediation is supported. When both the opportunity entrepreneurship variable as well as the personality variable are significant, there is partial mediation (Baron & Kenny, 1986). Hypotheses 1, 2 and 3 represent the relationships *c*, *b* and *a* respectively. Hypothesis 4 represents the mediation effect.

4.2 Analyses

In order to answer the four hypotheses, four models are estimated. To answer hypothesis 1 and hypothesis 2, the competing risks model is used. In order to answer hypothesis 3, an OLS analysis is used and to answer hypothesis 4, the KHB method is used. The KHB method is explained in section 4.2.3. Below, the analyses are explained.

4.2.1 Competing risks model

To test hypothesis 1 and hypothesis 2, the competing risks model is used. The competing risks model can be used when there is a continuous-time model with multiple events (Tuma et al. 1979; Kalbfleisch & Prentice, 1980). The continuous time model estimates the effect of a variable on the different kinds of events (Allison, 1982). In this dataset, the respondents, who are tracked over time, have three options, or events: they can start a firm, remain a NE or quit. The competing risks model estimates the hazard rate for each event to occur (Allison, 1982).

As mentioned before, the dependent variable is an unordered categorical variable, consisting three options: start a new firm, remain an NE or quit. The competing risks model is a discrete time model. The multinomial logistic regression is an appropriate estimator as it allows for treating all observations in all time periods to be treated as independent observations (Allison, 1982). The multinomial logistic regression raises the concern of the independence of irrelevant alternatives (IIA), meaning that the individual's choice is unaffected by alternative options (Cheng & Long, 2007). This assumption must hold for the regression to be valid.

In order to find the mediating effect of the personality variables on the probability of success through the variable of opportunity entrepreneurship, first the effect of being an opportunity entrepreneur on the probability success is tested.

First the restricted model, leaving out the personality variables, is estimated:

$$P_j = \frac{\exp [\alpha_j + \beta_R * \text{opportunity entrepreneurship} + \beta_{Rj} * \text{control variables}]}{1 + \exp [\alpha_j + \beta_R * \text{opportunity entrepreneurship} + \beta_{Rj} * \text{control variables}]} \quad [1]$$

Next, the full model is estimated, including the opportunity entrepreneurship as well as the personality variables:

$$P_j = \frac{\exp [\alpha_j + \beta_F * \text{opportunity entrepreneurship} + \beta_{F2} * \text{personality variable} + \beta_{Fj} * \text{control variables}]}{1 + \exp [\alpha_j + \beta_F * \text{opportunity entrepreneurship} + \beta_{F2} * \text{personality variable} + \beta_{Fj} * \text{control variables}]} \quad [2]$$

Where j indicates the options, α indicates the unspecified function of time (Allison, 1982).

The indirect effect can be estimated looking at the difference between the coefficient β_R of the restricted model, and β_F of the full model. This is done using the KGB method, explained in section 4.2.3.

4.2.2 OLS

In order to test hypothesis 3, and find the effect of being an opportunity entrepreneur on need for achievement, self-efficacy, endurance, need for autonomy and need for approval, OLS regressions are used. In this model, the personality traits are the dependent variables. The Breusch-Pagan is performed to test for heteroscedasticity.

4.2.3 KHB method

Since the multinomial logit model is a non-linear model, obtaining the mediation effect is not as straight forward as in a linear regression (Karlson & Holm, 2011). To find the indirect effect in a non-linear regression, the KHB method can be used. First, the reduced effect of opportunity entrepreneurship on success is estimated. This reduced effect is found in the estimated coefficient β_R . Then the full effect including the mediator is estimated, where the coefficient for opportunity entrepreneurship is denoted by β_F . The indirect effect is therefore $\beta_R - \beta_F$ (Kohler et al., 2011).

The KHB method estimates the direct and the indirect effect, and estimates the significance of its difference (see Kohler et al., 2011).

4.3 Altering the dataset

In order to find the effect of personality on the chances of entrepreneurial success, only respondents with more than 50% ownership are used in the regressions. Additionally, 51 respondents indicating to be both necessity and opportunity entrepreneurs are dropped because of the low number of observations. Four respondents indicating to have a job but are

looking for better employment are dropped for the same reason. The latter four respondents could be included as opportunity entrepreneurs as they choose to become NEs, however they are excluded from this sample as they did not indicate they saw an opportunity they wanted to pursue. Observations with missing values for the dependent and independent variables are excluded from the sample.

The effect of the personality characteristics is estimated using all quarterly data. This allows exploitation of all variance in the dataset. The dataset contains a cross-sectional time-series with 24 quarterly observations per respondent. Though some scholars, using the PSED database, choose to cluster the standard errors at the individual level (Ginther, 2014), this research does not cluster the standard errors based on the research of Allison (1982). Allison (1982) explicitly states that the estimated errors will be true and should not be clustered. Following existing research using the PSED database, robust standard errors are used (Audretsch et al., 2012; Wennberg et al., 2010; Parker & Belghitar, 2006; Andersson & Xiao, 2016). The dataset contains of a total of 24,364 observations of 981 individuals.

5. Results

In this section the results of the multinomial logit regressions, the OLS regression and the KHB method are discussed in order to determine whether evidence is found that supports or rejects the four hypotheses.

5.1 Initial analysis

The first analysis shows the number of opportunity and necessity entrepreneurs for the different entrepreneurial outcomes.

INSERT TABLE III ABOUT HERE

Table III shows the frequencies and percentage of opportunity and necessity entrepreneurs who succeed, remain an NE or quit their startup efforts. Looking at the percentages, a greater share of opportunity entrepreneurs (13.39 %) succeeds in their startup efforts than necessity entrepreneurs (11.56 %). Additionally, a greater share of opportunity entrepreneurs (62.58 %) remains an NE, relative to necessity entrepreneurs (59.31 %). Consequently, a greater share of necessity entrepreneurs (29.13 %) quit their startup efforts than opportunity entrepreneurs (25.02 %). In section 5.3, the first hypothesis is formally tested.

The second analysis, presented in table IV, shows a difference in means for the personality traits for the different entrepreneurial outcomes.

INSERT TABLE IV ABOUT HERE

As shown in table IV, the highest scores for need for achievement, need for autonomy and endurance are prevalent among those who remain an NE. The highest mean for self-efficacy and need for approval is found among the group that succeeds as an entrepreneur.

In the next sections, the hypotheses are tested using multinomial logit regressions, OLS and the KHB method.

5.2 Testing hypotheses

In this section, the hypotheses are tested and the estimates of the models are presented. The tables show the marginal effects and their significance. Table V shows the relationship between opportunity/necessity entrepreneurship and entrepreneurial success. Table VI shows the effect of personality on entrepreneurial success, and VII shows the relation between opportunity/necessity entrepreneurship and personality.

The output in tables VIII to Xe is used to test the fourth hypothesis and determine whether the personality variables are significantly mediating the relationship between opportunity entrepreneurship and success. Table VIII shows the multinomial regression including the opportunity entrepreneurship variable, the personality variables and the control variables. In this table we can see the mediating effect of personality on the relationship between opportunity entrepreneurship and success, although we cannot test its significance.

Table IX shows the outcome of the KHB method for the personality variables. Table Xa to Xe show the effects of the statements that are used to construct the personality variables.

For brevity and clarity, only the results for entrepreneurial success are shown in the tables VI to Xe, while the results for remaining an NE and quitting are excluded from the table.

5.3 Opportunity entrepreneurship and success

In this section, the first hypothesis is tested.

H1: Opportunity entrepreneurs have a higher probability on succeeding as an entrepreneur, compared to necessity entrepreneurs

To test the first hypothesis, the multinomial logistic regression with nascent entrepreneurial success as the dependent variable is performed taking only necessity/opportunity entrepreneurship and the control variables into account. The personality variables are left out of this regression. Table V presents the findings.

INSERT TABLE V ABOUT HERE

Table V shows the estimated marginal effects of the first multinomial logit regression. As shown, being an opportunity entrepreneur increases the probability to succeed as an NE ($\beta = 0.012$). This marginal effect is significant at 10%. Additionally, opportunity entrepreneurs are more likely to remain an NE ($\beta = 0.042$) and are less likely to quit ($\beta = -0.054$), relative to necessity entrepreneurs. These effects are significant at 5%.

Having a dual income, owning a house relative to renting it and being a white male with a college degree increases the probability of entrepreneurial success. This marginal effect is significant at 1%. Knowing other entrepreneurs and an increase in the number of owners decreases the probability of entrepreneurial success. These effects are significant at 5%.

There is an inverted U-shaped relationship between age and entrepreneurial success and quitting the startup efforts. Relative to being aged between 18 and 24, NEs that are between 25 and 44 have a higher probability to succeed or to quit, relative to remaining an NE. Being aged above 55 decreases this probability. These effects are significant at the conventional levels.

Last, as time passes by, NEs are more likely to either quit their startup efforts or succeed. The probability to remain an NE decreases over time. These effects are significant at 1%.

The assumption of IIA holds for this model ($\chi^2 = 716.71$, $p = 0.000$). The estimates are consistent (Hausman & McFadden, 1984).

The results show that, in this sample, opportunity entrepreneurs are more likely to start a new firm than necessity entrepreneurs, significant at 10%. Hence, hypothesis 1 is supported.

5.4 Personality traits and entrepreneurial success

Here, the multinomial logit regression of personality on entrepreneurial outcome is estimated to test the second hypothesis.

H2: NEs with the traits need for achievement, self-efficacy, endurance, need for autonomy, and need for approval have a higher probability of succeeding as an NE, compared to those who do not have these traits.

Table VI shows the marginal effects of the personality traits on entrepreneurial success. The variable of opportunity entrepreneurship is excluded in this model to find the effect of opportunity versus necessity entrepreneurship on personality. Most researchers tend to leave out this step, as it is not necessary to estimate the mediation. Because the mediator model of Kenny and Baron (1986) specifically describes the relationship b , between personality and success, the output of the regressions are shown in table VI to get a complete view on the causalities.

INSERT TABLE VI ABOUT HERE

The results in table VI show a significant effect of the personality variables on the probability of entrepreneurial success. Need for achievement, need for autonomy and need for approval decrease the probability of success significantly at 10%. Higher levels of self-efficacy and endurance increase the probability of entrepreneurial success significantly at 10%.

For these models the assumption of IIA holds, with p-values of 0.000.

All personality variables have a significant effect on the entrepreneurial outcome, though the sign of this effect is not as hypothesized. Need for achievement, need for autonomy and need for approval have a negative effect on the probability to succeed, while endurance and self-efficacy do have the hypothesized effect on the probability to succeed. Therefore hypothesis 2 is rejected.

5.5 Personality and opportunity entrepreneurship

In this section, hypothesis 3 is tested.

H3: Opportunity entrepreneurs have a higher probability of holding the traits need for achievement, self-efficacy and need for autonomy, and a lower probability for endurance and need for approval than necessity entrepreneurs

In order to test hypothesis 3, the relationship between opportunity entrepreneurship and personality is tested using OLS. Table VII presents the effect of being an opportunity

entrepreneur on having the personality traits need for achievement, self-efficacy, endurance, need for autonomy and need for approval. The regressions are tested for heteroscedasticity using the Breusch-Pagan test. The standard errors estimated by OLS are heteroskedastic. Therefore, robust standard errors are used.

INSERT TABLE VII ABOUT HERE

As shown in table VII, being an opportunity entrepreneur influences all personality traits significantly at 1%, except for need for approval, which is not significantly influenced. Opportunity entrepreneurs have higher levels of need for achievement, self-efficacy and endurance, compared to necessity entrepreneurs. Being an opportunity entrepreneur negatively influences the levels of need for autonomy, compared to being a necessity entrepreneur.

As hypothesized, opportunity entrepreneurs have a higher probability of holding the traits need for achievement and self-efficacy. However, opportunity entrepreneurs also have higher levels of endurance while they show a lower need for autonomy, while the hypothesized relationship was in the opposite direction. Additionally, there is no evidence supporting a relationship between opportunity entrepreneurship and need for approval. Therefore, hypothesis 3 is rejected.

5.6 Personality as a mediator

In section 5.5, no significant relationship between opportunity entrepreneurship and need for approval is presented. Whether the other personality variables significantly mediate the relationship between opportunity entrepreneurship and nascent entrepreneurial success is significant is explored in this section. Table VIII shows the estimated change in the coefficient of opportunity entrepreneurship. Table IX shows the estimated results using the KHB method. Lastly, tables Xa to Xe show the estimated change in the coefficient of opportunity entrepreneurship when the statements that are used to construct the personality variable are added separately.

In order to test the fourth hypothesis,

H4: The positive relationship between opportunity and necessity entrepreneurship and nascent entrepreneurial success is mediated by the traits need for achievement, self-efficacy and need for autonomy.

Six multinomial logit regressions are estimated, including both opportunity entrepreneurship and the personality variables. The marginal effects of these variables are presented in table VIII. Additionally, the KHB method is used to determine the significance of the mediation effect.

INSERT TABLE VIII HERE

Table VIII shows the mediating effect of personality on the relationship between opportunity entrepreneurship and the probability of entrepreneurial success.

Here, all personality variables have a significant effect on the probability of entrepreneurial success. When self-efficacy, endurance, need for autonomy and need for approval are added in the third until the sixth regression, the effect of opportunity entrepreneurship becomes insignificant. This indicates full mediation. Adding the variable need for achievement does not change the coefficient of opportunity entrepreneurship.

In all regressions presented in table VIII, the assumption of IIA holds ($p = 0.000$).

To test the significance of the mediation effect, the KHB method is conducted. The results are shown in table IX.

INSERT TABLE IX ABOUT HERE

As presented in the table, only the variable of self-efficacy causes a significant difference at 10%. The total effect is 1.09 greater than the direct effect. 8.24 % of the total effect is caused by the variable of self-efficacy.

For the other variables, the mediation effect is insignificant or equal to 0.000.

5.7 *The mediation effect per personality variable*

The personality variables are constructed by different statements. In order to find whether these statements have an opposing effect, which could bias the mediation effect, tables Xa to Xe show the multinomial regressions of variables that are combined in the personality construct.

For all of the regressions in the tables below the assumption of IIA holds. The either the p-value is equal to 0.000, or the regressions show a negative value of χ^2 . "It may happen that the test statistic is negative. This is evidence that the IIA holds" (Hausman & McFadden, 1984, p. 1226).

5.7.1 *Need for achievement*

The variable *need for achievement* is constructed using the statements 'Establishing a business is important for me to – *'achieve a higher position in society'*, *'achieve something and get recognition for it'* and *'have the power to influence an organization.'*

Table Xa presents the marginal effect of each of these variables on entrepreneurial outcome.

INSERT TABLE Xa ABOUT HERE

As shown in the table, those who value *'achieve something and get recognition for it'* and *'have the power to influence an organization'* more, are less likely to succeed as an entrepreneur. This effect is significant at 1%. The motivation to set up a business to achieve a higher position in society, does not significantly affect the probability of entrepreneurial success.

The mediation effect is tested, using the KHB method. None of the variables used to construct *need for achievement* significantly mediate the effect of opportunity entrepreneurship on entrepreneurial success.

5.7.2 *Self-efficacy*

The variable *self-efficacy* is constructed out of the statements '*My skills and abilities will help me start this new business*', '*My past experience will be very valuable in starting this business*', and '*I am confident I can put in the effort needed to start this new business*'.

INSERT TABLE Xb ABOUT HERE

As shown in the table, only the last statement has a negative effect on the probability for entrepreneurial success. This effect is significant at 1%.

Looking at the mediating effect of this statement, the coefficient of opportunity entrepreneurship becomes insignificant when adding these variables. This hints at full mediation. When testing the mediation effect, using the KHB method, the statement '*I am confident I can put in the effort needed to start this new business*' significantly mediates the relationship between opportunity entrepreneurship and nascent entrepreneurial success at 10%.

5.7.3 *Endurance*

The variable *endurance* is constructed using the statements '*There is no limit as to how long I would give maximum effort to establish this new business*' and '*My personal philosophy is to do whatever it takes to establish my own business*'.

INSERT TABLE Xc ABOUT HERE

Only the first statement has a negative and significant effect on the probability to succeed as an entrepreneur. This effect is significant at 1%.

The coefficient of opportunity entrepreneurship changes and becomes insignificant. Nevertheless, the KHB method does not find a significant mediating effect at a 10% significance level.

5.7.4 *Need for autonomy*

The variable *need for autonomy* is constructed using the statements ‘Establishing a business is important for me to – *‘have considerable freedom to adapt your own approach to work’* and *‘have a greater flexibility for your personal and family life’*’.

INSERT TABLE Xd ABOUT HERE

Both variables show a significant effect at 1% and the effects are contradicting in sign. Where the first statement has a negative effect on the probability to succeed, the second statement influences this probability positively.

When testing for mediation, using the KHB method, there is no evidence supporting the mediating effect of these statements on the relationship between opportunity entrepreneurship and entrepreneurial success.

5.7.5 *Need for approval*

Lastly, the variable *need for approval* is constructed using the statements ‘Establishing a business is important for me to - *‘Continue a family tradition’*, *‘Be respected by your friends’*, *‘Follow the example of a person you admire’* and to *‘Build a business your children can inherit’*’.

INSERT TABLE Xe ABOUT HERE

Again, a contradicting effect is found as the last statement, build a business your children can inherit, has a positive effect on the probability of success, while the second and third

statement have a negative effect. These effects are significant at 1%. The first statement, to continue a family tradition, has no significant effect on the probability of success.

When adding the statements in models 3 and 6, the coefficient of opportunity entrepreneurship becomes insignificant. Nevertheless, this effect is not significant according to the KHB model. Therefore no support is found that the statements have a significant mediating effect.

To conclude this section, only the statement *'I am confident I can put in the effort needed to start this new business'* shows a significant mediating effect. Although the coefficient of opportunity entrepreneurship becomes insignificant when adding some of the personality variables or statements, the KHB method does not estimate a significant mediating relationship, apart from the personality variable self-efficacy. Therefore hypothesis 4 is rejected. The positive relationship between opportunity and necessity entrepreneurship and nascent entrepreneurial is only significantly mediated by the trait self-efficacy.

6. Conclusion and discussion

Successful entrepreneurs foster economic growth (Baron, 2000; Schumpeter, 1947). It does not come as a surprise that entrepreneurial success is a much-researched subject. However, the role of personality in nascent entrepreneurial success of nascent necessity and nascent opportunity entrepreneurs has not been researched much. This research makes a contribution to the understanding of the difference in entrepreneurial success between opportunity and necessity entrepreneurs by looking at the mediating effect of the personality traits need for achievement, self-efficacy, endurance, need for autonomy and need for approval. To the best of my knowledge, the mediation of personality on the relationship between nascent necessity and nascent opportunity entrepreneurship and nascent entrepreneurial success has not been researched up until now.

This research tests four hypotheses in order to find the mediating effect of personality on the relationship between opportunity and necessity entrepreneurship and the probability of entrepreneurial success.

First, the relationship between nascent opportunity and nascent necessity entrepreneurship and success is tested and confirmed using a multinomial logistics regression. This research finds evidence that, *ceteris paribus*, nascent opportunity entrepreneurs have a higher probability of nascent entrepreneurial success than nascent necessity entrepreneurs.

Second, the relation between the five personality traits, need for achievement, self-efficacy, endurance, need for autonomy and need for approval, and nascent entrepreneurial success is tested. The personality variables need for achievement, need for autonomy and need for approval influence the probability of nascent entrepreneurial success negatively. NEs with higher levels of self-efficacy and endurance have a significantly higher probability to succeed.

The effect of need for achievement may be negative because it is positively related to risk behavior (Atkinson, 1957) as well as related to persistence (Wu et al., 2007). High levels of risk influence the chance of starting a business negatively for NEs (Van Gelderen et al., 2005). People with high need for achievement are more likely to move into entrepreneurship (Carragher et al., 2010). It may be that the NE wants to start a business regardless of what opportunity is at hand. This combined with higher levels of persistence may indicate that the

NEs are pursuing a less successful idea and are not willing to give up, but also fail to succeed.

The negative effect of need for autonomy may be because need for autonomy may hamper cooperation with others, which is needed to set up a business (Rauch & Frese, 2007b).

As mentioned before, need for approval may have a negative effect on nascent entrepreneurial success as it increases stress and loneliness for the NE (Alstete, 2008; Buttner, 1992).

For the third hypothesis, the relationship between nascent opportunity and nascent necessity entrepreneurship and the personality traits are tested. As hypothesized, opportunity entrepreneurs have higher need for achievement, self-efficacy and endurance than necessity entrepreneurs. Unexpectedly, higher levels of need for autonomy and need for approval are prevalent among nascent necessity entrepreneurs.

Scott (1980) explains the higher levels of need for autonomy among necessity entrepreneurs. The author finds that the need for autonomy may rise, especially when one is at risk of losing his/her job. This could explain the higher need for autonomy among nascent necessity entrepreneurs.

Higher levels for need for approval among necessity entrepreneurs may be caused by the fact that necessity entrepreneurs are less likely to be prepared to become a NE than opportunity entrepreneurs (Block & Wagner, 2010). Therefore they may tend to be looking for approval more than opportunity entrepreneurs who are more likely to be well prepared.

Ultimately for the last hypothesis tests the mediating effect of personality on the relationship between opportunity and necessity entrepreneurship and entrepreneurial success. The results show that only self-efficacy has a significant mediating effect. The other personality variables have no significant mediating effect. This may be due to the fact that there is a relationship between personality and nascent entrepreneurial success, but this relationship is not very strong in this sample.

The significant mediating effect of self-efficacy on the relationship between nascent entrepreneurial success and nascent opportunity entrepreneurship could have important implications. Self-efficacy can be strengthened by training institutions, which focus on that

subject (Chen et al., 1998). Strengthening the NEs self-efficacy could in particular help nascent necessity entrepreneurs to be more successful.

Overall, this research finds that there are linkages between opportunity entrepreneurship, entrepreneurial success and personality. The linkages between personality and nascent entrepreneurial success, as well as between personality and opportunity entrepreneurship are found in this research are not very strong. It seems that this research confirms the weak relation between personality and nascent entrepreneurial success as found in previous research (Begley & Boyd, 1987; Gartner, 1985; Lee & Tsang, 2001; Mischel, 1968).

On the other hand, the results as presented in this research may be biased due to some limitations. The most important limitation that could explain the small effect of personality is that not all entrepreneurs in the sample are alone in the startup process. The personality traits of the respondent are known, though the traits of the co-owners are unknown. To minimize this problem, all respondents with less than fifty per cent ownership are excluded from the sample. Nevertheless, the effect of personality on entrepreneurial success may be biased.

Another limitation of this research is that it is unclear whether the statements that are used to construct the personality variables were designed for the PSED or are based on a verified scale. Therefore the personality variables are constructed using the statements that are used by previous research that used the PSED database.

One question that is whether or not it can be regarded as a success if an NE takes 72 months to set up a business, or whether this should be seen as a waste of resources. NEs who find that their business plan is not worth setting up and abandon their startup efforts to find a new idea may be more successful in the long term than those who take six years to set up a less successful firm. This is another limitation of my research.

Future research should continue to focus on the mediating effect of personality on the relationship between necessity and opportunity entrepreneurship and their probability of success, taking into account that abandoning a startup idea is not necessarily failing, but could be a move to exploit a more valuable opportunity. Additionally, in future research one should take into account the personalities of the (future) co-owners with whom the NE is starting up a business.

Appendix

TABLE I: Hypothesized effect of personality traits on entrepreneurial success

Personality trait	Entrepreneurial success	More prevalent among
Need for achievement	+	Opportunity entrepreneurs
Self-efficacy	+	Opportunity entrepreneurs
Endurance	+	Necessity entrepreneurs
Need for autonomy	+	Opportunity entrepreneurs
Need for approval	+	Necessity entrepreneurs

TABLE II: Summary statistics

Variables	Definition	N	Mean	Std. Dev.
<i>Dependent variable</i>				
Outcome	Outcome of entrepreneurial efforts. = 1 if the respondent sets up a new firm, = 2 if the respondent remains NE, = 3 if the respondent quits	21,272		
	New firm		.13	.34
	Remain NE		.62	.49
	Quit		.25	.43
<i>Independent variable</i>				
Opportunity entrepreneur ^a	= 1 if so, necessity entrepreneur coded 0	21,272	.86	.35
<i>Personality variables</i>				
Need for achievement	The statements are important from 1 = no extent, 2 = a little, 3 = some, 4= a great, 5 = a very great extent	21,272	2.25	1.07
Self-efficacy	How strongly do you agree with the statements? 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree	21,272	4.50	.54
Endurance	How strongly do you agree with the statements? 1 = strongly disagree, 2 = disagree,	21,272	4.12	.85

Table II continued

	3 = neither agree nor disagree, 4 = agree, 5 = strongly agree			
Need for autonomy	The statements are important from 1 = no extent, 2 = a little, 3 = some, 4= a great, 5 = a very great extent	21,272	3.87	.98
Need for approval	The statements are important from 1 = no extent, 2 = a little, 3 = some, 4= a great, 5 = a very great extent	21,272	2.09	.98
<i>Entrepreneurial variables</i>				
Entrepreneurial experience	= 1 if having entrepreneurial experience, = 0 is otherwise	21,272	.28	.45
Knowing others ^a	= 1 if the person knows someone who started a business in the last two years, otherwise coded 0	21,272	.68	.47
Number of owners	Total number of owners, including the respondent	21,272	1.54	.97
<i>Economic variables</i>				
Dual Income ^a	= 1 if so, otherwise coded 0	21,272	.41	.49
Own house ^a	= 1 if the respondent owns the house he/she lives in, = 0 if otherwise	21,272	.68	.47
Income	Log of household income (\$)	21,272	10.84	.84
<i>Demographic variables</i>				
White ^a	= 1 if white, otherwise coded 0	21,272	.78	.41
Male ^a	= 1 if male, otherwise coded 0	21,272	.63	.48
College degree ^a	=1 if so, if lower than college degree coded 0	21,272	.46	.50
Age	Age in six categories:	21,272		
	Between 18-24		.08	.27
	Between 25-34		.20	.40
	Between 35-44		.25	.34
	Between 45-54		.28	.45
	Between 55-64		.37	.37
	Above 65		.03	.18
<i>Time variable</i>				
Month	Number of months since entering the startup process	21,272	34.18	22.02

Dummy variables are denoted by ^a.

TABLE III: Initial analysis on entrepreneurial success and opportunity/necessity entrepreneurs

Variable		New firm	Remain NE	Quit
Necessity entrepreneurs	Frequency	343	1,759	864
	Percentage	11.56	59.31	29.13
Opportunity entrepreneurs	Frequency	2,506	11,341	4,459
	Percentage	13.39	62.58	25.02

TABLE IV: Initial analysis on entrepreneurial success and personality

Dependent variable		Need for achievement	Self-efficacy	Endurance	Need for autonomy	Need for approval
Success	Mean	2.168	4.5254	4.152	3.829	2.049
	Std. Dev.	.979	.524	.851	.952	.911
Remain an NE	Mean	2.324	4.521	4.165	3.853	1.928
	Std. Dev.	1.087	.514	.822	.968	1.016
Quit	Mean	2.101	4.427	3.998	3.853	1.928
	Std. Dev.	1.069	.537	.852	.976	.982

TABLE V: The effect of being an opportunity entrepreneur on the probability of entrepreneurial success, using a multinomial logit regression

Variables	(1) New firm	(2) Still NE	(3) Quit
Opportunity entrepreneurship	0.012* (0.007)	0.042*** (0.011)	-0.054*** (0.010)
<i>Entrepreneurial variables</i>			
Entrepreneurial experience	0.004 (0.005)	-0.001 (0.008)	-0.003 (0.007)
Knowing entrepreneurs	-0.011** (0.005)	0.051*** (0.008)	-0.040*** (0.007)
Number of owners	-0.023*** (0.003)	0.011*** (0.004)	0.012*** (0.003)
<i>Economic variables</i>			
Dual income	0.019*** (0.005)	-0.019** (0.008)	0.000 (0.007)
Own house	0.028*** (0.005)	0.020** (0.009)	-0.049*** (0.008)
Log of income	0.002 (0.003)	-0.005 (0.005)	0.003 (0.004)
<i>Demographic variables</i>			
White	0.016*** (0.005)	-0.077*** (0.009)	0.061*** (0.007)
Male	0.008* (0.005)	0.075*** (0.008)	-0.083*** (0.007)
College degree	0.031*** (0.005)	-0.046*** (0.008)	0.016** (0.006)
Age between 25-34	0.037*** (0.010)	-0.081*** (0.016)	0.044*** (0.013)
Age between 35-44	0.022** (0.010)	-0.028* (0.015)	0.006 (0.012)
Age between 45-54	0.010 (0.009)	-0.021 (0.015)	0.012 (0.012)
Age between 55-64	-0.023** (0.010)	0.049*** (0.016)	-0.027** (0.013)
Age above 65	-0.025* (0.013)	0.082*** (0.023)	-0.057*** (0.018)
<i>Time variable</i>			
Month	0.004*** (0.000)	-0.011*** (0.000)	0.008*** (0.000)
Observations		21,195	
Log-pseudo likelihood		-16790.522	
Wald χ^2		4536.76	
Pseudo-R ²		0.1341	
<i>Hausman test</i>			
χ^2		716.71	
p-value		0.0000	

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

TABLE VI: The effect of personality variables on the probability of entrepreneurial success, using a multinomial logit regression

Variables	(1) New firm	(2) New firm	(3) New firm	(4) New firm	(5) New firm
<i>Personality variables</i>					
Need for achievement	-0.008*** (0.002)				
Self-efficacy		0.011** (0.005)			
Endurance			0.005* (0.003)		
Need for autonomy				-0.007*** (0.002)	
Need for approval					-0.005* (0.002)
<i>Entrepreneurial variables</i>					
Being self-employed	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)
Knowing entrepreneurs	-0.009 (0.005)	-0.011** (0.005)	-0.010* (0.005)	-0.009* (0.005)	-0.009* (0.005)
Number of owners	-0.023*** (0.003)	-0.023*** (0.003)	-0.023*** (0.003)	-0.024*** (0.003)	-0.023*** (0.003)
<i>Economic variables</i>					
Dual income	0.018*** (0.005)	0.018*** (0.005)	0.018*** (0.005)	0.019*** (0.005)	0.019*** (0.005)
Own home	0.027*** (0.005)	0.029*** (0.005)	0.029*** (0.005)	0.028*** (0.005)	0.028*** (0.005)
Log of income	0.003 (0.003)	0.003 (0.003)	0.004 (0.003)	0.003 (0.003)	0.003 (0.003)
<i>Demographic variables</i>					
White	0.014** (0.006)	0.017*** (0.006)	0.017*** (0.005)	0.015*** (0.006)	0.014** (0.006)
Male	0.008* (0.005)	0.006 (0.005)	0.007 (0.005)	0.007 (0.005)	0.008* (0.005)
College degree	0.030*** (0.005)	0.030*** (0.005)	0.032*** (0.005)	0.030*** (0.005)	0.030*** (0.005)
Age between 25-34	0.035*** (0.010)	0.038*** (0.010)	0.037*** (0.010)	0.039*** (0.010)	0.037*** (0.010)
Age between 35-44	0.018* (0.010)	0.021** (0.010)	0.022** (0.010)	0.021** (0.010)	0.021** (0.010)
Age between 45-54	0.004 (0.010)	0.009 (0.009)	0.009 (0.009)	0.008 (0.009)	0.008 (0.009)
Age between 55-64	-0.027*** (0.010)	-0.023** (0.010)	-0.022** (0.010)	-0.025*** (0.010)	-0.024** (0.010)
Age above 65	-0.031** (0.013)	-0.025* (0.013)	-0.025* (0.013)	-0.030** (0.013)	-0.027** (0.013)
<i>Time variable</i>					
Month	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)
Observations	21,195	21,195	21,195	21,195	21,195

Table VI continued

Log-pseudolikelihood	-16714.324	-16751.842	-16729.933	-16797.174	-16701.722
Wald χ^2	4539.85	4574.82	4625.15	4530.10	4595.77
Pseudo-R ²	0.1380	0.1361	0.1372	0.1337	0.1386
<i>Hausman</i>					
χ^2	685.44	567.89	570.10	530.70	496.88
p-value	0.0000	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. For clarity, only the results for entrepreneurial success are shown, while the results for remaining an NE and quitting are left out.

TABLE VII: The effect of being an opportunity entrepreneur on scoring high on the personality variables, using OLS

Variables	(1) Need for achievement	(2) Self-efficacy	(3) Endurance	(4) Need for autonomy	(5) Need for approval
Opportunity entrepreneurship	0.068*** (0.021)	0.083*** (0.011)	0.060*** (0.016)	-0.066*** (0.019)	-0.007 (0.020)
<i>Entrepreneurial variables</i>					
Entrepreneurial experience	-0.017 (0.015)	0.007 (0.008)	-0.026** (0.012)	0.026* (0.015)	-0.060*** (0.013)
Knowing entrepreneurs	0.205*** (0.015)	0.065*** (0.008)	-0.021* (0.012)	0.172*** (0.014)	0.218*** (0.013)
Number of owners	-0.003 (0.007)	0.003 (0.004)	0.011** (0.005)	-0.055*** (0.008)	0.016** (0.007)
<i>Economic variables</i>					
Dual income	-0.095*** (0.014)	0.038*** (0.008)	0.026** (0.012)	0.062*** (0.014)	0.118*** (0.014)
Own house	-0.232*** (0.018)	0.007 (0.009)	-0.002 (0.013)	-0.135*** (0.015)	-0.113*** (0.015)
Log of income	-0.111*** (0.010)	0.015*** (0.005)	-0.061*** (0.007)	-0.029*** (0.009)	-0.123*** (0.009)
<i>Demographic variables</i>					
White	-0.339*** (0.019)	-0.033*** (0.009)	-0.095*** (0.013)	-0.161*** (0.015)	-0.486*** (0.017)
Male	0.159*** (0.014)	0.104*** (0.008)	0.101*** (0.012)	-0.076*** (0.014)	0.276*** (0.013)
College degree	-0.099*** (0.014)	0.080*** (0.008)	-0.258*** (0.012)	-0.073*** (0.013)	-0.240*** (0.013)
Age between 25-34	-0.368*** (0.033)	0.040** (0.015)	0.084*** (0.023)	0.147*** (0.023)	-0.126*** (0.029)
Age between 35-44	-0.486*** (0.033)	0.035** (0.015)	-0.012 (0.022)	-0.105*** (0.024)	-0.042 (0.028)
Age between 45-54	-0.635*** (0.032)	0.059*** (0.015)	0.017 (0.023)	-0.218*** (0.024)	-0.147*** (0.028)
Age between 55-64	-0.503*** (0.034)	0.066*** (0.016)	-0.016 (0.024)	-0.457*** (0.027)	-0.173*** (0.029)
Age above 65	-0.693*** (0.044)	-0.054** (0.022)	-0.191*** (0.040)	-0.812*** (0.045)	-0.213*** (0.043)
Constant	4.145*** (0.100)	4.075*** (0.051)	4.840*** (0.077)	4.628*** (0.089)	3.729*** (0.088)
Observations	21,195	21,195	21,195	21,195	21,195
R-squared	0.122	0.029	0.043	0.095	0.131

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

TABLE VIII: The mediating effect of personality on the relation between opportunity entrepreneurship and entrepreneurial success, using a multinomial logit regression

Variables	(1) New firm	(2) New firm	(3) New firm	(4) New firm	(5) New firm	(6) New firm
Opportunity entrepreneurship	0.012* (0.007)	0.012* (0.007)	0.011 (0.007)	0.011 (0.007)	0.011 (0.007)	0.012 (0.007)
<i>Personality variables</i>						
Need for achievement		-0.008*** (0.002)				
Self-efficacy			0.011** (0.005)			
Endurance				0.005* (0.003)		
Need for autonomy					-0.007*** (0.002)	
Need for approval						-0.005* (0.002)
<i>Entrepreneurial variables</i>						
Entrepreneurial experience	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)
Knowing entrepreneurs	-0.011** (0.005)	-0.009* (0.005)	-0.011** (0.005)	-0.010* (0.005)	-0.009* (0.005)	-0.010* (0.005)
Number of owners	-0.023*** (0.003)	-0.024*** (0.003)	-0.023*** (0.003)	-0.023*** (0.003)	-0.024*** (0.003)	-0.024*** (0.003)
<i>Economic variables</i>						
Dual income	0.019*** (0.005)	0.018*** (0.005)	0.018*** (0.005)	0.019*** (0.005)	0.019*** (0.005)	0.020*** (0.005)
Own house	0.028*** (0.005)	0.027*** (0.005)	0.028*** (0.005)	0.029*** (0.005)	0.028*** (0.005)	0.028*** (0.005)
Log of income	0.002 (0.003)	0.001 (0.003)	0.002 (0.003)	0.003 (0.003)	0.002 (0.003)	0.001 (0.003)
<i>Demographic variables</i>						
White	0.016*** (0.005)	0.014** (0.006)	0.017*** (0.006)	0.017*** (0.005)	0.015*** (0.006)	0.014** (0.006)
Male	0.008* (0.005)	0.009* (0.005)	0.007 (0.005)	0.008 (0.005)	0.007 (0.005)	0.009* (0.005)
College degree	0.031*** (0.005)	0.030*** (0.005)	0.030*** (0.005)	0.032*** (0.005)	0.030*** (0.005)	0.029*** (0.005)
Age between 25-34	0.037*** (0.010)	0.034*** (0.010)	0.037*** (0.010)	0.037*** (0.010)	0.038*** (0.010)	0.036*** (0.010)
Age between 35-44	0.022** (0.010)	0.018* (0.010)	0.022** (0.010)	0.022** (0.010)	0.021** (0.010)	0.021** (0.010)
Age between 45-54	0.010 (0.009)	0.005 (0.010)	0.009 (0.009)	0.010 (0.009)	0.008 (0.009)	0.009 (0.009)
Age between 55-64	-0.023** (0.010)	-0.027*** (0.010)	-0.023** (0.010)	-0.023** (0.010)	-0.025*** (0.010)	-0.024** (0.010)
Age above 65	-0.025* (0.013)	-0.031** (0.013)	-0.025* (0.013)	-0.024* (0.013)	-0.030** (0.013)	-0.027** (0.013)
<i>Time variable</i>						
Month	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)

Table VIII continued

Observations	21,195	21,195	21,195	21,195	21,195	21,195
Log-pseudolikelihood	-16790.522	-16698.651	-16737.584	-16714.294	-16779.659	-16684.553
Wald Chi ²	4356.76	4559.90	4595.15	4641.50	4550.66	4611.55
Pseudo-R ²	0.134	0.1388	0.1368	0.1380	0.1346	0.1395
<i>Hausman</i>						
Chi ²	716.71	1004.69	609.99	567.95	537.75	906.02
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. For clarity, only the results for entrepreneurial success are shown, while the results for remaining an NE and quitting are left out.

TABLE IX: Estimates of the mediation effect using the KHB method

Variable	Reduced effect	Full effect	Difference
Need for achievement	0.3420*** (0.073)	0.312*** (0.073)	0.008 (0.011)
Self-efficacy	0.322*** (0.074)	0.294*** (0.074)	0.028* (0.016)
Endurance	0.321*** (0.074)	0.307*** (0.074)	0.014 (0.017)
Need for autonomy	0.318*** (0.073)	0.318*** (0.073)	0.000 (0.002)
Need for approval	0.318*** (0.073)	0.319*** (0.073)	-0.001 (0.015)

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

TABLE Xa. : The mediating effect of need for achievement on the relation between opportunity entrepreneurship and entrepreneurial success, using a multinomial logit regression

Variables	(1) New firm	(2) New firm	(3) New firm	(4) New firm	(5) New firm
Opportunity entrepreneurship	0.012* (0.007)	0.012* (0.007)	0.012* (0.007)	0.012* (0.007)	0.012* (0.007)
<i>Personality variables</i>					
Need for achievement		-0.008*** (0.002)			
<i>Personality construct</i>					
<i>Establishing a business is important for me to</i>					
Achieve a higher position in society			-0.003 (0.002)		
Achieve something and get recognition for it				-0.005*** (0.002)	
Have the power to influence an organization					-0.006*** (0.002)
<i>Entrepreneurial variables</i>					
Entrepreneurial experience	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)
Knowing entrepreneurs	-0.011** (0.005)	-0.009* (0.005)	-0.010* (0.005)	-0.010* (0.005)	-0.009* (0.005)
Number of owners	-0.023*** (0.003)	-0.024*** (0.003)	-0.024*** (0.003)	-0.024*** (0.003)	-0.023*** (0.003)
<i>Economic variables</i>					
Dual income	0.019*** (0.005)	0.018*** (0.005)	0.018*** (0.005)	0.019*** (0.005)	0.018*** (0.005)
Own house	0.028*** (0.005)	0.027*** (0.005)	0.028*** (0.005)	0.028*** (0.005)	0.027*** (0.005)
Log of income	0.002 (0.003)	0.001 (0.003)	0.002 (0.003)	0.001 (0.003)	0.002 (0.003)
<i>Demographic variables</i>					
White	0.016*** (0.005)	0.014** (0.006)	0.015*** (0.006)	0.016*** (0.006)	0.014** (0.006)
Male	0.008* (0.005)	0.009* (0.005)	0.009* (0.005)	0.008* (0.005)	0.009* (0.005)
College degree	0.031*** (0.005)	0.030*** (0.005)	0.030*** (0.005)	0.030*** (0.005)	0.030*** (0.005)
Age between 25-34	0.037*** (0.010)	0.034*** (0.010)	0.036*** (0.010)	0.035*** (0.010)	0.034*** (0.010)
Age between 35-44	0.022** (0.010)	0.018* (0.010)	0.020** (0.010)	0.020* (0.010)	0.019* (0.010)
Age between 45-54	0.010 (0.009)	0.005 (0.010)	0.007 (0.009)	0.007 (0.010)	0.006 (0.010)
Age between 55-64	-0.023** (0.010)	-0.027*** (0.010)	-0.025** (0.010)	-0.025** (0.010)	-0.026*** (0.010)
Age above 65	-0.025* (0.013)	-0.031** (0.013)	-0.028** (0.013)	-0.028** (0.013)	-0.029** (0.013)
<i>Time variable</i>					
Month	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)

Observations	21,195	21,195	21,195	21,195	21,195
<i>Table Xa continued</i>					
Log-pseudolikelihood	-16790.522	-16698.651	-16758.641	-16677.47	-16753.031
Wald Chi ²	4536.76	4559.90	4532.04	4618.71	4541.19
Pseudo-R ²	0.1341	0.1388	0.1357	0.1399	0.1360
<i>Hausman</i>					
Chi ²	716.71	1004.69	874.35	1050.48	1821.61
p-value	0.0000	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. For clarity, only the results for entrepreneurial success are shown, while the results for remaining an NE and quitting are left out.

TABLE Xb. : The mediating effect of self-efficacy on the relation between opportunity entrepreneurship and entrepreneurial success, using a multinomial logit regression

Variables	(1) New firm	(2) New firm	(3) New firm	(4) New firm	(5) New firm
Opportunity entrepreneurship	0.012* (0.007)	0.011 (0.007)	0.012* (0.007)	0.012* (0.007)	0.010 (0.007)
<i>Personality variable</i>					
Self-efficacy		0.011** (0.005)			
<i>Personality construct</i>					
My skills and abilities will help me start this new business			0.000 (0.004)		
My past experience will be very valuable in starting this business				0.002 (0.003)	
I am confident I can put in the effort needed to start this new business					0.025*** (0.004)
<i>Entrepreneurial variables</i>					
Entrepreneurial experience	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)
Knowing entrepreneurs	-0.011** (0.005)	-0.011** (0.005)	-0.011** (0.005)	-0.011** (0.005)	-0.011** (0.005)
Number of owners	-0.023*** (0.003)	-0.023*** (0.003)	-0.023*** (0.003)	-0.023*** (0.003)	-0.022*** (0.003)
<i>Economic variables</i>					
Dual income	0.019*** (0.005)	0.018*** (0.005)	0.019*** (0.005)	0.019*** (0.005)	0.018*** (0.005)
Own house	0.028*** (0.005)	0.028*** (0.005)	0.029*** (0.005)	0.028*** (0.005)	0.028*** (0.005)
Log of income	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)
<i>Demographic variables</i>					
White	0.016*** (0.005)	0.017*** (0.006)	0.017*** (0.006)	0.016*** (0.005)	0.017*** (0.005)
Male	0.008* (0.005)	0.007 (0.005)	0.008* (0.005)	0.008 (0.005)	0.006 (0.005)
College degree	0.031*** (0.005)	0.030*** (0.005)	0.031*** (0.005)	0.030*** (0.005)	0.030*** (0.005)
Age between 25-34	0.037*** (0.010)	0.037*** (0.010)	0.037*** (0.010)	0.037*** (0.010)	0.038*** (0.010)
Age between 35-44	0.022** (0.010)	0.022** (0.010)	0.022** (0.010)	0.022** (0.010)	0.023** (0.010)
Age between 45-54	0.010 (0.009)	0.009 (0.009)	0.010 (0.009)	0.010 (0.009)	0.010 (0.009)
Age between 55-64	-0.023** (0.010)	-0.023** (0.010)	-0.023** (0.010)	-0.023** (0.010)	-0.022** (0.010)
Age above 65	-0.025* (0.013)	-0.025* (0.013)	-0.025* (0.013)	-0.025* (0.013)	-0.022* (0.013)
<i>Time variable</i>					
Month	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)

Table Xb continued

Observations	21,195	21,195	21,195	21,195	21,195
Log-pseudolikelihood	-16790.522	-16737.584	-16757.806	-16755.285	-16745.558
Wald Chi ²	4536.76	4595.15	4584.70	4552.23	4638.97
Pseudo-R ²	0.1341	0.1368	0.1357	0.1359	0.1364
<i>Hausman</i>					
Chi ²	716.71	609.99	586.62	633.57	753.48
p-value	0.0000	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. For clarity, only the results for entrepreneurial success are shown, while the results for remaining an NE and quitting are left out.

TABLE Xc. : The mediating effect of endurance on the relation between opportunity entrepreneurship and entrepreneurial success, using a multinomial logit regression

Variables	(1) New firm	(2) New firm	(3) New firm	(4) New firm
Opportunity entrepreneurship	0.012* (0.007)	0.011 (0.007)	0.012* (0.007)	0.012 (0.007)
<i>Personality variable</i>				
Endurance		0.005* (0.003)		
<i>Personality construct</i>				
There is no limit as to how long I would give maximum effort to establish this new business			0.007*** (0.003)	
My personal philosophy is to 'do whatever it takes' to establish my own business				0.001 (0.003)
<i>Entrepreneurial variables</i>				
Entrepreneurial experience	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.003 (0.005)
Knowing entrepreneurs	-0.011** (0.005)	-0.010* (0.005)	-0.010* (0.005)	-0.010** (0.005)
Number of owners	-0.023*** (0.003)	-0.023*** (0.003)	-0.023*** (0.003)	-0.024*** (0.003)
<i>Economic variables</i>				
Dual income	0.019*** (0.005)	0.019*** (0.005)	0.018*** (0.005)	0.018*** (0.005)
Own house	0.028*** (0.005)	0.029*** (0.005)	0.028*** (0.005)	0.029*** (0.005)
Log of income	0.002 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)
<i>Demographic variables</i>				
White	0.016*** (0.005)	0.017*** (0.005)	0.017*** (0.005)	0.017*** (0.006)
Male	0.008* (0.005)	0.008 (0.005)	0.007 (0.005)	0.008* (0.005)
College degree	0.031*** (0.005)	0.032*** (0.005)	0.032*** (0.005)	0.031*** (0.005)
Age between 25-34	0.037*** (0.010)	0.037*** (0.010)	0.036*** (0.010)	0.037*** (0.010)
Age between 35-44	0.022** (0.010)	0.022** (0.010)	0.022** (0.010)	0.022** (0.010)
Age between 45-54	0.010 (0.009)	0.010 (0.009)	0.010 (0.009)	0.010 (0.009)
Age between 55-64	-0.023** (0.010)	-0.023** (0.010)	-0.023** (0.010)	-0.021** (0.010)
Age above 65	-0.025* (0.013)	-0.024* (0.013)	-0.024* (0.013)	-0.025* (0.013)
<i>Time variable</i>				
Month	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)

Table Xc continued

Observations	21,195	21,195	21,195	21,169
Log-pseudolikelihood	-16790.522	-16714.294	-16728.809	-16719.831
Wald Chi ²	4536.76	4641.50	4633.60	4614.91
Pseudo-R ²	0.1341	0.1380	0.1372	0.1371
<i>Hausman</i>				
Chi ²	716.71	567.95	655.65	898.90
p-value	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. For clarity, only the results for entrepreneurial success are shown, while the results for remaining an NE and quitting are left out.

TABLE Xd. : The mediating effect of need for autonomy on the relation between opportunity entrepreneurship and entrepreneurial success, using a multinomial logit regression

Variables	(1) New firm	(2) New firm	(3) New firm	(4) New firm
Opportunity entrepreneurship	0.012* (0.007)	0.011 (0.007)	0.012* (0.007)	0.013* (0.007)
<i>Personality variable</i>				
Need for autonomy		-0.007*** (0.002)		
<i>Personality construct</i>				
<i>Establishing a business is important for me to -</i>				
Have considerable freedom to adapt your own approach to work			-0.017*** (0.002)	
Have a greater flexibility for your personal and family life				0.006*** (0.002)
<i>Entrepreneurial variables</i>				
Entrepreneurial experience	0.004 (0.005)	0.004 (0.005)	0.005 (0.005)	0.004 (0.005)
Knowing entrepreneurs	-0.011** (0.005)	-0.009* (0.005)	-0.007 (0.005)	-0.012** (0.005)
Number of owners	-0.023*** (0.003)	-0.024*** (0.003)	-0.025*** (0.003)	-0.023*** (0.003)
<i>Economic variables</i>				
Dual income	0.019*** (0.005)	0.019*** (0.005)	0.020*** (0.005)	0.018*** (0.005)
Own house	0.028*** (0.005)	0.028*** (0.005)	0.026*** (0.005)	0.029*** (0.005)
Log of income	0.002 (0.003)	0.002 (0.003)	0.001 (0.003)	0.002 (0.003)
<i>Demographic variables</i>				
White	0.016*** (0.005)	0.015*** (0.006)	0.015*** (0.006)	0.018*** (0.005)
Male	0.008* (0.005)	0.007 (0.005)	0.007 (0.005)	0.009* (0.005)
College degree	0.031*** (0.005)	0.030*** (0.005)	0.030*** (0.005)	0.031*** (0.005)
Age between 25-34	0.037*** (0.010)	0.038*** (0.010)	0.036*** (0.010)	0.034*** (0.010)
Age between 35-44	0.022** (0.010)	0.021** (0.010)	0.016 (0.010)	0.021** (0.010)
Age between 45-54	0.010 (0.009)	0.008 (0.009)	0.006 (0.010)	0.011 (0.009)
Age between 55-64	-0.023** (0.010)	-0.025*** (0.010)	-0.030*** (0.010)	-0.021** (0.010)
Age above 65	-0.025* (0.013)	-0.030** (0.013)	-0.032** (0.013)	-0.020 (0.013)
<i>Time variable</i>				
Month	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)

Table Xd continued

Observations	21,195	21,195	21,195	21,195
Log-pseudolikelihood	-16790.522	-16779.659	-16756.914	-16779.331
Wald Chi ²	4536.76	4550.66	4577.33	4572.29
Pseudo-R ²	0.1341	0.1346	0.1358	0.1346
<i>Hausman</i>				
Chi ²	716.71	537.75	726.15	542.44
p-value	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. For clarity, only the results for entrepreneurial success are shown, while the results for remaining an NE and quitting are left out.

TABLE Xe. : The mediating effect of need for approval on the relation between opportunity entrepreneurship and entrepreneurial success, using a multinomial logit regression

Variables	(1) New firm	(2) New firm	(3) New firm	(4) New firm	(5) New firm	(6) New firm
Opportunity entrepreneurship	0.012* (0.007)	0.012 (0.007)	0.012* (0.007)	0.011 (0.007)	0.012* (0.007)	0.011 (0.007)
<i>Personality variables</i>						
Need for approval		-0.005* (0.002)				
<i>Personality construct</i>						
<i>Establishing a business is important for me to -</i>						
Continue a family tradition			0.002 (0.002)			
Be respected by your friends				-0.005*** (0.002)		
Follow the example of a person you admire					-0.012*** (0.002)	
Build a business your children can inherit						0.005*** (0.002)
<i>Entrepreneurial variables</i>						
Entrepreneurial experience	0.004 (0.005)	0.004 (0.005)	0.004 (0.005)	0.003 (0.005)	0.003 (0.005)	0.003 (0.005)
Knowing entrepreneurs	-0.011** (0.005)	-0.010* (0.005)	-0.011** (0.005)	-0.010* (0.005)	-0.008 (0.005)	-0.012** (0.005)
Number of owners	-0.023*** (0.003)	-0.024*** (0.003)	-0.024*** (0.003)	-0.024*** (0.003)	-0.024*** (0.003)	-0.025*** (0.003)
<i>Economic variables</i>						
Dual income	0.019*** (0.005)	0.020*** (0.005)	0.019*** (0.005)	0.019*** (0.005)	0.020*** (0.005)	0.019*** (0.005)
Own house	0.028*** (0.005)	0.028*** (0.005)	0.028*** (0.005)	0.028*** (0.005)	0.025*** (0.005)	0.028*** (0.005)
Log of income	0.002 (0.003)	0.001 (0.003)	0.002 (0.003)	0.002 (0.003)	0.001 (0.003)	0.003 (0.003)
<i>Demographic variables</i>						
White	0.016*** (0.005)	0.014** (0.006)	0.017*** (0.006)	0.015*** (0.006)	0.011* (0.006)	0.019*** (0.006)
Male	0.008* (0.005)	0.009* (0.005)	0.008* (0.005)	0.009* (0.005)	0.012** (0.005)	0.007 (0.005)
College degree	0.031*** (0.005)	0.029*** (0.005)	0.031*** (0.005)	0.029*** (0.005)	0.031*** (0.005)	0.034*** (0.005)
Age between 25-34	0.037*** (0.010)	0.036*** (0.010)	0.037*** (0.010)	0.035*** (0.010)	0.033*** (0.010)	0.037*** (0.010)
Age between 35-44	0.022** (0.010)	0.021** (0.010)	0.021** (0.010)	0.020** (0.010)	0.020* (0.010)	0.021** (0.010)
Age between 45-54	0.010 (0.009)	0.009 (0.009)	0.009 (0.009)	0.008 (0.009)	0.007 (0.010)	0.010 (0.009)
Age between 55-64	-0.023** (0.010)	-0.024** (0.010)	-0.023** (0.010)	-0.023** (0.010)	-0.027*** (0.010)	-0.022** (0.010)
Age above 65	-0.025* (0.013)	-0.027** (0.013)	-0.026* (0.013)	-0.026** (0.013)	-0.030** (0.013)	-0.023* (0.013)
<i>Time variable</i>						
Month	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)

Table Xe continued

Observations	21,195	21,195	21,195	21,195	21,195	21,143
Log-pseudolikelihood	-16790.522	-16684.553	-16724.805	-16721.859	-16706.292	-16701.204
Wald Chi ²	4536.76	4611.55	4596.67	4598.93	4548.92	4577.20
Pseudo-R ²	0.1341	0.1395	0.1375	0.1376	0.1384	0.1361
<i>Hausman</i>						
Chi ²	716.71	906.02	661.75	879.89	109.79	685.36
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. For clarity, only the results for entrepreneurial success are shown, while the results for remaining an NE and quitting are left out.

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