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Entrepreneur?s Social Skills: Experience, Hackers and Haikus

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Abstract

Utilizing computational linguistics on written haiku poems to identify social skills among more than 450 hackers and makers, we build a theory of conscientiousness, social awareness and social influence and their association with entrepreneurial experience defined by number of times the individual has been involved in new firm establishment. We tie these individual qualities to the individual?s entrepreneurial tendencies by considering three core activities of entrepreneurship: information gathering, translation of information into business opportunities, and securing resources. We distinguish theoretically between establishment of the first start-up (entrepreneurship) and the repeated transitioning into entrepreneurship (entrepreneurial experience). Entrepreneurial experience is found to be positively associated with self-confidence and social awareness while negatively associated with social influence. Qualitative scrutiny of the Haiku Poems provides further support for the findings on social influence and bestows added confidence in the use of computational linguistics on Haiku poems for addressing research questions on social skills. All results are robust with regard to generic personality traits.

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ABSTRACT

Utilizing computational linguistics on written haiku poems to identify social skills among more than 450 hackers and makers, we build a theory of conscientiousness, social awareness and social influence and their association with entrepreneurial experience defined by number of times the individual has been involved in new firm establishment. We tie these individual qualities to the individual's entrepreneurial tendencies by considering three core activities of entrepreneurship: information gathering, translation of information into business opportunities, and securing resources. We distinguish theoretically between establishment of the first start-up (entrepreneurship) and the repeated transitioning into entrepreneurship (entrepreneurial experience). Entrepreneurial experience is found to be positively associated with self-confidence and social awareness while negatively associated with social influence. Qualitative scrutiny of the Haiku Poems provides further support for the findings on social influence and bestows added confidence in the use of computational linguistics on Haiku poems for addressing research questions on social skills. All results are robust with regard to generic personality traits.

Keywords:

Entrepreneurial Experience, Social Skills, Computational Linguistics, Haiku Poems

INTRODUCTION

Is entrepreneurial experience associated with an individual's social skills? This is an important question because entrepreneurial experience, defined as the number of different entrepreneurial ventures undertaken, provides substantial benefits with respect to managerial, technological and market know-how, relevant for the creation of new business opportunities (Baron & Ensley, 2006, Gruber et al., 2008), firm performance (e.g. Stuart & Abetti, 1990, Delmar & Shane, 2006, Dencker et al., 2009) and extraordinarily high levels of stimulation of economic growth (Plehn-Dujowich 2010). Compared to number of years of experience in a single startup, number of different entrepreneurial ventures encompasses exposure to larger diversity and variation of experience, and thus a more varied set of skills and practices. Investigating whether entrepreneurial experience is correlated with social skills could provide a deeper understanding of the mechanisms generating these benefits, and suggest the training that is needed to unlock them.

Social skills may be key to understanding entrepreneurial experience since firm founding is a social process (Whetten & Mackey, 2002), and social interaction can reduce uncertainty and lower the barriers to entrepreneurship (Autio et al., 2013). Investigation of this issue should extend existing research that identifies social skills as one of the mechanisms driving entrepreneurship (see e.g. Hmieleski & Baron, 2009, Baron & Ensley, 2006, Baron & Tang, 2009, Forbes, 2005). Social skills are essential for interacting with others (Baron & Markman, 2000) and matter in terms for mobilizing and processing information and resources that apply to business opportunities and firm creation (e.g. Lounsbury & Glynn, 2001, Baron & Markman, 2003, Baron, 2007). By identifying the degree to which social skills are associated with entrepreneurial experience, this paper could potentially reveal some of the dynamics that trigger individuals to engage in repeated entrepreneurial venturing.

Three sets of social skills are investigated: a) self-confidence (Chen et al., 1998; Simon et al., 2000), b) social awareness, (McGinn & Croson, 2004, p. 334), and c) social influence (Baron & Markman, 2000). Each social skill is linked to entrepreneurial experience through mechanisms pertaining to core elements of entrepreneurial activity. First, social skills are argued to be predominant among individuals that position themselves in information corridors and individuals with the ability to govern the information accessible via these information corridors. Second, the social skills are associated with decision-making processes in entrepreneurial settings, with translating information into opportunities, and with implementing opportunities efficiently. Finally, we propose these social skills are associated with the ability to mobilize resources and recognize already owned resources. We thereby provide a more fine-grained and comprehensive understanding of how each social skill might be associated with entrepreneurial experience. We enhance this by distinguishing between the association with the likelihood of being an entrepreneur, and the association with entrepreneurial experience.

Measuring social skills, and specifically the different sets of social skills considered in this paper, is not straightforward. Prior work has provided leaps in our understanding of social skills and social interaction in the context of entrepreneurship (see e.g. Baron & Markman, 2003, Baron & Tang, 2009, Hmieleski & Baron, 2009). However, earlier studies rely on self-reported measures and may hence be biased since individuals may be less than honest in relation to revealing their social attributes. We apply an indirect measure of social skills by investigating language patterns in a heuristic, verbal creativity task. We focus on pronouns since they are valuable, socially revealing cues about individual differences and social relationships (Tausczik & Pennebaker, 2010). Specifically, we use the personal pronouns “I”, “You”, and “We” respectively to operationalize self-confidence, social awareness and social influence considering written Haiku poems.

The source of the data used for investigation is an online survey carried out among hackers and makers from a number of countries from the Western world including Australia. Hacker and maker spaces are open communities with a social content which aim to create new things in a physical workspace. Hacker and maker spaces are formed with the intent to create a hotbed of information that can be exchanged. They have many characteristics that make them cradles of entrepreneurial activities. The survey asked about respondents' private and professional lives as well as their hacker, maker and entrepreneurial activities. Respondents were also asked to write a haiku poem reflecting an event in their personal or social environment, which triggered a flash of genius or the generation of an idea. The haiku poems provided the data needed to create measures for the three sets of social skills using computational linguistics.

The empirical analysis indicates social skills to be highly relevant in understanding entrepreneurial experience. High levels of self-confidence and social awareness are associated with entrepreneurial experience. This is one of the first studies in entrepreneurship to empirically apply computational linguistics of language patterns in a heuristic, verbal creativity task. Previous work has been confined to psychology and related fields (e.g. Kao & Jurafsky, 2012; Mehl et al., 2006, Tausczik & Pennebaker, 2010, Ranganath et al., 2013), political science (e.g. Monroe et al., 2009), and management (e.g. Brett et al., 2007, Pfarrer et al., 2010, Bednar, 2012, Helms et al., 2012, Zavyalova et al., 2012, Kern et al, 2012). By using computational linguistics, this paper adds to our understanding of why a predominance of particular social skills is observed among entrepreneurs and especially individuals with more extensive entrepreneurial experience. This study suggests the particular skills needed for engaging in entrepreneurial activity, and offers some guidelines in relation to entrepreneurship education. Finally, the study extends research on sentiment analysis. By investigating the words used in a heuristic task with given guidelines and restrictions, we

propose a tool which makes the results more comparable than language used in conversations for instance (e.g. Ranganath et al., 2013, Kern et al., 2012) or written text of undefined length (e.g. Kao & Jurafsky, 2012).

ENTREPRENEURIAL EXPERIENCE AND SOCIAL SKILLS

Entrepreneurial experience, captured by the number of firms an entrepreneur has founded (Stuart & Abetti, 1990, Delmar & Shane, 2006, Hmelski & Baron, 2009), is associated with considerable benefits. Experience of establishing and running a firm provides firm founders with learning based advantages (e.g. Delmar & Shane, 2006; Bruederl et al., 1992). This learned knowledge is a crucial asset since experience matters with respect to the tendency to discover high quality opportunities (Baron & Ensley, 2006), and for initial public offer (IPO) purposes (Shane & Stuart, 2002). Moreover, firms founded by experienced entrepreneurs experience higher sales (Delmar & Shane, 2006) and lower failure rates (Bruederl et al., 1992). Experience provides entrepreneurs with a better understanding of the activities necessary for the entrepreneurial process, and the associated roles and responsibilities (Delmar & Shane, 2006) including hiring and distribution of labor (e.g. Bruederl et al., 1992). Experience also is advantageous with regard to the implementation of business processes including product development and sales (Bingham & Eisenhardt, 2011). Like experts, experienced entrepreneurs develop schemata or routines that they apply to subsequent venture creation, thereby increasing their efficiency (Hayes, 1989). Furthermore, experienced entrepreneurs will likely have useful networks established during prior founding events; the founder's network can be a significant asset in terms of the tangible and intangible benefits related to the identification and evaluation of opportunities (e.g. Autio et al., 2013) and resource mobilization (Stuart et al., 1999). Thus, experienced founders account for a relatively larger share of jobs and economic growth (e.g. Plehn-Dujowich, 2010). Investigating the factors associated with entrepreneurial experience is both interesting for

entrepreneurship research and relevant for practitioners. The switch from novice to expert has major implications with regard to the individual's cognitive capabilities (e.g. Busenitz & Barney, 1997, Forbes, 2005, Baron & Ensley, 2006).

Little has nevertheless been done to understand how entrepreneurial experience is associated with social skills. Drawing on Walker, Colvin & Ramsey (1995), here we define social skills as qualities that allow individuals to establish and maintain positive social relations, contribute to acceptance among and from peers, and function socially to a satisfactory degree in the wider social environment. Previous work has investigated the impact of social skills on firm performance (Hmieleski & Baron, 2009, Baron & Markman, 2003, Baron & Tang, 2009) but ignores the association between these skills and the experience of entrepreneurs. This is surprising since research has already theoretically established that social skills play an important role in the key activities of entrepreneurship including the creation of ideas, the recognition of business opportunities, and the acquisition of resources (Baron, 2007). Furthermore, it has been shown that people equipped with skills obtained from working in small firms are "better" entrepreneurs (Elfenbein et al., 2010). This implies that social skills matter if we want to understand entrepreneurial experience. Social skills have been argued to be imperative for entrepreneurship since they fuel the crucial dimensions of social capital, i.e. networks, reputation, and trust (Baron & Markman, 2003). As such, they are the skills required for people to interact with each other (Baron & Markman, 2000, 2003, Baron & Tang, 2009). We consider in particular, three distinct skills relevant to the context of entrepreneurship: a) self-confidence, b) social awareness, and c) social influence.

HYPOTHESES DEVELOPMENT

In the following we provide theoretical arguments suggesting that specific social skills can be associated with three key entrepreneurial activities; a) how people come across idea-

related information, b) how they proceed with this information and c) how they obtain resources (Shane & Venkataraman, 2000, Baron, 2007), which then translates into associations with entrepreneurial experience.

Self-confidence

Theoretically we propose three mechanisms pertaining to self-confidence. First, the initiation of opportunity identification relies on the encounter with complementary pieces of knowledge that later can be transformed into a business opportunity (Shane & Venkataraman, 2000, Shane, 2012). Low self-confidence deters individuals from exposing himself to unknown situations that entail new, relevant inputs, e.g. potential user needs (e.g. von Hippel, 1986, Autio et al., 2013). They avoid situations where they expect to have low levels of control (Wood & Bandura, 1989). Consequently, diffident individuals lack access to pieces of knowledge that complement their prior knowledge. Furthermore, low self-confidence is associated with inward looking attention (e.g. Davis & Brock, 1975, Ickes et al., 1986, Stirman & Pennebaker, 2001), making individuals less attentive to their surroundings and accordingly less receptive to new inputs. It also imposes restrictions on the proclivity to consider own knowledge as valuable inputs for a potential business opportunity. Hence, low self-confidence induces unwillingness to be exposed to situations where opportunity-related knowledge exists, and lower inclination to appreciate one's own information as representing a business opportunity. Indeed, individuals self-selected into entrepreneurship are found to be highly confident (Busenitz & Barney, 1997, Forbes, 2005).

Second, diffidence require the individual to compensate for lack of confidence by gaining approval and encouragement from others (Wood & Bandura, 1989). Potential entrepreneurs, however, face newness and uncertainty and are required to make independent decisions (Busenitz & Barney, 1997). Thus low scores for self-confidence can hamper the individual's likelihood of becoming an entrepreneur due to uncertainty about his or her skills

(Chen et al., 1998). Unconfident individuals may not think they have the ability to make the right decisions, which ultimately may lead them not to make any decision or delaying decision-making causing them to miss the window of opportunity. This applies in the case when uncertainty postpones decisions (Simon, 1997). Fast decision-making is crucial for catching windows of opportunity (Perlow et al., 2002). Self-confident individuals are able to rely on and even over-estimate their abilities and knowledge (Busenitz & Barney, 1997) and over-optimism among self-confident individuals may cause them to consider potential opportunities as being less risky than they are (Simon et al., 2000). In addition, self-confident individuals tend to have selective memory - remembering only the successful decisions. Unsuccessful or wrong decisions are forgotten or attributed not to being a mistake but rather an outcome due to exogenous factors beyond the control of the self-confident individual. This bias allows them continuously to pursue entrepreneurship when faced with adversity.

Self-confidence also entails the ability to mobilize and obtain resources and to shape events in their environment and the goals they set (Wood & Bandura, 1989). Self-doubt motivates others to question the individual's abilities. Thus, diffidence diminishes their access to crucial resources and stakeholders. Indeed, low self-confidence can hamper the individual's ability to secure core professional relationships such as potential founding partners, key employees, and customers. As a consequence, low self-confidence decreases the individual's belief in the entrepreneurial endeavor, and therefore the likelihood of embarking on a founding event. Self-confidence may be contextual in the sense that individuals feel very confident in settings in which they have experience (Chen et al, 1998). For this reason, we see individuals being entrepreneurial in known territories, and individuals who have selected into entrepreneurship likely to do so again due to the person-entrepreneurship fit (Markman & Baron, 2003). We hypothesize that:

Hypothesis 1a. The greater an individual's self-confidence, the greater the likelihood he is an entrepreneur.

Hypothesis 1b. The greater an individual's self-confidence, the greater his entrepreneurial experience.

Social Awareness

Being socially aware refers to the extent to which someone is conscious of and attentive to others (McGinn & Croson 2004). There are three rationales for why social awareness may be associated with an individual's tendency to select into entrepreneurship and extend entrepreneurial experience. First, socially aware individuals are more receptive to information in their surroundings (Kirzner, 1997, Kaish & Gilad, 1991). Their attention to others provides insights into information, in various contexts, that could be relevant for entrepreneurship (Endsley, 1995). Moreover, socially aware individuals are inclined to bridge social distance (McGinn & Croson, 2004; Kern et al., 2012), which is relevant for information exchange (Adair & Brett, 2005). Consequently, social awareness may increase the individual's acquisition of information that is both advantageous and disadvantageous with respect to potential entrepreneurial opportunities. Being socially aware may allow the individual to position himself favorably to secure information needed to discover or recognize an opportunity, information that signals the potential of the opportunity, and information about the uncertainties and risks associated with pursuing the business opportunity (Ardichvili et al., 2003). Social awareness induces a more rational decision-making process and consideration of a greater amount of data compared to a more heuristic and biased approach. Individuals well informed about the downsides to entrepreneurship will form more realistic expectations and hence decrease their likelihood of becoming an entrepreneur.

After selecting into entrepreneurship, the individual's cognitive frame changes, and entrepreneurs formulate templates that support the identification of and connections in

opportunity-relevant information (Baron & Ensley, 2006). The cognitive framework streamlines the information perceived since entrepreneurs, through experience, have learned where to put attention (Choo & Trotman, 1991). The entrepreneurial “filter” can increase the focus on information related to customer needs, and upcoming market and technology trends which are important for the recognition and evaluation of opportunities (Autio et al., 2013). Social awareness for this reason may extend the existing entrepreneurial experience.

Second, non-entrepreneurs lack the pattern recognition beneficial for firm foundation (Baron, 2006). Novices find it difficult to make the right connections across information inputs in order to discover opportunities and select “good” ones (Baron & Ensley, 2006). This is because they lack prior experience that would provide mental cues about what is feasible. Entrepreneurs on the other hand are trained in combining previously unrelated pieces of knowledge due to entrepreneurially-biased cognitive processing. At the same time, they generate more valuable business ideas that can be exploited for firm foundation (Baron & Ensley, 2006). Moreover, socially aware entrepreneurs benefit due to their better ability to retrieve and decipher market and technology information with respect to timing of entry. Social awareness helps the entrepreneur to better embed the new venture in the “wider socio-systemic context”, and increase the extent of entrepreneurial experience.

Third, based on studies related to labor market matching theory, individuals self-select into occupational contexts that fit their skills (Markman & Baron, 2003, Ozcan & Reichstein, 2009). Socially aware individuals may chose occupations that are aligned to their abilities. i.e. related to bridging social distances between parties (Kern et al, 2012). They are often successful employees in organizational occupations such as law or sales (Wayne et al, 1997), obtain higher outcomes with respect to their jobs (Hochwarter et al., 2006), achieve higher salaries (e.g. Belliveau et al., 1995), and are good negotiators (e.g., Lewicki et al., 2005). Socially aware individuals are less likely to make the transition into entrepreneurship given

their good match and evident success in the labor market which result in high opportunity costs for a first time transition to entrepreneurship. However, socially aware entrepreneurs enjoy several advantages. Having made the transition to entrepreneurship, socially aware entrepreneurs may be more cognizant of what is required for subsequent firm founding events. This includes an awareness of the importance of appropriate types of resources at the right stages in the process. Their skill is advantageous for negotiations (e.g. Thompson, 1991) with potential suppliers, customers, and employees. In particular this skill provides a better understanding of whether the information being provided is unbiased (Baron & Markman, 2000, 2003). Overall, social awareness may be a crucial asset for mobilizing high quality resources and allocating them efficiently, increasing the scope for further firm foundation. We hypothesize that:

Hypothesis 2a. The greater an individual's social awareness, the lower the likelihood that he is an entrepreneur

Hypothesis 2b. The greater the social awareness of an individual, the greater his entrepreneurial experience.

Social Influence

Individuals with social influence can change others' attitudes or behaviors in a preferred direction, which can be valuable in entrepreneurial activities (Baron & Markman, 2000). In order to identify an opportunity with commercial potential, having the right information at the right point in time is crucial because this information represents the core of an idea and consequently will determine whether a business opportunity can be created (Shane & Venkataraman, 2000, Baron, 2006). Knowledge of entrepreneurial value however, can be tacit (Sorenson & Audia, 2000) or specific (Chandler, 1996). Social influence allows individuals to persuade others to reveal information. Individuals that lack social influence tend to have information that requires no persuasion, such as publicly available data with low

market value. This information is of limited value in an entrepreneurship context and has low potential and viability. Lack of social influence consequently may inhibit the individual's ability to identify opportunities and ultimately limit the chances of transitioning to entrepreneurship. Socially influential individuals can make others disclose more critical information including forecasts, sensitive data and eventually ready-to-launch opportunities. In entrepreneurship, insights into technology or market trends, planned actions of competitors, i.e. product features and market launch dates and information about inventions and business ideas, have high market value. Indeed, high-quality opportunities have been found to increase the likelihood of firm foundation (Shane, 2001). Thus, given that influential individuals can evoke a desired behavior in others (Baron & Markman, 2000), more influential entrepreneurs can make others disclose more relevant information including in-depth knowledge, and market and technology expertise. Social influence therefore, may have a positive impact on both the quantity and quality of information and knowledge needed for further discoveries of opportunities, and thus, experience.

Social influence may also play a role in the implementation of opportunities. It may in particular become essential with regards to potential customers and collaboration partners - especially when founding a firm for the first time where the liability of newness may be particularly severe (Stinchcombe, 1965). Customers and more importantly pilot customers are vital for piloting the market offering and testing its feasibility (e.g. Bruederl et al., 1992). Lack of social influence may limit the individual's ability to persuade potential customers about the quality of the market offering and his or her ability to deliver and satisfy these customers' needs. We assume that this skill is core in this respect because pilot customers need to be convinced about a new or not yet launched market offering. Lack of social influence therefore, may decrease the likelihood of transitioning to entrepreneurship. Social influence has also been argued to allow individuals to be successful in sales related activities

(Wayne & Ferris, 1990) thus giving an individual the edge in convincing customers about the quality of their products despite potential skepticism about, and newness of the offering. Furthermore, persuasive individuals are able to get customers, willingly or unwillingly, to reveal key information for further developing the venture, i.e. needs, future projects, and sensitive data on previous suppliers, supplying the seeds for further new business opportunities. Influential entrepreneurs are more able to convince existing customers to test and buy newly created offerings, thereby overcoming potential lock-in effects (Arthur, 1989) of these customers to the focal entrepreneur's competitors. They are able to acquire new customers directly or indirectly through word-of-mouth advertising. Influential entrepreneurs are also more skilled at winning collaboration or alliance partners to realize entrepreneurial opportunities. This can be essential since the right network partner can be a vehicle for securing resources relevant for survival and growth (Stuart et al., 1999).

One of the biggest obstacles to entrepreneurship is acquisition of resources. Start-ups are subject to the liability of newness (Stinchcombe, 1965). They lack external acceptance (Stone & Brush, 1996) and legitimacy (Low & Abrahamson, 1997). Legitimation is crucial because it can facilitate acquisition of resources (Lounsbury & Glynn, 2001), and social influence can promote legitimacy and convince important stakeholders i.e. investors and founding members to support the business project improving the chances of successful entrepreneurship. In addition, socially influential individuals may be more able to exploit their potential success to achieve legitimacy, and to increasingly influence people to contribute to new additional entrepreneurial activities. Indeed, the ability to convince others through stories about the business idea's benefits for the market or society is an important skill for entrepreneurs to achieve legitimacy and resources (Lounsbury & Glynn, 2001). Socially influential individuals may also be better at attracting human resources and convincing potential employees about their business opportunity and its viability, thereby

lowering the perceived risk of participating in the newly started firm. Finally, socially influential individuals can persuade others that their contributions were significant, and will be reflected in personal wealth, thereby building the foundations for subsequent entrepreneurial activities. Therefore, we hypothesize that:

Hypothesis 3a. The greater an individual's social influence, the greater the likelihood to be an entrepreneur.

Hypothesis 3b. The greater the individual's social influence, the greater his entrepreneurial experience.

EMPIRICAL SETTING

To test the hypotheses we investigate the social skills and entrepreneurial experience of individuals active and participating in hacker and maker spaces. Hacker and maker spaces are open physical workspaces where like-minded individuals form communities for social interaction and engagement in projects in groups, or individually. Hacker and maker space members employ, modify, and reinvent various artifacts such as software, materials, and technologies. Their members are especially interested in entrepreneurship, and are usually representative of groups of individuals that deviate from convention. Furthermore, hacker and maker spaces provide platforms where individuals can engage in invention activities, creative problem-solving, exchange of ideas, and assistance. This makes hacker and maker spaces hotbeds of entrepreneurship. Physically, these communities may be located in garages, basements, warehouses, factory buildings, or education or social centers.

Members of these spaces are generally referred to as hackers or makers. Hackers are individuals that engage in the use and development of various types of software and hardware, beyond the original purpose of these IT related items. Makers undertake alterations to existing products or develop new products, designs, and concepts. In general, the activities in hacker and maker spaces are closely related to what is referred to generically as innovation

or invention related activity. They engage in projects that involve creativity to produce new ideas and artifacts. They seek to provide solutions to identified problems and undertake the development of new products or services with entrepreneurial potential.

These communities are characterized by openness to sharing, and common development of new ideas, information, and knowledge. They operate according to values such as freedom of speech, transparency, independence, and promotion of creativity and collaboration. The very low barriers to entry of these communities render them virtually non-exclusive. Given these values and beliefs, hackers and makers tend to be inclined not to affiliate themselves to large corporations and established organizations with formal hierarchies (Carlson, 2011). They are often highly educated, to college degree level, making their capacity to solve even complex problems relatively high (Lakhani & Wolf, 2005; Levi, 2010). Hackers often only engage in projects in which they have a particular interest, and perform in a rather informal way using shared common means of operation.

For these reasons, hacker and maker spaces are often seen as incubators of entrepreneurial activities making them an interesting focus for an investigation of entrepreneurship.

DATA AND METHOD

This paper relies on an online survey administered between May and July 2012 designed specifically to investigate entrepreneurial activities and individual qualities targeting hackers and makers. This is a desirable context since the individuals involved tend to be highly comparable because of their common cultural persuasion, their strong sense of unification, and their solidarity towards each other (Lakhani & Wolf, 2005; Levi, 2010). By targeting hacker and maker spaces, many of the idiosyncrasies that apply to other datasets are eliminated. Since it is imperative to have ex ante insight when conducting context specific

surveys (Barley and Kunda, 2001), one of the authors engaged in a field study and conducted numerous interviews and test studies with hackers and makers before the survey.

Accordingly, the survey design was tailored to investigating hacker and maker space communities and piloted online and offline among hackers and makers.

We marketed the survey in three hacker and maker social media platforms through the administrator of the biggest and the leading consortium of hacker and maker spaces worldwide in order to gain reliability through endorsement. We then emailed the hacker and maker spaces directly. The spaces were selected based on four criteria: accessibility, whether they were registered as being active, their claimed purpose and intention, and membership conditions. The survey was administered to 392 hacker and maker spaces and reached 369 (94%) members, located in the United States, Canada, Australia, New Zealand, Northern Europe, and the English and German speaking European countries.

We registered 2948 hits for the online survey. However, many visited out of curiosity with no intention of responding to the survey. 2324 respondent spent less than 10 minutes on the survey and were deleted from the analysis on the assumption of low validity and reliability;¹ 24 observations were deleted because response to the survey took more than 4 hours implying that other activities intervened, which in turn implied lack of complete attention to responding to the survey which might result in dubious and unreliable responses.² Finally, we dropped 146 respondents who did not complete a section in the survey on which our explanatory variables relied (see below). We were left with a sample of 454 responses. We tested the difference between the 146 observations that were dropped and the remaining 454, for number of start-ups founded by the individual. The 146 deleted observations exhibited an average of 0.92 startups, while among the remaining observation the average is

¹ The pilots indicated it was virtually impossible to complete the survey in less than 10 minutes. We tested whether reducing the limit to 7 minutes changed the results. We found no cause for concern.

² Setting the upper bound to 2 hours removed an additional 10 observation. The results are not sensitive to this choice.

1.03. The figures are not statistically different suggesting limited cause for concern from the removal of these 146 observations.

We also considered whether the final sample was representative with regard to hackers and makers in general. We found the sample reflected the characteristics of the community in relation to age, gender and entrepreneurship rate. However, hackers and makers tend to be more prone to entrepreneurial activities than the general population, thus the results may not reflect a representative individual.

Dependent Variable

Prior studies measure entrepreneurial experience as number of firms the individual has founded (see e.g. Baron & Ensley, 2006, Dencker et al., 2009). An alternative measure could be number of years of the individual's involvement in entrepreneurial activities. However, the results for this measure might be high even if the experience involved only a single founding event. For this reason we exploited the responses from a question in the survey that asked respondents to report the number of firms they had founded or co-founded. This variable is useful for the purposes of this study since it allows us to test both the *a* and *b* hypotheses by distinguishing between the likelihood of not having founded a firm (*a* hypotheses) and investigating the number of events in which the individual has been involved (*b* hypotheses). Number of founding events captures diversity and also varied experiences, while number of years might reflect relatively low level of variation in experience.

Explanatory Variables

We operationalize self-confidence, social awareness, and social influence through word patterns identified in the language used to write the haiku poems. A haiku poem is a distinct format of unrhymed Japanese poetry and consists of 17 syllables split across three lines. Survey respondents were instructed about how to write a three-line haiku poem, where

lines 1 and 3 must contain five syllables, and line 2 seven syllables. After being presented with an example, respondents were asked to write a poem describing an event in their personal or social environment that had triggered an idea or flash of genius. Overall, the task was designed in line with previous creativity research (e.g. Amabile, 1996) and adjusted for usage in an online format, and hence, was appropriate for the context of hacker and makerspaces.

There were several motivations for deploying this particular verbal creativity task in entrepreneurship research. First, the combination of strict formal guidelines in terms of given lines and syllables with an open but guided instruction to write about recognition of an idea, refers to heuristics, and makes the performance of study subjects relatively comparable. Heuristics matter for decision making (Simon, 1997) and entrepreneurship (e.g. Busenitz & Barney, 1997). Second, collecting data through this task allows us to investigate the language used to describe the personal moment of opportunity discovery. The way individuals use language functions like a fingerprint and is relatively stable over their lifetimes (Pennebaker & King, 1999). Thus, operationalizing a person's social skills via language patterns can provide interesting insights for entrepreneurship research that are less vulnerable to potential bias.

In particular pronouns, i.e. "I", "you", "we", are an indicator of the individual's focus of attention, which is valuable to investigate since it increases our understanding of how people process situations and information (Tausczik & Pennebaker, 2010), as well as his or her discovery of opportunities (Simon, 1997). Put differently, the words we use are important in social interaction since language provides insights into how people understand, evaluate, and draw conclusions from social interaction (Gumperz & Levinson, 1991). Because of their meaningfulness, pronouns are used in the literature to operationalize social skills, for instance, social awareness (Kern et al., 2012). Consequently, we assume that using pronouns to

operationalize social skills is particularly appropriate in entrepreneurship research because social skills have major implications for entrepreneurship (Baron & Markman, 2000; 2003), in particular since firms are socially constructed (Whetten & Mackey, 2002).

Computational linguistics was used to operationalize the study's explanatory variables. We utilized the LIWC (language inquiry word count) program, because it is based on validated and reliable word categories (Pennebaker et al., 2003, 2001). This application has been used to examine emotional writing in psychology (e.g. Pennebaker, 1997), poetry (Kao & Jurafski, 2012), and computer science (Ranganath et al., 2013), and triggered an upsurge of interest in the management literature in measuring concealed dimensions of agents (Brett et al., 2007, Pfarrer et al., 2010, Bednar, 2012, Helms et al., 2012, Zavyalova et al., 2012). We selected this approach since language is a critical dimension of entrepreneurship (Aldrich & Fiol, 1994), and the analysis of narratives represents an important tool in the field (e.g. Lounsbury & Glynn, 2001).

Self-confidence. Self-confidence was operationalized by a score calculated in combination with the LIWC category "I" containing the expressions "I", "I'd", "I'll", "I'm", "I've", "my", "myself", "mine", "me". This score captures use of first person singular pronouns per total words in a poem, but in an inverse, negative format. We inversed the score because high usage of "I" related pronouns refers to high self-involvement (e.g. Davis & Brock, 1975, Ickes et al., 1986, Stirman & Pennebaker, 2001) whereas very low rates of I-words in language are associated with very self-confident individuals (Pennebaker, 2011).

Social awareness. Social awareness was measured using the LIWC category "You" including "you", "you'll", "your". We operationalized the measure in line with prior work by computing the number of second personal pronouns divided by the total number of words (Kern et al., 2012).

Social influence. We measure social influence in analogy with social awareness by computing the percentage of first person plural pronouns (LIWC category “We”) i.e. “we”, “we’re”, “us”, “our”, “let’s”, “lets” in the haiku. Using “we” suggests shared beliefs as in the context of political speeches and hence, is associated with high status and leadership (Pennebaker, 2011). Given the aspect of persuading and influencing the social environment (Mooney et al, 2010), we operationalize social influence using this word category.

Control Variables

Entrepreneurship is often about identification and development of opportunities (Ardichvili et al., 2003) with commercial value or at least potential commercial value. We control using a dummy (*opportunity implementation*) for whether the individual is able to do this by exploiting the responses to a survey question asking respondents to indicate how many of their hacks have been realized as new products or services, publicly performed plays, exhibitions, music compositions, novels, trademarks, patents or patent applications.

Individual creativity has been argued to be central in understanding entrepreneurship (Amabile, 1996, Ward, 2004). We control for individual *creativity* by generating a latent variable using orthogonal rotated principal component factor analysis on four items from the survey. The survey asked respondents to characterize themselves with respect to how they work with ideas, information, and novelty, and rate themselves on these dimensions on a five point likert scale. These items correspond to implicit theories on thinking styles thereby reflecting the inside views of individuals (Sternberg, 1985) which are particularly appropriate for this study since implicit theories represent a mental framework within which information is processed (Chiu et al., 1997). All four dimensions load into a single factor identified by a unit eigen vector. The details of the principal component factor analysis and the questions, are

presented in the top part of Table 1. The Cronbach's alpha of the items amounts to 0.686 suggesting an acceptable level of internal consistency.

Intrinsic and extrinsic motivation has been argued to be prerequisites for different stages of the entrepreneurial process (Amabile, 1997). We control for intrinsic and extrinsic motivation using latent constructs based on six 7-point likert scale items from the survey. The items relate to the reasons why the individual engages in hacker and maker activities. These items follow the method for capturing motivations used by Deci and Ryan (1985) and Ryan and Connell (1989) and were adapted in line with studies investigating motivations in similar settings (e.g. Lakhani & Wolf, 2005; Roberts et al., 2006). The latent constructs were generated using principal component factor analysis subject to orthogonal rotation. The items load into two factors, which we are able to identify as representing extrinsic and intrinsic motivation. Details of the questions and related statistics are presented in the middle part of Table 1. The Cronbach's alpha with respect to the extrinsic motivation latent construct is relatively high at 0.73, suggesting good internal consistency. The corresponding figure for intrinsic is a disappointing 0.3 indicating rather poor internal consistency.

Insert Table 1 about here

The psychology literature suggests a close link between entrepreneurship and personality traits (see e.g. Zhao & Seibert (2006) for a meta-analysis). In order to limit the likelihood of drawing conclusions based on spurious correlations acting through personality traits, we include controls for personality traits that have been found to be predominant among entrepreneurs. Specifically, we control for *Openness to experience*, *Agreeableness*, and *Conscientiousness*. Table 1 presents the results of an orthogonal rotated principal component factor analysis based on 11 items from the survey. Respondent were asked to indicate on a 5-point likert scale the extent of agreement with statements used in the prior literature to map

personality traits (Donnellan et al., 2006). The Internal validity of the agreeableness construct proved strong with a Cronbach's alpha of 0.771 while the corresponding numbers for conscientiousness and openness to experience proved acceptable only at 0.624 and 0.608 respectively.

Hacker/maker community members are often passionate about their activities (Lakhani & Wolf, 2005) and often pursue hacker and maker activities in their professional lives. We control for whether their hacker/maker activities are *occupation related* and expect a negative association. We exploited a question in the survey, which asked respondents to indicate to what extent the activities in their current professional occupation related to their hacking activities.

Entrepreneurship has been shown to be closely associated with personal and extended networks (Dubin & Aldrich, 1991). We control for individual tendencies to create networks and ties by including a variable for the extent of embeddedness in the hacker/maker community. We utilize a dummy item based on responses to a question about whether the individual *Contributes to or posts in hacker/maker communities*.

We control for age in entrepreneurial experience following the prescriptions in entrepreneurship research, by including both normalized *Age* and its squared term (Dunn & Holtz-Eakin, 2000, Sørensen, 2007). We account for *gender* (see e.g. Hout & Rosen, 2000) differences by adding a control for whether the respondent is female. Prior studies provide evidence that private status in terms of having a partner or not, matters for the rate of entrepreneurship (see e.g. Dunn & Holtz-Eakin, 2000) wherefore we control for whether the individual *Lives with a partner*. The questionnaire also asked whether the respondent had children. We use a dummy variable for the response *Has children*.

Finally, since the data are drawn from a variety of different geographical locations, differences in entrepreneurial tendencies may be due to institutional factors (see e.g. Mueller

& Thomas, 2001; Thomas & Mueller, 2000). We therefore control for whether the respondent is associated with a hacker/maker space in an *Anglo-Saxon region*.

Econometric Analysis

Entrepreneurial experience is measured as the number of firms established by the individual thereby being a count variable taking on integer values only. We focus on zero inflated models for two reasons. First, it is likely that the decision to establish the first firm is different from the decisions related to establishing subsequent start-ups. The variable for entrepreneurial experience may exhibit a quirky association, moving from 0 to some, compared to moving from some to more, for the same individual making the decision. Some individuals may never establish a firm, always scoring zero for the entrepreneurial experience distribution function, which triggers this quirk. This reasoning is expected based on the proposed a and b hypotheses. Second, the variable entrepreneurial experience takes integer values between 0 and 10 with an average of 1.026. The percentage of respondents reporting never establishing a firm is 52. Although more than 20 percent of respondents established only one firm, the standard deviation is only 1.55 (see Table 2) suggesting over-dispersion of the data. Zero-inflated models are specifically designed to model over-dispersion, which may be attributed to excess numbers of zeros compared to the theoretical underlying distributions of the count variable. We also empirically investigated the need to consider a zero inflation specification using the Vuong test. It was significant which supports the above reasoning. We also considered whether the zero-inflation choice removed any remaining concern about the over-dispersion finding. This, however, was not the case. The log-likelihood ratio test indicates significant over-dispersion in zero-inflation models. Therefore, we chose a zero-inflated negative binomial model as opposed to the alternative Poisson specification. We ran the analysis using an OLS specification on observations where the individual had founded at least one firm. Finally we used a combination of probit regressions (to investigate the jump

from 0 to at least 1 established start-up) and Tobit regressions (for entrepreneurial experience setting the lower limit at 0) thereby considering the data to be of a character dictating a hurdle model. These additional regressions establish the robustness of the results with regard to the model specification. All the reported results are robust estimations using the Huber-White sandwich technique.

RESULTS

Table 2 presents the descriptive statistics and Pearson correlation coefficients of the variables considered. None of the correlation coefficients approaches a magnitude that causes concern over multicollinearity. Also, the variance inflation factor indicates only a minute chance of bias due to multicollinearity.

 Insert Table 2 about here

Table 3 presents the results of the zero inflated negative binomial regressions. Model 1 includes only the controls. Model 2 includes only the three explanatory variables; *self-confidence*, *social awareness*, and *social influence*. Model 3 includes all independent variables. Model 4 is an OLS version of Model 3. Model 5 is the corresponding probit and Tobit specification combination.

Table 3 provides ample support for hypothesis 1b that *the greater the self-confidence of an individual, the greater his entrepreneurial experience*. The estimate associated with self-confidence in the count equation is significantly positive in both models 2 and 3 at the 1% and 5% levels respectively. We find no support for hypothesis 1a.

The regressions lend strong support to the hypotheses about social influence (hypotheses 2a and 2b). Hypothesis 2a states that *the greater an individual's social awareness, the lower the likelihood that he is an entrepreneur*. The positive estimate in the

“inflated” equation of Model 3 indicates that high social awareness is associated with a high likelihood of never having founded a firm (i.e. zero) which supports this hypothesis. The positive estimate for the “count” equation supports hypothesis 2b indicating that *the greater the social awareness of an individual, the greater his entrepreneurial experience.*

 Insert Table 3 about here

Finally, the regressions do not provide much support for hypotheses 3a and 3b. The “inflated” equation is not significant, and the estimate of the “count” equation does not support the hypothesized association that *the greater the individual’s social influence, the greater his entrepreneurial experience.* The estimate is strongly significant and negative rather than positive as expected.

The above findings for the b hypotheses are supported and confirmed by the OLS regression in Model 4. The Tobit specification reported in Model 5 also confirms all the results for entrepreneurial experience; when we consider the Probit specification as an alternative to the inflation equation, some discrepancies emerge. We interpret these findings as indicating that the results are not a bi-product of the selected regression technique.

Based on model 3, we estimate the marginal effects of the count equation considering in particular the three explanatory variables. The results of the analysis are displayed in Figure 1a-c below. The margin plots illustrate how the marginal effect changes as the values for self-confidence (Figure 1a), social awareness (Figure 1b) and social influence (Figure 1c) increase. The plots also include confidence intervals to assess the significance of the marginal effects. Figure 1a indicates clearly that entrepreneurial experience increases as individuals become more self-confident. Although the marginal effects do not differ across self-confidence values, it is evident that the marginal effects are significant at all values of the variable of interest. The results for social awareness (Figure 1b) are similar with respect to the

significance of the differences in marginal effects. However, there is a clear monotonic association suggesting greater social awareness is associated with greater entrepreneurial experience. The lack of significance in differences is due, at least in part, to relatively few individuals exhibiting a high level of social influence, producing relatively high standard errors in estimates. Social influence (Figure 1c) does not provide equally strong results. The margins do not exhibit a monotonic tendency. Furthermore, the margins at different values of social awareness clearly are not significantly different from one another. However, the marginal effects tend to be significant at all values of social influence.

 Insert Figure 1a-c about here

Pronoun “we” as a Measure of Social Influence

The rather puzzling results for social influence caused us to look closer at the poems and their content. Applying computational linguistics allows us to equate the use of lets, let's, our, us, we, we're, to social influence. However, we consider the possibility that hackers and makers use these words in a different way to what is described in the literature on which we rely for the analysis. Indeed, literature debates the multiple ways these words can be used and interpreted (see e.g Pennebaker, 2001, 2011, Gonzales et al., 2010).

Forty-five of the poems use one of the pronouns listed as representing social influence. The hypothesis is based on the assumption that the pronouns were used as “the every-likeminded-person-on-earth-We”. Some respondents use one of these pronouns in the way hypothesized. For example, one poem reads:

Art lives within us

To make is to release it

Making room for more

Here the use of “us” refers to mankind or the global us, thereby creating distance. However, not all poems use this form. In scrutinizing the poems we discovered that, in some cases it was difficult to identify whether the pronoun was used in this way or was used to refer to a group of friends or akin individuals. In 27 cases we were able to categorize the poem as using the pronouns in the latter two ways. The following poem is a good example of the pronoun used to refer to the hackers and makers as a group and not the “every-likeminded-person-on-earth-We”, often used by politicians (Pennebaker, 2011, p. 276).

All nerds laugh and talk

We exchange amusing puns

One word hits my head

It is plausible that the identified group of individuals under investigation would use the first person plural pronouns in a different way to suggested by hypotheses 3a and 3b. Its use refers to a group of friends or a group of like-minded individuals rather than mankind or society. The respondents are members of communities that share strong and common social values. The respondents responded to the questionnaire from the point of view of being a member of the hacker and maker community; thus their use of this pronoun may often refer to this collective rather than the world in general. The two poems cited above clearly refer to characteristics of hacker and maker activities. Therefore, it is likely that respondents’ thought processes center around the confined group of individuals identified as the hacker and maker space community, or on their own locally defined hacker and maker space.

The alternative use of the first person plural illustrates a more collectivist culture among the respondents. It has been shown that collectivism compared to individualism may both hinder and promote entrepreneurship (see e.g. Tiessen, 1997). This makes it difficult to predict a positive or a negative sign for use of these particular pronouns.

DISCUSSION

The results of our study suggest that the social skills of self-confidence, social awareness, and social influence vary in their effect on the individual's likelihood of becoming an entrepreneur and the individual's extent of entrepreneurial experience. By employing computational linguistics, especially analysis of pronouns, in the field of entrepreneurship our research highlights a new way to overcome potential bias when measuring individual-related variables. Specifically, we show that high levels of self-confidence and social awareness are positively linked to greater entrepreneurial experience, i.e. individual experience of firm foundation. At the same time, socially aware individuals are less inclined to follow the path of entrepreneurship. In addition, there is some indication (from our supplementary analysis) that the puzzling finding of social influence being associated with a lower level of entrepreneurial experience, can be explained by the different meanings implied by we-related pronouns. In the context of this study, hacker and makerspaces, shared basic values strengthen the feeling of collectivism which is expressed in the way the first person plural pronouns are used.

From a theoretical perspective, these findings support the notion of social skills being important assets in key entrepreneurial activities associated with accessing and leveraging opportunity-related knowledge and resource mobilization. Moreover, by disentangling these effects, we are able to consider the separate impact of the individual's social skills on the individual likelihood of becoming an entrepreneur, and the extent of entrepreneurial experience. Our empirical approach to the analysis of pronouns represents an innovative way to measure entrepreneurship-relevant variables but is consistent with the view that language functions as an important facilitator of entrepreneurship (e.g. Aldrich & Fiol, 1994) and that the analysis of narratives is a crucial tool for advancing this field (e.g. Lounsbury & Glynn, 2001).

From the point of view of the cognitive science literature, our study complements research on verbal creativity. Prior studies have used haiku poems to measure creative

performance in experimental settings with small numbers of participants (e.g. Amabile, 1996). Through the use of new media platforms, we are able to analyze hundreds of poems and to extend the investigation across regions and social groups (i.e. entrepreneurs, non-entrepreneurs, experienced entrepreneurs). Through experiments, previous studies demonstrate the influencing factors of creativity and its measurement, often with students in psychology-related disciplines functioning as study subjects. Consistent with the notion of analyzing a setting that is reasonably closed, we examined the hacker and maker community, a distinct real-life setting that is infused with creativity.

Furthermore, by analyzing the words used in the haiku poem and not just the participant's writing performance, we propose a new way of investigating data gathered in verbal creativity research. We link analysis of the haiku task to the field of entrepreneurship beyond the well-established relationship between creativity and entrepreneurship. We refer to the haiku task as a heuristic task, where no defined solution exists, and where participants' prior knowledge matters for examining the impact on the entrepreneur's experience defined as the individual's prior experience of firm foundation. Given that heuristics matter for entrepreneurship (Busenitz & Barney, 1997), and that experienced entrepreneurs process information differently (Baron & Ensley, 2006), we think this link is a reasonable one to make.

Our results are also consistent with research on psychology that uses sentiment analysis. Our findings support the notion that a dominance of the first person singular pronoun is counter intuitively an indicator of anxiety and low self-confidence. Furthermore, our results are in line with the linguistics literature and supporting the view that "we" pronouns are the most puzzling in our vocabulary since their meaning is ambiguous. Accordingly, there is the global, rather equivocal "we", favored in political speeches and academic writing, which has been identified as marker of power and leadership. But the first

person plural can also refer to the “we” that expresses connection to others in the sense of shared identity (Pennebaker, 2011).³ Methodologically however, we think that our approach, of analyzing haiku poems, is particularly interesting because the formula (i.e. given lines, syllables, and topic) creates a data sample in which the basic shape and content of the text corpus is defined and in which differences can be observed making the results more comparable across individuals.

Finally, our research has implications for the analysis of text data in entrepreneurship research. Language analysis is a promising trajectory in social science since the words individuals use, in particular pronouns, convey much information about their users. Computational linguistics, in particular sentiment analysis, provides new ways of revealing underlying aspects of individuals such as identity, status, behavioral tendencies and the networks individuals engage in. Hence, investigating core variables in entrepreneurship research through language patterns should be of interest to both scholars and practitioners.

Implications for Educators and Practitioners

Among practitioners, in particular entrepreneurs, the natural conclusion would be to pay more attention to the words they use. However, this is not easy and requires thorough training and practice. Entrepreneurship educators try to instill an awareness of the importance of language, and style, when presenting a business idea. Consistent with the adage that “first impressions matter”, our research points to an important aspect in this respect. The style of language and speech is crucial for the social interaction, and matters considerably for achieving access to information sources for business opportunities and mobilizing relevant resources such as financial and human capital. The quality of the interaction with venture capitalists, key employees, and founding team members is crucial to entrepreneurship. In particular, in conflict-laden or unfamiliar situations, social skills such as social awareness, i.e.

³ For further meanings of “we”, e.g. the royal “we” (majestic plural), plural usage while referring to a single person, see Pennebaker 2011.

reflected in the usage of “you” pronouns, can be facilitators of negotiation and can bridge social distances (Kern et al., 2012).

Limitations and Future Research

The limitations of our study suggest interesting avenues for future research. First, our results reveal insights into the role of personal pronouns for measuring social skills in entrepreneurship and entrepreneurial experience. Our pronoun analysis examined the style of the language but not its content. Although words reflecting style are more meaningful than content-related words, future research could use computational linguistics in combination with word dictionaries to extend this analysis. By combining both style and content analysis, future studies could analyze the narratives of entrepreneurs and their association with performance.

Second, previous creativity studies using the haiku writing technique to measure creative performance have mostly ignored natural language processing as an objective measurement method. Although our study does not measure creativity evaluated by external judges, we implement a self-reported measure to single out potential interferences. Future research could examine creativity related to word content, compared to self-reported creativity and externally rated creativity.

Conclusion

This paper analyzed self-confidence, social awareness, and social influence as important social skills for entrepreneurship, in particular with regards to entrepreneurial experience. Our empirical strategy of operationalizing social skills through computational linguistics proposes a new way to overcome potential bias in measuring individual-level variables in entrepreneurship research. We have provided theoretical and empirical insights into the value-laden usage of personal pronouns, and added to understanding of the role of

social skills in core entrepreneurship activities related to accessing and processing opportunity-related information and mobilizing resources.

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TABLE 1

Survey Questions, Factor Loadings, Variances and Cronbach's Alphas

Creativity factor analysis			
Questions	Creativity		
I am someone who ...			
makes connections & distinctions between ideas & things			0.718
is able to grasp abstract ideas & focus my attention on those ideas			0.759
is able to put old information, theories, & so forth together in a new way			0.763
uses the materials around me & makes something unique out of them			0.633
Variance			2.075
Proportion			0.519
Cumulative			0.519
Cronbach's Alpha			0.686
Motivation factor analysis			
Questions	Extrinsic	Intrinsic	
I hack because ...			
I enjoy the activity of hacking itself			0.805
I enjoy being part of a community			0.576
I forget everything around me when I get into <i>the Zone</i>			0.567
I would like to discover a business opportunity	0.843		
I want to enhance my career opportunities	0.803		
the hacker community gives support to found a company	0.765		
Variance	1.972		1.305
Proportion	0.329		0.218
Cumulative	0.329		0.547
Cronbach's Alpha	0.730		0.300
Personality traits factor analysis			
Questions	Agreeableness	Conscientious-ness	Openness to experience
Indicate the extent to which you agree or disagree with the following statements:			
I sympathize with others' feelings	0.851		
I am not interested in other people's problems (reverse coded)	0.677		
I feel others' emotions	0.814		
I am not really interested in others (reverse coded)	0.718		
I get chores done right away		0.628	
I often forget to put things back in their proper place (reverse coded)		0.768	
I like order		0.589	
I make a mess of things (reverse coded)		0.736	
I do not have a good imagination (reverse coded)			0.593
I am not interested in abstract ideas (reverse coded)			0.831
I have difficulty understanding abstract ideas (reverse coded)			0.786
Variance	2.397	1.899	1.762
Proportion	0.218	0.173	0.160
Cumulative	0.218	0.391	0.551
Cronbach's Alpha	0.771	0.624	0.608

Note: Only factors loadings above 0.3 are reported

TABLE 2

Descriptive Statics and Pearson's Correlation Coefficients (N=454)

Variables	Mean	S.D.	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
[1] Entrepreneurial experience	1.026	1.55									
[2] Self-confidence	0.965	0.549	0.12								
[3] Social awareness	0.008	0.028	0.06	0.03							
[4] Social influence	0.010	0.033	-0.01	0.11	-0.07						
[5] Opportunity implementation	0.319	0.467	0.20	-0.02	0.03	-0.11					
[6] Creativity	0.000	1.000	0.20	0.07	-0.09	0.07	0.17				
[7] Extrinsic motivation	0.000	1.000	0.11	-0.02	0.01	0.00	0.10	0.16			
[8] Intrinsic motivation	0.000	1.000	-0.03	0.09	-0.01	0.00	0.06	0.28	0.00		
[9] Openness to experience	0.000	1.000	0.18	0.08	0.01	0.01	0.11	0.41	0.00	0.20	
[10] Agreeableness	0.000	1.000	-0.05	-0.01	-0.02	0.09	-0.07	0.17	0.03	0.15	0.00
[11] Conscientiousness	0.000	1.000	0.01	-0.04	0.03	0.03	0.03	0.01	0.07	-0.08	0.00
[12] Age (mean centred)	0.000	10.141	0.23	-0.05	-0.02	-0.04	0.10	0.12	-0.01	-0.04	0.14
[13] Age ² (based on mean centered)	102.000	177.572	0.13	0.00	-0.06	0.02	0.03	0.04	0.01	-0.02	-0.02
[14] Occupational relatedness	3.046	1.395	0.07	0.06	0.05	0.03	0.19	0.05	0.13	0.20	0.05
[15] Gender: Female	0.141	0.348	0.03	-0.09	-0.04	0.00	-0.01	0.06	-0.01	-0.03	-0.08
[16] Lives with parents	0.496	0.501	0.05	0.04	-0.04	0.02	0.07	0.05	-0.04	0.03	0.04
[17] Has children	0.220	0.415	0.15	-0.02	-0.02	-0.04	0.09	0.05	-0.01	0.07	0.07
[18] Contribution	0.921	0.270	-0.15	0.00	-0.09	0.03	0.08	0.05	-0.04	0.23	0.12
[19] Anglo-saxon region	0.619	0.486	0.13	0.02	-0.04	-0.05	0.06	0.29	0.19	0.12	0.15

	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
[11] Conscientiousness		0.00							
[12] Age		-0.11	0.01						
[13] Age ²		-0.09	-0.04	0.61					
[14] Occupational relatedness		0.04	0.02	-0.11	-0.07				
[15] Gender: Female		0.12	0.01	0.01	0.00	-0.10			
[16] Lives with parents		0.02	-0.02	0.26	0.07	0.06	0.03		
[17] Has children		-0.10	-0.07	0.50	0.26	0.03	-0.11	0.42	
[18] Contribution		0.03	-0.03	-0.07	-0.04	0.07	-0.16	-0.02	0.02
[19] Anglo-saxon region		-0.06	0.06	0.21	0.01	-0.07	0.03	0.05	0.14

TABLE 3

Determinants of Entrepreneurial Experience, Results of Zero Inflated Negative Binomial Regressions, OLS and Probit and Tobit Regressions

	Model 1 Controls Model Count Inflated		Model 2 Explanatories Model Count Inflated		Model 3 Full Model Count Inflated		Model 4 OLS	Model 5 Probit Tobit	
<i>Explanatories</i>									
Self-confidence			4.540***	2.918	2.235**	-4.216	3.638***	2.104**	3.625***
			[1.444]	[5.853]	[1.315]	[4.336]	[1.387]	[1.199]	[1.342]
Social awareness			5.450***	8.377*	4.331***	9.174**	8.341**	-0.771	8.201**
			[1.915]	[5.604]	[1.680]	[4.691]	[4.735]	[1.934]	[4.539]
Social influence			-2.987*	-22.734	-3.73**	-21.803	-3.806**	2.458*	-3.543*
			[2.093]	[45.737]	[2.020]	[20.591]	[2.289]	[1.853]	[2.168]
<i>Controls</i>									
Opportunity implementation	0.392***	-0.055			0.261*	-0.572	0.266	0.382***	0.283*
	[0.149]	[0.554]			[0.161]	[0.581]	[0.213]	[0.138]	[0.203]
Creativity	0.298***	0.098			0.341***	0.313	0.325***	0.159**	0.301***
	[0.102]	[0.336]			[0.098]	[0.366]	[0.125]	[0.081]	[0.119]
Extrinsic motivation	0.085	0.076			0.079	0.073	0.104	0.061	0.081
	[0.100]	[0.317]			[0.112]	[0.387]	[0.116]	[0.067]	[0.111]
Intrinsic motivation	-0.133**	0.109			-0.138**	0.049	-0.098	-0.132**	-0.104
	[0.069]	[0.214]			[0.067]	[0.232]	[0.117]	[0.072]	[0.111]
Openness to experience	0.102*	-0.214			0.057	-0.263	0.091	0.158**	0.096
	[0.072]	[0.239]			[0.079]	[0.258]	[0.097]	[0.075]	[0.093]
Agreeableness	0.019	0.244			0.037	0.261	-0.005	-0.028	-0.004
	[0.074]	[0.314]			[0.080]	[0.324]	[0.108]	[0.064]	[0.104]
Conscientiousness	0.11*	0.552***			0.106*	0.578***	0.096	-0.068	0.086
	[0.067]	[0.208]			[0.066]	[0.202]	[0.117]	[0.064]	[0.113]
Occupational relatedness	-0.076*	-0.605***			-0.068	-0.57***	-0.113	0.143***	-0.105
	[0.059]	[0.169]			[0.070]	[0.206]	[0.100]	0.143***	-0.105
Contributes	-0.8***	-0.668			-0.781***	-0.552	-1.781***	-0.105	-1.824***
	[0.248]	[0.674]			[0.265]	[0.742]	[0.691]	[0.235]	[0.680]
Age	-0.01	-0.136**			-0.009	-0.149***	-0.014	0.036***	-0.013
	[0.014]	[0.061]			[0.013]	[0.062]	[0.019]	[0.010]	[0.019]
Age-square	0.001*	0.002*			0.001*	0.003*	0.001**	-0.001	0.001**
	[0.000]	[0.002]			[0.000]	[0.002]	[0.001]	[0.000]	[0.001]
Gender: Female	0.01	-0.202			0.012	-0.339	-0.028	0.089	-0.024
	[0.183]	[0.743]			[0.198]	[0.858]	[0.328]	[0.191]	[0.315]
Lives with partner	-0.277**	-0.83*			-0.231*	-0.75	-0.332*	-0.004	-0.330*
	[0.168]	[0.560]			[0.162]	[0.644]	[0.210]	[0.142]	[0.201]
Has children	0.575***	1.809**			0.519**	1.724*	0.582**	0.026	0.545**
	[0.204]	[0.961]			[0.242]	[1.175]	[0.334]	[0.197]	[0.322]
Anglo-Saxon region	-0.204	-1.749***			-0.226	-1.821***	-0.398*	0.370***	-0.199
	[0.171]	[0.578]			[0.194]	[0.622]	[0.271]	[0.139]	[0.226]
Constant	1.217***	2.176**	4.131	-4.026	-0.949	6.223	0.629	-0.654**	4.124***
	[0.379]	[0.959]	[1.434]	[5.965]	[1.376]	[4.524]	[1.468]	[0.289]	[0.851]
log(α) Constant/ σ	-1.712***		-0.492		-1.847***			1.429***	
	[0.492]		[0.474]		[0.513]			[0.110]	
Number of Observations	454		454		454		214	454	214
Number of zeroes	240		240		240				
Log-Likelihood	-567.691		-627.718		-558.451			-266.777	-380.013
χ^2 /F-Statistics	78.092***		17.882***		101.09***		2.38***	77.918***	2.600***
Vuong Statistics/ R^2 /Pseudo R^2	3.61		1.43		3.89		0.213	0.150	0.063

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, Standard errors in parentheses

FIGURES 1a-c

Margins plot of explanatory variables associations with entrepreneurial experience

