



Paper to be presented at the DRUID Academy Conference 2017 at University of Southern Denmark, Odense, Denmark on January 18-20, 2017

Narcissism and innovative performances: the moderating role of market scenarios.

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Abstract

Entrepreneur's experience and personality traits influence strategic choices and performance of the firms, mostly when firms are small firms or start-up or they are located in industries with particular market scenarios.

This work responds to the request of many authors to shed light on how the dark side of personality can influence performances. Between all dark traits, I chose narcissism because previous works show that: narcissistic CEOs' strategic choices differ systematically from those of other CEOs; narcissism is prevalent in top management position; and narcissism represents comprehensively the personality of a CEO. In particular, I focus on start-ups because often entrepreneurs are founders and top management team leaders and their personality traits have a direct impact on performances; and I focus on innovative performances, because, until now, narcissism has been studied only in relation to financial performances. Furthermore, dynamic or concentrated markets allow entrepreneurs to have greater managerial discretion, thus the relationship between entrepreneurs' personal characteristics and performances is influenced from these market scenarios. The market scenarios that I consider are market concentration and market dynamism, and I show that they moderate the relationship between entrepreneurs' narcissism and innovative performances.

Narcissism and innovative performances: the moderating role of market scenarios.

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Abstract: Entrepreneur’s experience and personality traits influence strategic choices and performance of the firms, mostly when firms are small firms or start-up or they are located in industries with particular market scenarios. This work responds to the request of many authors to shed light on how the dark side of personality can influence performances. Between all dark traits, I chose narcissism because previous works show that: narcissistic CEOs’ strategic choices differ systematically from those of other CEOs; narcissism is prevalent in top management position; and narcissism represents comprehensively the personality of a CEO. In particular, I focus on start-ups because often entrepreneurs are founders and top management team leaders and their personality traits have an direct impact on performances; and I focus on innovative performances, because, until now, narcissism has been studied only in relation to financial performances. Furthermore, dynamic or concentrated markets allow entrepreneurs to have greater managerial discretion, thus the relationship between entrepreneurs’ personal characteristics and performances is influenced from these market scenarios. The market scenarios that I consider are market concentration and market dynamism, and I show that they moderate the relationship between entrepreneurs’ narcissism and innovative performances.

Keywords: Narcissism; innovative performances; market concentration; market dynamism; start-ups; entrepreneurship.

Introduction

According to the upper echelon theory, entrepreneur’s experience and personality traits influence strategic choices and performances of the firms (Hambrick & Mason, 1984). In conducting this research, I focus on start-ups firms. These are firms at the early stage of the life cycle and often entrepreneurs are both founders and top management team leaders; for these reasons their personality traits have a direct impact on start-ups’ structure and performance (Gatewood, Shaver, & Gartner, 1995). Among many personality traits, I chose narcissism for the following reasons: firstly, Chatterjee and Hambrick (2007) show that narcissistic CEOs’ strategic choices differ systematically from those of other CEOs; secondly, management and psychology literatures agree that narcissism is prevalent in top management position and that the prevalence of

narcissistic CEOs has increased over the last two decades (Campbell & Campbell, 2009; Engelen, Neumann, & Schmidt, 2016; Grijalva & Harms, 2014); thirdly, narcissism is described as a trait that cover the personality of a CEO comprehensively (Engelen et al., 2016); and lastly previous literatures show the existence of a relationship between entrepreneurs' narcissism and performances (Chatterjee & Hambrick, 2007; Judge, LePine, & Rich, 2006; William J. Wales, Patel, & Lumpkin, 2013) but they don't contextualize this relationship in a given market scenario.

Many authors state that there are two types of narcissism: productive/constructive and destructive (de Vries, 1994; Lubit, 2002; Maccoby, 2003). The first, that I consider in this study, is a person who has a precise vision to change the world, is risk taker and acts independently, pursues his/her vision with great passion and perseverance, and has strategic intelligence (Maccoby, 2003). Based on this new vision of narcissism, some scholars show the existence of a relationship between entrepreneurs' narcissism and performances; in particular they have extreme performances, both positive and negative (Chatterjee & Hambrick, 2007; Judge et al., 2006; William J. Wales et al., 2013). Therefore, my research questions are: does entrepreneurs' narcissism influence start-ups' innovative performances? Does market concentration moderate this relationship? And, does market dynamism moderate this relationship?

I focus on market dynamism and market concentration because many authors state that when firms are in markets with these characteristics, entrepreneurs have greater managerial discretion; thus their personal traits have significant effects on firm-level outcomes (Engelen, Neumann, & Schwens, 2014; Hambrick & Finkelstein, 1987).

This work contributes to entrepreneurship literature by extending personality research beyond personality traits; to start-ups' literature by showing that personality traits of entrepreneurs influence innovative performances of start-ups; to narcissism literature by focusing on the impact of entrepreneurs' narcissism on innovative performances; and to strategic and innovation literatures by showing that personality traits can influence firms' innovation in some market scenarios. In the following sections I analyse the theoretical background, I delineate my hypotheses, and I describe the method I use. The paper closes with a discussion of the results and a brief conclusion, in which I discuss some practical implications, and I address limitations and avenues for future research.

Theoretical Background

The importance of innovative performances for the growing and survival of start-ups.

In start-ups' literature there are controversial thesis about the relationship between innovation and the growth and survival of start-ups (Groenewegen & de Langen, 2012; Rosenbusch, Brinckmann, & Bausch, 2011; Song, Podoyntsyna, Van Der Bij, & Halman, 2008). These are firms at the early stage of the life cycle, often are very innovative, and, in most cases, entrepreneurs are both founders and top management team leaders (Gatewood et al., 1995). Innovation per se is the essence of change, because it destroys and creates markets and organizations and allows gain competitive advantage both in international and global markets (Freeman, 1982; Joseph Alois Schumpeter, 1951). Some scholars assert that high innovative performances could be

detrimental for younger firms, because they may carry only a single innovative project and the possible failure of this project can threaten the existence of the entire venture (Hyytinen, Pajarinen, & Rouvinen, 2015); also because they can suffer from a liability of newness, which manifests itself in lower survival probability compared with a similar incumbent organization, both in terms of difficulty in cooperating with other firms, both in terms of interacting with stakeholders (J. A. Baum & Oliver, 1996); and finally because start-ups may have few assets, long and uncertain payback times, and more limited access to external financing, which leads their ability to improve innovative performances (Hyytinen et al., 2015; Nohria & Gulati, 1996). Conversely, other authors suggest that innovation allows start-ups to grow and survive because innovativeness enhances ability to escape and outperform competition, reduces costs of production, and creates dynamic capabilities (Dahlqvist & Wiklund, 2012; Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997). This high competitiveness comes from less rigid routines that allows to adapt more quickly changes in their operating environment (Bruderl & Schussler, 1990), and be alert and entrepreneurially oriented (Lumpkin & Dess, 1996). Agreeing with this second line of thought,

The relationship between personality traits and innovative performances.

Regarding the relationship between personality traits and performance, entrepreneurial firms need entrepreneurs that have high levels of innovativeness, proactiveness and risk taking (William J Wales, Gupta, & Mousa, 2011). In particular, this is important in small firms or start-ups, because entrepreneurs are both founders and top management team leaders and their personality traits have a direct impact on start-ups' structure and performance (Gatewood et al., 1995). The upper echelons theory, designed by Hambrick and Mason (1984), claims that organisational outcome, i.e. strategic choice and performance levels, are influenced by entrepreneur experience and personal characteristics. Entrepreneurs' personality is fundamental because generally entrepreneurs are faced with a lot of information, ambiguity, complexity, and contradiction (Engelen et al., 2016; Nadkarni & Herrmann, 2010). Furthermore, entrepreneurs' personality determines how external information, condition, and stimuli are filtered, interpreted, and incorporated into a decision (Engelen et al., 2016; Hambrick & Mason, 1984).

Concerning the relationship between personality traits and start-ups' innovative performances, many scholars show that start-ups' innovative performances are strongly influenced by entrepreneur personality (Baron & Markman, 2003; King, Walker, & Broyles, 1996; Patterson, 1999, 2002). Patterson (1999) argues that personality characteristics are related to the propensity to innovate in the workplace, and she describes the principal traits that are relevant to the generation and application of ideas in organizations. Other authors show there are a stable set of core of personality characteristics that consistently relate to innovation and creativity (King et al., 1996).

Narcissism a controversial personality trait.

In this paper, I focus on the personality trait of narcissism, accepting the invitation of Klotz and Neubaum (2016) and D. Miller (2014, 2016) of analysing the real impact of the "dark side" of personality on the organisational context and on the new venture outcome. In particular, Klotz and Neubaum (2016)

“encourage entrepreneurship researchers to think deeply about what aspects of the entrepreneurial context (i.e., extreme resource constraints or high market uncertainty) will activate certain dispositional tendencies in entrepreneurs, and how personality affects entrepreneurs’ actions following major events in their work lives” (p. 11). Many authors state the need and the importance of further studies about this controversial tract, because narcissism is prevalent in top management position, it is described as a trait that cover the personality of a CEO comprehensively, and, in the last two decades, the prevalence of narcissistic CEOs has increase exponentially (Campbell & Campbell, 2009; Engelen et al., 2016; Grijalva & Harms, 2014). Other authors have shown the importance of studying this trait because the strategic choices of narcissistic CEOs differ systematically from those of other CEOs (Chatterjee & Hambrick, 2007). Previous literatures show the existence of a relationship between entrepreneurs’ narcissism and performances (Chatterjee & Hambrick, 2007; Judge et al., 2006; William J. Wales et al., 2013) but they do not focus on innovative performance and they do not contextualize this relationship in a given market scenario.

The main characteristics of narcissistic entrepreneurs.

In the early ‘900, narcissism is considered a psychological disorder or pathology (see Freud, 1914), but some authors, later, started to consider it a personality trait. The first definition of narcissism as personality trait is given by Waelder (1925), and he says: “these individuals are condescending, they feel superior to others, they are absorbed by admiration of themselves, and they lack of empathy”. But, the last and most common definition of narcissist, describes him/her as someone who is arrogant, haughty, and grandiose, he/she thinks he/she is superior and deserving of special treatment, he/she requires admiration, he/she is oblivious to the feelings of others, he/she lacks of empathy, he/she is authoritarian, he/she takes advantage of others, and he/she overestimates his/her abilities (Campbell, Goodie, & Foster, 2004; Chatterjee & Hambrick, 2007; Rosenthal & Pittinsky, 2006; William J. Wales et al., 2013). Summarizing narcissism contains a broad assortment of entirely negative characteristics, a synonym for every sort of self-absorbed and self-centred behaviour (Maccoby, 2003). Many authors state that there are two types of narcissism: productive/constructive and destructive (de Vries, 1994; Lubit, 2002; Maccoby, 2003). I consider narcissist as productive narcissist and, agreeing with Maccoby (2003), I define narcissist as a person who has a precise vision to change the world; he/she acts independently and he/she is risk taker, he/she pursues his/her vision with great passion and perseverance, he/she has strategic intelligence and he/she is competitive. I briefly analyse these features.

- *Vision to change the world:* narcissists see the world as a place that needs change, and if their plans fall, they are able to mobilize their strengths in order to achieve their goals. Narcissistic entrepreneurs use their firms as vehicles for their visions. Moreover their vision engages others, thus they provide a meaning not only for themselves but also for people who work for them, believe in them, and follow them (J. R. Baum & Locke, 2004; Goncalo, Flynn, & Kim, 2010; Maccoby, 2000).
- *Independent thinking and risk taker:* productive narcissists are relatively free from internal constraints (they are freer than other personality type because they do not listen to the social pressure

that leads them to conform) and external constraints (they are free to act as they wish and believe); also they are willing to take risks that others can not or will not dare, and they are able to create and seize opportunities (Lakey, Rose, Campbell, & Goodie, 2008).

- *Passion*: means curiosity that never stops or ends. Productive narcissists have constantly new ideas that need to be tested and tried out. It is known that frequently narcissists tend to isolate themselves: this is not the case. When they are in this phase, they are dependent on the phone (they call trusted people to know what they think about their ideas), and sometimes they want someone always around of them, not to keep him company, but to be present when a new idea arises (Goncalo et al., 2010; Maccoby, 2003).
- *Charisma*: is the result of an interaction between the productive narcissist and the people who are charmed and motivated by him; in general, narcissists become more spontaneous and sure of their message when know they are admired of others. Moreover they employ rhetoric art to persuade, influence, and mobilize others (Gardner & Avolio, 1998; Goncalo et al., 2010; Maccoby, 2003).
- *Perseverance*: productive narcissists are not discouraged by failure; they learn from it and don't give up (Maccoby, 2000).
- *Strategic intelligence*: this allows narcissists to stay on the top and sustain success, although there are losses or drops. *Foresight, system thinking, motivating, and partnering* compose it:
 - *Foresight* means that narcissistic entrepreneurs have the ability to anticipate how current movements, ideas, forces will pay out in the future, driving changes in technology, products, competitors, and customers needs and values. Of course this does not mean that all the bets about the futures are correct; it means that on average they are more right than wrong. *System thinking* means that productive narcissistic entrepreneurs have a different way of see the world, an odd ability to synthesize and integrate all information they have, instead of treating them as separate parts.
 - *Motivating* means the ability to get people to embrace a common purpose and implement the entrepreneurs' vision.
 - *Partnering* means make strategic alliance to achieve the goal (Maccoby, 2003).
- *Competitiveness*: narcissist entrepreneurs are driven by an overwhelming desire to compete and to do so they direct their organizations to take bolder and more aggressive strategic actions (Lumpkin & Dess, 1996; Maccoby, 2000; Rosenthal & Pittinsky, 2006).

To recap, in Table 1, designed by me, there is a brief summary of the main characteristics of a productive narcissist with a short description.

-Table 1 about here-

However, measures that contain and limit narcissist personality should be taken, in order that he/she does not exceed. Maccoby (2000) suggests that the best way is to identify a trusted friend that make sure that the vision of the narcissistic coincides with those of the company, and that acts as an anchor to point out the operational requirement of the narcissist's vision and keep him rooted in reality.

Market scenarios

In this paper I consider two important market scenarios: market concentration and market dynamisms. Several authors request to investigate how the relationship between the dark side of personality and performances can be moderate from environmental dynamics (DeNisi, 2015; Klotz & Neubaum, 2016; D. Miller, 2014, 2016). Therefore, I decided to investigate how these two industry conditions influence the relationship between narcissism and innovative performances. Hambrick and Finkelstein (1987) show that the environment in which the firm is, influence the managerial discretion of entrepreneurs. This means that the absence of constraint or the presence of multiple plausible alternatives is influenced by the competitive environment in which firms operate. For this reason the impact of entrepreneurs' personality traits is greatest under boundary conditions because they offer high degrees of discretion (Engelen et al., 2014; Finkelstein & Boyd, 1998). Boundary conditions occur when there is high market concentration or high market dynamism within an industry. In particular, market concentration refers to the degree of competition in one market; it is given by the comparison between the number of competitors and the number of areas in which they compete (Jansen, Van Den Bosch, & Volberda, 2006; D. Miller, 1987). In these markets there are fewer price wars, less competition, and greater market power. Instead, market dynamism pertains to unpredictable and rapid change in environments in which new ventures operate (Dess & Beard, 1984; Duncan, 1972). Stable environments are characterized by minimal change in customer preferences, technologies, and competitive dynamics, whereas highly dynamic industries are characterized by a high rate of change, instability, and increasing decision uncertainty (Jansen et al., 2006; Sørensen & Stuart, 2000; Wallace & Baumeister, 2002). Uncertainty is defined as the difference between something who is projected and actual outcomes (Simon, 1955).

Hypotheses

Entrepreneurs' narcissism and start-ups' innovative performances.

Unlike the studies about narcissism and performance (Chatterjee & Hambrick, 2007; Ham, Seybert, & Wang, 2014; Judge et al., 2006; William J. Wales et al., 2013), there are not studies about narcissism and innovative performance. Narcissism has some strengths that allow to have positive innovative performance, but a lot of weakness that lead to have negative innovative performance. The strengths could be the fact that narcissistic entrepreneurs are risk taker and they will have an early advantage in garnering support for entrepreneurial endeavours because when they "pitch" ideas to investors or peers, even if these ideas are not superior to those of others, they gain success (Elsbach & Kramer, 2003; Goncalo et al., 2010; Grijalva & Harms, 2014). But there are a lot of weaknesses: firstly, narcissist entrepreneurs have clear vision and they pursue this vision at any cost. However, if this vision does not match with the start-up's vision, there is a problem; furthermore entrepreneur may not have trusted friends that help him/her in focusing on start-up and not on himself/herself. Secondly, narcissist entrepreneurs act independently. This is a big problem because generally start-ups are founded by team; thus, it is important the presence of a leader, but he/she should

moderate the ideas of the team, and not impose his/her view. Finally, narcissist entrepreneurs generate continually new ideas; this is not useful for a start-up, because it does not allow focusing on one idea, and carrying it out to develop it. I propose that the relationship between narcissism and innovative performances have a non-linear form. Precisely, I state that there is an inverted-U shape relationship between entrepreneurs' narcissism and innovative performances because narcissism per se should be negative for innovative performance but both very low and very high levels of narcissism should be detrimental for innovative performances. Instead, medium levels of narcissism should have less negative impact on innovative performances. For these reasons my first hypothesis is:

Hypothesis 1 (H₁): Narcissists' entrepreneurs will have an inverted-U relationship with start-ups' innovative performances. Hence, narcissism levels, both too low than too high are damaging for start-ups' innovative performances.

The moderator role of market concentration.

The features of concentrated markets can affect survival chances of new entrants because of the significant competitive threats (Burke, Gorg, & Hanley, 2007). Furthermore, firms have higher margins than their peers in fragmented markets and usually enjoy higher barriers to market entry, higher prices, and higher relative margins (Hambrick & Finkelstein, 1987; Jansen et al., 2006; Luo & Homburg, 2007; Matusik & Hill, 1998). Economic theory suggests that there is a close relationship between market concentration and competitive intensity: higher market concentration is related to lower level of competitive intensity (Gatignon, Weitz, & Bansal, 1990; Steenkamp, Nijs, Hanssens, & Dekimpe, 2005). In concentrated markets entrepreneurs should have the capabilities to organise new combinations of complementary competencies in a flexible way, and to exploit the opportunity to cooperate with other firms within the market to increase the innovativeness and competitiveness of all participating (Vickery & Wurzburg, 1996).

According to Nevicka, De Hoogh, Van Vianen, Beersma, and McIlwain (2011), narcissist are more sensitive to context than no narcissists. Other authors state that narcissists perform better and work harder when there is an opportunity for self-enhancement; this self-enhancement can take place both thanks to an audience that observes and acclaims the narcissist's performance, both thanks to some task for which success indicates personal superiority of narcissist (Dess & Lumpkin, 2005; Wallace & Baumeister, 2002). In general, the size of an entrepreneur's audience increases when there are few players in a market, so the degree of market concentration appears to be very relevant (Engelen et al., 2016). Also, motivating and partnering are features that allow to increment innovative performances in concentrated markets, because permit to implement strategic alliance and motivate competitors to collaborate for achieve a common goal. These arguments suggest that if market concentration is high, the relationship between entrepreneurs' narcissism and innovative performances becomes positive, but it depends of the levels of narcissism: this relationship will be more positive with low levels of narcissism. While if market concentration is low, the relationship between entrepreneurs' narcissism and innovative performances becomes positive, but the results will be less

positive than the highly concentrated market; in the same way, this relationship depends of the levels of narcissism: it will be more positive with low levels of narcissism. For these reasons, I can affirm that:

Hypothesis 2 (H₂): The relationship between entrepreneurs' narcissism and start-ups' innovative performances is moderate by market concentration. The marginal effects of entrepreneurs' narcissism on start-up innovative performances are stronger when market concentration is high.

The moderator role of market dynamism.

The features of dynamic markets influence behaviour of entrepreneurs. In particular, decision makers have limited availability of information and tend to suffer from greater information processing burdens, this implies that they should act by speed and comprehensiveness (Ensley, Pearce, & Hmieleski, 2006; K. D. Miller, 2007; Tushman, 1979). If they do not have these features, they will find themselves to perform limited search in their assessment of the environmental situation, to develop solutions by taking concrete actions quickly, and to attempt less integration of various emergent responses (Li & Simerly, 1998). Entrepreneurs who are in dynamic environments "should be able to circumvent the effects of stress, which can impair cognitive processing, in order to maximize their ability to rapidly acquire and process information" (Ensley et al., 2006, p. 248). According to Ensley et al. (2006), in dynamic environments, start-ups could have high innovative performance only if entrepreneurs are people who do not tend to rise from the ground, and therefore unify top management teams to work together toward a common goal. Dynamic environments that require extraordinary commitment, focus and effort, are ideal for entrepreneurs who emphasize the possible gains that they can achieve by sharing the responsibility and rewards of their undertaking with followers.

When there are high levels of market dynamism, some features of narcissist entrepreneurs can be beneficial, but the majority will have a negative influence on the relationship with start-ups' innovative performance. In particular, foresight can help entrepreneurs to predict and anticipate new technologies and customer need, and respond quickly at these changes; charisma allows to motivate and reassure peers and employees when they are facing uncertainty (Baron & Tang, 2011; Judge & Piccolo, 2004); and independent and system thinking gives entrepreneurs a high degree of discretion, when there are unpredictable outcomes, limited availability of information, and uncertainty (Baron & Tang, 2011; Gupta, MacMillan, & Surie, 2004; Judge & Piccolo, 2004). However, their tendency to act independently, without share ideas with top management teams, and avoiding to share the credit and the reward for the success, is a huge weakness, that penalizes innovative performances in high dynamic market. These arguments suggest that if market dynamism is high, the relationship between entrepreneurs' narcissism and innovative performances becomes more negative, than if market dynamism is low. But this depends from the level of narcissism: if entrepreneurs' narcissism is high the situation deteriorates further. For these reasons, the hypothesis 3 is:

Hypothesis 3 (H₃): The relationship between entrepreneurs' narcissism and start-ups' innovative performances is moderate by market dynamism. The marginal effects of entrepreneurs' narcissism on start-up innovative performances are worse when market dynamism is high.

The research model, summarized in Figure 1, illustrates the core components of my research and how they are related.

-Figure 1 About Here-

Methodology

Sample and procedure

The present study relies on Italian start-up companies. I selected all the start-ups listed in the Italian register of innovative start-ups and founded between 2012 and 2015. I administered questionnaires on narcissism at these entrepreneurs. To contact entrepreneurs, I added them on LinkedIn and, when they accept my request, I sent the link to the electronic survey used for measure their narcissistic level. Entrepreneurs who did not have a LinkedIn profile were contacted via Facebook or via personal e-mail address. The questionnaire was administered in Italy in 2016 and the language used is Italian. I contacted 495 entrepreneurs, but only 391 accepted my request, and of that number, only 115 responded to the questionnaire (response rate 29.41%).

After I looked for economic and financial information on Aida, which is a Bureau Van Dijk's database that contains comprehensive information on companies in Italy. Aida allows research, consultation, analysis and processing of financial information, accounts and business of all joint stock companies operating in Italy. All data is indexed for easy search and comparison, and are also available in their original format.

After that, I defined each industry using the two-digit ATECO code, and I measured for each industry the levels of market concentration and market dynamism for period between 2012 and 2015, also in this case data are exported from Aida.

Measures

Start-ups innovative performance

In order to avoid common method bias problem, data on start-up innovative performance comes from different database. I used secondary data that I found in the Italian register of innovative start-ups. The index consider if start-up has trademarks or patents, or it is owner of registered software. This is a dummy value, so if start-up has trademarks or patents, or registered software the value is 1 otherwise is 0. According to the Italian law, a start-up must have at least one of the necessary requirements, in order to be considered innovative and can be entered in the Italian register of innovative start-ups. These necessary requirements are: *i.* R&D costs should be equal to or greater than 15%, of the greater of the star-up's cost or total value of production; *ii.* Two-thirds of the founders and/or employees should possess the master degree or a Ph.D.; *iii.* Start-up should posses at least one trademarks, patents, or registered software. I focus on this last one requirement because is the most consistent and widespread in my sample.

Entrepreneurs' narcissism

The most common questionnaire used to measure the trait of narcissism in social-personality psychology literature is the Narcissistic Personality Inventory ideated by Wallace and Baumeister (2002). This questionnaire is very long, in fact it has 40-item and it is a forced-choice version. Agreeing with Raskin and Terry (1988) in certain workplaces, respondents do not have time and attention for answer at longer surveys. For this reason, we measure narcissism using the 16-item Narcissistic Personality Inventory (NPI-16) developed by Ames, Rose, and Anderson (2006), which has a significant correlation ($r = .90$) with the original version. The NPI-16 original version is in English and to ensure accuracy in translation in Italian, I employed a rigorous back-translation technique Ames et al. (2006). The questionnaire was translated from English to Italian by a bilingual English-Italian speaker, and then back translated from Italian into English by another bilingual speaker.

Furthermore, the NPI-16 original questionnaire is composed by 2 statement for each questions and each of these have dummy variables choices: narcissism-consistent responses are coded as 1 and narcissism-inconsistent responses are coded as 0 (Brislin, 1980). In this paper, I use a 5-point Likert scale version, because, agreeing with Ames et al. (2006), the forced-choice response could negatively impact participant experience. The Likert version was created by Gentile (2013) by removing the non-narcissistic statement from each items; the correlation between the two versions is very high ($r = 0,97$; $p < .001$). In my data the Cronbach's Alpha is 0.855.

Market concentration

I measured market concentration using the Herfindahl index. Data were gathered from Aida. I used the formula $H = \sum_{i=1}^I S_i^2$, where S represents the revenue market share and i the index for individual firm, to calculate the Herfindahl index for each industry included in the final sample. The average value of market concentration in my sample is 1.073 and standard deviation is 3.181. I used the values of 2012, but analysing the values of the others years I saw that they were constant over the time.

Market dynamism

Market concentration is calculated considering the standard deviation of the annual industry (two-digit ATECO code) sales growth rates Barelds and Dijkstra (2010). Required data for the last four years are gathered from Aida. The average of the market dynamism in our sample is 0.063 and standard deviation is 0.096. I used the values of 2012, but analysing the values of the others years I saw that they were constant over the time.

Control variables

In line with the existing literature, I controlled for start-up initial capital, start-up age, number of founders,

total number of employees, entrepreneur's age, and if the founder is a serial entrepreneurs. In particular, start-up initial capital, start-up age, number of founders, total number of employees are control variables at firm level, while entrepreneur's age and serial entrepreneurs are control variables at individual level. I do not add any additional control variables for the industry, because there are already two variables for the industry (i.e. market concentration and market dynamism). Briefly, I explain these control variables: *Start-up initial capital* is gathered from Aida and checked with the data into the Italian register of innovative start-ups; this is a multinomial variable: if start-ups are founded with 1 euro of initial capital the value is 1, if start-ups have from 2 to 5,000 euros of initial capital the value is 2, if start-ups have from 5,001 to 10,000 euros of initial capital the value is 3, if start-ups have from 10,001 to 50,000 euros of initial capital the value is 4, if start-ups have from 50,001 to 100,000 euros of initial capital the value is 5, if start-ups have from 100,001 to 250,000 euros of initial capital the value is 6, if start-ups have more than 250,001 euros of initial capital the value is 7. *Start-up age* is calculated considering as reference the year 2016 and it is nested subtracting the start-up's year of foundation. Required data are gathered from Aida. *Number of founders* this variable is gathered from Aida and indicates the number of the founders of each start-up. *Total number of employees* (last year available) is gathered from Aida and checked with the data into the Italian register of innovative start-ups; this is a multinomial variable: if start-ups have from 0 to 4 employees the value is 1, if start-ups have from 5 to 9 employees the value is 2, and if start-ups have from 10 to 14 employees the value is 3. I controlled for these variables because they have an impact on the ability to innovate (initial capital, start-up age, total number of employees) and because they impact on the influence of entrepreneurs in the decision making process (number of founders).

At individual level, I checked for *Entrepreneur's age* and if the founder was a *Serial entrepreneurs*, I have chosen those variables because they may influence entrepreneurs' risk-taking propensity (Engelen et al., 2016; Hambrick & Abrahamson, 1995). *Entrepreneur's age* is a multinomial variable; I asked entrepreneurs to indicate their age on the survey, so if they have less than twenty years the correspondent value is 1, if they have between twenty and twenty-nine years the correspondent value is 2, if they have between thirty and thirty-nine years the correspondent value is 3, if they have between forty to forty-nine years the correspondent value is 4, if the have between fifty to fifty-nine years the correspondent value is 5, and finally if they have more than sixty years the correspondent value is 6. I check also these data on Aida, in the section about the entrepreneur, and on their LinkedIn and Facebook profiles. The last variable, if the founder is a *Serial entrepreneurs*, is a dummy variable; I asked entrepreneurs to indicate if they have founded other firms beyond the start-up in question, thus if they answered yes the correspondent value is 1, otherwise the correspondent value is 0.

Model specifications

I build a STATA's logistic regression because the dependent variable is a dummy variable. Before starting with the regression calculation, I conducted an exploratory factor analysis (EFA) to extract the right number of factors from the narcissism measure. According to Osborne and Costello (2009) the best choice for decide

how many factors consider is the scree test. This entails the examination of the eigenvalues' graph, looking for the natural bend or breaking point in the data where the curve flattens out. In my case, I will use one factor because the scree test shows that there is a high slope between the first and the second factor. This first factor explains the 63% of all the items, rotation gives confirmation of this result.

After that, I run the logistic regression and I checked tests to see if I have included all the relevant independent variables, using the STATA's command *linktest*. Afterwards, I controlled the goodness of fit, using the STATA's command *fitstat*. The result supports positively the model I use. Moreover, I checked for influential observations, and using the STATA's command *predict* I calculated the deviance residuals to delete outliers. Total observations were 115, after the deletion of outliers remained 113.

Results

Table 2 summarizes means, standard deviations, min, max, and correlations for all variables. I checked for multicollinearity using the STATA's commands *Collin*. This command gives two important measures the tolerance and the variance inflation factor (VIF). If all the variables are completely uncorrelated with each other, both the tolerance and VIF are 1, in my case, all the variables are near 1.

-Table 2 about here-

-Table 3 about here-

Table 3 provides logistic regressions' findings. Model 1 contains the control variables and Model 2 introduces the quadratic term of entrepreneur's narcissism. Model 3 and Model 6 include only the key independent variables. Model 4 and Model 7 introduce the moderator variables. Model 5 and Model 8 examine the potential moderating effects of market concentration and market dynamism.

As model 2 shows, entrepreneur's narcissism has a significant negative linear effect on start-ups' innovative performance ($\beta=-0.958$, $p < 0.1$); this negative effect is amplified if I consider the quadratic term of entrepreneur's narcissism ($\beta=-1.765$, $p < 0.05$). This confirms my hypothesis 1, which proposes a negative inverted U-shape relation between entrepreneurs' narcissism and start-up innovative performances. Figure 2 plots this effect and shows that narcissism per se is not good for start-ups' innovative performance, in particular if entrepreneurs have very low or very high level of narcissism. Instead, if there are medium levels of narcissism, results are negative but not so dramatic.

-Figure 2 about here-

To add robustness to the proposed effect, I use the STATA's command *utest* to verify the nonlinear relationship. The test confirmed that this is an inverse U-shape relation ($t\text{-value}=2.32$, $p<0.01$).

Model 4 shows a significant positive relationship between market concentration and start-ups' innovative performance ($\beta=0.172$, $p < 0.01$). This reflects what many scholars say about the relationship between more concentrated market and innovative performances; in particular small firms are facilitated to innovate, and have better innovative performances, because thanks to the small dimensions can react more quickly to

market demands. This is also an opportunity for smaller firms gain share of potential market power through innovation (Lind & Mehlum, 2010). Model 7 shows a significant negative relationship between market dynamism and start-ups' innovative performance ($\beta=-1.042$, $p < 0.1$). Dynamic markets, per se, penalize start-ups innovative performances; for these reasons, high dynamic markets require entrepreneurs and top management team, which have particular characteristics and particular traits, that allow to entrepreneurs to take the chance and transform the dynamism from threat to opportunity (Bhattacharya & Bloch, 2004; Joseph A Schumpeter, 1950; Van Dijk, Den Hertog, Menkveld, & Thurik, 1997).

In Models 5 and 8 I insert the moderating effects on the quadratic terms.

In Model 5, I found that market concentration has a non-significant moderating effect on the relationship between the quadratic term of entrepreneur's narcissism and start-ups' innovative performance. For this reason, I must reject the hypothesis 2.

Finally, Model 8 shows that the regression coefficient between entrepreneur's narcissism² \times market dynamism and start-ups' innovative performance is negative and significant ($\beta=-8.923$, $p < 0.1$). Following the recommendation of Dawson (2014), to facilitate interpretation of the significant coefficient, I have illustrated the interaction effect graphically.

-Figure 3 about here-

The schematic illustration in Figure 3 reaffirms that narcissism per se has not a good impact on start-ups' innovation performances, but the moderating effect of market dynamism has a big and more negative impact on this relationship. In particular, when market dynamism is low, high levels of entrepreneurs' narcissism allow better performance than when market dynamism is high. Indeed, Figure 4 illustrates that the curve is steeper in dynamic markets than it is in more stable ones. Model 8, also confirms that market dynamism has a negative and significant moderating effect on the relationship between entrepreneur's narcissism and start-ups' innovative performance ($\beta=-23.539$, $p < 0.05$). Therefore, the less dynamic the market is, the stronger is the effect of entrepreneur's narcissism on start-ups' innovative performance and this is in line with the hypothesis 3.

As a final robustness check, I also included the cubic term (not reported in this paper) of entrepreneur's narcissism in order to make sure that the quadratic term is the highest significant order that determines the shape of the relationship between entrepreneur's narcissism and start-ups' innovative performance. I introduced this term into Model 5 and Model 8 and I did not receive significant regression coefficients.

Discussion and Conclusion

The present study investigates the relationship between entrepreneurs' narcissism and star-up innovative performances and how does it vary in the presence of specific boundary conditions. According to Hambrick and Mason (1984) and their upper echelon theory, entrepreneur's experience and personality traits influence strategic choice and performance levels. In this paper, I demonstrated that this concept is also valid for the

relationship between entrepreneurs' narcissism and innovative performance. I showed that the relationship between entrepreneurs' narcissism and innovative performance is negative, but because they have an inverted-U shape this relationship is worse when entrepreneurs have both low and high levels of narcissism. Instead, when entrepreneurs have medium levels of narcissism the relationship is negative but not so dramatic. When I inserted the moderating effect of the market scenarios, I proved that market concentration does not have significant effect on the relationship between entrepreneurs' narcissism and start-ups' innovative performances, while market dynamism has an important, significant, and more negative effect on this relationship. In fact, when market dynamism is low, high levels of entrepreneurs' narcissism allow better innovative performance than when market dynamism is high, but this effect is always negative.

Implication for the literature

This paper contributes to entrepreneurship literature and start-up literature by extending personality research beyond the relationship between personality trait's and performances. This study has also implication for upper echelon research (Hambrick & Mason, 1984), because only recently someone starts to use personality traits instead of demographics characteristics to investigate the relation with performances. Moreover, my findings underline that personality trait's are very influent on firm performances, particularly in small firm or start-ups. This because entrepreneurs are both founders and top management team leaders, and sometimes they operate alone. In this work, I respond to the request of many authors to shed light on how the dark side of personality can influence performances (DeNisi, 2015; Klotz & Neubaum, 2016; D. Miller, 2014, 2016). This research contributes also to narcissism literature, because is consistent with the other studies that have examined entrepreneurs' narcissism and firms' performances, but it expands this literature by focusing on the impact of entrepreneurs' narcissism on innovative performances. In fact, I demonstrate that narcissism is not always linked to poor performance, but in certain contexts can be a plus, to achieve better performance than the average. Further, this paper considers a non-linear relationship between narcissism and innovative performance, and this is new because almost all others papers on narcissism consider only linear relations. This research is also innovative, because papers that examine narcissism and explain the relationship with this trait and performances are tested on MBA students or using secondary data (Chatterjee & Hambrick, 2007; Judge et al., 2006; William J. Wales et al., 2013); instead, I administered surveys at real entrepreneurs. Finally, this paper contributes to strategic and innovation literatures by showing that personality traits can influence firms' innovation in some market scenarios. The results of this paper show the importance of the environment in which firms operate, because it can mitigate or aggravate the effects of the personality traits and transforming weakness into strength. This contribution stems from the request of several authors to investigate how the relationship between the dark side of personality and performances can be moderate from environmental dynamics (DeNisi, 2015; Klotz & Neubaum, 2016; D. Miller, 2014, 2016). Also in this field, the moderating effect on the non-linear relationship between narcissism and star-ups' innovative performance is new, because generally is considered the moderation with linear relations.

Practical implication

The findings of the paper have some practical implications for entrepreneurs and stakeholders. Firstly entrepreneurs should consider the main features of the market in which they are, because performances can increase or decrease due to the moderating effect of these features on the relationship with personality traits. Practically, this means that a very safe entrepreneur should consider whether his start-up is, for instance, in a concentrated market or not, because this can affect its results. While if his start-up is in a dynamic market, he should try to limit your own person, even relying on the help and advice of people with less strong characters. Secondly, for stakeholders, because as Maccoby (2003) states, if the goals of narcissists entrepreneurs are aligned with those of their start-up, they will engage in order that the organization success will match with personal success. This is an aspect that the management team members should monitor. Therefore moderate levels of entrepreneurs' narcissism can be productive and value adding to the company, but the destructive side of narcissists should be kept under control. For this reason, assertiveness and immediate actions are required in case shareholders suspect an increasing level of narcissism.

Limitations and future research directions

The present study has several limitations that provide avenues for further research. This study's results are based on an Italian sample, so the study does not address the impact of narcissism in other cultures. In Italy, there are strong values of individualism and considerable tolerance for uncertainty, and both of which offer entrepreneurs considerable freedom of action. Therefore, the results may change if the study is replicated in a culture that has less discretion. Furthermore, I consider narcissism as a one-factor construct, but future research might examine how different elements of narcissism (i.e. the four-factor solution of Emmons (1987) leadership/authority, self-absorption/self-admiration, superiority/arrogance and exploitiveness/entitlement) play different roles in the innovative performances' relationship. Future research, also, could consider a replication of the study after three or five years to investigate if age or some life events could mitigate or amplify personality traits. Finally, it should be interesting to investigate how the narcissism of the team leader entrepreneur can influence or be influenced by the other members of the working team. More precisely, agreeing with Klotz and Neubaum (2016) it should be interesting examine the positive and negative dispositions of lead entrepreneurs as well as the mean level of these traits within the team.

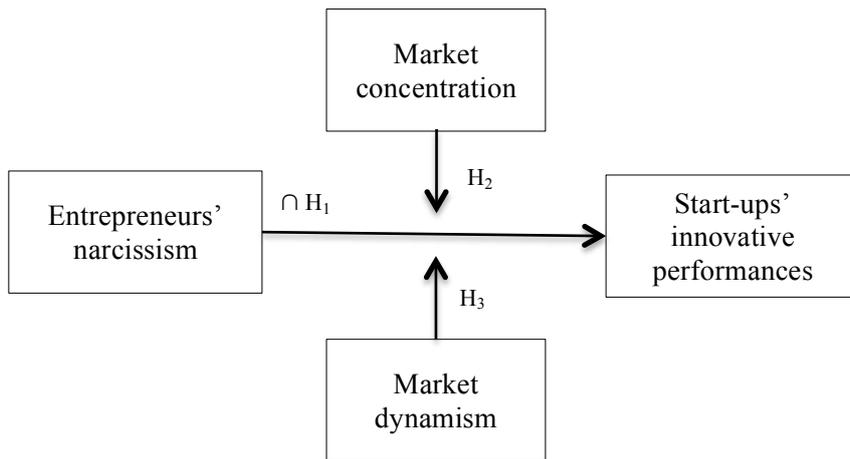


Figure 1: Research model.

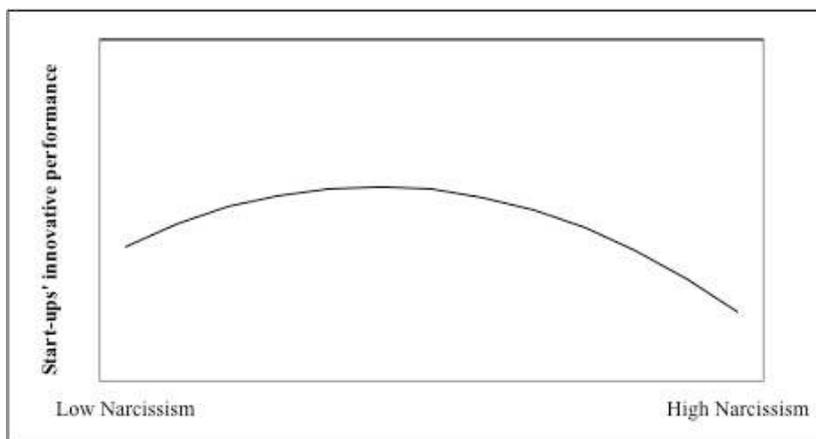


Figure 2: The nonlinear relationship between entrepreneur's narcissism and start-ups' innovative performances.

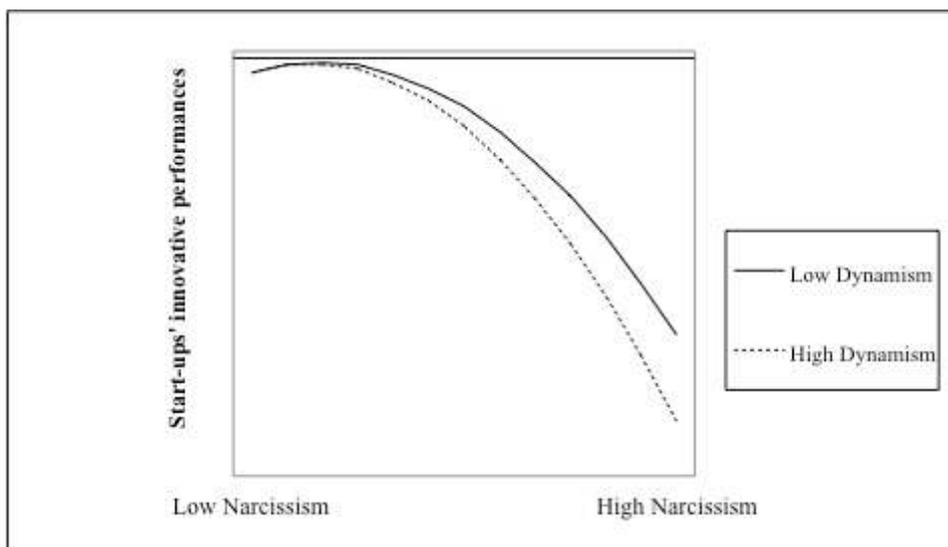


Figure 3: Moderation of market dynamism on the quadratic relationship between entrepreneur's narcissism and start-ups' innovative performances.

Table 1: Description of the main adjectives of a productive narcissist

Adjective	Description	Authors	
Vision to change the world	<ul style="list-style-type: none"> • He/she sees the world as a place that needs change; • He/she uses firms as vehicles for their visions. 	J. R. Baum and Locke (2004); Goncalo et al. (2010); Maccoby (2000)	
Independent thinking	<ul style="list-style-type: none"> • He/she is free from: <ul style="list-style-type: none"> • internal constraints (e.g. social pressure); • external constraints (act as he/she wish and believes). 	Maccoby (2000)	
Risk taking	<ul style="list-style-type: none"> • He/she takes risks that others can not or will not dare; • He/she is able in create and seize opportunities. 	Lakey et al. (2008)	
Passion	<ul style="list-style-type: none"> • He/she is curios; • He/she has constantly new ideas that need to be tested and tried out. 	Goncalo et al. (2010); Maccoby (2003)	
Charisma	<ul style="list-style-type: none"> • He/she employs rhetoric art to persuade, influence, and mobilize others; • If he/she knows that is admired of others, he/she becomes more spontaneous and sure of his/her message. 	Gardner and Avolio (1998); Goncalo et al. (2010); Maccoby (2003)	
Perseverance	<ul style="list-style-type: none"> • He/she is not discouraged by failure; • He/she uses failures to improve his/her knowledge. 	Maccoby (2000)	
Strategic intelligence	Foresight	<ul style="list-style-type: none"> • He/she is able to anticipate how current movements, ideas, and forces will pay out in the future, driving changes in technology, products, competitors, and customers needs and values. 	Maccoby (2000)
	System thinking	<ul style="list-style-type: none"> • He/she is able to synthetize and to integrate all information he/she has, instead of treating them as separate parts. 	Maccoby (2000)
	Motivating	<ul style="list-style-type: none"> • He/she is able to get people to embrace a common purpose and implement his/her vision. 	Maccoby (2000)
	Partnering	<ul style="list-style-type: none"> • He/she makes strategic alliance to achieve goals. 	Maccoby (2000)
Competitiveness	<ul style="list-style-type: none"> • He/she prefers to take bolder and more aggressive strategic actions. 	Lumpkin and Dess (1996); Maccoby (2000); Rosenthal and Pittinsky (2006).	

Table 2: Descriptive statistics and correlation (N=113)

Variable	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9
1 Start-up innovative performance	0.186	0.391	0	1									
2 Entrepreneur's narcissism	-0.016	0.928	-1.549	3.218	-0.111								
3 Market concentration	1.073	3.181	0.000	10.714	0.304***	-0.011							
4 Market dynamism	0.063	0.096	0.003	0.266	-0.216**	-0.180*	-0.210**						
5 Start-up initial capital	3.425	0.989	1	7	0.210**	0.009	0.100	0.036					
6 Start-up age	2.814	0.606	1	4	0.147	0.045	0.104	-0.373***	0.133				
7 Number of founders	2.354	1.400	1	7	0.173*	-0.188**	0.001	-0.019	0.227**	0.163*			
8 Total number of employees	1.142	0.460	1	3	0.150	-0.120	-0.104	0.114	0.259***	-0.065	0.158*		
9 Entrepreneur's age	3.708	0.942	2	6	0.028	-0.127	0.099	0.070	0.230**	-0.112	0.032	0.096	
10 Serial entrepreneur	0.575	0.497	0	1	-0.004	0.034	-0.081	0.013	0.134	0.091	0.064	0.187**	0.076

* p<0.1, ** p<0.05, *** p<0.01

Table 3: Results of regression analyses market concentration as moderating effect

Start-ups' innovative performance	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Controls								
Entrepreneur's age	-0.004 (0.296)	0.090 (0.311)		-0.047 (0.340)	-0.180 (0.356)		-0.042 (0.327)	-0.252 (0.372)
Serial entrepreneur	-0.374 (0.535)	0.288 (0.556)		-0.118 (0.591)	0.012 (0.632)		-0.358 (0.582)	-0.139 (0.657)
Start-up initial capital	0.441 (0.286)	0.739** (0.349)		0.712** (0.364)	0.089** (0.412)		0.792** (0.368)	0.958** (0.433)
Start-up age	0.861 (0.664)	1.363 (0.886)		1.212 (0.957)	1.119 (1.104)		0.990 (1.210)	0.783 (1.525)
Number of founders	0.161 (0.173)	0.024 (0.190)		0.059 (0.197)	0.010 (0.210)		0.020 (0.204)	0.072 (0.213)
Total Number of employees	0.508 (0.493)	0.148 (0.527)		0.317 (0.534)	0.173 (0.563)		0.245 (0.567)	0.322 (0.569)
Main effects								
Entrepreneurs' narcissism		-0.958* (0.555)	-1.798** (0.764)	-0.999* (0.570)	-2.305*** (0.939)	-11.216** (4.428)	-1.093* (0.582)	-14.542*** (5.897)
Entrepreneurs' narcissism ²		-1.765** (0.713)	-1.629** (0.776)	-1.688** (0.738)	-2.132** (0.945)	-5.834** (2.310)	-1.538** (0.714)	-7.480** (3.171)
Market concentration			0.196*** (0.757)	0.172*** (0.070)	0.207*** (0.081)			
Market dynamism						-12.050*** (4.426)	-1.042* (0.624)	-15.332*** (5.596)
Moderation linear effect								
Market concentration x Entrepreneurs' narcissism			0.285** (0.129)		0.305** (0.133)			
Market dynamism x Entrepreneurs' narcissism						-18.651** (7.521)		-23.539** (9.786)
Moderation linear effect								
Market concentration x Entrepreneurs' narcissism ²			-6.010 (5.534)		-6.183 (5.656)			
Market dynamism x Entrepreneurs' narcissism ²						-7.184** (3.560)		-8.923* (4.886)
Constant	-6.335*** (2.470)	-7.717** (3.251)	-1.138*** (0.394)	-7.405** (3.440)	-7.106* (3.824)	-1.138*** (2.371)	-6.799* (4.002)	-7.717** (3.251)
N	113	113	113	113	113	113	113	113
Log likelihood	-49.347	-44.173	-42.308	-41.133	-37.302	-40.368	-41.484	-35.314
Chi2	9.82*	20.17***	23.89***	26.24***	33.91***	27.77***	25.54***	37.88***

*p< 0.1, **p<0.05, *** p<0.01

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