



DEPARTMENT OF ECONOMICS AND FINANCE

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THE RELATIONSHIP BETWEEN RESILIENCE AND
EXPLORATION & EXPLOITATION: A STUDY ON ITALIAN
ENTREPRENEURS

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Abstract

This thesis develops and tests hypothesis on the role that an entrepreneur's resilience plays on the exploration and exploitation strategies. Based on Italian entrepreneurs of innovative SMEs, the discoveries showed that there is a positive relationship between explorative strategies and resilience, however nothing could be concluded for the link between resilience and exploitative strategies as the results were not statistically significant. We add to current literature as there are no study which have scrutinized this relationship and it sets the groundwork to begin building a stronger knowledge on this topic.

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Introduction

A firm's performance is often heavily impacted by its leaders' abilities and decision-making process (Hambrick and Mason, 1984). Starting from this supposition, it becomes glaringly important to begin analyzing the psychology of an entrepreneur's mindset, in order to assess the firm's long-term sustainability. For the purpose of this experimental thesis, I identified one personality trait and two types of decision-making progresses to study their relationships and their impacts on firms. More specifically, I studied the entrepreneurs behind the Italian Innovative SMEs to test their *resilience* level and discover how that would affect their strategic mindset.

The strategic mindset was divided using the definitions provided by March (1991) along the spectrum of *explorative* strategies to *exploitative* strategies. Each immensely important, but neither singularity sufficient to effectively run a business.

The first chapter will be spent explaining the current literature that exists on these two topics. Resilience has been thoroughly studied under its several forms, but this overview will focus only on those aspects which are permanent to the study that was done and to the sample on which it was based upon. Exploration and exploitation have not been studied as largely, however enough work has been done to effectively be able to explain the phenom and portray a clay picture of the spectrum of strategies.

Literature in which refers to both the two strategies and resilience is scarce, and no study has already proven the existence of a link. The literal support provided for the

hypothesis that will be exposed will entirely rely on circumstantial or correlated studies which indirectly helped shape this thesis.

The second chapter will focus on highlighting the methodology used and the results obtained. I will also discuss my main conclusions from the study and portray what the limitations of the study were and where future studies could build upon.

Chapter 1

Resilience

Abrupt events and unexpected situations are always around the corner. Sometimes these events are positive, and they help boost a person's confidence and work ethic (Cohen et al., 1983), other times these events are negative, and they risk hampering the person's commitments (Blaine et al., 1993). The ability to recover and grow from such negative events is how *resilience* is commonly defined in literature. However, the term does not have one established definition as many different facets are looked upon. For the purpose of this thesis we will adopt the Resilience Research Center (2008) definition which states that resilience is an "individual's ability to overcome adversity and continue his or her normal development."

The use of the term resilience has been steadily growing in the modern era, this can be observed easily by making use of the Google Ngram. This factor can be likely attributed to a culture-wide shift from "hard skills" to "soft skill" (Heckman and Kautz, 2013) as employers are beginning to weigh more heavily the intangible side of candidates.

Having a strong resilience culture in a company is positively linked to higher levels of work efficiency and lower levels of stress amongst workers (Yoshikawa et al., 2015). It is important to note that resilience is a skill and not a personal trait (Yeager and Dweck, 2012), a common misconception, which would have otherwise implied that it is something

which cannot be improved. Studies have repeatedly shown that resilience can be improved upon (Bernard, 1999) and general argument can be made that investing time into building up one's resilience can be crucial in improving both social and work life. This argument becomes glaringly true if said person aims to become an entrepreneur (Bullough et al., 2013). In the following sections, further proof of such claims will be provided as well as several methods to assess resilience and improve it.

Organizational Resilience

In the context of an organization, adversities occur often on a common basis. Working under, or with, hardly cooperative colleagues and engaging in burdensome tasks can all cause a great ordeal of problems. Therefore, as stated in the aforementioned introduction, resilience plays a greater role in work related contexts. Sutcliffe & Vogus in their 2003 paper went as far as adding to resilience the degree of not only recovering, but additionally learning and growing from such adversities, setting a new standard. This is a heavy break from past research which mostly focused addressing the coping abilities of an individual and had only been partially marred by research on the BRS.

Organizational resilience is defined as the “capability of an organization to anticipate and respond and adapt to, incremental change and sudden disruptions in order to survive and prosper” by the UK Government Standard (OR). This definition dwells on the concept that, as compared to normal resilience, organizational resilience has a broader

focus as using this skill to create value for a firm and translate this success into long term growth.

Research suggests that achieving this resilience ability is facilitated by positive relationship with others (Stephens et al., 2013). It is human nature to rely on those around us to draw comfort, either because we hope to receive clarifying information to reduce uncertainty, or because we directly hope that we will receive direct intervention and aid (Fredrickson et al., 2003). Particularly interesting is the suggestions that through a well-reacting resilient team, overall there is an increase in comprehension of strenuous situations and adoption of clearer answers. Drawing on the conclusions reached by the antecedent research, we illustrate the effects of resiliency on individuals and teams when there is a culture behind the fostering this behavior.

Emotional Carrying Capacity in Top Management Teams

To study resilience in teams we can postulate a link between the type of interactions, the way in which emotions and concerns are shared and the strength of the resilience, and the strength of said resilience. The Emotional Carrying Capacity (ECC) is exactly how Stephens et al. (2013) defined these types of interaction in a relationship. More specifically they defined them as “a property of relationships wherein partners express more of their emotions, express both positive and negative emotions, and do so in a manner that is constructive.” The whole of ECC can be condensed in three characteristics: the statement of feelings, the outflow of both positive and negative feelings, and the

constructiveness of the expression. This tool was mostly developed to analyze relationships; however, it can be adapted to study behaviors in working teams and analyze resilience building forms.

As relationship closeness can be a critical indicator of resilience in people, trust can be a key quality for empowering resilience in groups. Relational trust is the conviction that one individual will be responsive and act in a morally legitimate way (Stephens et al., 2013). Therefore, trust can be seen as a useful tool to foster team resilience since trust is at the basis of everything a team will encounter. The whole team would benefit and become more dynamic if in situation of dangers or of pressing decision, each component can lie tranquil in doing their own work and collaborating with others and focus on the best possible outcome. As such, it is postulated that team members working in such an environment will feel freer to voice their opinion and concerns, all the while improving resiliency as a team which moves as a unit (Edmondson, 1999).

Stephens and his colleagues devised a test on Top Management Teams to study the link between ECC and resilience. This application is very useful for the purpose of this discussion as it correlates heavily to the type of research which will be explained later on. The results of the study proved a positive relationship between ECC and resiliency. More specifically, it shows how trust empowers TMTs to react versatily even with misfortune. Trust empowers colleagues to be helpless against each other, in this way setting the phase for them to express a full range and measure of feelings. ECC at that point enables the group to surface a full scope of data that can originate from the enthusiastic responses to affliction, and in addition have the capacity to experience and travel through feelings

instead of stifle or be stalled by them. Instead of adding to the rundown of social factors that affect strength, this examination recommends that ECC might be a major component for how unique social factors foresee flexibility. ECC's one of a kind spotlight on passionate articulation may help clarify its capacity, in that misfortune triggers feelings, which are important to work through with a specific end goal to react versatilely. Be that as it may, communicated feelings are once in a while tended to in our proportions of social quality at work. (Stephen et al., 2013)

Subordinate Resilience

A major aspect which should be studied to further understand where organizational resilience stems from, is the study of the impact of leadership behavior. There have been a few papers postulating a link between leadership and resilience, such as Luthans and Avolio (2003) which suggest that it is vital for an authentic entrepreneur to aid the development of resilience, while the previously mentioned Sutcliffe and Vogus (2003) raised the same concern adding that raising their resilience capabilities increases effectiveness. Indirect support can also be obtained from Bass's (1998) studies of the relationship which linked transformational leadership and adversity. He proposed that transformational leaders may convert emergencies into formative situations. By exhibiting these emergencies as difficulties that can be survived and by giving incitement to advance the subordinates' astuteness to circumvent distressing conditions, as opposed to rushed and uncoordinated ones. (Harland et al., 2005).

Based on these conclusions, researcher Harland and his team set out to find empirical evidence to support these claims. As a base model for leadership they relied upon Bass and Avolio's (1999) work in Full-Range Leadership Theory. This incorporated hypothesis underscores to a more noteworthy degree the conceivably transformational parts of leadership. Transformational leadership is seen as a key to take the procedure of leadership past the minor objective fulfillment and order satisfaction, but to a higher significance. There are five proposed factors to explain what transformational leadership is and they are:

1. Attributed Charisma
2. Idealized Influence
3. Inspirational Motivation
4. Intellectual Motivation
5. Individualized Consideration

To describe these five behaviors, we start with Attributed Charisma, this measurement centers around how much the pioneer carries on with certainty, induces regard and pride among subordinates, and appears to look past their own particular self-intrigue. The second measurements, Idealized Influence, underscores leadership practices transmitting a feeling of higher reason that goes past the objectives of the individual and spotlights consideration on the benefit of everyone. Inspirational Motivation, underlines leadership practices that transmit energy and capacity to explain a convincing vision without bounds. Intellectual Stimulation stresses the importance of leadership practices that dwell on successful critical thinking practices, by reconsidering basic suspicions and

looking for alternate points of view and methodologies. The last transformational measurement, Individualized Consideration, accentuates leadership practices, which simply aid and support workers, but mainly shows the significance of regarding said workers as people.

Harland and his team's study hypothesized that there would be a positive correlation between transactional leadership characteristics and subordinate resilience. This testing was done on each of the macro area as to be able to single out important characteristics from the dormant ones. Interestingly, however, it was noted that the participants that voluntarily mentioned their leaders as a source of dealing with a stressful situation tended to exhibit greater resilience.

In the end, most of the hypothesis turned out to be true, with only the dimension of Inspirational Motivation not displaying a significant correlation to resilience (Harland et al., 2005). The reasons for this are up for speculation, but since the test results were controlling for the variable of optimism, it could be inferred that that leadership trait helped create an optimistic environment and so correlating with other factors which sustain resilience which would not be picked up by the aforementioned experiment.

Therefore, through the past two studies which have been analyzed, it was proven that leadership behavior plays a great role in the resilience of both the workers and the organization, and that this should be highly pursued as it links to all-kinds of positive results in working environments.

Exploration and Exploitation

The second part of the literature review regards the studying of how entrepreneurs and organizations endure through dynamic changes in an environment, which has become more and more relevant in today's fast-paced society (March, 1991). As past research has portrayed, there is an apparent difficulty by firms to grasp a firm understanding of how to efficiently adapt to these changes through the use of exploration and exploitation activities (Tushman and O'Reilly, 1996), therefore it is crucial to begin learning what these two tools are and how to effectively manage them.

Exploration is defined as activities which correlate to the “searching for, discovering, creating, and experimenting with new opportunities” (Mom et al.,2007), while exploitation is concerned with “selecting, implementing, improving and refining existing certainties” (Mom et al.,2007).

Investigations into organizational learning show that the quintessence of exploration activities is correlated with widening a director's current learning base. Such activities by managers incorporate hunting down new hierarchical standards, and frameworks exploring different avenues regarding new methodologies towards developing and receiving a long-haul introduction and rethinking existing convictions and choices. Exploitation exercises creates unwavering quality which is related with developing a supervisor's current information base. These exploitation activities incorporate utilizing and refining their current information, applying, and expanding existing capabilities. This

generates and embraces a somewhat short-term introduction and expounding on existing convictions and choices.

Knowledge Inflows

While learning sharing and information trade suggest a proportional relationship as far as exchanges of learning, the idea of information streams permits more noteworthy accuracy about the directionality of the information being exchanged. That is, information surges are related with a benefactor giving a beneficiary learning. Researched among others is the effect of investigation and the misuse of learning forms inside a unit on this current unit's information outpourings.

Information inflows are related with a beneficiary securing learning from a contributor, where the information beneficiary is the central unit of investigation (Schulz, 2003). As we endeavor to understand how a leader's procurement from different people as well as units impacts upon the entrepreneur's exploration and exploitation activities, the focal point of this investigation will be on a director's information inflows. For these information inflows, both the learning giver as well as beneficiary might be the initiator.

Past examinations and contextual investigations into strategy research look towards demonstrating that exploration and exploitation related exercises of the entrepreneur are encouraged by vertical learning streams. Some point to the critical job of flat information streams inside an association with respect to exploration activities (Subramanian and

Youndt, 2005). In this manner, we will examine not just best down and base up learning inflows, even information inflows of entrepreneurs.

Balancing Exploitation and Exploration

In their paper about the contingency role that competition plays on the relationship which exists with regards to exploration and exploitation strategies, Auh et al. (2005) theorized a linear diagram depicting on the extreme ends complete exploration and complete exploitation. They defined *Defenders* as the organization that dominantly seeks an exploration strategy, while *Prospectors* as the organization that dominantly seeks and exploitation strategy. Each can decide once intense competition starts to kick in.

Defenders can decide to stay still, increase exploitation and decrease exploration, or vice versa. Increasing exploitation means stooping to strategies which are related to promotions and price-cutting type of measures which, or limit to copying the strategies of the competition. These decisions are attractive in the short-run as they are able to raise capital and generate interest very fast, however they could prove to hurt the competitive advantage in the long run. If the company keeps investing quick solutions which cut margins, this could lead to nothing of use, as they would just be skimping through to the next period. Therefore, Auh and Menguc (2005) hypothesized that in a competitive market you must invest into explorative strategies. Explorative strategies mean that the company will begin investing and weighing solutions which can alter the performance and the perception of the products.

These strategies are key towards building a sustainable long-term advantage which can truly make a difference. Having a sustainable competitive advantage means that the firm can differentiate on more than just price and promotions, giving it the opportunity instead to raise price and earn higher profits, benefiting from a product which is different from the competition.

On the opposite end of the spectrum, Prospectors can benefit from engaging in more exploitative strategies. Focusing too much on innovation and development could cause the firm to become overly inefficient into the market. as it is only investing on an aspect which is of crucial importance, but not the full measure of success. Therefore, a firm which is already heavy in the spectrum of exploration might be on the leading edge of technology and innovation but not particularly focused on the small steps that get you towards long-term sustainability (He and Wong, 2004). As so, they should begin exploring more exploitative measures and start validating those things which they already have and pushing their products through the already existing channels in a more efficient manner.

Knut Haanaes during his TED@BCG talk explained that two reasons why companies fail are that “they only do more of the same, or they only do what’s new.” A famous example of a company that focused too much on specializing their specialized good is “Facit”. The Swedish calculator maker was the leading brand in the market, making these huge chunky calculators was their sole purpose and they became really specialized and good at it. However once new technologies started rolling in they were not ready.

The irony in their story is that the engineers from the said company had bought cheap small calculators which had been produced in Asia, and they were utilizing them to check their calculations in the making of their own inefficient calculators. Instead of adapting and changing, they kept doing what they were good at, and eventually became irrelevant as market competition pushed the technology forward. They were clearly doing too much exploitation.

Practical examples of too much exploitation range widely. Most notable nowadays are the several crowd-funded campaigns popping up (Mollick, 2013). There are many organizations which are formed by raising capital through online platforms. Their job is to generate hype for an innovative product and ask for capital ahead of time in order to buy the resources to mass produce it. Needless to say, most of these companies fail even when they reach their target capital (Lerner and Stern, 2013). Their problem is often that they focused too much on creating the most innovative product that they overlook the basic exploitative actions which would have lend them to a more sustainable business model.

Getting stuck in one strategy is fairly simple. CEOs are often deluded in thinking that it is their business model which pushes them that way, however this is not always the case. Haanaes identified these four steps to avoid getting stuck in one strategy and escape this trap:

1. Get ahead of the crisis
2. Think in multiple time scales
3. Invite challenge
4. Be skeptical of success

Any company that is able to innovate constantly will be able to achieve the first step. An example of this is Netflix. They were able to foresee that there would soon be a raise in other platforms and heightened competition for the rights to air TV shows and movies, so they went ahead of the problem and began successfully producing their own content and moved their business model away from reliance on other producers granting them rights.

To think in multiple time scales it means to always have an eye on what is going to come, on what the next domino to fall will be. The advice was given to allow companies to think past their exploitative strategies, which, as thoroughly explained before, will lead to a path of irrelevance.

Inviting challenge is Haanaes' optimistic view of the business world where he makes the claim that it is impossible to balance perfectly explorative and exploitative strategies, however it is possible to strive for reaching it. Therefore, through challenges which highlight certain inadequacies of the organization, an elastic company can study their past mistakes and work to never repeat the,

Being skeptical of success is an advice which links to both personal life and to organization. As Bill Gates said, "Success is a lousy teacher." He says this to highlight the fact that once we succeed at something, we start thinking that we can't lose. We focus on all the things that we did right, forgetting our mistakes and overlooking the fact that outside factors could have played a role in our success. Therefore, even when a strategy succeeds it is important to go back and analyze every step.

Resilience in Exploration and Exploitation Strategies

Literature Support

Insofar, there is no direct literature support for the link between resilience and exploration and exploitation strategies, however we can identify corollary proof in other studies.

March himself, in his 1991 publication which first coined the exploration and exploitation strategies, had highlighted that strategies of an explorative type are led by leaders who he characterized as being flexible and risk-takers. This would seem to infer that an entrepreneur who is willing to risk would be more inclined in pushing the boundaries of his companies and observe the results. Through this we try to analyze that an entrepreneur who is willing to expose himself would also be more resilient.

Stevenson Fergus and Marc A. Zimmerman (2005) proved that there is a link between risk and resilience, but it could be defined more as a longitudinal one. Their study on teenagers showed how resilience can be successfully developed through risk taking experiences. Therefore, an entrepreneur who has endured through several risks, has most likely already faced several failures and has learned how to cope with them and grow. The link here is that a leader which has taken such risks in the past has already developed a resilient skill and will therefore be less afraid of failure and dare more to push his company into aggressive explorative strategies.

Additionally, Seigyoung Auh and Bulent Menguc's (2005) study discussed that leaders who don't show transformational practices would be related with an absence of inspiration of authoritative individuals all through the association to step up and seek after incremental advancements. Expected to advance incremental change caught in exploitative innovation on the grounds that incremental developments are frequently presented at center or lower levels of administration where there is more straightforward contact with clients.

Through all of this literature however, there is not a clear place where a clear link between exploitation and its presumed correlated traits has been explored. As such, it is hard even to link these secondary traits and skills to resilience.

Hypothesis

Based on all the information gathered, I have developed a hypothesis to explain the relationship between resilience and the leaning towards explorative and exploitative strategies. From the information that was gathered, and March's definition, it can be postulated that a leader which engages in more explorative strategies, which therefore pushes his company forward and is willing to risk more, is more likely to be resilient. The reasoning is that, as exploration comes with a certain degree of doubt, of the risk of wasting time and resource, an entrepreneur which aggressively pushes for this strategy is someone who is not afraid to risk as they are able to recover from these setbacks without major implications.

Hypothesis 1 (H_1): There exists a positive correlation between resilience and explorative strategies in entrepreneurs.

On the opposite end, an entrepreneur who seeks more exploitative strategies, is someone who is not willing to risk their resources and time, so they will tend to try to improve already what is working. In this case I suppose that they will do this because they fear that they will not be able to sustain and recover from a potential setback caused by exploration, and therefore imply that these types of entrepreneurs are not resilient.

Hypothesis 2 (H_2): There exists a negative correlation between resilience and exploitative strategies in entrepreneurs.

Chapter 2

Methodology

Sample and Procedure

The present study relies on Italian SMEs, randomly selected from the Italian Chamber of Commerce registry. The initial sample was constructed of 687 SMEs. The entrepreneurs were contacted through personal LinkedIn profiles, to invite their cooperation and layout the project. Once the requests were accepted, a link was sent to redirect them towards the online survey. Entrepreneurs who were not present on LinkedIn were reached through their personal or work e-mail addresses. The total amount of entrepreneurs that completed the questionnaire was of 144, a response rate of 20.96%, which is ranks above other researches based upon surveys linked with entrepreneurs (Cardon et al., 2013). The survey, which was administered to participants in Italian, was carried out between May and August 2018. The first versions of the questionnaire's items were written in English. To precisely translate them towards Italian, a strong back-translation technique was applied (Brislin, 1980). A bilingual English-Italian speaker was used to translate the survey from English to Italian, afterwards, we used another bilingual speaker to translate the Italian back to English.

Measures

Entrepreneurs' Resilience

Global research over the coming years has increased considerably in the field of resilience (Luthar et al., 2006). As it garnishes support from policy-makers and international businesses alike, there have been many attempts to try to create scales and quantify levels of resilience and find a practical use to it. Thanks to its high correlation with health and quality of life, as well as problem solving and overcoming (Hildon et al., 2010) learning how to tap into this ability and optimize it is becoming an undervalued tool for something which most assumed would have been obvious. For the purpose of this study, the 10 item Connor-Davidson Resilience Scale was used.

In the following paragraphs we will analyze two of the major scales adopted in this field and analyze how their findings have impacted how we look at resilience and how what we can infer from it.

CD-RISC

The Connor-Davidson Resilience Scale was developed namely by researchers Kathryn Connor and Jonathan Davidson as they deemed resilience as an important target in the treatment of conditions such as anxiety and depression. The underlying definition which they were using to define it was tied as a measure of stress coping ability, more than the ability to recover from a setback. The purpose of the scale is “to develop a valid and

reliable measure to quantify resilience, to establish reference values for resilience in the general population and in clinical samples, and to assess the modifiability of resilience in response to pharmacologic treatment in a clinical population.” (Connor and Davidson, 2003).

The scale is comprised of 25 items rated on a 5-point scale, with higher points representing higher resilience.

With such considerations in mind, the scale was created and tested over 5 groups. Some groups had health conditions and others in normal health, with validity established through test-retesting and internal validity established using Cronbach’s alpha. The final data went on to demonstrate that this scale is a reliable measure of resilience, proving that it is an ability which can be quantified. It also demonstrated that there is a link between resilience and health status, showing that individual with mental illnesses have lower levels of resilience. Most importantly to this paper, it highlighted that resilience can be improved with treatment, and that this improvement is linked to a betterment of health condition.

As the researchers have pointed out, the application of the scale can assist in screening for individuals for high-risk, high-stress occupations (Connor and Davidson, 2003), exactly the type of situation where we would expect to place in an entrepreneur of a PMI. However, this scale is not without its flaws, which have been targeted and improved upon in other studies.

Brief Resilience Scale

The Brief Resilience Scale (BRS) was created to step in where other studies had not looked upon. As previously mentioned, the CD-RISC had attributed a slightly different definition to resilience and had therefore been calculating resilience through “protective factors or resources that involve personal characteristics or coping styles” (Smith et al., 2008). The BRS is more closely aligned with the definition used in this paper, as resilience is tied to the ability to recover from adversity. Therefore, as other studies targeted personal characteristics which promoted adaptation, the BRS is the only measure which assesses the ability of a person to bounce back (Agnes, 2005).

The BRF is constructed in six items, with half the items being positively worded and the other half being negatively worded. The scoring is based reverse coding items 2, 4, and 6, after which we find the mean of all the 6 items (Smith et al., 2008). The 6 items are:

1. I tend to bounce back quickly after hard time.
2. I have a hard time making it through stressful events.
3. It does not take me long to recover from a stressful event.
4. It is hard for me to snap back when something bad happens.
5. I usually come through difficult times with little trouble.
6. I tend to take a long time to get over set-backs in my life.

The participants were administered these items and asked to rank on a scale from 1, if they strongly disagreed, and 5, if they strongly agreed. The patients were also administered another set of already established studies chosen to compare the results and assess compatibility of scales. The tests were divided in the following sections:

1. Resilience-Related Constructs
2. Other Personal Characteristics
3. Coping Styles
4. Social Relationships
5. Health-Related Outcomes

Each of the other measures will be briefly described to understand the contribution they provided. For the construction of the first section, Resilience-Related Constructs, the CD-RISC was used to understand the personal characteristics tied to resilience (Smith et al., 2008). Other Personal Characteristics instead used a mix of studies regarding optimism and pessimism and others to assess the degree to which a person believes that outside factors affect their life. Coping Styles is a straight forward analysis of how the subjects respond to adversities and what their habits are in internalizing them. Social Relationship is a measure that considers the social support and social interactions impacting personal life and how they correlate to the personal characteristics. Health-Related Outcomes instead is a pool comprised of scales and measures to assess mental health and strains.

In the end, the scale proved a reliable internal consistency and proved to be the only existing scale to measure specifically the meaning of resilience adopted in this thesis: the ability to bounce back. The BRS mediates the effects of other resources on health outcomes (Smith et al., 2008), such as optimism and active coping which aid the ability to recover from problematics. This would in turn imply that the ability to recover may have a more direct relationship with the wellbeing of a person.

Exploration and Exploitation

For the purpose of this thesis we used the scale devised by Mom et al. (2007) to assess the tendency towards explorative and exploitative strategies. The scale translated to Italian for our sample. It is composed of 14 items in total. There are 7 items which are used to assess the extent to which the manager engages in exploitative activities, while the other 7 items are used to assess the extent to which the manager engages in explorative activities.

Control variables

We control for whether the entrepreneur was serial, their level of education and age. Entrepreneurial seriality was included as a dummy variable for this experiment, assigning 0 if the entrepreneur had not founded other companies, and 1 if they had. This was included as the formation of several businesses can be a defining feature in testing for

resilience. We have also chosen to control for level of education since entrepreneur with a higher education have an increased chance to be able to access more resources to sustain their entrepreneurial ambitions, displaying a greater possibility to seize opportunities (Frank et al., 2005, Altinay and Wang, 2011). This was included as a multinomial variable. Assigning the following values depending on their level of education:

- 1- High School Diploma
- 2- Bachelor's Degree (Laurea Triennale)
- 3- Master's Degree (Laura Magistrale)
- 4- Master's in Business Administration
- 5- PHD

Finally, we control entrepreneur age. This was done so because past researches suggested that age influences how aggressive in reaching their objectives an entrepreneur can be (Bertrand and Schoar, 2003). This was also used as a multinomial variable with the following values:

- 1- <40
- 2- 41 – 50
- 3- 51 – 60
- 4- >61

Model Specification

Once all the data was collected and pieced together, it was placed to run through the statistical software STATA. In order to extract the appropriate number of factors from the resilience and exploration/exploitation scales, we conducted the Exploratory Factor Analysis (EFA). For the entrepreneurs' resilience, the analysis confirms that only one factor is able to correctly measure resilience. We obtained a really good confidence interval for this regression at 86%. For the exploration/exploitation scale, the EFA extracts two factors, the first measures the value of exploration and the second measures the value of exploitation. This yielded a confidence interval of 63%, that even if near 60%, it was still acceptable. After that, we ran four linear regressions to test our hypotheses.

Results

Table 1 shows the observations, mean and standard deviations, minimum and maximum values and degree of correlation among the variables. We tried to look for multicollinearity and found that none of the variables was related.

Table 1: Descriptive statistics and correlation (N=144)

Variable	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6
1 Exploration	1.41E-09	0.881708	-3.137182	1.819998	1					
2 Exploitation	2.94E-09	0.8548631	-2.083686	2.695174	0.399***	1				
3 Resilience	-1.74E-09	0.9316478	-3.719163	1.253684	0.479***	0.376***	1			
4 Education	2.795775	1.217711	1	5	-0.090	0.173	-0.023	1		
5 Age	1.964789	0.8945221	1	4	-0.074	0.006	-0.153	0.136	1	
6 Serial Entrepreneurship	0.7253521	0.4479166	0	1	-0.090	-0.059	-0.046	-0.290**	-0.284**	1

Notes: + p<0.1, * p<0.05, ** p<0.01, *** p<0.001

Table 2 presents the results of the linear regression. The first two Models were run on Exploration, Model 1 includes only the control variables; Model 2 adds the resilience variable. The other two Models regards Exploitation. Model 3 includes only the control variable while Model 4 adds resilience. Model 1 shows that entrepreneur's age has a significant negative impact on exploration ($\beta=-0.163$, $p < 0.05$). This is not a surprising result: the older the entrepreneur the less risk they want to take, therefore less exploration activities. Model 2 supports H_1 brought forward by this paper showing a statistically significant positive correlation between resilience and exploration ($\beta=0.516$, $p < 0.001$). This supports the hypothesis that the more resilience the higher the exploration activities the entrepreneur will undertake. Model 3 shows that entrepreneur exploitation is also negatively correlated with age, a mixed result which shows that the older the entrepreneur the less exploitative they tend to be ($\beta=-0.170$, $p < 0.05$). Model 4 also provides the same negative relation between age and exploitation with the same degree of coefficient and p-value. Most importantly however, Model 4 tells us that we do not reach statistical significance in the regression between entrepreneur resilience and exploitation activities, which means that H_2 cannot be proven.

Table 2: Results of regression analyses (N=144)

	Exploration		Exploitation	
	Model 1	Model 2	Model 3	Model 4
Control Variables				
Education	0.0837 (0.060)	0.078 (0.051)	0.0345 (0.059)	0.035 (0.059)
Age	-0.163* (0.082)	-0.087 (0.069)	-0.170* (0.080)	-0.170* (0.081)
Seriality of Entrepreneurship	-0.073 (0.165)	-0.150 (0.139)	0.034 (0.161)	0.034 (0.162)
Main effects				
Entrepreneur Resilience		0.516*** (0.067)		0.003 (0.078)
Entrepreneur Exploration				
Entrepreneur Exploitation				
Constant	.140 (0.279)	0.061 (0.234)	0.213 (0.272)	0.212 (0.273)
R ²	0.041	0.331	0.034	0.034
Adjusted R ²	0.020	0.311	0.013	0.005

Notes: The standard error is in parentheses. + p<0.1, * p<0.05, ** p<0.01, *** p<0.001

Discussion and Conclusion

The following study analyzed the relationship, and if it even existed at all, between resilience in entrepreneurs and activities of exploration of exploitation. The first hypothesis brought forward was proven correct, indeed there exists a positive relationship between resilience and entrepreneurial activities of exploration. This was heavily supported by corollary literature and something which intuition could have brought amends to; however, it had not been proven practically before. The second hypothesis could not be assessed. Sadly, the statistical exercise yielded a set of data which is not significant and therefore nothing can be attributed or inferred by it. The lack of statistical significance can probably cause by a low sample size.

Focusing on the hypothesis that was proven correct, we can discuss the relevance of resilience as related to exploration in today's society. It is important to note that resilience is a skill and not a personal trait, therefore something which everyone should aim to obtain, whether it is for work or personal life. Specifically, for entrepreneurs, this skill is relevant because it pushes them to (possibly acting through their subconscious) to lead the way in more explorative strategies. As was thoroughly discussed in this paper, explorative strategies alone are not a clear-cut way to be successful, however these types of strategies are crucial. With the rise of start-ups in a world of fast digitalization and globalization, competition and problems can arise from any place; therefore, it is important

to be heavily looking towards the future to effectively manage a company without running the risk of becoming obsolete.

Limitations and future research directions

Albeit only partially successful, this thesis managed to highlight a scientific lack of knowledge in a field which is of growing importance and gaining awareness. The obvious limitation of this exercise was the sample size, which possibly caused the lack of statistical relevance, so any further study could aim to enlarge the pool size. Potential focuses could be placed on normal SME's, or possibly expand the study past the national confines. More research needs to be done to assess how well resilience impacts exploitative strategies and whether a relationship exists at all.

Having assessed the positive relationship between exploration and resilience, future research could work towards deciphering the level and the degree as to which the two are related and go further in depth into what causes this relationship. Most importantly it is important to recognize that resilience is not the only ability which is linked with exploration, and though May himself had highlighted a list of some skills, it is not an exhaustive list and there is not scientific research to back those links.

Additionally, what could be looked upon is the relationship between exploration and exploitation and certain personality traits. The research in this field is bare and requires further studies as there are many important aspects which can be learned from this

understudied subject, which can be used to monitor and advice today's CEO to more efficiently run their companies.

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