

UNIVERSITY OF TWENTE.

The relationship between Sensory Processing Sensitivity and Entrepreneurship

- the moderating role of the ETP, extraversion, agreeableness and neuroticism -

Master thesis

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Foreword

The topic of this thesis regards the role that Sensory Processing Sensitivity (SPS) plays in regard to entrepreneurship. The research of this study explores the relationship between the genetically inherited personality trait SPS and opportunity recognition, as well as entrepreneurial intent. Additionally, this study explored whether certain moderating effect, as the entrepreneurial trait profile (ETP) and the individual Big Five personality traits, affect the strength of this relationship. This thesis has been created for the obtainment of the Master of Science in Business Administration at the Business Management School at the University of Twente. The data gathering for this research was collectively undertaken by two students from the Entrepreneurship, Innovation and Strategy specialization track, thus a joint effort in this thesis is presently noticeable. The chapters concerning the systematic literature review, methodology and the data analysis have been written together. A clear description of the exact division is given in the following paragraph.

Few chapters were written individually and shared as these chapters were equally applicable. The subchapters of the Systematic Literature Review concerning the search strategy, practical screen have been primarily written by Miss Engelbertink. All papers of the SLR were read by both authors. The table for the SLR was created by Miss Cieslik, last papers added after changing the search strategy were added by Miss Engelbertink. The analysis of the articles involving the description of the current knowledge and justification of new research were primarily written by Miss Cieslik and the critique and quality of current research were developed as a team. The chapter of the methodology involving the research design, population and sampling as well as the operationalisation of SPS and Entrepreneurial Intent have been written by Miss Engelbertink. The operationalisation of the opportunity recognition scales, Big Five and ETP as well as description of the control variables and the pre-test have been written by Miss Cieslik. The resulting questionnaire for this research has been finalized together. The chapter concerning the data analysis was again divided. The reliability of the measurement scales and the common method variance bias has been written by Miss Cieslik. The preliminary data analysis and statistical analysis has been written by Miss Engelbertink. The assumption testing has been done together, where the testing was done by Miss Engelbertink and the writing-up by Miss Cieslik. Since the common chapters are part of both theses, all parts have been thoroughly discussed, rewritten and criticized by both students, therefore you may find slightly adapted formulation due to different writing styles.

With regards to individual contributions, the abstract, introduction, literature review (except for the systematic one), findings and discussion and conclusion were formulated independently and in own efforts. The questions for the interviews were brainstormed about and formulated as a team, the interviews however were conducted, transcribed and analyzed individually.

Anna Engelbertink and Ann-Kristin Cieslik
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Abstract

Considerable debate surrounds the influence of personality and character traits on entrepreneurship. It is found that certain traits are advantageous and provide benefits in the execution of some entrepreneurial tasks (Wiklund, Hatak, Patzelt, & Shepherd, 2018). This research reviews the relationships between the character trait Sensory Processing Sensitivity (SPS), Opportunity Recognition (OR) and Entrepreneurial Intent (EI). Additionally, the moderating role of the Entrepreneurial Trait Profile (ETP), extraversion, agreeableness and neuroticism are researched. Both quantitative and qualitative methods are used. The interviews are conducted in order to understand the null findings of the hypotheses as no relationships have been found between the constructs. Based on the interviews, it is proposed that Highly Sensitive People (HSP) show little initial EI what changes due to the need for self-fulfilment. The ability of OR is argued to be dependent on an optimal number of stimuli. The research discusses several limitations.

Keywords: Entrepreneurship, Opportunity Recognition (OR), Entrepreneurial Intent (EI), Entrepreneurial Trait Profile (ETP), Big Five, Sensory Processing Sensitivity (SPS), information processing.

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Abbreviations

BMS	Behavioural, Management and Social sciences
CTW	Engineering Technology
EI	Entrepreneurial intent
ES	Effect Size
ETP	Entrepreneurial trait profile
EWI	Electrical Engineering, Mathematics and Computer Science
HSPS	Highly sensitive person scale
ITC	Geo-Information Science and Earth Observation
LSPS	Low sensory processing sensitivity
MSPS	Medium sensory processing sensitivity
OE	Opportunity exploitation
OR	Opportunity recognition
SDB	Social desirability bias
SLR	Systematic literature review
SPD	Sensory processing disorder
SPS	Sensory processing sensitivity
SRMR	Standardized root mean residual
TNW	Science and Technology
TPB	Theory of Planned Behaviour
UT	University of Twente

Key definitions

Information processing means interpreting incoming information (stimuli) to make a response which is suitable within a particular context of an objective, problem, or situation (Atkinson & Shiffrin, 1971, p.115).

An **entrepreneur**, according to global entrepreneurship monitor, is defined by any attempt at new business or new venture creation, such as self-employment, a new business organization, or the expansion of an existing business, by an individual, a team of individuals, or an established business (GEM, n.d.).

Entrepreneurial intent is a self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future (Thompson, 2009, p.676).

An **opportunity** is an idea or dream that is discovered or created by an [...] entity and that is revealed through analysis over time to be potentially lucrative (Short, Ketchen Jr, Shook, & Ireland, 2010, p.55).

Opportunity recognition is defined as the cognitive process through which individuals conclude that they have identified an opportunity (Baron, 2004, p.1).

Sensory processing sensitivity (SPS) is a trait that differentiates individuals according to the extent to which they deeply process environmental stimuli (Yano & Oishi, 2018, p.49).

1. Introduction

Entrepreneurial intent (EI) and the ability to recognize opportunities (OR) have been found to be influenced by personality (Shane & Nicolau, 2015). Personality in turn, amongst others, is dependent on certain genetic traits (Wiklund, Hatak, Patzelt, & Shepherd, 2018). Scholars have found evidence of relationships between genes and entrepreneurship e.g. Shane, Nicolau, Cherkas & Spector (2010) found correlations between extraversion and openness to experience and self-employment. Therefore, it has been suggested that certain personality traits may be beneficial to specific steps within entrepreneurship. Although, personality is not new within the studies of EI and OR, deeper-level personality traits such as the genetic trait Sensory Processing Sensitivity (SPS) are still a black box.

SPS is a genetic character trait characterized by a deeper and stronger processing of stimuli from the external environment, and a deeper emotional processing (Aron & Aron, 1997; Jagiellowicz 2011). Highly Sensitive People (HSP) have been found to process information quicker and more efficiently, due to the use of heuristic and substantive processing. A type of information processing that has been found to be beneficial to opportunity recognition (Baron, 2006). However, due to the nature of HSP, they are prone to overstimulation, which results easily in psychological issues like stress, anxiety and depression (Ahadi & Basharpoot, 2010; Brindle, Moulding, Bakker, & Nedeljkovic, 2015). Wanting to avoid large stressors, as entrepreneurship is often associated with, low entrepreneurial intent can be expected.

Until now, it has not been clarified if and how SPS and entrepreneurship are related. Getting insights into this relationship is of scientific and practical interest as it will clarify the advantages and disadvantages HSP have in entrepreneurship. In order to provide nuanced findings, the moderating roles of the Entrepreneurial Trait Profile and the individual Big Five factors will be considered. Therefore, the following research questions are formulated:

What is the relationship between Sensory Processing Sensitivity and Opportunity Recognition and Entrepreneurial Intent?

And;

How do the Big Five factors and the ETP affect the relationship between Sensory Processing Sensitivity and Opportunity Recognition and Entrepreneurial Intent?

To investigate the lead question of this research, the following methods will be leveraged. Firstly, a Systematic Literature Review (SLR) was conducted to provide a complete and coherent overview of the topic of SPS. Another reason for the SLR was the broadened perspective the SLR offers. Secondly, quantitative data collection was done to answer the formulated hypotheses aimed at

answering the research questions. Multiple regression analyses have been conducted to test the relationships between SPS, OR and EI and the moderating role of the ETP and the Big Five factors. Lastly, interviews were held to understand the findings of the quantitative analysis. All in all, the three data collection methods were thought to provide a complete overview, whole answering the research question of this study.

The current study makes several contributions to the field of entrepreneurship. First, in answering this research question, the research is the first to search for relationships between SPS, OR and EI. Second, it aids the current study in the further exploration of the role of character traits in entrepreneurship. Final, the results emphasize the role of entrepreneurial cognitions and emotions.

2. Theoretical background

2.1 Hyper-sensitivity

Multiple concepts claiming to explain the difference in environmental sensitivity among individuals have been introduced over the years, by for instance personality researchers (Evers, Rasche, & Schabracq, 2008; Jagiellowicz, 2012; Van Hoof, 2016; Wolf, Van Doorn, & Weissing, 2008). A personality trait is defined as “*dispositions to exhibit a certain kind of response across various situation*” (Rauch & Frese, 2007, p. 355). In the search for explanations of personalities, researchers found two strategies for responding on environmental stimuli (Aron & Aron, 1997). Either, members of the species respond strongly on changes in the environmental or they did significantly less. Some have explained the difference caused by introversion (Gray, 1981), inhibition (Eysenck, 1981), or avoidance temperament (Elliot & Thrash, 2002). All involving, among other things, the behaviour of reflecting prior to acting, assumed due to, high anxiety, low sociability and low positive affect (Jagiellowicz, 2011). In 1935, Schweingruber (a Swiss theologist), was one of the first to describe a concept similar to one of the main topics under review in this research, the ‘sensiblen Menschen’. The ‘sensiblen Menschen’ loosely translates to sensitive people. An important statement is the complex nature of this group of people, that could not be changed (Van Hoof, 2016), indicating a personality trait.

Sensory-Processing Sensitivity (SPS), is a genetic trait characterized by a heightened sensory sensitivity and deeper cognitive processing of stimuli from the external environment (i.e. tastes and sounds) that result in easier overstimulation and stronger emotional responses (Aron, Aron, & Jagiellowicz, 2012; Van Hoof, 2016). The trait is found to be a continuous variable, in which individuals can be characterized as high, medium or low sensitive (Aron & Aron, 2018; Lionetti et al., 2018). People with high SPS react more strongly to stimuli as opposed to people with low SPS, especially in regions of the brain involved in awareness, integration of sensory information, empathy and action planning (Acevedo et al., 2014; Jagielowicz, 2012).

Personality, moods, and lifestyle are said be influenced by the traits like SPS (Aron & Aron, 1997; Brindle, Moulding, Bakker & Nedeljkovic, 2015). Moreover, it is “*believed that sensory processing sensitivity is a major element and infrastructure of person’s reactions and perceptions and a determining factor in the personality development*” (Ahadi & Basharpour, 2010, p. 1). Research on SPS has mainly been directed on the disadvantages and special needs of the personality of Highly Sensitive People (HSP). The most commonly research disadvantages will be described below.

First, due to the depth of processing, high SPS is associated with behaviour of thoughtfulness, conscientiousness and caution (Aron & Aron, 1997; Van Hoof, 2016). In new situations, HSP’ers are prone to “pause to check”, which is cause for slower decision-making (Aron & Aron, 1997). For this

reason, they require relatively more time to themselves in order to recharge. Due to this behaviour HSP'ers are often confused with being introverted (Aron & Aron, 1997; Grimen & Diseth, 2016). However, research shows 30% of the HSP'ers to be socially extraverted (Aron & Aron, 1997). Thus, SPS is related to the personality construct of introversion but is not identical.

Second, the HSP's proneness to overstimulation is found to result in higher levels of stress and consequently in poor (mental) health issues (Ahadi & Basharpour, 2010; Benham, 2006). HSP attempt to avoid stress and anxiety, by minimising exposure to situations unknown to them and withdrawing from large social settings (Ahadi & Basharpour, 2010; Aron et al., 2012). SPS and the personality construct of neuroticism correlate moderately (Grimen & Diseth, 2016; Smolewska et al., 2006). Thus, the relationship between SPS and stress, anxiety and depression has received attention in the research and proven to be positively related (Benham, 2006; Liss et al., 2008; Evers et al., 2008).

Last, due to the higher emotional reactivity that is driven by deeper cognitive processing, HSP experience life more emotional, both positivity and negatively (Ahadi & Basharpour, 2010). Especially negative experiences have a greater impact and can advance the development of poor mental health. Therefore, highly sensitive individuals are often seen as emotionally instable and stereotyped as mentally weak.

The advantages on the other hand, show SPS to be related to more rapid and accurate detection of differences and connections in situations and processes (Jagiellowicz, 2012), a strong developed ability for empathy, and ability to reflect (Van Hoof, 2016). These abilities are argued to be, at least partially, the result of the depth of information processing that in turn is influenced by the intensity of feeling emotions. Scholars argue HSP better equipped in associating incoming 'new' stimuli, or new information, with 'old' information (Jagiellowicz et al., 2010), already stored in the brain, closely related to heuristic processing and substantive processing (Baron, 2008; Forgas & George, 2001). This relation will be further explained in the section of information processing and affect. Crucial for HSP to process information on an enhanced level seems to be the optimal level of stimulation, since overstimulation will lead to poor cognitive functioning (Ahadi & Basharpour, 2010). This relationship will be discussed more thoroughly at a later chapter.

2.1.1 Systematic Literature Review

A systematic literature review is conducted for a deeper reflection of existing literature as well as a coherent comparison mechanism of what has been done and may still be missing. In dissertations, reviewing existing literature concerning a specific research topic for aids to increasing awareness and understanding and shows the commitment of the researchers search of literature (Frank & Hatak, 2014; Okoli & Schabram, 2010). The influence of personality receives increasing attention in the field of

entrepreneurship. As information on SPS is still lacking, especially with regards to management studies, a systematic literature review seems to be the best fit (Fink, 2005). Although, some scholars argue that a SLR is not beneficial when limited studies have been done, as it will not reflect the best information, it has become common practice for literature reviews with a less focused scope (Bryman & Bell, 2011; Okoli & Schabram, 2010).

Using the structure of Fink (2005), the central question guiding this systematic literature review could be described as 'What is known about SPS in relation to the concept of entrepreneurship in adults?'.

2.1.1.1 Search Strategy

For the search of literature, the databases SCOPUS and Web of Science were employed. Additionally, Google Scholar has been used to find literature not showed in the database search. Scopus and Web of Science are article databases and allow for cross-disciplinary, in-depth exploration of article among multiple journals.

Narrowing the search requires inclusion and exclusion criteria that are objective and unbiased. The general inclusion criteria for this literature review are: papers referring to the trait "SPS" or "Sensory Processing Sensitivity" within their title, abstract or keywords. Over the years, several terms and concepts, similar to SPS, have been used in referring to a similar combination of traits. Although the frameworks are similar in respect to sensitivity, only the theory on SPS is recognized as a trait and moreover, finds its core in cognitive processes (Andresen et al., 2017). Therefore, the first level of criteria for studies in the SLR are the studies that solely focussed on SPS.

Secondly, keywords referring to personality traits are added since the study researches this moderating effect, representing the second layer of inclusion criteria for a narrower scope. The following keywords have been applied throughout the title, abstract and keywords: 'personality', 'traits', 'characteristics', and 'Big Five'. In order to capture all results similar to the Big Five, the separate traits have also been entered as search words. The search words included: 'alertness' and 'emotional stability' as these are also associated with personality literature on the Big Five, as well as 'neuroticism', 'introversion', 'extraversion', 'openness', 'agreeableness' and 'conscientiousness'. Third and last, the inclusion of entrepreneurship needed to be considered, representing the third condition for collection. For this purpose, the following words have been used in screening titles, abstracts and keywords: 'entrepreneur', 'management', 'business', 'firm', 'company', 'opportunity recognition' and 'entrepreneurial intent'.

Next, the applicable subject areas have been selected, including Psychology, Business, Management and Accounting and Social Studies, for the reason that only these fields of study are in line

with the field and topic of this research. Other inclusion criteria that could have been applied were year of publication, journal and publication language. However, based on the limited amount of research available based on the first three literature selection criteria, these screening conditions were not applied.

2.1.1.2 Practical screen

A graphical representation of the practical screen can be found in Figure 1. The initial search combining Sensory Processing Sensitivity and SPS in Scopus and Web of Science resulted in 34 document results. After applying the second layer of personality traits, 25 remained. Finally, 12 articles remained after applying the third layer of criteria.

After filtering for the applicable subject areas, 10 document results remained. It was found that, a significant portion of the articles focused on the effects of SPS on children and the role of parents. Since this content is not relevant for answering the central question guiding this literature review, the following words and were excluded: “children”, “childhood environment”, “parents”, “life altering events”, “parent-child relations”, “adolescent”, “young adult”, “child”, “infant”, “infants”, “child behaviour”, “child of impaired parents” and “childhood”. This resulted in a total of 8 relevant papers.

As expected, only a few studies apply SPS in the business management research field. However, as eight articles does not suffice for a SLR, the central question guiding this review was altered. The third layer of criteria, focussing on entrepreneurship, was decided to not apply in the search strategy. Therefore, a change in the central question was necessary to ‘What is known about SPS in relation to the personality characteristics of adults? Restarting with 25 articles after applying the first search word layer, the same subject areas and exclusion words were applied, deriving at 10 document results. In Google Scholar, the first 10 pages were screened for additional articles. The screening involved an evaluation by reading the abstract. This search contributed an additional seven articles. When applying a ‘backward search’ (Okoli & Schabram, 2010), an additional five articles could be identified articles which have been incorporated in the literature framework. Finally, the website hsperson.com, which is dedicated to contributing efforts to research on SPS, is stating a list that recommended certain studies for research. This list offered one additional study that was not yet included. This resulted at a final of 23 articles on the behaviour of people with high SPS.

2.1.1.3 Graphical representation practical screen

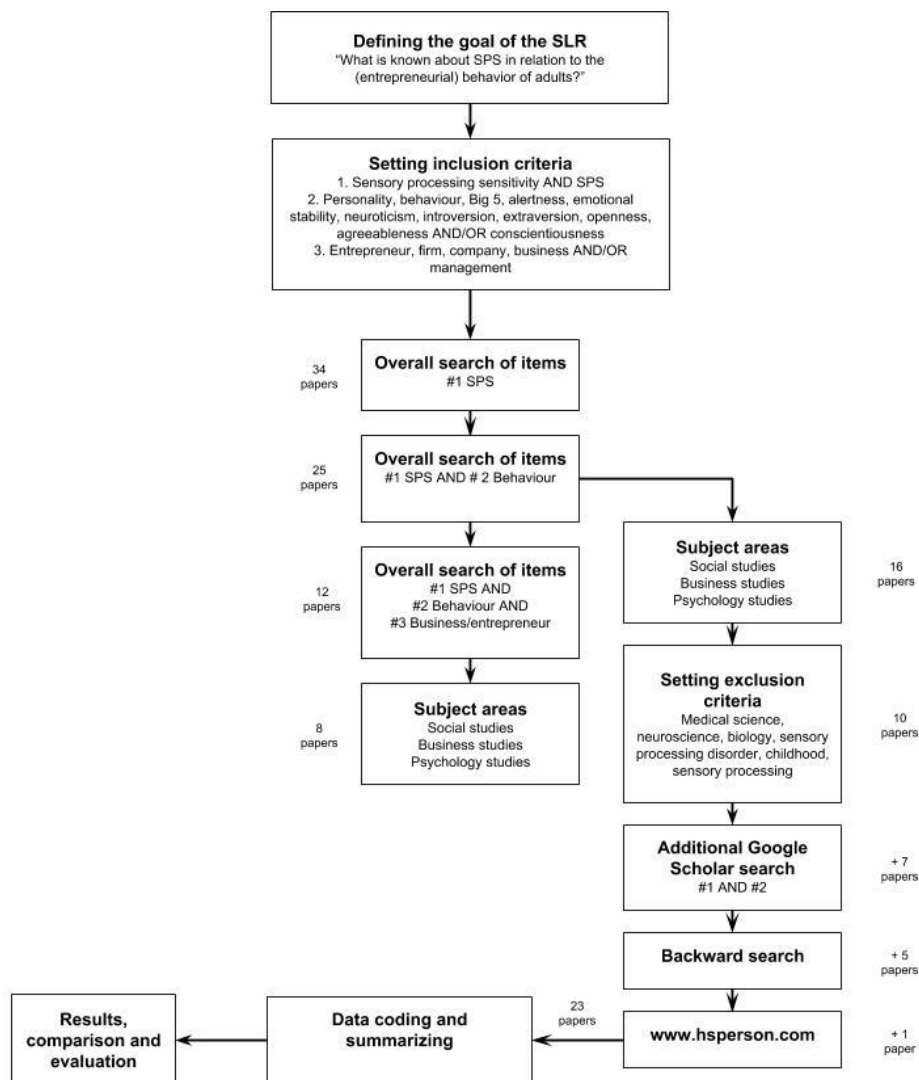


Figure 1 Graphical representation practical screen

2.1.1.4 Analysis of articles

When analysing articles in a systematic literature review, a certain structure is needed. According to Okoli and Schabram (2010), the structure is aimed at providing distinctive steps to ensure a complete and coherent overview about the current state of the art. These structural steps include the **status of current knowledge, the justification for new research, quality description and criticism**. This section will provide an overview of the different outcomes. The articles found were considered in closer detail in order to be able to assess their individual and combined implications towards SPS on human behaviour. The analysis of the articles is structured based on the findings of the systematic literature review. These findings regard the general construction of SPS, SPS as an individual personality trait, implications about

the Big Five and SPS, as well as the physical relation of SPS to stress, as this is a often researched relation.

The status of current knowledge

Disagreement on the construction and the biological direction of SPS is popular. Although common ground is found in the existence of an underlying concept proving individual differences in environmental sensitivity, researchers argue for different theoretical insights. Most accepted are sensory processing sensitivity, biological sensitivity to context theory and the differential susceptibility theory (Andresen, Goldman & Volodina, 2017; Lionetti et al., 2018). Further research dedicated efforts to the differentiation of SPS from other traits to create a clearer, common understanding of the concept and reduce the confusion that had been surrounding literature in regards. Aron, Aron, and Jagiellowicz (2012) spend their research capacities on differentiating SPS from other evolutionary inhabited traits. SPS has been confused with the Big Five trait of Neuroticism before SPS had its own clear distinction, thus work in differentiating the concepts was also of need (Smolewska et al., 2006). Jagiellowicz et al. (2010) investigated the brain mechanisms underlying SPS, which causes the difference in individuals with and without SPS. They found that SPS was associated with greater activation in brain areas that are involved in high-order visual processing when detecting minor changes in stimuli. The findings remained significant even after controlling for neuroticism and introversion. Therefore, SPS is activating a different area in the human brain.

It has been found that SPS is a personality trait that is inherited. Acevedo et al. (2014) were able to prove in their research that SPS is indeed a personality trait, which is associated with enhanced awareness and behavioral readiness to environmental stimuli. This finding appears to be of importance for this research. The authors suggest that the trait is found in roughly 20% of humans and was identified in over 100 other species as well. This related to the responsiveness to the environment and to social stimuli when seeing facial impressions and reacting to them accordingly. The authors find that neural activations were in regions that related to sensory information, emotional meaning making, and empathy. SPS also increased self-other processing, self-awareness and cognitive processing. The responses stayed consistent when interacting with or reacting to both partners and strangers.

SPS is responsible for causing variances of personality traits and mental health, ultimately being responsible for individuals to be more prone to suffer from mental illness. Relating the concept of SPS to personality traits and mental health was done by Ahadi and Basharpour (2010). Thereby, they used the Big Five personality factors. The authors conducted regression analysis between the three factors of SPS; EOE, LST, and AES, as well as each Big Five factor. Results outlined a negative relationship between SPS and extraversion and affect (emotionality), which indicates that these persons are very

emotional and tend to worry. The authors also indicated findings on ease of excitation, which individuals with SPS try to avoid because of the fear of overwhelmingly lot of sensory stimuli. This avoidance can consequently limit their social relations, reduce the positive emotions and lead them into introversion. A positive relationship between SPS and openness as well as conscientiousness could be identified. Possible explanations for that were the rich experiences and extreme positive/negative emotions an individual made, predicted increased levels of openness and conscientiousness as well. Mental health constructs were also tested for and results showed a positive relation between SPS and physical problems, anxiety, social functioning disorder, and depression. This accords with findings of Liss et al. (2008). The high level of stimuli that people with SPS have to process internally create constant and dominant stimulation which causes anxiety. EOE and LST were found to particularly represent the negative aspect of SPS, which is related to anxiety and depression and also present in the conceptualized HSPS one-factor scale. AES, on the other hand, was found to significantly relate to anxiety, but not to depression. This may relate to individuals who report a rich, complex inner life so they can enjoy fine arts and music, but due to a high level of conscientiousness, they may spend more time thinking about their actions which can result in anxiety. Liss et al (2008) also related individuals who score low in AES to be more prone to suffering from communication deficits due to externally-oriented thinking. Communication deficit is a symptom of autism as well, hence confusion of the origin may arise.

SPS has been proven to cause more stress, thus this statistically positive relation has been described by a vast majority of researchers (Benham, 2000; Brindle, Moulding, Bakker, and Nedeljkovic, 2015; Carr and Nielsen, 2017; Gerstenberg, 2012 and Evers, Rasche, and Schabracq, 2008). As pointed out, increased stress levels will lead to a higher tendency in anxiety. As a result, individuals who inhabit the trait of SPS are more likely to experience stress and show anxious tendencies or anxiety related depression. Results show that the constructs of stress or anxiety are independent of personality constructs and the Big Five (Gerstenberg, 2012). Individuals who have SPS will always perceive greater stress levels, regardless of whether they, for example, find themselves to be highly neurotic or not. This finding is interesting when being linked to Jagiellowicz et al. (2010) findings on brain areas involved when processing stimuli, as SPS targets different brain areas compared to individuals who do not show HSPS.

Justification for new research

Overall disagreement on the construction of SPS exists. Some authors consider SPS as one construct (Carr & Nielsen, 2017; Pazda & Thorstenson, 2018), whereas others treat it as one overarching construct that entails three sub-components (Liss et al., 2008; Listou Grimen & Diseth, 2016, Smolweska, 2006). These three subcomponents are ease of excitation (EOE), low sensory threshold (LST) and aesthetic

sensitivity (AES), which combined describe the trait of SPS. Ease of excitation is being easily overwhelmed by external and internal stimuli, aesthetic sensitivity refers to the awareness of aesthetics and low sensory threshold is referring to the individual reflection of unpleasant sensory arousal to external stimuli. The three traits relate differentially to behavioral activation and inhibition as well as to the Big Five. Smolweska et al. found that some Big Five factors relate more to a certain SPS factor over others. Neuroticism, for instance, was found to be most strongly related to EOE, confirming that there is a tendency to become easily overwhelmed and disrupted by stimulation. It is recommended, though, to use the rather general factor of SPS exclusively, as AES for instance is more related to positive worded items in the measurement scale and is not mainly about “aesthetic sensitivity” (Aron & Aron, 2018). Still, a one-way solution has not been introduced yet. The general disagreement on the composition has been criticized in literature, as SPS is missing clear common ground and structured definition when measuring the concept (Gerstenberg, 2012).

The disagreement on composition of SPS, including possible cut-off rates, was only very recently picked up by Lionetti et al. (2018) who spend their research efforts on the classification of SPS. Results of a confirmatory factor analysis supported a bifactor structure of SPS, meaning that the HSP scale consists of both one general sensitivity construct as well as three individual subscales. Both are simultaneously valid rather than mutually exclusive. Additionally, Lionetti et al. (2018) also demonstrated a normal and continuous distribution of SPS in the general population, resulting in three classifications which they gave flower metaphors based on the fragility. The highly sensitive individuals (orchids) make for 31% of the population, then the broader mass in between was classified as medium sensitive (tulips) entailing 40%, and lastly the low sensitive population (dandelions) makes for 29% of the population. Lionetti et al. (2018) could therefore conclude that individuals differ on rather to the degree of sensitivity they inherit than the relative composition of the different HSP components they inherit. However, the authors await for replication of their study, using the preliminary cut-off scores in an independent sample.

Critique & quality of current research

When critically reviewing the quality of the articles found, one factor becomes distinct. All available research is building upon the work done by Aron & Aron (1997). These researchers introduced the concept of SPS, and the Highly Sensitive Person (HSP) -scale for measuring SPS among individuals. Since, it has become the universally applied measurement construct within this field of research. Although attempts have been made to validate the construct since its introduction in 1997, the researchers have never reflected on how the items for the questionnaires were selected and by what means a person was characterized as highly sensitive. Also, the measurement is based on a self-completion test, which

is considered not to be objective. Lastly, according to Aron & Aron (1997), it can be assumed that 20% of the general population show the trait SPS. In former research, Aron and Aron made a cut at the higher end of the spectrum, at 25% precisely, and assumed that this would entail the HSPS individuals of the population drawn. Consequently, this technique is more of an assumption than an accurate test of SPS of an individual per se. Thus, an extension to accurately measure whether a person is actually highly sensitive, instead of just relying on the approximated values and self-report measures, would be a desirable contribution to existing literature. This could be a weakness of the concept measured, as further validation would be desirable. However, Aron and Aron do conduct further research since the 90's, to further on complete the theory they introduced and correct diminish smaller errors that were identified over time as well as broaden the scope. The broadened scope especially helped to raise awareness of the concept SPS and may motivate further research.

Most recently, a bi-factor solution for SPS was introduced by Lionetti et al, suggesting that the HSP scale reflects both three independent scales as well as one general, overarching sensitivity factor across all items. Along this pursuit, in their recent paper Lionetti et al. (2018) were able to detect a normal distribution of SPS in the general population, being 29% for low sensitivity, 40% for medium sensitivity, and 31% for high sensitivity. Although this is not an exact testing outcome just yet, the normal distribution is applicable to a population and is already more accurate than estimating a rough 20% of a population sample will entail high SPS. Cut-off rates regarding personality constructs should be treated with care. As SPS, like other constructs, is a question of degree rather than yes/no, it indicates a more fluent and fluctuating distribution that would deny the use of a strict cut-off rate. SPS is a continuous variable and is best to be measured continuously. One reason for that may be the noise that is included in any self-report measurement. Therefore, cut-offs may disqualify some participants by labeling them in a wrong category, leading to statistical measurement errors (Aron & Aron, 2018).

What became apparent when scanning the articles of this systematic literature review was that many scholars build upon student samples at a university setting (Gearhart & Bodie, 2012; Gerstenberg, 2012; Liss, Mailloux, & Erchull, 2008; Smolewska, McCabe, & Woody, 2006; Yano & Oishi, 2018). This may be related to the relative ease of setting and data collection. Some authors gave their students' academic course credit as an incentive for participating. Another striking objective that became visually apparent in the SLR table (Appendix I) was the use of quantitative data collection by (nearly) all authors under review. The conduction of only one data gathering method may be problematic, especially when that one method is collectively used and not questioned (Bryman & Bell, 2011). Results should be consistent by the use of several data collection methods. These shortcomings were also criticized by Gerstenberg (2012). Therefore, the literature groundings of SPS can only benefit from diversity.

Furthermore, many authors call for the need of longitudinal studies into SPS (Acevedo et al., 2014; Andresen et al., 2017; Jagiellowicz et al., 2010; Liss et al., 2008; Smolewska et al., 2006; Yano & Oishi, 2018). Due to the nature of SPS's deeper processing of stimuli, it is found that HSP'ers process information in brain regions responsible for awareness, attention and responsiveness; which consequently may be beneficial in similar future situations; since HSP'ers recognize similarities sooner (Acevedo et al., 2014). It is proposed that over time the experienced stress may reduce because of the similarity of a former experience (Acevedo et al., 2014; Liss et al., 2008). In order to examine this possible relation, longitudinal research is required. A second reason for the need of longitudinal studies lies in the nature of cross-sectional correlational studies as they do not proof causal effects, these can only be tested by longitudinal studies (Andresen et al., 2017; Liss et al., 2008; Smolewska et al., 2006).

The last point of criticism that was identified is linking to the fact that SPS has not yet been related to business literature. In a very recent addition, Andresen, Goldmann, and Volodina (2017) were able to relate SPS to human resource literature. The research of the authors, uniquely, entails managerial implications of SPS in relation to economic benefits. Due to the characteristics of SPS, it is believed that the implication can impact job performance, thus insights may be of high interest and relevance in literature in the near future.

2.1.2 Information processing

Feelings and emotions (affect) in combination with cognition are topics often linked in cognitive research (Baron, 2008; Forgas & George, 2001). Both concepts are types of information processing (Lerner & Arsenio, 2000). Information processing refers to *"the processes through which information is entered into memory, processed, and retrieved for later use"* (Baron, 2008, p. 328), ultimately influencing judgments and behaviour. Some basic assumptions can be made on any information processing approach. First, information is retrieved from the environment and is processed by a series of so-called processing systems. Second, the processing systems adjust the information in a systematic way (Neisser, 1967).

Several models explaining the human processing of information exists, one being the Affect Infusion Model (AIM) (Forgas & George, 2001). According to the AIM theory, different levels of affect are infused in the processing systems, this depends on the chosen processing strategy (George & Dane, 2016). According to AIM four processing strategies are identified; direct access processing, motivated processing, heuristics processing and substantive processing (Forgas & George, 2001). The choice of which strategy to follow is among others dependent on *personal variables*, like personality traits and processing capacity.

Especially heuristic processing and substantive processing are open to affect infusion. Substantive processing is the superlative of heuristic processing involving generative constructive processing, where *“active elaboration and transformation of the available stimulus information, require the activation and use of previous knowledge structures, and result in the creation of new knowledge from the combination of stored information and new stimulus details”* (Forgas & George, 2001, p.9). Heuristic processing is commonly used when the task is relatively simple and of low personal relevance. The strategy is sometimes referred to as using mental ‘shortcuts’ (Baron, 2008). In both strategies, affect will influence, directly and indirectly the associations from memory.

Too much emphasis on using heuristic and substantive information processing is not without risk however. This enhanced tendency may be detrimental to decision-making and problem solving (Baron, 2008; Isen, 2000). Especially when in novel situations, individuals relying heavily on this information processing may be short on information gained in prior experiences.

Another issue with information processing influencing decision making and behaviour is the overload of information. The term refers to *“a state of affairs where an individual’s efficiency in using information in their work is hampered by the amount of relevant, and potentially useful, information available to them”* (Bawden & Robinson, 2009, p.182). Feelings associated with information overload are loss of control over the situation and in extreme cases damages to health (Bawden & Robinson, 2009; Jackson & Farzaneh, 2012). By natural response individuals protect themselves by ‘shutting down’. The point at which overload occurs is called the ‘tipping point’ (Jackson & Farzaneh, 2012).

Typically, HSP are found to rely on heuristic and substantive processing (Jagiellowicz et al., 2010). As HSP are found to process more information at a deeper level, while also being prone to overstimulation, it may be argued that the efficiency of processing of information is quicker up to a certain amount of information, where it becomes detrimental.

2.2 Entrepreneurship

The influence of *affect* on entrepreneurship has been shown in multiple studies. Traits influence affect in a direct and constant manner, creating similar reactions across different situations (Baron, 2008). Although some psychological variables caused by a trait may be beneficial to some entrepreneurial activities within a process, it may be detrimental in others (Wiklund et al., 2018). As the current study focusses on entrepreneurial intent and opportunity recognition, the following section will give an overview of the known effects of affect in these steps of entrepreneurship. As entrepreneurial intentions are argued to be the first step in the process, entrepreneurial intent is discussed first, followed by opportunity recognition (Schlaegel & Koenig, 2014; Shane & Venkataraman, 2000).

2.1.1.1 Entrepreneurial Intent

Over the years several definitions of entrepreneurial intent have been used in research (Shook, Priem, & McGee, 2003; Thompson, 2009). Some scholars define intent as the intention of owning a business, while others specify the intent of starting one's own business (Krueger, Reilly, & Carsrud, 2000; Shook, et al., 2003). More variation is found in Jenkins and Johnson (1997), who stated that entrepreneurial intentions refer to the owners' desires of increasing revenue and profit performance of a business. In this research the following definition is used *"a self-acknowledged conviction by a person that they intend to set up a business venture and consciously plan to do so at some point in the future"* (Thompson, 2009, p. 676).

Exogenous factors are proposed to predict entrepreneurial intent. As is the case with most behaviour, when it is difficult or rare to observe, *"intentions offer critical insights into underlying processes such as opportunity recognition"* (Krueger et al., 2000, p. 414). Some research indicates that intent is only weakly influenced by exogenous factors like situational (e.g. employment status) but by individual factors (e.g. personality traits) (Krueger et al., 2000; Liñán & Chen, 2009; Thompson 2009). Nonetheless, the discussion about the effects of personality traits on entrepreneurial intention keeps gaining attention and no consensus has thus been reached (Brandstätter, 2011; Liñán & Fayolle, 2015; Liñán et al., 2011).

Entrepreneurship is concerned with a deliberate planning and thinking of the creation of a company and is therefore a planned intentional behaviour. Consequently, entrepreneurial intent relevant to intention models (Schlaegel & Koenig, 2014). Research focussing on intention and personal characteristics has resulted in several successful intention-based models aiming at understanding the process and predicting (entrepreneurial) activity. The two most known models in predicting intentions are the Theory of Planned Behaviour (TPB) and Schapero's model of Entrepreneurial Event (SEE) (Liñán & Chen, 2009; Schlaegel & Koenig, 2014).

The TPB identifies antecedents for three attitudes. These being; attitude toward the behaviour, perceived social norms and perceived behavioural control (Liñán & Chen, 2009; Schlaegel & Koenig, 2014). These motivational factors refer to; the personal valuation of being an entrepreneur (PA), the perception of important people within direct personal environment about being an entrepreneur (SN) and the perceived difficulty involved in becoming an entrepreneur (PBC), respectively. Overall, research found these antecedents to explain 40-60% of the variance in entrepreneurial intent (Kautonen et al., 2013; Liñán & Fayolle, 2015).

According to the SEE, entrepreneurial intent is derived from the perception of three elements; the perceived desirability, the propensity to act and the perceived feasibility (Fitzsimmons & Douglas, 2011; Schlaegel & Koenig, 2014). The model assumes inertia until an event interrupts this inertia. So,

the individual's direct situation changes, positively or negatively, by which the individual re-thinks his or her 'life', e.g. job loss or inheritance (Krueger et al., 2000). A disrupting event causes the change in behaviour where the person seeks the best alternative course. The alternative course depends on the 'perceived desirability and perceived feasibility' (also 'credibility') and the 'propensity to act'.

Important similarities in these theories are the perceived desirability of the entrepreneurial activity and the perception of one's control. Both theories are based on the perceived self-efficacy. However, the study from Krueger et al. (2000) also points out that entrepreneurs not always show initial intent only a few years prior to venture creation. This accounts the other way around as well. Many nascent entrepreneurs never become actual entrepreneurs. Here, the SEE accounts for the propensity to act, whereas the TPB does not. However, both models have been found to be compatible in predicting intent, more so than individual and situational variables (Krueger et al., 2000). According to Baron (2006), this is due to the implied difficulty of measuring cognitive variables.

Possible factors influencing the perceived desirability of entrepreneurship are the associated high job demands, while also offering high job control (Stephan & Roesler, 2010). Entrepreneurship has been found to offer great autonomy in crafting one's own work life fitting to the special needs and wishes of that person, especially individuals prone to mental issues may benefit from this flexibility (Wiklund et al., 2018). However, stress is often associated with entrepreneurship. Even though, studies show mixed results concerning the relationship between entrepreneurship and stress (Rauch, Hatak, & Fink, 2018). Nonetheless, it is expected that HSP are more prone to avoid entrepreneurship. Entrepreneurship is often associated with stress, insecurity, networking, aspects that highly sensitive individuals try to keep to a minimum as they are easily overstimulated (Aron & Aron, 1997; Ahadi & Basharpour, 2010). Therefore, the following hypothesis is formulated:

H1.1: SPS is negatively related to EI.

2.1.1.2 Opportunity Recognition

Identifying the processes involved in opportunity formation has a long history. Nowadays, the consensus is that the process of opportunity recognition has a psychological and social nature (Wang et al., 2013). Cognitive researchers, like Shane and Venkataraman (2000), define entrepreneurial opportunity recognition as a cognitive process whereby individuals identify, recognize and discover potential opportunities to create and develop new business, ventures, markets and technology.

The source of entrepreneurial opportunity formation lies in shifts in technological, political, social, regulatory and other conditions that create new information, which in turn makes entrepreneurial action feasible (Shane & Venkataraman, 2000). Entrepreneurial action is defined as any

activity entrepreneurs take to form and exploit opportunities (Alvarez & Barney, 2007; Grégoire et al., 2010). For the purpose of this study, opportunity formation is solely concerned with the establishment of new organisations, since opportunity formation could also be applied to organisational strategy development, learning, renewal and adaption (Grégoire et al., 2010).

The literature shows two main theories concerning entrepreneurial opportunity formation; Discovery theory and Creation theory (Alvarez & Barney, 2007; Grégoire et al., 2010). Entrepreneurial opportunity is defined as, *“perceived mean of generating value, that has not previously been exploited, and are not currently being exploited by others”* (Baron, 2004, p. 1). The two theories differ in the nature of the opportunity. According to the Discovery theory, opportunities exist independently from the entrepreneurs, while the Creation theory argues for entrepreneurs building opportunities. Overall, the Creation theory received far less attention by scholars as opposed to the Discovery theory (Alvarez & Barney, 2007; George et al., 2016). While both theories have been tested, scholars have only focussed on one or the other.

Although, the two theories are very distinct in their formation of opportunities and the empirical implications are considerable, the theories co-exist. The commonality in both theories is the role of information and the processing thereof, as the difference between entrepreneurs and non-entrepreneurs is due to cognition (Alvarez & Barney, 2007). Recognition occurs when people mentally compare the new information acquired, by either alertness or systematic searching, with prior gained knowledge, in order to find resemblances and make sense of the new information (Baron, 2006). This finding corresponds with scholars arguing for opportunity recognition through *‘structural alignment’*, meaning cognitive processes aimed at comparing old and new information as well as drawing implications of this comparison (Baron, 2006; Grégoire et al., 2010).

As structural alignment concerns processing at two distinct levels, it is found that the processing of structural high-order relations is more demanding than the processing of superficial features (Grégoire et al., 2010). High-order relationships *“include more abstract relationships between relationships”* (Grégoire et al., 2010, p. 416). One requires to pay attention to a wide variety of signals from the environment. This finding is of importance because it proves why opportunity recognition is a challenging task. Moreover, the study finds the processing of the high-order relations to occur at a deep cognitive level that requires a significant amount of energy.

The ability to recognize opportunities might come more easily to specific individuals prone to process information at this deeper level. It is therefore argued that certain personalities and individuals with certain character traits and even mental disorders are better at recognizing opportunities, e.g. ADHD (Wiklund et al., 2018). The extent of feeling affect has been found to be of importance as well. As previously argued, affect determines what information is processed and what information is retrieved and used from memory (Forgas & George, 2001). In other words, affect acts as a filter, that determines

which information comes in and goes out, especially in types of processing infused with affect like heuristic and substantive, which seems to be of importance for structural aligning. Two important characteristics of HSP seem to be positively associated to the ability of recognizing opportunities. Highly sensitive individuals are characterized by a deeper level of information processing, especially heuristic and substantive (Jagiellowicz et al., 2010). Due to their deep cognitive processing their behaviour shows more emotional involvement (Aron & Aron, 1997). This leads to the following hypothesis:

H1.2: Sensory processing sensitivity is positively related to Opportunity Recognition ability.

As previously stated, entrepreneurial intent is dependent on the perceived desirability, feasibility and the perception of one's control. Superior processing of information is found to enhance the structural alignment required in the recognition of opportunities (Baron, 2006; Grégoire et al., 2010). The ability and the knowledge thereof will very likely positively influence entrepreneurial intent.

H1.3: Opportunity recognition ability is positively related to entrepreneurial intent.

2.3 Entrepreneurial Trait Profile & Big Five dimensions

In the attempt to understand entrepreneurs, entrepreneurship has often been linked to personality traits (Caliendo, Fossen, & Kritikos, 2014; Rauch & Frese, 2007; Obschonka, Silbereisen, & Schmitt-Rodermund, 2012; Zhao et al., 2010). However, there is a deep-rooted scepticism about this relationship. According to the American Psychological Association (APA), personality can be described as: *"individual differences in characteristic patterns of thinking, feeling, and behaving"* (APA, 2017). Thus, the effect on behaviour is assumed to influence one's job-decision behaviour as well (Caliendo et al., 2014; Rauch & Frese, 2007).

A widely accepted model for describing a personality is the Big Five also referred to as the five-factor model (Leutner, Ahmetoglu, Akhtar, & Chamorro-Premuzic, 2014). This model of personality has been found to be the most established and validly proven. It offers a common language for the identification and validation of personalities (Goldberg, 1993). Additionally, it is accompanied by a measurement scale of high proven reliability and validity (Schmitt et al., 2007).

The Big Five construct is argued to be better able in identifying relevant relations with entrepreneurial behaviour as opposed to other constructs due to the proven reliability and validity (Caliendo et al., 2014). According to the five-factor model the dimensions of extraversion, agreeableness, conscientiousness, neuroticism and openness to experience new things make up a personality (Caliendo et al., 2014; Obschonka et al., 2012). The factors are not specifically traits but

factors that consist of related traits, e.g. openness to experience is related to traits like; insightful, daring, and creative (Leutner et al., 2014).

Entrepreneurial behaviour is often linked to the existence of a specific entrepreneurship-prone personality trait profile (ETP). The ETP can be viewed as a combination of Big Five traits, that are beneficial of entrepreneurial success (Schmitt-Rodermund, 2004). Scholars, like Brändstatter (2011) and Zhao & Seibert (2006) have proven differences in personality between entrepreneurs, managers and employees, especially in behaviour like opportunity recognition (Leutner et al., 2014). Although, a majority of researchers have researched the effect of one single trait on an individual's entrepreneurial behaviour. Schmitt-Rodermund (2004) researched the existence of an entrepreneurial trait profile. This profile is characterized by high extraversion, conscientiousness, and openness to experience new things, while low in agreeableness and neuroticism.

According to this ETP, certain traits need to be presented while others are expected to have a negative effect on entrepreneurial behaviour. High extraversion is associated with being more sociable. Being more sociable in turn is related to seeking leadership, being assertive and developing networks (Caliendo et al., 2014). Being extraverted especially has been found to be important for entrepreneurial entry and survival of one's company. Equally as important is being open to new experiences and novel ideas. Without this open-mindedness innovative, creative ideas are not explored which are essential to becoming an entrepreneur. Especially OR is found to be related to the imagination, creativity and curiosity involved with openness to experience (Shane & Nicolau, 2015; Wiklund et al., 2018). In order to survive being self-employed, the character trait of conscientiousness is found to be of importance, also. The trait is associated with hard working, dutiful and efficient, but also achievement oriented (Zhao et al., 2010). Especially, the component of achievement oriented has been found to be positively related to the survival of a company (Zhao & Seibert, 2006).

The trait of agreeableness offers in both high and low presence both positive and negative effects in the decision for entrepreneurial entry. Agreeableness as factor is concerned with the attitudes and behaviour towards others (Zhao et al., 2010). Being agreeable is associated with being forgiving, trustworthy, altruistic and flexible, while being disagreeable is associated with self-centeredness and hard-bargaining. Particularly, trying to survive as an entrepreneur, being disagreeable is argued to be advantageous (Zhao & Seibert, 2006). To conclude the Big Five factors, the trait of neuroticism is supposed to have a negative effect on entrepreneurial behaviour. Being an entrepreneur involves considerable stress and uncertainty. Being an emotionally stable individual would therefore, greatly benefit entrepreneurial activities. Especially, concerning entry in self-employment.

The above described entrepreneurial personality profile is found to be specifically related to the entrepreneurial intent (Zhao, Seibert & Lumpkin, 2010). Leutner et al., (2014) assumed for this reason

that the ETP also explains behaviour such as opportunity recognition. However, the research of Obschonka et al. (2012) did not find proof of an effect on business idea generation.

The following hypotheses are derived from the theory on the entrepreneurial prone trait profile:

H2.1: The negative relationship between SPS and EI is moderated by the ETP, higher levels of ETP are weakening the negative relationship between SPS and EI.

H2.2: The positive relationship between OR and EI is moderated by the ETP; higher levels of ETP are strengthening the positive relationship between OR and EI.

In addition to testing the moderator effect of the ETP, also the individual five-factor dimensions are considered.

Research shows high SPS to be related to introversion (Aron & Aron, 1997). HSP'ers are viewed as less sociable and assertive. Whereas entrepreneurs show behaviour associated with extraversion (Caliendo et al., 2014; Schmitt-Rodermund, 2004). Therefore, it is assumed that extraversion weakens the already negative effect of SPS on EI.

H3.1.1 The negative relationship between SPS and EI will be moderated by extraversion. The more extraverted, the weaker the negative the relationship between SPS and EI becomes.

As previously mentioned, the trait of agreeableness is open to interpretation as to the effect it has in the entrepreneurial behaviour (Zhao & Seibert, 2006). However, according to the ETP, agreeableness has a negative effect on the undertaking of entrepreneurial activities, and thereby also entrepreneurial intent (Schmitt-Rodermund, 2004). HSP are found to have the tendency to avoid conflict and conform with the wants and needs of others (Aron & Aron, 1997). Therefore, it is assumed that agreeableness strengthens the effect on the negative relation between SPS and EI.

H3.1.2: The negative relationship between SPS and EI will be moderated by agreeableness. The more agreeable, the stronger the negative relationship between SPS and EI becomes.

Entrepreneurs are often characterized as people who are not easily discouraged by setbacks or self-doubt. Being neurotic, on the other side of the scale, are low on this emotional stability. Scholars have proven relationship between high SPS and neuroticism. Therefore, due to the responsibilities and stresses of entrepreneurship, it is expected that neuroticism strengthens the negative relation between SPS and EI.

H3.1.3: The negative relationship between SPS and EI will be moderated by neuroticism. The more neurotic, the stronger the negative relationship between SPS and EI becomes.

Extraversion enables the search for excitement and stimulation (Zhao & Seibert, 2006). HSP have been found to process information at a deeper level and are cognitively better able to make connections (Aron & Aron, 1997; Jagiellowicz et al., 2010), as described per structural alignment theory that facilitates opportunity recognition. Therefore, extraversion is expected to strengthen the positive relation between SPS and OR.

H3.2.1: The positive relationship between SPS and OR will be moderated by extraversion. The more extraverted, the stronger the positive relationship between SPS and OR becomes.

Being agreeable is associated with being forgiving and flexible. For the purpose of recognizing entrepreneurial opportunities, a certain level of self-centeredness is found to be of importance (Caliendo et al., 2014; Zhao & Seibert, 2006). So, agreeableness is expected to weaken the positive relation between SPS and OR.

H3.2.2: The positive relationship between SPS and OR will be moderated by agreeableness. The more agreeable, the weaker the positive relationship between SPS and OR becomes.

Individuals have been found to be more entrepreneurial active when having an extravert personality. They are argued to be attracted to entrepreneurship because of their search for excitement and stimulation (Zhao & Seibert, 2006; Zhao et al., 2010). Therefore, it is expected that extraversion strengthens the relationship between OR and EI.

H3.3.1: The positive relationship between OR and EI will be moderated by extraversion. The more extraverted, the stronger the positive relationship between OR and EI becomes.

Individuals high on agreeableness are often characterized by traits like modest, cooperative and altruistic and are often concerned for the needs of others (Zhao et al., 2010). However, entrepreneurship, where the focus lies on personal financial gain (Schumpeter, 1934), is often associated with more self-centered behaviour in attempt for entrepreneurial survival. Therefore, it is assumed that high levels of agreeableness weaken the relationship between OR and EI.

H3.3.2: The positive relationship between OR and EI will be moderated by agreeableness. The more agreeable, the weaker the relationship between OR and EI becomes.

2.4 Hypotheses

Due to the complexity of the hypotheses, the following model presents a graphical depiction of the ten (out of the total of 21) hypotheses. Three models have been created of increasing detail. The first model is concerned with the relationships between the main concepts. The second model includes the moderator effect of the ETP on these relationships. The third model, the moderator effect of the individual Big Five dimensions on the relationships between the main concepts.

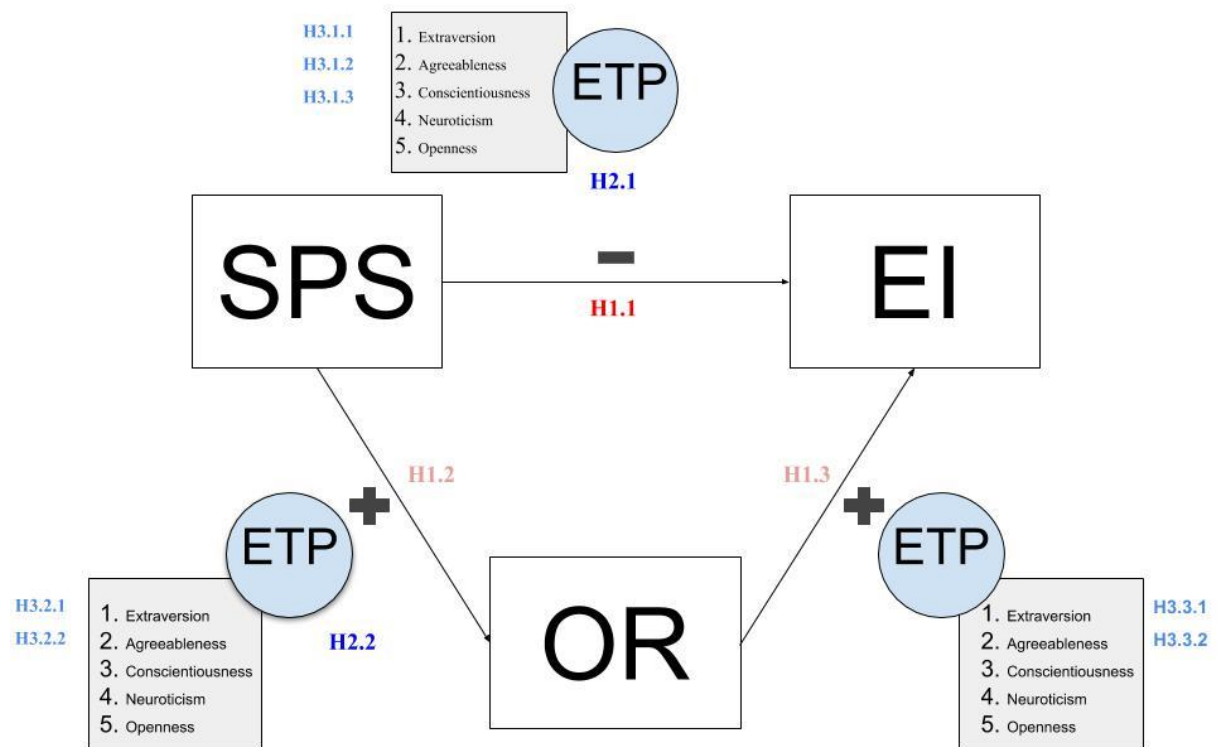


Figure 2 Graphic model of hypotheses

3. Methodology

3.1 Research Design

The current study triangulates its findings by using both a self-completion questionnaire as well as interviews. By using both quantitative and qualitative data gathering methods, the findings of the

qualitative research method helped interpret and put the results of the quantitative measurements into context. Ultimately, this is leading to a higher understanding of the concept and a more valid and reliable research (Bryman & Bell, 2011). A mixed method research is conducted due to the expected limited number of individuals with SPS.

The chosen quantitative method in this study is self-completion questionnaires, accessible via the Web. This method has been chosen because it is a convenient way of addressing a large sample as well as researching multiple variables at once (Bryman & Bell, 2011; Babbie, 2007). The chosen method is cheap to administer, reduces bias error and provides for a greater anonymity for the respondent which increases the reliability of the response (Phellas, Bloch & Seale, 2011). However, since the research requires multiple concepts to be tested, one of the main concerns is to keep the questionnaire short and simple in order to avoid questionnaire fatigue (Bryman & Bell, 2011). A pre-test among students provided a check for comprehensibility and a confirmatory factor analysis of the scales and the Cronbach's Alpha for internal reliability.

The quantitative element of the research was supported by the qualitative method of semi-structured interviews. This method aids in a deeper understanding of the findings provided in the questionnaires. Additionally, research regarding entrepreneurship relies heavily on surveys. By supporting the method with interviews, room is given for triangulation of the results as encouraged by Shook et al., (2003). During the interviews, questions were asked relating to the main concepts of the questionnaire; Entrepreneurial Intent, Opportunity Recognition and Sensory Processing Sensitivity (see appendix VII for the interview guide). The questions were presented in a way that the necessary data was retrieved while also the necessary background stories and motives became apparent. Overall, the aim of the interviews was to better understand the outcomes of the quantitative study and to get a rounded overview of a) individuals who are entrepreneurs despite being highly sensitive, and b) identifying barriers for highly sensitive individuals to not become entrepreneurs. The advantage of this method is the allowance for flexibility from both the interviewer and the interviewee (Bryman & Bell, 2011).

Based on the results of the questionnaire, respondents that were found to exhibit high or low entrepreneurial behaviour in combination with having a high SPS score were asked to join in an individual semi-structured interview. Due to the low amount of HSP'ers showing entrepreneurial behaviour, only 4 interviews have been conducted. HSP'ers with no entrepreneurial behaviour have shown to be more common.

3.2 Population & sampling

The sample was retrieved from students enrolled in the University of Twente. This university offers 10,435 students an education from five academic schools (W. Nijhuis, Centre for Educational Support, personal communication, May 30th, 2018). Solely UT students have been included in the study firstly, because of the difficulty involved in achieving a stratified random sample based on multiple universities. A second reason for relying solely on UT students was due to the time constraints of this research, as it was limited to the scope of a master thesis. Lastly, for the reason that students from the UT are easily accessible to the researcher, it was concluded to only focus on a UT for stratifying reasons, as the results, when stratified, should give a general depiction of the population. The use of a random stratified sample ensures the researcher of a true representation of the subgroups within the sample (Bryman & Bell, 2011).

The stratified random sample was made proportional to the size of the study programme, level of education and gender (see table 1). The first stratification based on study direction has been categorized into *MINT* (Mathematics, Informatics, Natural & Technology) and *Social* studies. Thereby, MINT consisted of faculties TNW, CTW, EWI and ITC, whereas Social consisted out of the faculty BMS. Second criterion applied was the current level of education applied on Bachelor, Master and PhD students, and finally stratified on gender (male or female). The criteria used will ensure homogeneous groups within the strata (Bryman & Bell, 2011). Consequently, the results are relatively unbiased and more resembling a normal distribution (Ding, Hsieh, Wu & Pedram, 1996).

Table 1 Random stratified sample

	BACHELOR	M	F	MASTER	M	F	PHD	M	F	TOTAL
MINT	38	27	11	26	18	8	4	3	1	68
SOCIAL	19	10	9	14	7	7	2	1	1	35
TOTAL	57	37	20	40	25	15	6	4	2	103

The use of student samples has been criticised heavily, mainly due to concerns with the generalization to non-student populations (Bello, Leung, Radebaugh, Tung & Van Witteloostuijn, 2009; Peterson & Merunka, 2014; Randall & Gibson, 1990). However, student samples are very common in entrepreneurial research (Liñan & Chen, 2009).

The final sample consisted of 103 students from the UT. Theories concerning the optimum sample size are heavily criticized over the years (Fowler, 2009). Recommendations differ in sample-to-

variable, namely, 5:1 has been found adequate but the 10:1 ratio is more commonly applied. Hair, Black, Babin & Anderson (2014), recommend looking at the number of independent variables, preferred significance level and R^2 . The survey of this research was designed to measure eight independent constructs (SPS, OR, EI and the Big5). Based on a significance level of .05 and a preferred R^2 of 20 percent, the sample should be around 90 respondents. Therefore, the acceptable sample is set on 100. This number is similar to Cohen's (1992) recommendation and is furthermore supported by using the rule of thumb of Green (1991) for multiple regression analyses.

3.3 Data collection

Data collection has been collected via different distribution channels. First, personal contacts have been approached via private e-mail or been messaged directly and asked to send the questionnaire to their personal contacts as well. Among these contacts were members of student associations and other UT based associations. In the e-mail, the link to the online-survey was provided. The online survey has been created by using the Google docs forms. Secondly, students have been approached via social media, using special groups within Facebook and LinkedIn, not directly affiliated to the UT but well used by the students. Some bias is involved in the stratified random sampling because of the distribution channels, since direct friends and/or colleagues are more likely to respond on the request.

3.4 Common method bias

The common method variance bias is considered one of the main sources of reach error, as it threatens to interfere with the causality amongst constructs which ends up manipulating possible interpretations to draw (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Always at risk to be biased is self-reported data, like the data that was accessed by the means of the questionnaire. Self-reported data must, therefore, always be treated with care in regard to common method variance bias as described in literature prior (J. Chen, Reilly, & Lynn, 2005; Podsakoff & Organ, 1986). In order to minimize this occurring phenomenon of distortion, interviews with individuals who showed significant signs of SPS were conducted in order to validate findings retrieved from the quantitative data analysis at a later point.

Interviewing individuals in person, however, may increase the social desirability bias (SDB). According to Fisher (1993), the occurrence of SDB can be negatively influenced by using indirect questions in contrast to direct questioning. Thus, when dealing with socially sensitive variables, a significant difference exists between direct and indirect questioning. For socially neutral variables, no significant difference could be measured. As the questionnaire is not testing for socially sensitive variables (e.g. beliefs, norms, purchasing behaviours), it can be assumed that the occurrence of SDB will be relatively low. Other techniques for gathering data more objectively, like using a close friend as a

second responder or relying on objective data purely, were not feasible for the context of this research, as the main constructs of this study need to be reflected on in person (Podsakoff et al., 2003).

3.5 Operationalisation

In total the questionnaire contained 43 items, 34 measuring the main concepts, as well as 9 additional items for control and information purposes, including aspects on study faculty, type of study or entrepreneurship parents.

Based on the reliability and validity reported by previous research, well-known measurement scales have been selected for the measurement of the main concepts. The chosen scales include the HSP-scale of Aron & Aron (1997), the OR scale by Ozgen & Baron (2007), the OR scale of Kuckertz et al. (2017), the EI scale from Linñan & Chen (2009), and finally the Big Five measurement as used in Rammstedt and John (2007). Already established measures were preferred over coming up with new measurement scale due to these being already tested and validated, but also due to the timely limitation of this research. The following sections will summarize why the respective measures were chosen and state their original reliability and validity, so that these can be compared to the respective outcomes of this research at a later point.

The reasoning for using two OR scales is based on security and reassurance, as using the 3-item test scale for the measurement of a key variable is risky in samples. This is due to need of a high reliability on the 3-item test as well as three distinct factors in the factor analysis for this OR scale. However, the probability of clear results appearing is less in this type of research as it is limited by scope and time. So, for security a second measurement was applied, to test how both of the scales would perform and be able to draw a comparison between the two. Besides the measurement scale, also the Likert scale were adopted from the prior research to further ensure the validity and reliability. The OR scale of Ozgen & Baron (2007) and the Big Five were measured on a 5-point Likert scale ranging from 1 = disagree strongly/fully disagree to 5 = agree strongly/fully agree. The HSP-scale was measured on a 7-point Likert scale ranging in the extent to which the respondent could associate him/her self in the situation (1 = not at all and 7 = extremely). EI and OR (Kuckertz et al., 2017) has also been measured using a 7-point Likert scale anchored by 1 = totally disagree and 7 = totally agree.

In the following sections, each construct will be shortly introduced.

3.3.1 12-item HSP-scale

The Highly Sensitive Person (HSP-) scale is the only self-report measure for assessment of the general sensitivity to the environment (Aron & Aron, 1997). Based on a 27-item questionnaire, it measures the personality trait SPS.

In the current research, a 12-item scale is used to measure SPS, which is a shorter version of the original 27-item scale. (see Appendix III) (Aron & Aron, 2018). The shortened scale is found to be comparable to the HSP-scale in psychometric and construct validity properties, the Cronbach's alpha range between .74 (Pluess & Boniwell, 2015) and .89 (Lionetti et al., 2018). Example items are 'Do you seem to be aware of subtleties in your environment?', 'Do changes in your life shake you up?' and 'Are you bothered by intense stimuli, like loud noises or chaotic scenes?'.

Recent research indicates the division of SPS in three groups (high, medium and low) (Lionetti et al., 2018). For the purpose of the identification of Highly Sensitive People, as necessary for the interviews, the mean score of SPS was computed. Therefore, preliminary cut-off scores were used to determine certain personality profiles for the sake of clustering groups in this research (Lionetti et al., 2018). The sole purpose of the clustering was to determine the profile for contacting interview participants at the very end of the research, to validate the hypotheses. The cut-off rates were not used during the quantitative analysis. Highly Sensitive People comprise of the 31% highest scores, 29% of the lowest scores the Low-sensitive group and 40% in the middle the Medium-sensitive group. For the cut-off rates for the present study, low-sensitive people present an average score below 3.5, high-sensitive are classified by an average score of above 4.5 and medium-sensitive individuals entail average scores between 3.5 and 4.5. However, cut-off rates must be applied with caution, since the HSP-scale is a self-report measurement that may result in some noise due to its constitution (Aron & Aron, 2018), as already mentioned and criticised in the analysis of the SLR.

3.3.2 OR-scales

For the measurement of opportunity recognition, an established 3-item scale was used, which is a self-report tool. Ozgen and Baron (2007) conducted an exploratory factor analysis in their research on all items they included. The results showed irregularities within the construct of opportunity recognition. Two clearly distinct factors emerged, one on self-reflecting ability to recognize opportunities and the other on alertness to opportunities when they are present. The same factors had previously been reported in research by Singh. As the reliability only resulted in a satisfactory level on two factors, the others revised the measure of opportunity recognition. The three items used to measure the construct of OR were as follows: (1) "While doing about day-to-day activities, I see potential new venture ideas all around me", (2) "I have a special alertness or sensitivity towards new venture opportunities", and (3) "Seeing potential new venture opportunities does not come very natural to me", which is reverse scored. The reliability resulting from the three items was relatively high with a Cronbach's alpha of 0.80 scoring a "good" on internal consistency. The results of Ozgen and Baron

(2007) research underlines the fact that OR cannot be measured in one single question and more factors have to be considered to do so. Therefore, the opportunity recognition item scale for this research will build upon the 3-item scale Ozgen and Baron (2007) used.

As it is risky to measure one of the main concepts of this research with only a 3-item scale, as the factor analysis may not result in three distinct factors, another scale was introduced to measure OR, but also to be able to compare the measuring power of the two consecutive scales. The 5-item opportunity recognition scale was developed by Kuckertz et al. (2017) and is a relatively recent addition to literature. The authors make a point to differentiate between opportunity recognition, which they characterize by *“being alert to potential business opportunities, actively searching for them, and gathering information about new ideas and services”* (p.92), and opportunity exploitation, which they define as *“developing a product or service based on a perceived entrepreneurial opportunity, acquiring appropriate human resources, gathering financial resources, and setting up the organization”* (p.92). They criticize the lack of distinct measures for both very different concepts, which hinders to obtain a common understanding of similarities and differences. The scale was specifically developed to overcome these limitations. The 5-item OR scale is measured on a 7-point Likert scale. The factor analysis resulted in two factors, one for OR and one for OE which both performed well ($\chi^2/df = 3.76$, CFI = 0.94, SRMR = 0.05). In the one factor model, which measured each scale individually, the retest results did perform equally as well ($\chi^2/df = 7.32$, CFI = 0.87, SRMR = 0.09). The coefficient α for the opportunity recognition scale was 0.87, which is considered good. The total item correlations ranged from 0.62 to 0.76, averaging at 0.7, which is also adequate. Each of the 5 items has been tested as *“reflective”* by a confirmatory factor analysis.

3.3.3 EI Questionnaire

The EIQ was specifically developed to overcome previous research limitations. The goal was to better comprehend what the factors affecting entrepreneurial perceptions are. In the past, a lot of research on entrepreneurial intentions has used linear regression models (e.g. Chandler & Lyon, 2011) despite the risk of biased results.

The six items representing the measurement scale are all aggregates measures for the three motivational antecedents from the TPB theory (PA, SN and PBC), measured on a 5-point Likert-scale. The items asked have been based on theory and previous conducted empirical research (Linan & Chen, 2009). The measurement of six items instead of only one was used based on Nunnally (1978), who suggests that multi-item scales are more reliable than single-item scales. Example items are: ‘I am ready to do anything to be an entrepreneur’ and ‘I have very seriously thought of starting a firm’.

Structural Equation Modelling was used to test the empirical validity of the measurement (Linan & Chen, 2009). The factor analysis resulted in 4 factors on all four constructs they measured, in line with the theoretical assumptions prior. This includes one overall factor for EI. Previous research shows Cronbach's alphas on the factors within the construct ranged from .776 to .953, which indicates "reliable" to "very good" on internal consistency (Linan & Chen, 2009).

3.3.4 BFI-10

When measuring the Big Five, many established options are given to researchers. The first Big Five Inventory (BFI) was developed in the late 1980s. 44 short-phrase items, which took about 5 minutes response time, were sufficient to measure the Big Five. However; there are more inventory tests, like the 140-item NEOP Personality Inventors (Costa & McCrae, 1992), the 100-item trait-descriptive inventory (Goldberg, 2006), the 60-item NEO Five-Factor inventory (Costa & McCrae, 1992), and the most used and popular 50-item International Personality Item Pool (IPIP) (Goldberg 2006). There are many more item tests to test an individual's personality, Credé, Harms, Niehorster, and Gaye-Valentine (2012) give a neat overview and comparison in their article.

When asking respondents to complete a long survey with seemingly repetitive items, boredom, fatigue, and annoyance may result (Burisch, 1984; Robins, Hendin, & Trzesniewski, 2001). The likelihood that respondents will attend the questionnaire at all, fill it in with care or agree to follow-up research, therefore, shrinks.

The demand for shorter personality instruments is growing. Two minimal personality measures were developed by Rammstedt and John (2007) introducing a single-item ability rating (BFI-10) and Gosling, Rentfrow, and Swann Jr (2003) introducing a 10-item measure of the Big Five (TIPI). These short instruments show respectable psychometric characteristics, which suggests that a short version of the BFI may be feasible (Burisch, 1997). For this research, the focus will lie on the Big Five Instrument of Rammstedt and John (2007), who adapted the original Big Five inventory, a 44 short-phrase item pool, and abbreviated it into 10 items, with 2 items on a 5-point Likert scale (1 = Disagree strongly, 5 = Agree strongly), one being normally scored and one being reverse scored per item. The Big Five inventory scales captured 70% of the Big Five inventory variance and retrained 85% of the retest reliability. For Agreeableness, a third item was included, as the correlation and the validity of Agreeableness can be increased by including a representation of altruism. This resulted in a total of 11 items. The reliability coefficients ranged from a .58 (agreeableness) to a .84 (extraversion), averaging at a .73. The BFI-10 was chosen over the TIPI because it shows a clear five-factor structure and has high internal reliability, whereas Gosling et al. (2003) report item intercorrelations within the TIPI and the expected five-factor

structure did not emerge. Therefore, the BFI-10 will be used to measure the Big Five in this research. Short instruments are recommended to be used instead of long ones, when time is limited, personality is not the primary topic of interest, or brevity prevents survey fatigue (Gosling et al., 2003).

3.3.5 ETP

The entrepreneurial trait profile (ETP) measurement in this research will be inspired by research conducted by Schmitt-Rodermund (2004) who introduced the concept of the ETP originally and has been widely cited and used in literature accordingly (Obschonka et al., 2013; Rauch & Frese, 2007; Thompson, 2009). Generally speaking, the higher the value an individual is able to reach in the ETP, the more of an entrepreneurial personality the individual inhibits. On the Likert scale ranging from 1-5, which measures the Big Five constructs, the trait profile will be as follows: agreeableness (5 = low, 1 = high), conscientiousness (1 = low, 5 = high), extraversion (1 = low, 5 = high), neuroticism (5 = low, 1 = high), openness (1 = low, 5 = high). Consequently, the ETP consists of high extraversion, conscientiousness and openness, as well as low agreeableness and neuroticism. To determine the total score, however, agreeableness and neuroticism are measured reversely (table 2).

Table 2 Scoring ETP

Construct	Score	Meaning
Extraversion	1	Individual scores low on extraversion
	5	Individual scores high on extraversion
Conscientiousness	1	Individual scores low on conscientiousness
	5	Individual scores high on conscientiousness
Openness to experience	1	Individual scores low on openness to experience
	5	Individual scores high on openness to experience
Agreeableness*	1	Individual scores high on agreeableness
	5	Individual scores low on agreeableness
Neuroticism*	1	Individual scores high on neuroticism
	5	Individual scores low on neuroticism

- Items with a * are reverse coded, the higher the score, the higher the ETP

In a cross-sectional study, Schmitt-Rodermund (2004) compared a sample of school students (age 14-17) in east Germany by questionnaire to a sample of business founders by the means semi-

structured interviews (age: $m = 39$, $SD = 8.64$). The aim of the study was to collect parallel data for the founders and students. The Cronbach's alpha for both groups is displayed in table 3.

Table 3 Cronbach's alpha of ETP among students and founders

ETP	Score	Alpha Students	Alpha Founders
Extraversion	1 = low 5 = high	.78	.71
Conscientiousness	1 = low 5 = high	.78	.76
Openness to experience	1 = low 5 = high	.58	.71
Agreeableness*	1 = high 5 = low	.56	.74
Neuroticism*	1 = high 5 = low	.67	.77

In the questionnaire, out of each of the five traits, one was measured reversed according to the authors, so that scores had to be reversed again during analysis to be able to determine an accurate ETP. As the scale for agreeableness or neuroticism, in the questionnaire, determined a high score for the personality trait, whereas the ETP considers a high score for the opposite, agreeableness and neuroticism had to be reverse coded again, for the ETP particularly. Generally, it can be said, the higher the values attained on the ETP scale, the better the entrepreneurial profile becomes and vice versa.

3.3.6 Control variables

To control the outcomes for possible cause and effect, the relation was controlled for gender, student entrepreneurship, parental entrepreneurship, entrepreneurial education, and study direction. The number of variables controlled were based on prior literature. Since the unit of analysis is university students, a variable for being a student needed to be included as anyone who was not could be excluded from the research. This relates to the measure of age, as students are typically in a certain age group. The University of Twente offers programs in Bachelors, Masters and PhD's; thus, it is included in this research for filter purposes. Study direction, however, has been added as control variable since it is assumed to be associated with character traits. Gender is of special importance for this research, as it has been found that males had a significantly higher intention of starting a company and general entrepreneurial intent than females (Mazzarol, Volery, Doss & Thein, 1999). It is, however, not expected to correlate with SPS, as the genetical trait seems to appear independent of gender (Aron & Aron, 1997).

Entrepreneurship education was also controlled for, as students who have undertaken entrepreneurship courses report higher levels of entrepreneurial intention than other students (Webb, Quince & Wathers, 1982). Entrepreneurship among parents have been found to be more likely to express entrepreneurial intentions themselves also (Krueger, 1993). Consequently, the variable is tested for.

3.3.7 Reliability of measurement scales

When testing for the internal validity of the main constructs, initial analyses on SPS show a Cronbach's Alpha of $\alpha = .788$, for OR1 $\alpha = .117$ and OR2 $\alpha = .937$, EI $\alpha = .962$ and for Big five $\alpha = .372$. Indicating acceptable reliabilities for SPS, OR and EI. Based on the low negative reliability of the 3-item scale the 5-item scale by Kuckertz et al. (2017), will be used ($\alpha = .937$ vs. $\alpha = .117$). The first analyses of the Big five showed a worrisome Cronbach's Alpha. For this reason, the initial data set was checked for outliers which diffused the alpha. Few cases that did indeed show high levels of diffusion were able to be excluded without violating the restrictions of the strata. Due to the Big Five consisting of several factors it is incorrect to use an overall Cronbach's Alpha, instead you have to use individual ones. Table 4 shows an overview of the separate factors. Rammstedt (2007) uses a mean Cronbach's Alpha, for this reason the same technique is applied, resulting in a mean of $\alpha = .543$. Reviewing the data, the low reliability of the Big five can probably be contributed to the fact that especially male bachelor students of the MINT faculties responded the two-item questions with high dispersions.

The comparison between the Cronbach alpha's of the original scale's creator and the alphas resulting from this questionnaire can be found in table 5. Overall, the reliability could be replicated from using the scales, with two exceptions being OR1 and Big Five.

Table 4 Cronbach's Alpha's Big Five factors

Factor	Cronbach's Alpha
Extraversion	.625
Agreeableness	.479
Conscientiousness	.488
Neuroticism	.688
Openness to experience	.435
Mean Cronbach's Alpha	.543

Table 5 Cronbach's Alpha's SPS, OR, EI & Big Five

	SPS (Pluess & Boniwell, 2015)	OR1 (Ozgen & Baron, 2007)	OR2 (Kuckertz et al., 2017)	EI (Linan & Chen, 2009)	Big Five Rammstedt. 2007)
Original Cronbach's α	.74	.80	.87	.80	.73*
This research's Cronbach's α	.788	.117	.937	.962	.543*

* alpha derived from the mean of all factors

3.6 Pre-test

Before the data collection starts to its fullest extent, a pre-test is considered an important step to improve the quality of a questionnaire. Following this principle, the questionnaire was pre-tested after the initial creation of such and before the full-scope data collection started. The first run of the questionnaire was considered a valuable investment of time and effort, as it helped to clarify whether the questionnaire would have succeeded in the real data collection phase. According to Babbie (2007), pretesting should never be skipped, even if it is only done on a short scale, as it provides valuable insights and feedback on the chosen measurement method. The pre-test helped to implement given feedback on any ambiguities, to process further suggestions and to pre-assess the items in the questionnaire for representativeness and distribution. A pre-test also ensures the accurate distribution of the questionnaire (e.g. via email), that the technical spectrum is working without error and that data are processed and recorded. Thus, pre-testing the research design is value bale to discover expectancies before starting the primary research effort.

For the pre-test, 22 students of the University of Twente have been asked to fill in the questionnaire and hand back their feedback, positive or negative so that the questionnaire could possibly be improved. Participants were of German and Dutch heritage, and 1/3 had one entrepreneurial parent, 2/3 none. The entire questionnaire was tested, not only specific subparts, in the exact format as it would have been sent out at a later point in time. This style of pre-testing has the advantage to find a full, appropriate pre-test sample (Babbie, 1990). The results of the pre-test served to clear up ambiguity that certain questions raised, especially with regards to the SPS measurement. Using the method of pre-testing, it could be ensured that the future respondents will be able to fill in the questionnaire to their fullest capabilities and without suffering lack of understanding or comprehension. Valuable insights were given onto clearer formulations, more examples, the overall survey design, slight grammatical mistakes based on formulation and the logical structure of the items. Consequently, minor changes had to be done resulting out of the pre-test.

Please find the feedback and the resulting adaptations of the questionnaire in table 6.

Table 6 Feedback pre-test questionnaire

Feedback	Adaptation
Are you a student? Yes/No – after clicking “No”, non-students could exit the questionnaire	Non-students are directly forwarded to the last segment of the questionnaire and are, therefore, not asked to spend time on the questionnaire
Type of student was not clear, some filled in HBO	Question “Are you a student?” has been changed to “Are you a student at the University of Twente?”
Detailed differentiation on study program seems irrelevant	Study program was generalized into two categories
Some questions of the SPS measurement scale are not easily formulated	Examples were given to some items to give a clearer perspective on what the questions aim at
What if my parents still are entrepreneurs?	Changed “Have your parents been entrepreneurs?” to “Are or have your parents been entrepreneurs?”
Difficult wording in the SPS scale	Included synonyms of the words underneath the question
A progress bar would be nice to stay motivated, as you can anticipate how many questions are still to come	Included progress bar
What if I already own my own business? There is no option to state that somewhere	Control variable “Own business” was added

Additional feedback was provided by the student sample group of the pre-test in form of written feedback at the end of the test version where the option for written feedback was given. This has proven as very valuable and will also remain in the questionnaire for the final version. The cover letter, which was aimed at introducing the research, was improved. This is crucial, as the cover text is the first thing participants see and read when answering a questionnaire. A short introduction about the scope of the research, the content and the purpose of the research as well as the expected benefits for each participant were stated. A progress bar was included, after one participant stressed that he lacked motivation at the end, as he did not know much more items were still to come and perceived motivation is higher when the end is in sight. The pretesting also helped to indicate a necessary timeframe to fill in the questionnaire, which averaged at 8 minutes.

The pre-test sample was tested via SPSS on internal validity and reliability. The conducted factor analysis resulted in factors complementing the literature, which was ideal. The Cronbach’s alpha score resulted in a .9 for all scales except for OR 1.2, which scored below .5 and was therefore unacceptable.

The 3-item scale showed an internal consistency of .113. This could have occurred due to the small scale of the pre-test, thus for the real test is going to stay in for now. However, OR was tested twice and the other 5-item scale had good internal consistency of .887. Consequently, all main items of this research can be measured by the means of this questionnaire based on the pre-test results.

4. Data analysis

4.1 Preliminary data analysis

Initially, 185 (N=185) respondents replied on the questionnaire. The online questionnaire was publicly accessible for precisely one month. Several respondents did not meet the inclusion criteria, as they were no students or had not answered all of the questions. Therefore, the final sample consisted of 163 respondents, indicating a total drop-off rate of 11.9%. The sample was further reduced based on fulfilment of the strata. Once a stratum reached the required respondents, it was closed, resulting in 103 respondents (n=103).

Prior to the analyses, negative worded items were reversed. This was necessary for items of the Big Five and OR. Followed by computing the total score by taking the mean of the different items. As argued by Pallant (2005), the total scores based on the mean are easier to interpret. In the next chapter, an explanation of the analytical procedures will be described.

The initial descriptive statistics showed 66 males (64.1%) and 37 females (35.9%), of which 57 students were bachelor students (55.3%), 40 were master students (38.8%), and 6 PhD students (5.8%). Furthermore, 35 students (34%) studied a social study, while a majority of 68 students (66%) belonged to MINT study. From this can be concluded that the majority of the respondents is male. More than half of the students at the UT study for their bachelor's degree, while only a small percentage is affiliated with the UT while studying for their PhD. Moreover, more than half of the student's studies in a MINT related study which can be contributed to the fact that the UT is a technical university, the same argument can be applied to the distribution of male/female.

The other demographics show that the majority of the sample was Dutch (56.3%), followed by German (17.5%). The remainder of respondents were all international from varying countries like India, Vietnam, Bulgaria, Colombia etc. The age of the respondents was on average 22.9 years (SD = 2.77), ranging from 19 to 30. 18 is the average minimum age to start university in the Netherlands, while PhD'ers are on average somewhere in their mid to late 20's. This age range is not uncommon in a student sample (Bryman & Bell, 2011).

Other characteristics show that 18.4 percent of the respondents are currently active as an entrepreneur. Additionally, more than half (57.3%) of the respondents do not have entrepreneurs as

parents, while 31.1 % have one entrepreneurial parent and 11.7% have both parents working as an entrepreneur. Moreover, 50 respondents (48.5%) confirmed having had any form of entrepreneurship courses, while 44.7% did not have any courses related to the subject and 6.8% did not know whether they did or did not.

4.2 Statistical Analysis

The hypotheses of this research concern 3 models of increasing depth. The first model is concerned with solely the relation of SPS on entrepreneurial behaviour like OR and EI. For the concepts of SPS, OR, EI and ETP the mean sum scores were calculated for analysis. To control the outcomes for possible cause and effect, the relation was controlled for gender, student entrepreneurship, parental entrepreneurship, entrepreneurial education, and study direction. The applicable analysis is a standard multiple regression analysis (Hair et al., 2014; Pallant, 2005).

Model 2 and 3 involve hypotheses focussing on how SPS is related to entrepreneurial behaviour and the moderating role of the ETP and the Big Five factors in this relation. Since the research question involves the possible interaction of certain moderators, a moderated regression analysis has been applied. These relationships were tested for model fitness, statistical significance, estimated model coefficients and the statistical significance of the independent variables. In order to calculate the moderators which varied due to SPS and OR being the independent variable of the hypothesis, the main predictor (SPS or OR) was multiplied by the centered variable of ETP as well as each of the individual Big Five traits. This resulted in two separate moderator variables for measuring ETP in the relation between SPS and OR/EI and ETP in the relation between OR and EI. Centering independent variables has been found to reduce multicollinearity in the predictor variables, which is an important assumption in testing multiple regressions (Aiken & West, 1991; Pallant, 2005).

4.3 Assumptions

Within the multiple regression analysis, it is researched how the multiple independent variables affect the dependent variable and which is the strongest predictor of the dependent variable (Hair et al., 2014).

Prior to the analyses, certain statistical assumptions were made and were checked whether they have to be met. While the first layer of hypotheses only requires a check for violation of the assumption of linearity and homoscedasticity. The second and third layer concerns a multiple regression, which assumptions include: sample size, multicollinearity, outliers and normality, linearity, homoscedasticity and independence of residuals (Pallant, 2005). The assumptions of the hypotheses

from both researchers will be described and checked in the following, while providing a graphical representation for concrete understanding.

4.3.1 Linearity & homoscedasticity of model 1

H1.1 SPS - EI

The scatterplot (figure 3) suggests that the correlation between SPS and EI is low due to the random spread of the data points. A random distribution of plots indicates no possible relation between the two variables, neither is the scatterplot highlighting any major outliers that may diffuse the outcome.

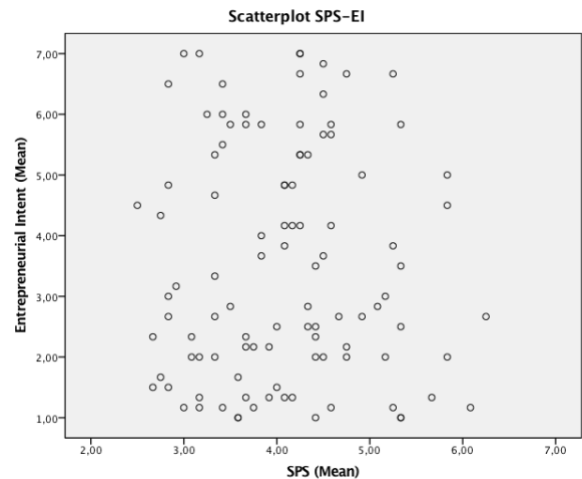


Figure 3 Scatterplot SPS - EI

H1.2 SPS - OR

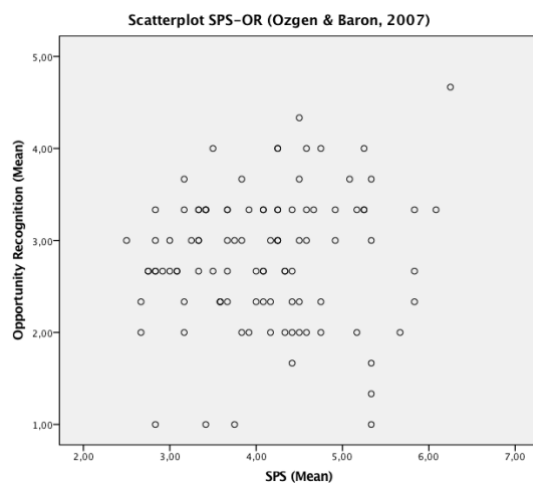


Figure 4 Scatterplot SPS - OR1

From the scatterplot based on the OR scale developed by Ozgen & Baron (2007), it can be suggested that there is a low correlation. There is one outlier scoring both high on OR and SPS.

From the scatterplot based on the OR scale developed by Kuckertz et al. (2017), it can be suggested that there is a very low to no correlation due to the random distribution of the plots. No outliers are detected based on the scatterplot.

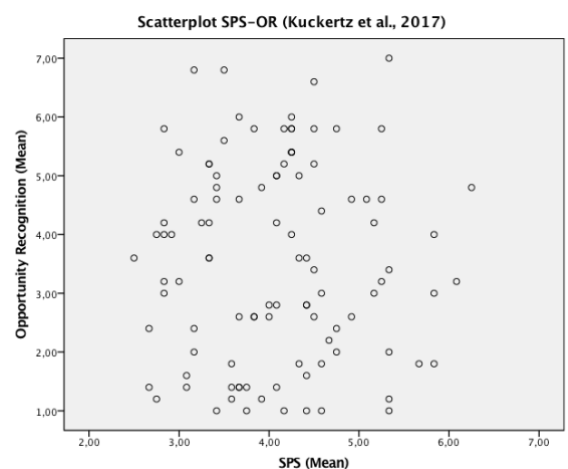


Figure 5 Scatterplot SPS - OR2

H1.3 OR-EI

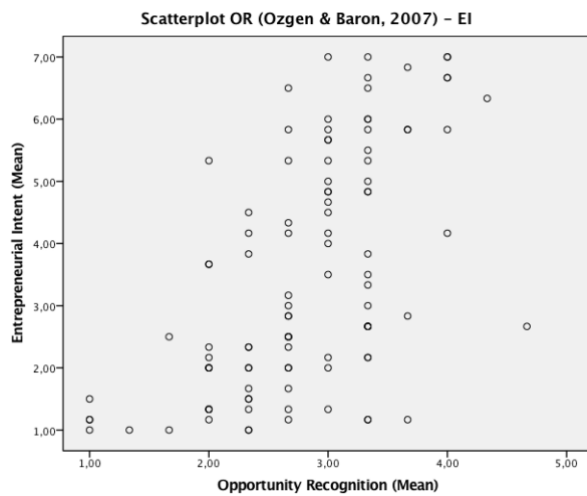


Figure 6 Scatterplot OR1 - EI

The scatterplot based on the OR scale of Kuckertz et al., (2017) (figure 7) suggests a medium correlation. As before, an upward trend can be detected, suggesting a positive relation between the two constructs. Also, there appears to be two outliers.

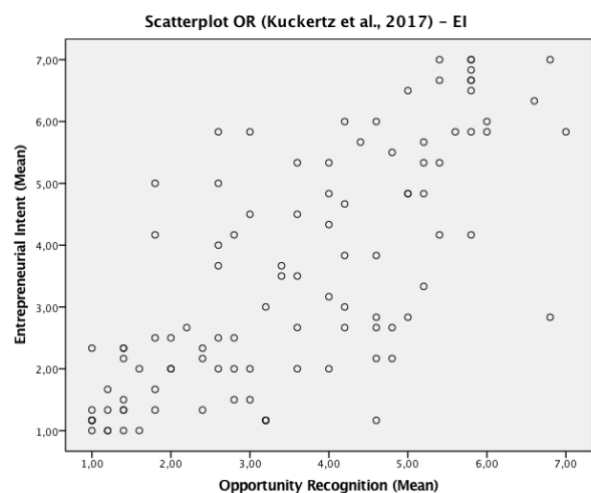


Figure 7 Scatterplot OR2 - EI

4.3.2 Sample size - model 2 & 3

As previously discussed, the sample size has been designed according to the desired power and ES and significance criterion (Cohen, 1992; Hair et al., 2014). Based on a significance level of .05 and an ES of .15 and eight independent variables, the required sample should consist of at least 100. Therefore, this assumption is met based on the fact that $N = 103$ (Hair et al., 2014).

4.3.3 Multicollinearity & singularity – model 2 & 3

When the relationship between independent variables is highly correlated, the phenomenon is called multicollinearity, whereas singularity is describing the case where one independent variable is in fact a combination of other independent variables (Pallant, 2005).

In the case of this research regarding H2.1, the Pearson correlations show values below .3 (.055

(moderator) and -.024 (SPS), indicating no relation. Furthermore, the correlation between the independent variable is high (.838). According to Pallant (2005), this should not be higher than .7. Therefore, a centralized composite variable is created. This does not alter the correlation of SPS (-.024) but does for the moderator ETP (-.179). However, this is still below .3. The largest effect is noticeable in the correlation between the independent variables (.230) and are therefore not bivariate correlated. Additionally, the results of the Tolerance and VIF shows no violations indicating multicollinearity, as Tolerance is higher than .10 and VIF less than 10 (.947 and 1.056, respectively) (Pallant, 2005).

H2.2 assumes that the positive relationship between SPS and OR is moderated by ETP. The correlation matrix indicates again values of below .3 (-.006 (SPS) and -.091 (moderator ETP)) for the 5-item OR measurement and the 3-item measurement (.117 (SPS) and .032 (moderator)). Thereby, both are indicating no significant relationship. The Tolerance and VIF show .947 and 1.056 respectively. Therefore, no signs of multicollinearity could be statistically outlined.

H2.3 hypothesizes an effect of ETP on the relationship between OR and EI. The correlation matrix shows values of -.179 and .733 for the moderator and OR, respectively. The bivariate correlation shows a -.091, which indicates no violations. Furthermore, the Tolerance and VIF show no violations, .992 and 1.008 respectively.

In the third set of hypotheses, H3.1 assumes a moderating effect by each of the Big Five individually on SPS negatively influencing EI. The correlation matrix (table 7) indicates values below .3 for the relation between the dependent and independent constructs. The bivariate correlation shows one value that is below .3, which is concerned with the relation between conscientiousness and extraversion (.334). This, however, is below 0.7 and therefore not violating multicollinearity assumptions. This finding could be confirmed by the collinearity diagnostics in table 9, which show no violations regarding the tolerance (below 1) and the VIF (below 10).

	Correlations						
	EI	SPS	(E)	(A)	(C)	(N)	(O)
EI	1						
SPS	-,024	1					
Extraversion (E)	-,030	,196*	1				
Agreeableness (A)	,213*	-,128	,125	1			
Conscientiousness (C)	-,120	,238*	,334**	-,134	1		
Neuroticism (N)	-,085	,217*	,036	-,262**	,036	1	
Openness (O)	-,145	,297**	,319**	-,150	,124	,153	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 7 Pearson correlation EI, SPS & Big Five factors

Construct	Tolerance	VIF
SPS	.838	1.193
Extraversion	.761	1.314
Agreeableness	.855	1.170
Conscientiousness	.929	1.206
Neuroticism	.890	1.123
Openness	.811	1.233

Table 9 Collinearity diagnostics SPS & Big Five factors

The second set of hypotheses 3.2 refer to the effects of the individual Big Five on the relationship between SPS and OR. Pearson's correlation analysis (table 10) showed no values above .3, which indicates low to non-existent correlation between the dependent variables and the moderator. However, SPS is found to be correlated with extraversion, conscientiousness and neuroticism at .05 significance level, while openness correlates at a .01 level.

	Correlations							
	OR1	OR2	SPS	(E)	(A)	(C)	(N)	(O)
OR1	1							
OR2	,644**	1						
SPS	-,006	,117	1					
Extraversion (E)	,037	,141	,196*	1				
Agreeableness (A)	,086	,025	-,128	,125	1			
Conscientiousness (C)	-,028	,099	,238*	,334**	-,134	1		
Neuroticism (N)	,048	,082	,217*	,036	-,262**	,036	1	
Openness (O)	-,085	-,032	,297**	,319**	-,150	,124	,153	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 10 Pearson correlation OR1, OR2, SPS & Big Five factors

Construct	Tolerance	VIF
Extraversion	.751	1.331
Agreeableness	.855	1.169
Conscientiousness	.853	1.172
Neuroticism	.909	1.200
Openness	.845	1.183
OR (Ozgen & Baron, 2007)	.962	1.040

Table 12 Collinearity diagnostics OR1 & Big Five factors

Construct	Tolerance	VIF
Extraversion	.761	1.314
Agreeableness	.851	1.175
Conscientiousness	.855	1.169
Neuroticism	.911	1.098
Openness	.844	1.184
OR (Kuckert et al., 2017)	.977	1.024

Table 11 Collinearity diagnostics OR2 & Big Five factors

The findings could be confirmed by the collinearity diagnostics in table 11 and 12, which show no violations regarding the tolerance and the VIF.

When checking the correlation (Table 13) of H.3.3, a high correlation between OR and EI becomes distinct (.733 and .576) both showing significant correlations at a .01 level. In this case, OR correlates substantially with EI. This is, however, in line with the findings of literature and is not surprising to outline a statistically proven positive correlation. The other bivariate items are below .7, which indicates no relation with other independent variables. The findings could be confirmed by the collinearity diagnostics in table 12 and 13, which show no violations regarding the tolerance (below 1) and the VIF (below 10).

	Correlations							
	OR1	OR2	EI	(E)	(A)	(C)	(N)	(O)
OR1	1							
OR2	,644**	1						
EI	,733**	,576**	1					
Extraversion (E)	,037	,141	-,030	1				
Agreeableness (A)	,086	,025	,213*	,125	1			
Conscientiousness (C)	-,028	,099	-,120	,334**	-,134	1		
Neuroticism (N)	,048	,082	-,085	,036	-,262**	,036	1	
Openness (O)	-,085	-,032	-,145	,319**	-,150	,124	,153	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 13 Pearson correlation OR1, OR2, EI & Big Five factors

4.3.4. Normality & scatterplots – model 2 & 3

In order to check the normality assumptions of the data, normality plots come in extremely useful. Thereby, plots are more accurate than a histogram, which is not capable of picking up subtle deviations. A P-P plot plots two cumulative distribution functions against each other. When interpreting a P-P Plot, the individual plots are desired to be found as close and straight to the middle line dividing as possible, outlining a normal distribution (De Veaux et al., 2005). In case the line is shaped like an s, this indicates thick tails. An inverted-s form indicates thin tails, on the other hand.

Moderation effect of ETP:

Independent SPS - Dependent variable EI

When considering the P-P plot of EI (figure 9), a s-shape close to the centered line is visible. This indicates normal distribution with slightly thick tails. The scatterplot (figure 8) is randomly distributed, and shows an ideal distribution of data, except for few outliers to the right. The plot does not show an obvious pattern overall.

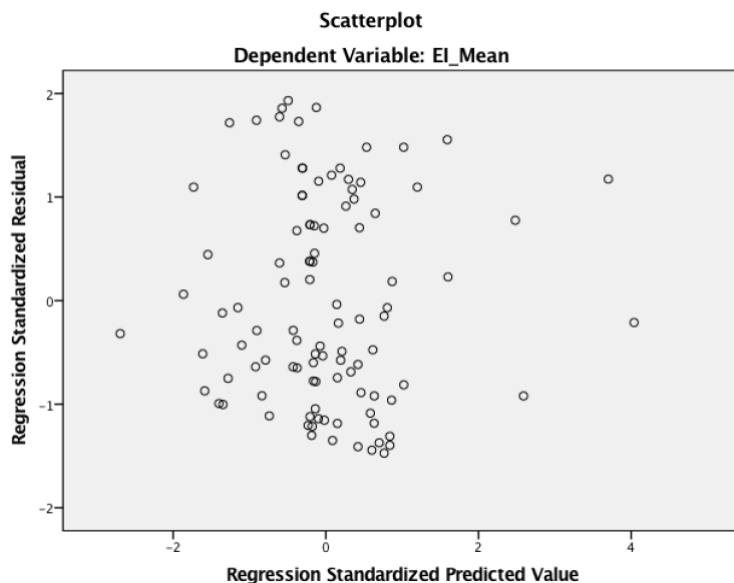


Figure 8 Scatterplot SPS - EI moderated by ETP

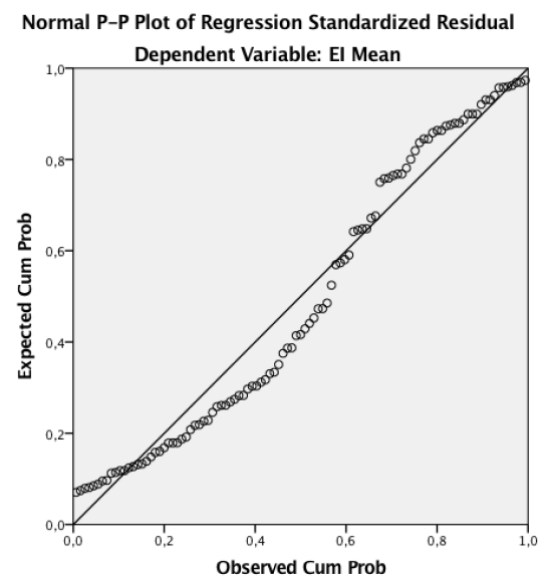


Figure 9 P-P Plot SPS - EI moderated by ETP

Independent SPS - Dependent variable OR1 (Kuckertz, 2017)

The P-P plot for OR1 (figure 10) is relatively straight, highlighting a slight s-curve which identifies thick tails of the normal distribution. Overall, the sample appears to be normally distributed based on the P-P plot. The scatterplot (figure 11), on the other hand, is randomly diffused, and no pattern seems to

become distinct. There are, however, a couple of outliers diffusing the variance. This is supporting the normality assumptions of the variable.

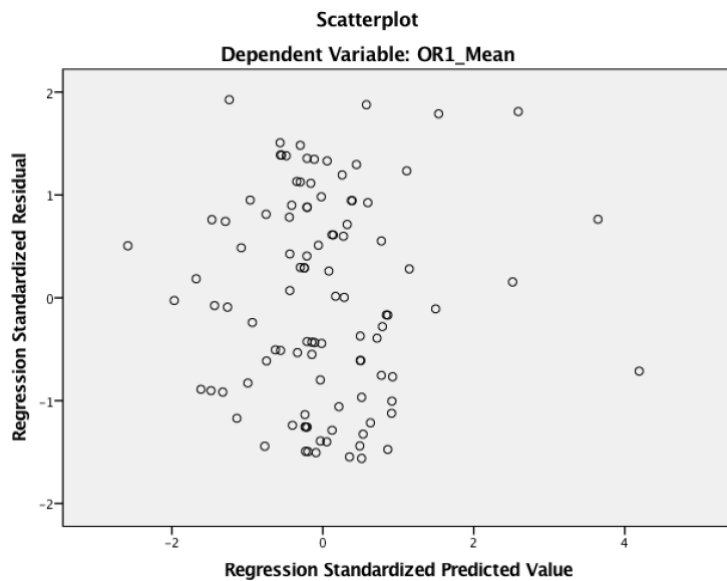


Figure 11 Scatterplot SPS - OR1 moderated by ETP

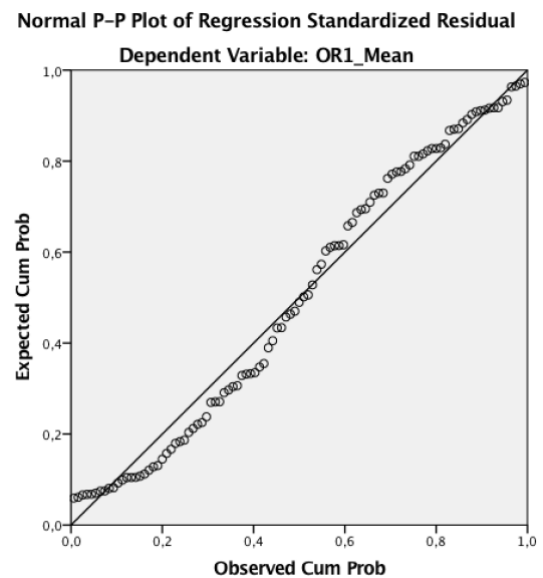


Figure 10 P-P plot SPS - OR1 moderated by ETP

Independent SPS - Dependent variable OR2 (Ozgen & Baron, 2007)

The P-P plot for OR2 is relatively straight, highlighting the slightest, inverted s-curve which identifies thin tails of the normal distribution (Figure 13). Nevertheless, the plots are close to the centered line. Overall, the sample appears to be normally distributed based on the P-P plot. The scatterplot (Figure 12), on the other hand, is randomly diffused, and no pattern seems to become distinct. One outlier seems to be indicated in the plot, though. This is supporting the normality assumptions of the variable.

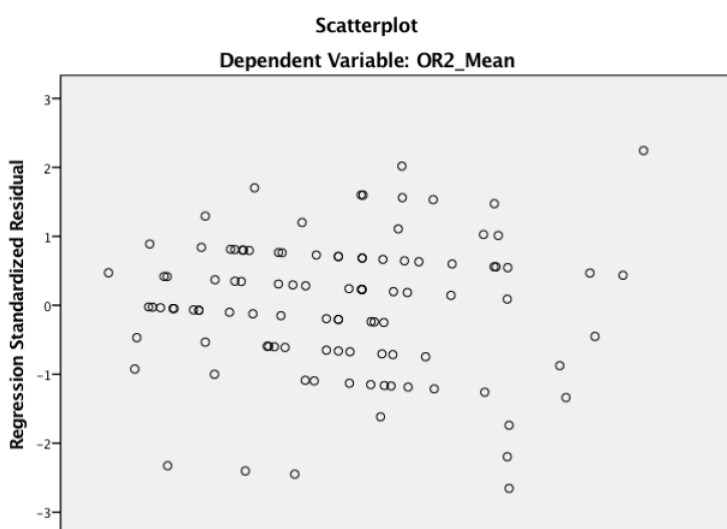


Figure 12 Scatterplot SPS - OR2 moderated by ETP

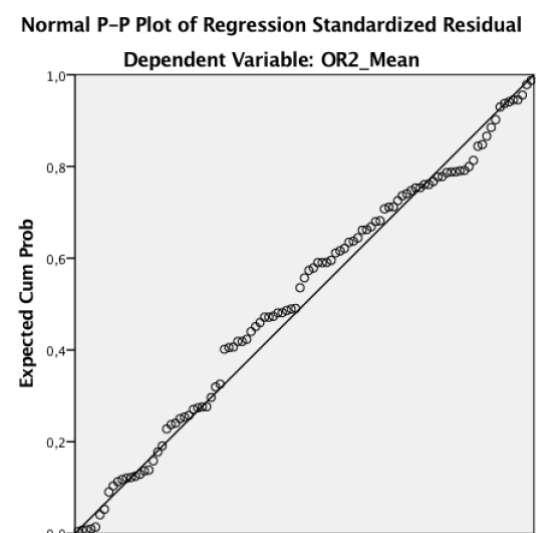


Figure 13 P-P plot SPS - OR2 moderated by ETP

Independent OR1 - Dependent variable EI

The P-P plot (figure 14) demonstrates a very straight line, with plots located close to the central line. The scatterplot (figure 15) displays a very random pattern, which concludes normality assumptions. In the scatterplot, a couple of outliers are visible.

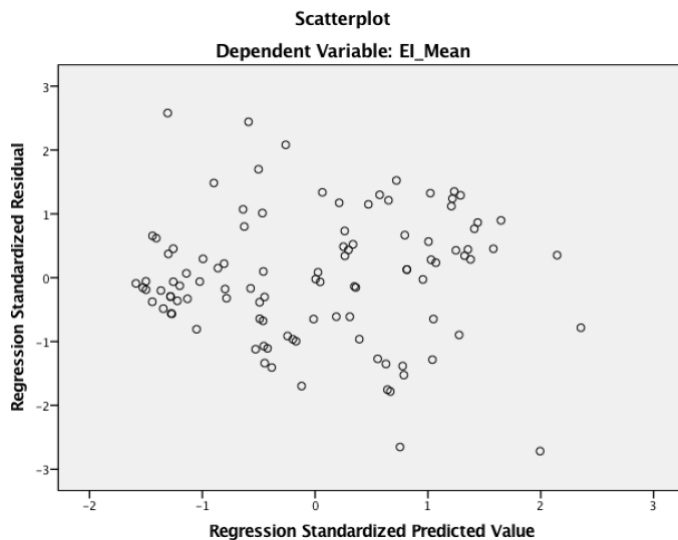


Figure 15 Scatterplot OR1 - EI moderated by ETP

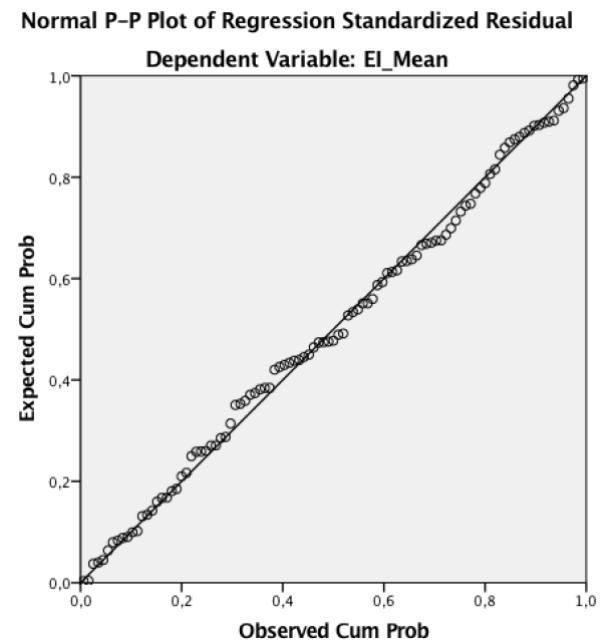


Figure 14 P-P plot OR1 - EI moderated by ETP

Independent OR2 - Dependent variable EI

The P-P plot of EI highlights a very slight s-curve, but the plots are still very close to the centered line which indicates normality. Additionally, the scatterplot is being randomly distributed and no clear pattern can be detected. This confirms the normality assumption. (figure 16 & 17)

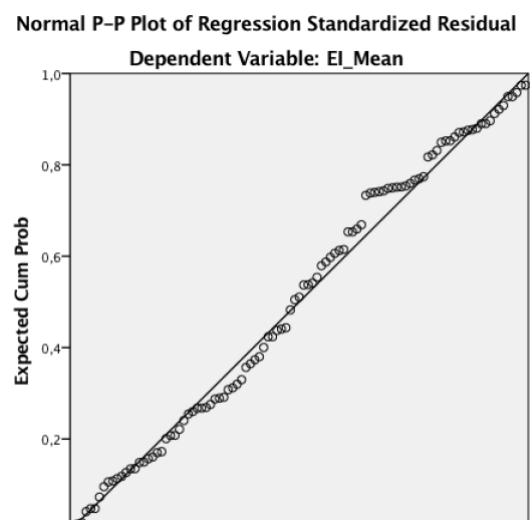


Figure 16 P-P plot OR2 - EI moderated by ETP

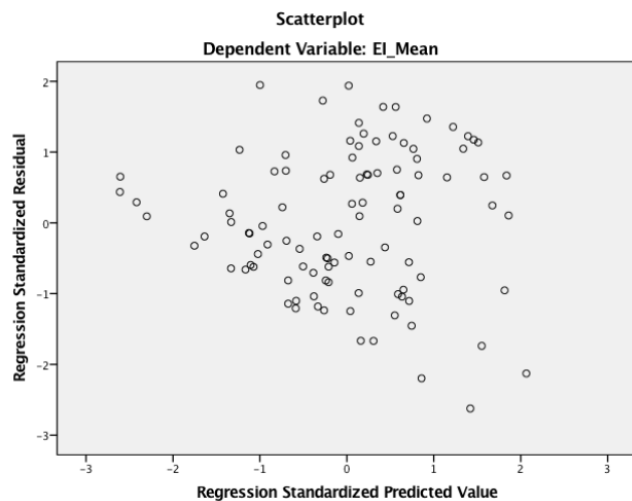


Figure 17 Scatterplot OR2 - EI moderated by ETP

Additionally, the Mahalanobis distances can be used to check for outliers. These were computed in the data file of SPSS. To use this method of checking for outliers, the critical value should be identified. This value is based on an alpha level and the number of independent variables. Following the suggestion of Tabachnick & Fidell (1989), an alpha level of .001 is used. In the case of the second layer of hypotheses, two independent variables constitute for a critical value of 13.82. Table 14 shows an overview of the maximum Mahalanobis distances of all hypotheses. Based on these findings, all hypotheses show the existence of outliers. However, the maximum values of OR, ETP and EI are just slightly exceeding the critical value.

Table 14 Mahalanobis distances SPS, OR1, OR2, EI & ETP

	SPS, ETP & EI	SPS, ETP & OR1	SPS, ETP & OR2	OR1, ETP & EI	OR2, ETP & EI
Max. Mahal. Distance	22.931	22.931	22.931	14.720	14.425

Moderation effect of Big Five factors:

Independent SPS - Dependent variable EI

The P-P plot (figure 18) for the EI mean shows a slight s-curve, close to the centered line, from which can be concluded that thick tails are given, but normality is not violated. The scatterplot (figure 19) shows a dense form at the centre, from which few outliers form. This does not indicate a distribution as random as prior scatter plots, but no linear trend was able to be identified.

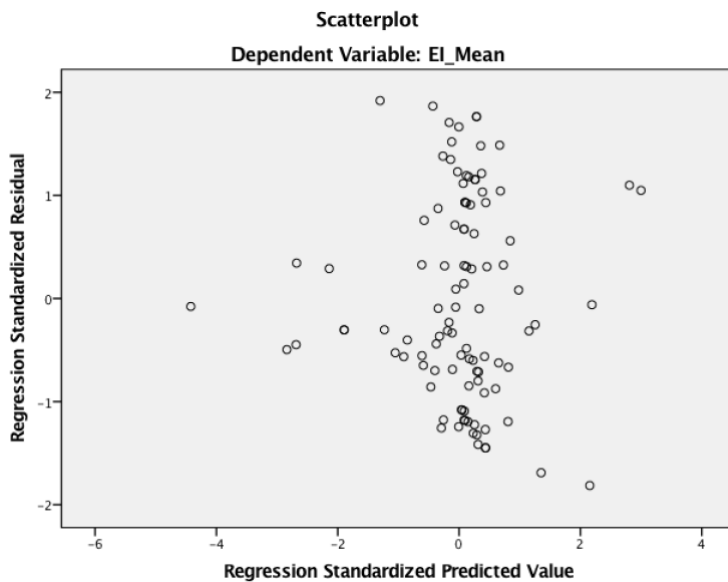


Figure 19 Scatterplot SPS - EI moderated by Big Five factors

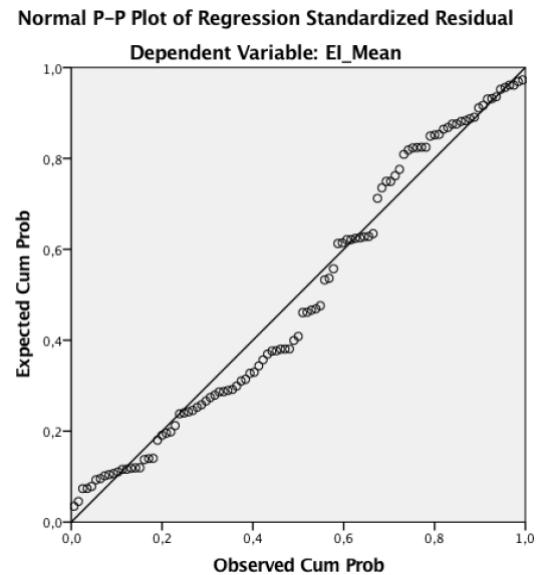


Figure 18 P-P plot SPS - EI moderated by Big Five factors

Independent SPS - Dependent variable OR1

The P-P plot for OR1 (figure 21) shows a slight s-curve, but close to the centered line. This indicates normality and does not violate the assumptions. In the scatterplot (figure 22), plots are randomly

distributed, which aligns with the assumptions as well. A few outliers can be detected, especially skewed to the right.

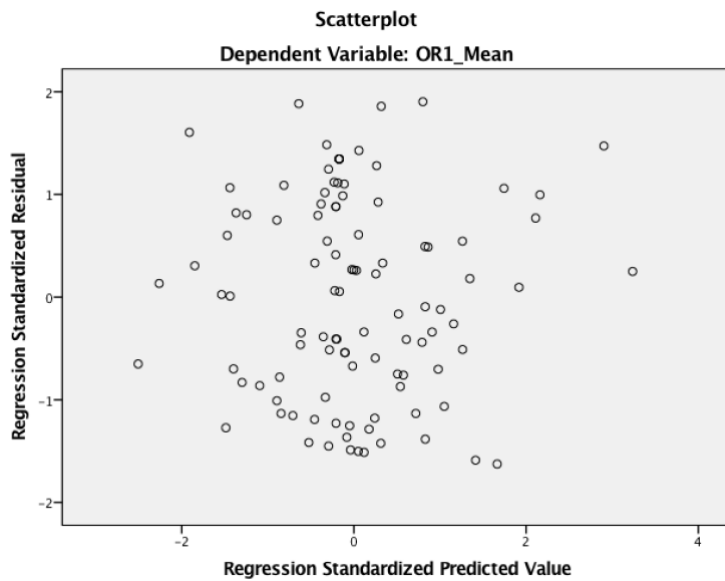


Figure 20 Scatterplot SPS - OR1 moderated by Big Five factors

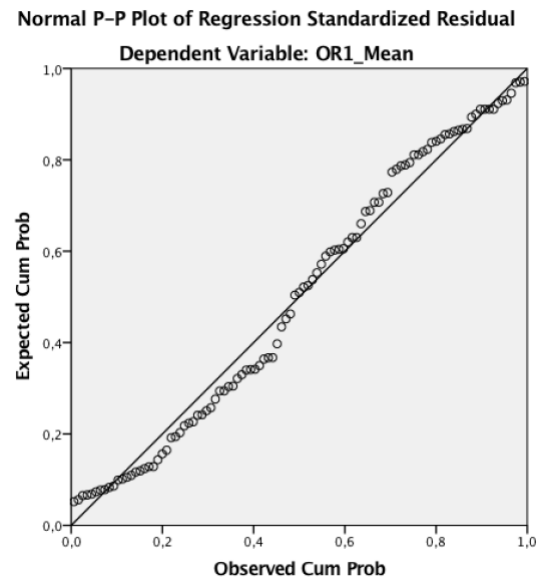


Figure 21 SPS - OR1 moderated by Big Five factors

Independent SPS - Dependent variable OR2

The P-P plot for OR2 (figure 22) is relatively straight, highlighting the slightest, inverted s-curve which identifies thin tails of the normal distribution. Nevertheless, the plots are close to the centered line. Overall, the sample appears to be normally distributed based on the P-P plot. The scatterplot (figure 23) is randomly diffused, and no pattern seems to become distinct. One major outlier could, however, be detected based on this scatterplot.

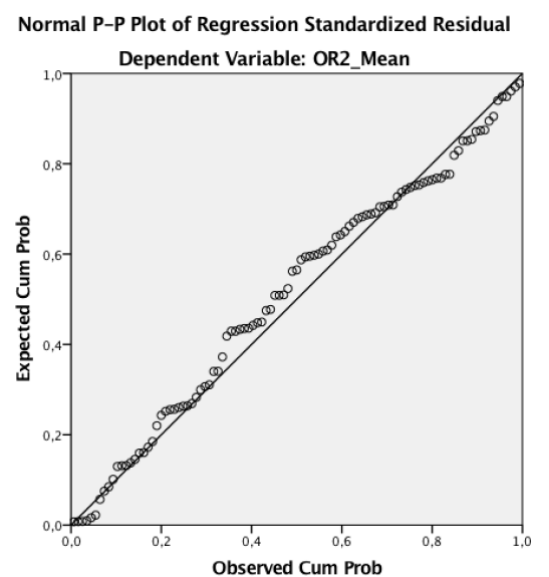


Figure 22 P-P plot SPS - OR2 moderated by Big Five factors

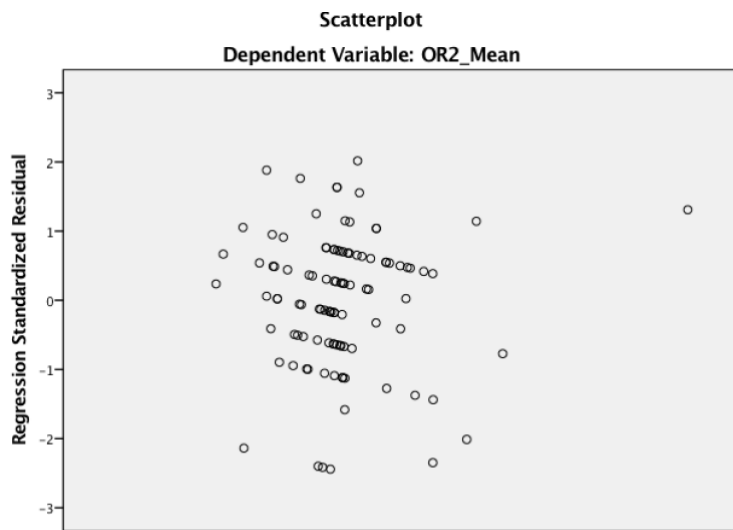


Figure 23 Scatterplot SPS - OR2 moderated by Big Five factors

Independent OR1 - Dependent variable EI

The P-P plot for EI is straight and indicates a normal distribution (figure 24). The plots are close to the centered line. The scatterplot is randomly diffused, and no distinct pattern becomes apparent. A couple of outliers seem to be present, however (figure 25). Overall, a normal distribution can be assumed.

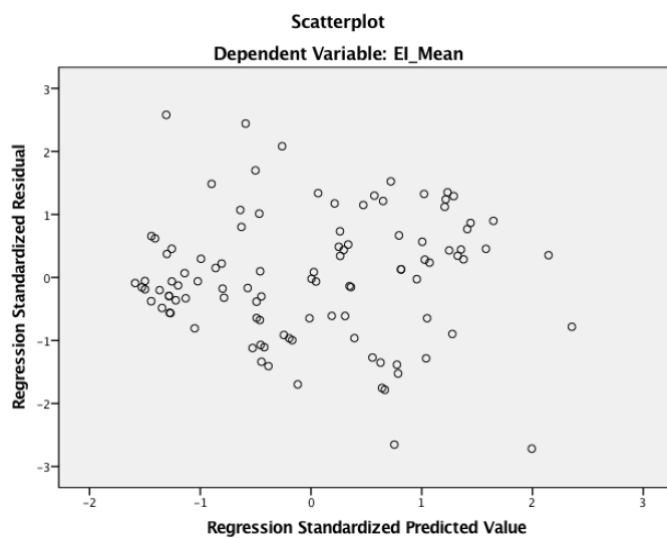


Figure 25 OR1 - EI moderated by Big Five factors

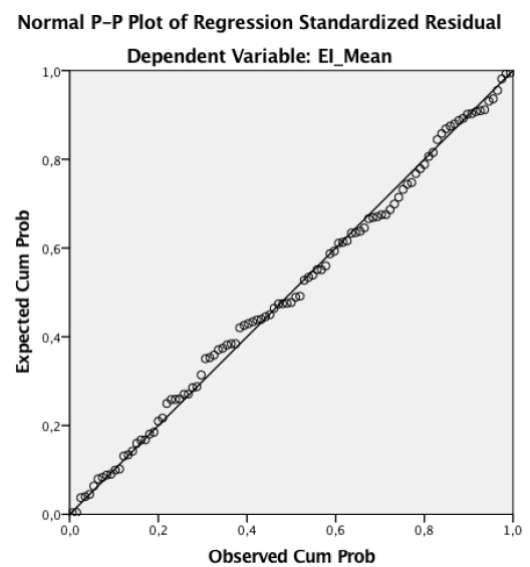


Figure 24 P-P plot OR1 - EI moderated by Big Five factors

Independent OR2 - Dependent variable EI

The P-P plot for EI is straight, and dots are meeting the centered line (figure 26). Therefore, a normal distribution is indicated. The scatterplot (figure 27) is randomly diffused, indicating two small outliers to the right. Overall, a normal distribution can be assumed.

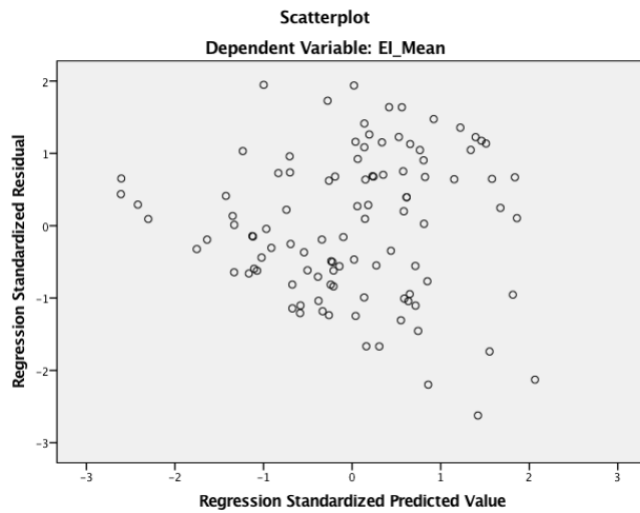


Figure 27 Scatterplot OR2 - EI moderated by Big Five factors

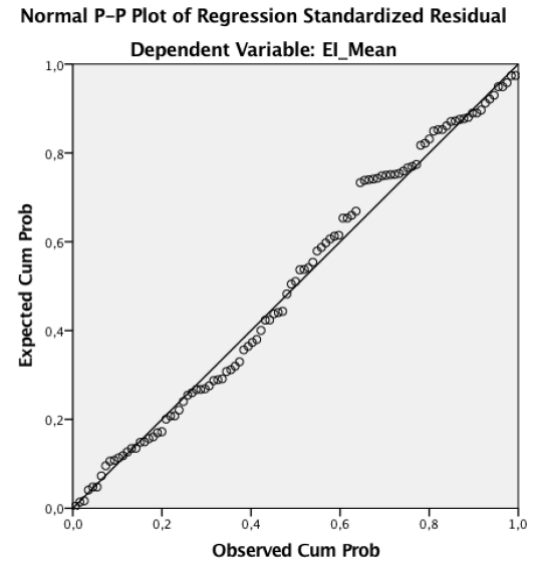


Figure 26 P-P plot OR2 - EI moderated by Big Five factors

Independent OR1 - Dependent variable EI

The line of the P-P plot of EI (figure 28) is very much straight, which fulfils the normality assumption. The scatterplot (figure 29) is very randomly spread, which indicates no pattern of concern. There are, however, few outliers.

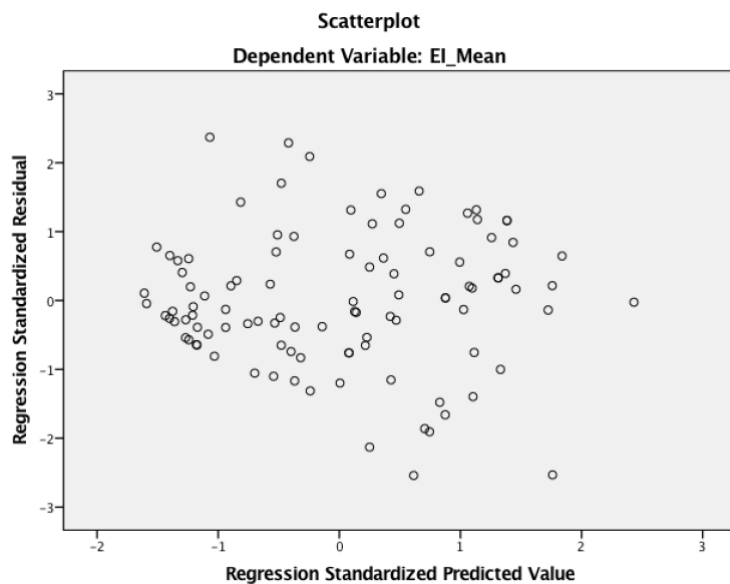


Figure 29 OR1 - EI moderated by Big Five factors

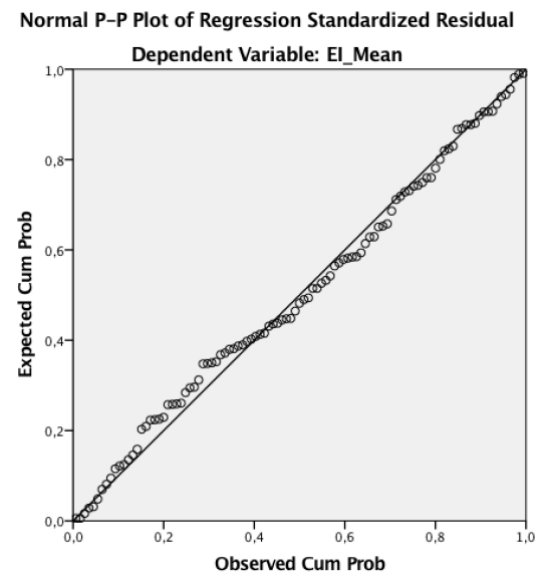


Figure 28 OR1 - EI moderated by Big Five factors

Independent OR2 - Dependent variable EI

The P-P plot for EI (figure 30) indicates a distribution of the plots close to the centered line, which suggest normality. The scatterplot (figure 31) is randomly spread, and no clear pattern is identified, which is in accordance with normality assumptions. No major outliers can be detected based on this scatterplot.

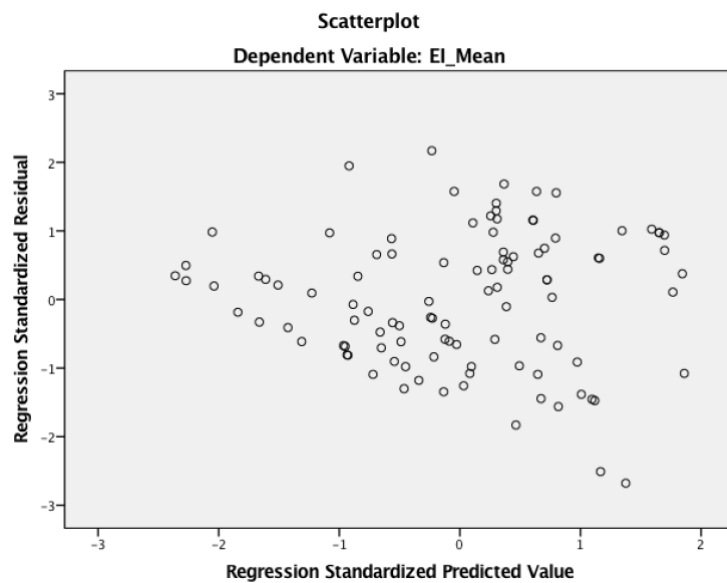


Figure 31 Scatterplot OR2 - EI moderated by Big Five factors

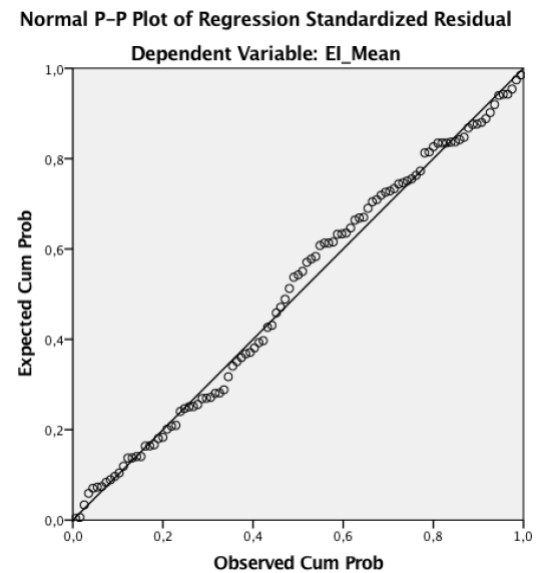


Figure 30 P-P plot OR2 - EI moderated by Big Five factors

Again, an overview of the Mahalanobis values is given. Based on the 6 independent variables, the critical value is 22.46 with an alpha of .001. So, the assumption of outliers is violated. According to Pallant (2005), cases that have much larger values than the critical value may need to be removed from the analysis.

Table 15 Mahalanobis values SPS, OR1, OR2, EI and Big Five factors

	SPS, Big5 & EI	SPS, Big5 & OR1	SPS, Big5 & OR2	OR1, Big5 & EI	OR2, Big5 & EI
Max. Mahal. Distance	47.768	47.768	47.768	47.266	49.198

To conclude the assumptions testing, the assumptions of normality, linearity, homoscedasticity and independence of residuals were controlled. These aspects all refer to “various aspects of the distribution of scores and the underlying relationship between the variables” (Pallant, 2005, p. 149). In order to check these assumptions, the residuals scatter plots were checked.

Table 16 Independence of residuals

Construct	Skewness	Std. Error	Kurtosis	Std. Error
SPS	.331	.238	-.468	.472
OR1 (Kuckertz et al., 2017)	.106	.238	-1.119	.472
OR2 (Ozgen & Baron, 2007)	-.314	.238	.291	.472
EI	.349	.238	-1.234	.472
ETP	-.890*	.238	3.576*	.472
Extraversion (mod)	.51	.238	5.780*	.472
Agreeableness (mod)	-.718	.238	8.381*	.472
Conscientiousness (mod)	-.203	.238	6.981*	.472
Neuroticism (mod)	1.652*	.238	3.921*	.472
Openness (mod)	.539	.238	1.364	.472

Skewness assesses the symmetry of the distribution (Pallant, 2005). Regarding the skewness, the rule of thumb of three times the standard error is applied. The skewness should, therefore, not be three times the std.error. This is given, except for ETP and Neuroticism, which do not fulfil the criteria (Table 15). Overall, it can be concluded that the variables are normally distributed.

The standard reference point to identify a normal distribution breaks down to a kurtosis of 3. A normal distribution has a kurtosis of exactly three (excess = 0) and is called mesokurtic. A distribution with a kurtosis that is <3 is called platykurtic. This indicates, in comparison to the normal distribution, that the tails of the distribution are shorter and thinner, the peak is often lower and broader. Lastly, a distribution with a kurtosis that is >3 is called leptokurtic. In comparison to a normal distribution, leptokurtic distributions have wider tails and a higher, sharper peak (Westfall, 2014).

Based on the results (table 15), the kurtosis level for the main construct (SPS, OR, EI) are showing platykurtic distributions. The ETP is within 3, therefore it is normally distributed. The moderator variables of the Big Five, except for openness, are well above 3, indicating leptokurtic distribution, while openness is platykurtic.

To check the independence of the residuals, a Durbin-Watson test statistic was done. The Durbin Watson test reports a test statistic, with a total value ranging from 0 to 4, where 2 identifies no autocorrelation, 0 to <2 outlines positive autocorrelation and >2 to 4 highlights negative autocorrelation

Thereby, a rule of thumb is that test statistic values in the range of 1.5 to 2.5 are still to be considered relatively normal. Values outside of this range could be cause for concern, as it is suggested that values under 1 or more than 3 are a definite cause for concern (Field 2009). For the current data, the values of the residuals are demonstrated in table 16. The first table (table 17) displays the values of the second layer of hypotheses. As the Durbin-Watson statistic is around 1.5 for each residual, but certainly above 1, it can be concluded that the residuals are independent.

The second table (table 18) Durbin-Watson statistic is around 1.8 for each residual, but certainly above 1, it can be concluded that the residuals are independent.

Table 17 Durbin-Watson statistics SPS, OR1, OR2, EI & ETP

	SPS, ETP & EI	SPS, ETP & OR1	SPS, ETP & OR2	OR1, ETP & EI	OR2, ETP & EI
Durbin-Watson	1.533	1.538	1.523	1.575	1.411

Table 18 Durbin-Watson statistics SPS, OR1, OR2, EI & Big Five factors

	SPS, Big5 & EI	SPS, Big5 & OR1	SPS, Big5 & OR2	OR1, Big5 & EI	OR2, Big5 & EI
Durbin-Watson	1.827	1.815	1.803	1.611	1.483

4.3.5 Correlation analysis

Table 18 contains a Pearson correlation matrix between all constructs and the respective control variables. The implications of the correlations will be evaluated in the discussion part.

		Correlations														
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1.	SPS	1														
2.	OR1	-,006	1													
3.	OR2	,117	,644**	1												
4.	EI	-,024	,733**	,576**	1											
5.	ETP	-,199*	,323**	,256**	,177	1										
6.	Extraversion	,196*	,037	,141	-,030	,078	1									
7.	Agreeableness	-,128	,086	,025	,213*	,071	,125	1								
8.	Conscientiousness	,238*	-,028	,099	-,120	,055	,334**	-,134	1							
9.	Neuroticism	,217*	,048	,082	-,085	,052	,036	-,262**	,036	1						
10.	Openness	,297**	-,085	-,032	-,145	-,134	,319**	-,150	,124	,153	1					
11.	Student Entrepr.	-,145	,278**	,176	,360**	,172	-,009	,236*	,017	,150	-,139	1				
12.	Parents Entrepr.	-,025	,105	,184	,210*	-,065	-,083	,090	-,070	-,021	-,201*	,121	1			
13.	Ent_Education_2	,070	-,378**	-,377**	-,279**	-,247*	-,013	,064	-,029	,011	-,149	,068	,043	1		
14.	MINT	-,073	-,276**	-,186	-,126	-,147	-,114	,061	-,094	-,087	-,144	-,012	-,002	,312**	1	
15.	Social	,083	,339**	,258**	,205*	,213*	,116	-,050	,103	,065	,148	-,006	,029	-,423**	-,917**	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 19 Pearson correlation constructs and control variables

Looking at the correlation between SPS and the other variables, neuroticism seems to be correlated ($p < .001$) as well as the ETP which shows a negative correlation ($p < .05$). It is surprising, that SPS is not showing a significantly positive correlation with conscientiousness, and neither a negative correlation with extraversion. This is against the assumptions of HSPS being introverted and highly conscious. This also contradicts the findings of Aron & Aron (1997). The ETP does not show a correlation with EI, neither does EI with any of the Big Five. Based on the assumptions made prior in the literature review (e.g. Schmitt-Rodermund, 2004), the finding seems odd.

As expected, SPS is neither correlated with MINT or social studies, because of SPS being a personality trait not influencing study preferences. The variables concerning entrepreneurship constructs (OR and EI) show high correlations ($p < .001$) between student entrepreneurship and entrepreneurial education, but no correlation with parent entrepreneurship. This finding is surprising, as parents are thought to be one of the leading influencers when it comes to entrepreneurial intent (Krueger, 1993). Interestingly, OR is positively correlated with social studies, yet negatively correlated with MINT studies. This finding is surprising, as the ability to recognize opportunities should be given independently from the study background, otherwise students with a technical background would not identify economically valuable opportunities that lead into innovation. Regarding EI, social studies show a weak correlation ($p < .05$), while no correlation with MINT studies.

5. Results

The findings of this research include hypotheses of three models. The hypotheses for all layers reached a total of 21 and were divided in half for the aim of this research. Please find a detailed overview of all hypotheses in Appendix II. According to Pallant (2005), the model fitness needs to be evaluated first which is done by assessing the Model Summary and the ANOVA table. Then, each of the independent variables have to be evaluated via the Coefficient table. An overview of all the analyses per hypotheses can be found in Appendix V.

Model 1:

The first model of hypotheses entails the relationship of the main constructs of this research, namely SPS, OR and EI. These hypotheses are tested by the means of a simple linear regression analysis and controlled for by entrepreneurial education, parental entrepreneurship, student entrepreneurship, and study background (MINT or Social). Only of the hypotheses previously explained are reported on.

H1: Sensory Processing Sensitivity is negatively related to Entrepreneurial Intent

The results of the regression analysis for the hypothesis do not indicate a statistically significant relationship between the dependent variable EI and the independent variable SPS ($F = .056$, $p = .813$). This indicates that the trait of SPS does not influence the entrepreneurial intentions of individuals, positively or negatively. When looking at the control variables, there was indeed a strongly positive significant relationship between student entrepreneurship ($p < .05$) as well as a strongly negative significant relationship between prior entrepreneurial education ($p < .05$) and EI. Based on the findings, there was not enough evidence to support the hypothesis. H.1 will be rejected.

Layer 2:

The second layer of hypotheses includes the effects of the moderator ETP on the relationship between SPS, OR and EI. A real moderator effects the strength of the relation between the dependent and independent variable. To interpret the results of the multiple regression the unstandardized Beta coefficient, R Square, the F-statistic and the p-value were considered.

H2.1: The negative relationship between SPS and EI is moderated by the ETP, higher levels of ETP is weakening the negative relationship between SPS and EI.

The results do not indicate a statistically significant relationship between the dependent variable EI and the independent variable SPS, moderated by the ETP ($F = 1.665$, $p = .194$). The moderator effect did neither show a statistically significant relationship ($\beta = -.183$, $p = .073$). This indicates that the trait of SPS does not influence the entrepreneurial intent of individuals and is not moderated by a high ETP. Based on the findings, there was not enough evidence to support the hypothesis. H.2.1 will be rejected.

H2.2: The positive relationship between OR and EI is moderated by the ETP; higher levels of ETP is strengthening the positive relationship between OR and EI.

The results of the multiple regression analysis for the hypothesis do indicate a statistically significant relationship between the dependent variable EI and the independent variable OR, moderated by the ETP ($F = 58.913$, $p < .001$). The R square measured .541, which means that 54.1% of the variance is explained by the model. This indicates that the trait of OR does influence entrepreneurial intent. The moderator effect did, however, not show a statistically significant relationship ($\beta = .059$, $p = .389$). Based on the findings, there was not enough evidence to support the hypothesis. H.2.3 will be rejected.

Layer 3

The third layer of hypotheses include the effects of the individual Big Five dimensions as one moderator each. In this research, extraversion, agreeableness and neuroticism will be considered. This applies to the relationship between all main constructs.

H3.1.1 The negative relationship between SPS and EI will be moderated by extraversion. The more extraverted, the weaker the negative the relationship between SPS and EI becomes.

The results of the multiple regression analysis for the hypothesis do not indicate a statistically significant relationship between the dependent variable EI and the independent variable SPS, moderated by the Big Five trait extraversion ($F = .061$, $p = .941$). This indicates that the trait of SPS in human beings does not influence their entrepreneurial intent and is not moderated by extraversion. The moderator effect did neither show a statistically significant relationship ($\beta = -.026$, $p = .797$). Based on the findings, there was not enough evidence to support the hypothesis. H.3.1.1 will be rejected. Overall, it can be concluded that extraversion does not moderate an effect between individuals high in SPS that show EI.

H3.1.2: The negative relationship between SPS and EI will be moderated by agreeableness. The more agreeable, the stronger the relationship between SPS and EI becomes.

The results of the multiple regression analysis for the hypothesis do not indicate a statistically significant relationship between the dependent variable EI and the independent variable SPS, moderated by the

Big Five trait agreeableness ($F = 2.385$, $p = .097$). This indicates that the trait of SPS in human beings does not influence their entrepreneurial intent and is not moderated by agreeableness. The moderator effect did, however, show a statistically significant positive relationship ($\beta = .214$, $p < .05$). This is expected due to crossing slopes of SPS and agreeableness, as there is no main effect between SPS and EI (Aiken & West, 1991). Based on the findings, there was not enough evidence to support the hypothesis. H.3.1.2 will be rejected.

H3.1.3: The negative relationship between SPS and EI will be moderated by neuroticism. The more neurotic, the stronger the relationship between SPS and EI becomes.

The results of the multiple regression analysis for the hypothesis do not indicate a statistically significant relationship between the dependent variable EI and the independent variable SPS, moderated by the Big Five trait neuroticism ($F = .365$, $p = .695$). This indicates that the trait of SPS in human beings does not influence their entrepreneurial intent and is not moderated by neuroticism. The moderator effect did neither show a statistically significant relationship ($\beta = -.084$, $p = .413$). Based on the findings, there was not enough evidence to support the hypothesis. H.3.1.4 will be rejected. Overall, it can be concluded the effect of neuroticism does not moderate the non-significant relation between SPS and EI.

H3.2.1: The positive relationship between SPS and OR will be moderated by extraversion. The more extraverted, the stronger the relationship between SPS and OR becomes.

The results of the multiple regression analysis for the hypothesis do not indicate a statistically significant relationship between the dependent variable OR and the independent variable SPS, moderated by the Big Five trait extraversion ($F = .080$, $p = .924$). This indicates that the trait of SPS in human beings does not influence their opportunity recognition ability and is not moderated by extraversion. The moderator effect did neither show a statistically significant relationship ($\beta = .04$, $p = .694$). Based on the findings, there was not enough evidence to support the hypothesis. H.3.2.1 will be rejected. Overall, it can be concluded the effect of extraversion does not moderate the non-significant relation between SPS and OR.

Hypothesis 3.2.2: The positive relationship between SPS and OR will be moderated by agreeableness. The more agreeable, the weaker the relationship between SPS and OR becomes.

The results of the multiple regression analysis for the hypothesis do not indicate a statistically significant relationship between the dependent variable OR and the independent variable SPS, moderated by the Big Five trait agreeableness ($F = .37$, $p = .691$). This indicates that the trait of SPS in human beings does

not influence their opportunity recognition ability and is not moderated by agreeableness. The moderator effect did neither show a statistically significant relationship ($\beta = .086$, $p = .393$). Based on the findings, there was not enough evidence to support the hypothesis. H.3.2.2 will be rejected. Overall, it can be concluded the effect of agreeableness does not moderate the non-significant relation between SPS and OR.

H3.3.1: The positive relationship between OR and EI will be moderated by extraversion. The more extraverted, the stronger the relationship between OR and EI becomes.

The results of the multiple regression analysis for the hypothesis do indicate a statistically significant relationship between the dependent variable EI and the independent variable OR, moderated by the Big Five trait extraversion ($F = 59.046$, $p < .001$). The R Square explains 54.1% of the variance in EI by OR. The moderator effect, however, did neither show a statistically significant relationship ($\beta = -.063$, $p = .353$). Based on the findings, there was not enough evidence to support the hypothesis. H.3.3.1 will be rejected. Overall, it can be concluded the effect of extraversion does not moderate the significant relation between OR and EI.

Hypothesis 3.3.2: The positive relationship between OR and EI will be moderated by agreeableness. The more agreeable, the weaker the relationship between OR and EI becomes.

The results of the multiple regression analysis for the hypothesis do indicate a statistically significant relationship between the dependent variable EI and the independent variable OR, moderated by the Big Five trait agreeableness ($F = 59.753$, $p < .001$). The R Squared explains 54.4% of the variance in EI by OR. The moderator effect, however, did neither show a statistically significant relationship ($\beta = -.083$, $p = .22$). Based on the findings, there was not enough evidence to support the hypothesis. H.3.3.2 will be rejected. Overall, it can be concluded the effect of agreeableness does not moderate the significant relation between OR and EI.

6. Discussion

In this section, inferences and conclusion will be drawn from the results from the previous sections. This chapter will be structured as follows. First, a repetition of the hypotheses and the results of the quantitative research will be described, followed by the results of the interviews. Second, the theoretical and managerial implications will be outlined. Last, the limitation and direction for future study directions will be given.

6.1 Key findings of the hypotheses testing

The aim of this research was to explore the relationship between the personality trait SPS and entrepreneurship in the form of OR and EI, accounting for the moderating role of the ETP and the isolated personality traits of extraversion, agreeableness and neuroticism. Overall, all of the hypotheses were rejected. The following section aims at explaining these results by linking it to existing literature.

Based on the first hypothesis, it can be stated that SPS has no relation to the entrepreneurial intent of individuals. It was expected that due to the temperament of highly sensitive people, they would avoid situations which are stressful, risk full and require social behaviour, as entrepreneurship is often associated with. Interestingly, appendix VI shows only minor differences between the different levels of SPS. The results might be due to the relatively young age of the highly sensitive respondents, the lack of self-awareness among and the social desirability of being an entrepreneur within the Netherlands and the University of Twente.

Research shows age, gender, education and previous entrepreneurial experience to be of influence on EI (Hatak, Harms, & Fink, 2014). Young individuals are argued to be more willing to invest in entrepreneurship, especially when stimulated by culture that promotes entrepreneurship as is the case in the Netherlands and at the University of Twente. Individuals, aged between 25 and 34 years, have been found to show high levels of entrepreneurial activity and ambition (Cassia, Criaco, & Minola, 2012) and view entrepreneurship as an effective way of generating income. Entrepreneurial intent among HSP, might be explained by the influence of the reasons explained above as well as their search as to who they are, and what they want.

Checking for the moderating role of the ETP in the second model, the results show that even though the highly sensitive individual scores high on the ETP, it does not influence the relation between SPS and EI. This could possibly be explained by the low reliability of the Big Five measurement scale used in this study. The test was not adequate to measure either the separate Big Five factors nor the ETP. The longer version like the 60- item NEOP Personality Inventors (Costa & McCrae, 1992) and the 50- item International Personality Item Pool (IPIP) (Goldberg, 2006) may show higher reliability.

ETP was neither found to affect the relationship between OR and EI. So, in recognizing opportunities, the more one's personality matches the ETP, it will not affect one's entrepreneurial intent. This result is surprising, since extensive literature finds proof for suggesting this relationship (e.g. Schmitt-Rodermund, 2004). The results of the current study are in line with the findings of the study by Obschonka et al. (2012). Here, they found the ETP no significantly related with entrepreneurial behaviour also. A possible reason for the results of the current study may be, again, the unreliability of the Big Five measurement.

The moderating role of the individual Big Five factors showed interesting results in all relations between SPS, EI and OR. It was found that neither extraversion nor neuroticism influences HSP'ers to

show a higher or lower intent to become an entrepreneur. The moderating role of agreeableness showed a surprising significant positive relation, contradicting existing studies (e.g. Zhao et al., 2010), where agreeableness was found not to be related to EI. It is presumed to be due to a cross-over interaction effect where the slopes of SPS and agreeableness cross. As there is no main effect between SPS and EI, a cross-over interaction may be the cause of the positive moderating role (Aiken & West, 1991). Therefore, this significant positive moderator effect is regarded as a false positive.

The non-significant moderating roles of extraversion and neuroticism on the relation between SPS and EI were as surprising as the significant moderating role of agreeableness. Scholars have found significant relations between SPS and extraversion and neuroticism (Aron & Aron, 1997), as well as significant relations between EI and extraversion and neuroticism (Brandstätter, 2011; Leutner et al., 2014; Zhao et al., 2010). Again, the Big Five measurement may be detrimental in the testing of all hypotheses testing for the moderating role of the Big Five factors.

As it is found that at least the broad character traits like the Big Five factors, probably do not influence the relationship between SPS and EI. It may be proposed that the entrepreneurial intent of HSP is affected differently, e.g. because of necessity or out of a sense of injustice. Baron (2006) finds a link between increased levels of emotional processing and the likelihood of people choosing for them own economic interests. As insinuated in research focussing on mental disorders in entrepreneurship, the type of disorder will likely influence the type of entrepreneur one will be (Wiklund et al., 2018). The genetic character trait SPS may likely influence the type of entrepreneur a HSP becomes which in turn may influence the reason or motivations for showing entrepreneurial intent.

The final hypotheses checking for the moderating roles of extraversion and agreeableness on the relationship between OR and EI shows no moderation effect by either. Meaning that, the relation between OR and EI becomes is not influenced by a more or less extraverted person or agreeable person. Particularly surprising are the results for extraversion. On the one hand, extraversion is associated with assertive behaviour and seeking for excitement and stimulation. An entrepreneurial career may fit this description (Zhao et al., 2010). Agreeableness, on the other hand, is proposed to have a negative effect. Being an entrepreneur requires a certain level of disagreeability; looking out for one's own interest, as well as driving hard bargains and sometimes even manipulating others (Zhao & Seibert, 2006; Zhao et al., 2010). So, the results of this study do not confirm the expectations of the theory. It is assumed to be mainly caused by the inadequate Big Five measurement scale.

Overall, based on the results of the quantitative research method it can be concluded that SPS has no relation to either EI, or OR, and these relationships are neither influenced by extraversion, agreeableness, neuroticism or the ETP. In order to understand the results and find alternative explanations of the relationship between SPS and entrepreneurship, it is asked via interviews what instead motivates highly sensitive individuals to become entrepreneurs and how they recognize

opportunities. To understand the motivation of HSP'ers two sets of interviews have conducted. One, focussing on HSP'ers who decided to become entrepreneurs despite their nature. And the other one, HSP'ers who show high entrepreneurial intent but have not made any serious attempt at doing so, yet.

6.2 Key findings of interviews

What motivates HSP to become an entrepreneur? More specifically, how do circumstances, motivations and goals influence entrepreneurial intent and how is opportunity recognition related to SPS?

The finding that character traits do not clearly explain the link between ideas and action, started scholars to rediscover motivational theories (Carsrud & Brännback, 2011). To better understand the outcomes of the questionnaire and indicate motivators for HSP'ers to become entrepreneurs and barriers for not doing so, the interview was focussed on identifying motivations for showing entrepreneurial intent and the process of opportunity recognition among HSP.

Two respondents were found to meet the requirements of being highly sensitive in combination with being entrepreneurial active. Only one indicated to be available for follow-up questions. As one interview seemed not sufficient, an acquainted highly sensitive entrepreneur was asked to join in the interviews. As she is no longer a student, the influence of age has to be taken into consideration (Cassia et al., 2012).

Table 20 shows an overview of the participants who joined in the interview. Unfortunately, after conducting the second interview, the interviewer was of the opinion that the second interviewee did not constitute as highly sensitive and was therefore not included in reasoning results. Reasons for arguing that participant B is not highly sensitive is due to the lack of indication for overstimulation resulting in physical or mental problems, no indication he experiences life more emotionally and no strong intuition or reflective power. Moreover, he seemed to be surprised of the finding. Although there were some similarities with SPS, it seems more probable that another character trait is applicable.

Table 20 Overview interviewees

	PARTICIPANT A	PARTICIPANT B
GENDER	Female	Male
EDUCATIONAL LEVEL	No student	Master
STUDY	BMS background	MINT
SPS SCORE	Category 1 - High	Category 1 – High

ETP SCORE	27 – Low	38 – Medium high
ENTREPRENEURIAL STATUS	Active	Active
ENTREPRENEURIAL INTENT	4.5 - Medium	6.67 - High

Before the decision of becoming self-employed, Participant A never intended to become an entrepreneur. Having both parents working as entrepreneurs gave her clear view on the benefits and disadvantages of entrepreneurship. Becoming an entrepreneur was perceived as stressful and full of insecurity, emotions of which she was aware from a young age.

For the last couple of years, she has been aware of her high sensitivity and it being the cause of some mental issues, like stress and anxiety. Besides being a highly sensitive person, she has been found to be highly intelligent. This is a relatively common combination according to some researchers, but awaits further research (Van Hoof, 2016). The problems she experienced concern primarily difficulty with connecting to people while at the same time experiencing life more emotionally than others in her direct surrounding. She feels different, even stating *“I am not normal”* (17m52s), she argues this has mainly to do with the way she processes information resulting in the opinion of her *“thinking different and feeling different”* (18m16s). To her, this resulted in a lot of unacceptance, stress and sadness, and still does.

The turnaround happened when she became a mother of children who have been found to show the same character traits, both high sensitivity and highly intelligent. From a young age on, she knew she wanted to work with children. She states: *“I always knew I wanted to do something with children, even though I lost sight of that for a while when I started university... it is a dream of mine, not necessary via entrepreneurship but focussed children nonetheless”* (43m39s). Knowing she wanted to work with children, she recognized the opportunity once she saw the struggles of her kids. Since, this realization has been her goal, as she herself knows how it feels to feel different and misunderstood.

Entrepreneurial intent came once she found entrepreneurship fitting to the flexibility requires. As entrepreneurship offers considerable latitude to in crafting their work environment according their personal needs (Wiklund et al., 2018). After being employed for several years she felt unhappy by the fact that she was performing the job someone else wanted her to do. She indicates, *“if I would not have to come back tomorrow, that would also be fine”* (12m34s). Her life partner is even of the opinion that *“she fled out of payed employment”* (34m15s). In paid employment she speaks about never feeling a challenge, involvement or engagement, not by the tasks nor by her colleagues. She feels that this is due to her high SPS and her high intelligence. Ultimately, this was leading to overall dissatisfaction and the need for change, where she based her decisions on her feelings. She argues *“If you listen to your emotions, you will find a solution”* (38m42s).

Participant A feels that entrepreneurship was her only option. At that moment, there were no companies nearby that specialized in either SPS or high intelligence, nor did she want to go back to paid employment if it would not be necessary. If the family would have been dependent on her income, she feels like she would never have chosen for entrepreneurship. If things change, and the family becomes dependent she will look for (part-time) employment. Her attempt at entrepreneurship is formulated as *"I am going to try"* (9m40s) ... *"my goal is not to make tons of money"* (36m02s), simply providing for her family in a way that makes her happy. She states, *"I always thought the insecurity of entrepreneurship is nothing for me, but the awareness of the flexibility it offers is, as that came later"* (12m54s).

Participant A enjoys the benefits of being entrepreneur but struggles with a significant amount of self-doubt which she feels holds her back. She is of the opinion that her self-doubt is mainly caused by her being highly sensitive (29m05s). For this reason, she just recently decided to contact a business coach. *"Someone not specific to her area of expertise but someone that can help her flourish as an entrepreneur"* (28m06s). On the flip side, she argues that because of her high SPS she is better at her job as a children's coach.

Since becoming an entrepreneur participant A argues the stress has become different. Before, *"the stress was the cause of the need to comply to the will and needs of others, while now it is concerned with whether I will succeed and can make enough money to contribute in the provision of my family"* (44m53s). Attempting to relieve stress, she is focussed on solving problems as soon as they occur, attempting at changing the feeling that is the result of it (22m40s). But she seems to accept the stress as ultimately being an entrepreneur makes her feel happy and in control. She has found sports and yoga to be beneficial. However, she is clear on when she stops with entrepreneurship. Once the stress becomes too much and her children suffer from it, she won't hesitate.

According to participant A, being SPS is detrimental in the process of recognizing opportunities. She argues the following; because of her high SPS (and high intelligence) and the implied level of information processing she finds herself to be well at approaching situations emotional and rational, often, too well. When new information is entered in the brain, she quickly finds resemblances to old information stored in the brain. But trying to focus on the rational side of life she quickly sets up roadblocks. This, she argues, influences her opinion of the feasibility of acting on entrepreneurial opportunities significantly. The fear and self-doubt, due to SPS are affecting her not pursuing opportunities (20m20s).

6.3 Discussion of the interview

From one interview no real conclusion can be formed, but assumptions can be made. Based on the literature research and the interviews it is proposed that HSP do not show initial intent because of the implied insecurity and stress. As goals change along the way, entrepreneurship can be used to create the work environment according to the personal needs and wants of the entrepreneur. Thus, using entrepreneurship as a means to an end (Wiklund et al., 2018). In addition, HSP are expected to be better at recognizing opportunities but are sensitive to factors that complicate the opportunities from being realized. Thus, the opportunities created by heuristic and substantive information processing are directly filtered by the perceived feasibility and desirability, decreasing the propensity to act.

Accepting less risk in becoming an entrepreneur seems important for HSP'ers. Participant A would not have become an entrepreneur if her life partner would not have had a steady paying job. It can be argued, due to risk avoiding behaviour, the time between the decision to start a firm and the motivation to act, takes longer. The level of reflection and fear of failure for an HSP, is likely to result in more overstimulation and stress as opposed to other individuals thinking about entrepreneurship.

It can be argued that, in the case of participant A, she became an entrepreneur out of lifestyle choice. Lifestyle entrepreneurs are defined as: *"individuals who owned and operate businesses closely aligned with their personal values, interests, and passions"* (Marcketti, Niehm, & Fuloria, 2006, p.241). Although, she voluntarily chose to leave her employment, there seemed to be a greater mental health risk if she did not. Thus, her quality of life was found to be of more importance than economic reasons. Lifestyle entrepreneurs become entrepreneurs not because of the career but to achieve self-fulfilment (Marcketti et al., 2006). Especially in the case of participant A, the desire was to earn a respectable living by doing something self-fulfilling and being able to spend time with her family. As HSP are highly emotional and tend to conform to the needs of others, it seems plausible to assume when the decision of entrepreneurship is made, highly sensitive individuals tend to pursue something that is close to their heart.

About the exact motivations driving opportunity recognition for highly sensitive individuals remains some speculation. Theory acknowledges a link between SPS and creativity which in turn is related to OR. In the case of participant A, it seems she is well able to recognize opportunities, and also claims to be better at it than others in her surroundings. As, recognizing the opportunity involves heuristic and substantive processing; this is not surprising. However, the number of stimuli entered may be of crucial influence. If the amount of relevant and useful information is too much, information overload is the result (Bawden & Robinson, 2009). As HSP process information deeper, this overload may occur sooner as opposed to 'normal' people. So, under the right circumstance a HSP may be better

at recognizing opportunities but may become detrimental when confronted with too much stimuli. This suggest an inverted U-curve relationship on the ability of recognizing opportunity among HSP.

6.4 Theoretical and Managerial Implications

The current study has been able to make several theoretical and managerial implications. The findings of the current research are important to the field of entrepreneurship and for the research on SPS. Although, the results of the study have not been able to proof a relationship between SPS and OR or EI. SPS has further advanced into the field of business and management. Furthermore, by introducing the character trait SPS in the study of OR and EI, this study aided at the exploration of the role of character traits in entrepreneurship aiming at the development of novel insights and theories, that in turn, hopefully benefit the development of theories on career choice and psychology of work.

The argument that certain traits are advantageous and provide benefits in the execution of some entrepreneurial tasks can still be made (Wiklund et al., 2018). It may be proposed, with the right amount of stimulation, a HSP is better equipped in recognizing business opportunities. First, as argued previously, OR is linked to heuristic and substantive processing, the linking of old information with new information into ideas for new ventures. A type of information processing often used by HSP. Second, high positive affect can facilitate OR (Baron, 2008). HSP tend to experience life more emotional, high negative and high positive affect. This affect is related to creativity which is also found of influence on OR. The assumption of certain people being better at specific entrepreneurial task has already been linked to mental disorders like ADHD and dyslexia (Wiklund et al., 2018). ADHD is found to be related to higher levels of creativity, that suggests an enhanced ability of recognizing opportunities. A similar assumption can be made for SPS as they process information on a deeper level, however, due to their tendency to reflect, the creative thinking process might get constrained.

The relationship between EI and SPS seems to be primarily influenced by the perceived stress that is involved in entrepreneurship. Therefore, a deeper understanding of the different aspects of the entrepreneurial process that is thought to result in stress for HSP is required. This insight is further proof of the necessity of focussing research on the stress-inducing and stress-releasing relationships in entrepreneurship (Wiklund et al., 2018). Also, exploring the potential stressors is assumed to offer insight on how to build resilience (Wiklund et al., 2018). Studies show mixed results on the entrepreneurship-stress relationship, due to job design stress is decreased, while the long working hours increase stress (Wiklund et al., 2018).

The relationship between childhood environment, entrepreneurship and character traits like SPS seem to be of influence on entrepreneurial intent. Based on the interview, it can be assumed that one of the causes for a low initial entrepreneurial intent was due to the example of the father. Living

with an entrepreneur, is generally stressful for the loved ones because of the uncertainty surrounding e.g. income (Wiklund et al., 2018). Highly sensitive people, even more aware of their surroundings and the emotions of others are even more perceptible for this stress.

In a more practical sense, the results of this study should be taken into consideration by universities, career counselling organizations and government agencies. Awareness among universities is essential, especially because of the increased number of students with mental health issues, such as depression and anxiety (Krause, 2017). By being aware of the personality of students, universities can act more promptly and maybe even prevent mental health issues. By creating support systems with special training programs, career agencies and/or government agencies, can help HS individuals in their personal and/or work life.

6.5 Limitations & future research

This current research is not without its limitations. This section will describe the main limitations and argue for improvements for future research.

First, as this research focusses on SPS and its relation to entrepreneurial behaviour, moderated by the Big Five factors, several well-known measurement scales have been used in the self-completion questionnaires. Although, the questionnaires offer advantages like anonymity and cost reduction, the results are not objective. Future research should therefore make use of more objective methods, e.g. by interviews.

Second, the current study attempts to triangulate the results from the quantitative method with the qualitative method of interviews. However, only one interview was conducted that met the requirements. Since interviews are conducted to obtain shared experiences, feelings, perceptions and opinions of people regarding a certain topic, one interview does not suffice to base a deeper understanding of the topic that can be generalized (Phellas et al., 2011). Consequently, future research should attempt including more interviews.

Third, measuring SPS can only be done via the measurement scale created by Aron & Aron (1997). All research relies on this scale. Current research focusses only on further validating the measurement scale. Future research should focus on developing new scales. Another line of research within the development of scales for SPS is the adaptation of cultural differences within the scale. Based on the conflicting results of the quantitative and qualitative results of participant B, it is advised to develop a measurement scale that is generalizable to other cultures and languages (Yano & Oishi, 2018). Currently, the scale is only available in German, English and Dutch.

Fourth, the measurement scale of the Big Five showed a low internal reliability. Therefore, the results should be interpreted with caution. The confirmatory factor analysis of the Big Five scale

confirmed five factors, but the internal reliability was found to be of low reliability ($\alpha = .543$). The individual Cronbach's Alpha's of the Big Five showed low reliability for agreeableness, conscientiousness and openness to experience. These findings are similar to the ones found by Rammstedt (2007). However, the approach used to calculate the Cronbach's alpha is oddly based on a mean measurement. Reviewing multiple researches conducted by her, the researcher references not consistently to the same Cronbach's Alpha. Therefore, future research should use another measurement scale. Additionally, the 11-item scale used in this research shows high dispersions between the two questions assigned to each factor. A more elaborate questionnaire might resolve this issue.

Fifth, concerning the research of personality of entrepreneurial behaviour, future research should focus on more narrow traits, specific to entrepreneurship and motivation, instead of the Big Five. Following the research of Rauch & Frese (2007), these traits could include need for achievement, locus of focus, risk tolerance, need for autonomy, trust and impulsivity (Caliendo et al., 2014; Leutner et al., 2014). Or as proposed by the results from the interview, including motivation as link between intention and action (Carsrud & Brännback, 2011).

Final, studies on entrepreneurial behaviour have mostly been done on student samples. Although, this group offers a relatively homogenous group, the generalizability of the results is questionable. Researching nascent entrepreneurs will presumably generate different results, especially in combination with SPS.

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Appendix

I - SLR

Authors	Article Title	Year Published	Addressed Issues	Problem Statement / Research goal	Methodological Philosophy	Findings
Acevedo, B. P., Aron, E. N., Aron, A., Sangster, M. D., Collins, N. & Brown, L. L.	The highly sensitive brain: an fMRI study of sensory processing sensitivity and response to others' emotions	2016	Examination of neutral systems engaged in response to others' emotions	Extended research on SPS by examining the brain activations engaged in processing emotional social stimuli	Quantitative	Activation of brain regions involved in awareness, attention, and action planning. Other neural activations found in regions implicated in the integration of sensory information, emotional meaning making and empathy.
Ahadi, B., & Basharpoor, S.	Relationship between sensory processing sensitivity, personality dimensions and mental health	2010	Provides some associations between sensory processing sensitivity, big five personality dimensions and mental health.	The goal is to examine the relationship between SPS, personality, and mental health. SPS is thought to be the main factor of personal development, but this has to be tested further	Quantitative	Ease of excitation negatively related to affection and emotionality, Positive relationship between sensitivity and openness to experience, Positive relationship between sensitivity and conscientiousness. Sensitivity also directly predicted conscientiousness.
Andresen, M., Goldmann, P., & Volodina, A.	Do Overwhelmed Expatriates Intend to Leave? The Effects of Sensory Processing Sensitivity, Stress, and Social Capital on Expatriates' Turnover Intention	2017	Entering a new country can be emotionally demanding to expatriates. SPS is considered in the context of human resource management and organizational behavior.	The study strives to reveal the effect of resources (SPS and social capital) on stress and turnover intention, to raise awareness of the trait of SPS in the field of HR and to deduce implications for expatriates	Quantitative	26.4% of expatriates show high SPS. SPS influences the levels of stress perceived. The interpretability of results also indicates a 3-class solution, which may be interpreted as high, moderate, and low levels of SPS.
Aron, A., Ketay, S., Hedden, T., Aron, E. N., Rose Markus, H., & Gabrieli, J. D.	Temperament trait of sensory processing sensitivity moderate's cultural differences in neural response	2010	It is explored whether a basic personality trait (sensory processing sensitivity; SPS) might moderate a previously established cultural difference in neural responses when making context-dependent vs context-independent judgments of simple visual stimuli.	This research tests the interaction of SPS with culture in predicting differences in neural response. Additionally, the study questions gene, environment and culture interaction.	Quantitative	Some categories of individuals are less influenced by their cultural background than others., it is especially weaker for individuals with SPS
Aron, E. N., & Aron, A.	Sensory-Processing Sensitivity and Its Relation to Introversion and Emotionality	1997	This research identifies a unidimensional core variable of SPS and demonstrate its partial independence from social introversion and emotionality	The authors review previous conceptualizations of this basic psychobiological difference of SPS and give their own view	Literature review	Both individual and situational differences influence the process of opportunity identification
Aron, E.N., Aron, A., & Jagiellowicz, J.	Sensory Processing Sensitivity: A Review in the Light of the Evolution of Biological Responsivity	2012	SPS in relation to evolutionary biology. The study considers traits relevant to specific hypothesized aspects of SPS: inhibition of behavior, sensitivity to stimuli, depth of processing, and	Does SPS in humans correspond to biological responsivity?	Quantitative	Considers advantages in species for SPS - uniqueness an advantage. SPS is confused with some evolutionary traits. Also, the authors correlated SPS with s-allele of the 5-HTTLPR polymorphism to help inconsistencies with

			emotional/physiological reactivity			predicting depression based on childhood environment
Bakker, K., & Moulden, R	Sensory-processing sensitivity, dispositional mindfulness and negative psychological symptoms.	2012	The study investigates the relationships between SPS, mindfulness and acceptance, and negative affect, using a cross-sectional questionnaire design	The aim of this research is to investigate the relationship between SPS, mindfulness and distress using a cross-sectional methodology in a non-clinical sample	Quantitative	Examined Sensory-Processing Sensitivity (SPS) in relation to negative affect. Investigated the moderating effect of trait mindfulness and acceptance on SPS. SPS only related to anxiety when mindfulness and acceptance were low. Mindfulness and acceptance based treatments may be helpful for those high on SPS
Benham, G.	The Highly Sensitive Person: Stress and physical symptoms reports	2006	Examines whether SPS is associated with self-perceived stress levels and physical health complaints	Little additional research has been done on the construct of PS, though the concepts seems to resonate with many individuals buying the books of Aron. Therefore, they aim of the study was to examine whether SPS is associated with self-perceived stress levels and physical health complaints	Quantitative	SPS is associated with greater stress and more frequent symptoms of ill health. The analysis revealed that SPS is a predictor of health, more powerful even than stress
Brindle, K., Moulden, R., Bakker, K., & Nedeljkovic, M.	Is the relationship between sensory-processing sensitivity and negative affect mediated by emotional regulation?	2015	The study examines the relationship between SPS and the feeling of distress.	The study aimed to investigate the relationships among SPS, emotional regulation, and symptoms of distress (i.e., depression, anxiety, and stress).	Quantitative	An individual's lack of access to emotional regulation strategies, greater awareness of emotion, and lack of acceptance towards feeling distressed, acted as partial mediators between sensory processing sensitivity and symptoms of depression. Combinations of these variables also partially mediated the relationship between sensory-processing sensitivity and symptoms of anxiety and stress.
Carr, M., & Nielsen, T.	A novel Differential Susceptibility framework for the study of nightmares: Evidence for trait sensory processing sensitivity	2017	Nightmares happen due to sensitivity. Sensory processing sensitivity is proposed as a novel trait marker that underlies the unique symptoms and imaginative richness found in nightmare-prone individuals.	The goal of this research is to demonstrate how sensory processing sensitivity may be reflected in the dreams and even waking imaginations of individuals with nightmares.	Quantitative	Nightmare-prone individuals are sensitive and responsive to a wider than normal range of environmental influences. Training directed towards modifying emotion regulation strategies, such as positive psychology or mindfulness, and increasing dream awareness, such as lucid dreaming, may prove beneficial for decreasing nightmare frequency and associated distress.
Evers, A., Rasche, J., & Schabracq, M. J.	High Sensory-Processing Sensitivity at Work	2008	SPS is not a one-dimensional construct. The authors relate it to coherence, alienation, self-efficacy, negative affectivity, and work stress	Some people are more easily disturbed than others - stress complaints at work, and therefore being unable to work	Quantitative	No confirmed negative relationship between meaningfulness and self-efficacy. Results confirm that HSPS does not measure a one-dimensional construct. The main lesson from the results is that an effective intervention should aim at boosting the sense of coherence, self-efficacy, commitment, and affective state of the persons involved

						This allows them to perceive the work as more comprehensible, manageable and meaningful, so that they can effectively influence it, commit to it, and connect with it.
Gearhart, C.C.	Sensory-Processing Sensitivity and Nonverbal Decoding: The effect on listening ability and accuracy	2014	Examines the effect of SPS on nonverbal decoding like identifying emotions from paralinguistic cues.	To investigate whether HSP'ers perform more poorly on nonverbal tasks when exposed to adverse stimulation, and better than non-HSP'ers when not exposed to stimulation	Quantitative	HSP'ers are no worse (and better) at recognizing vocal expressions of emotions than are non-HSP'ers, regardless of whether they are exposed to conditions of stimulation or not.
Gearhart, C.C. & Bodie D.	Sensory-Processing Sensitivity and Communication Apprehension: Dual Influences on Self-Reported Stress in a College Student Sample	2012	Investigation of the influence of SPS on communication apprehension and self-reported stress levels among college students.	Examination of whether communication apprehension is a possible system of a HSP'er, by way of empirically test its relation to SPS. And to investigate the degrees to which CA and SPS relate to academic stress.	Quantitative	(1) measures of SPS and CA are moderately correlated providing preliminary self-report evidence that these two biologically based constructs may share a common origin; (2) both sensory-processing sensitivity and communication apprehension are positively associated with levels of college stress; and (3) the magnitude of the association between SPS and stress is three times that of CA and stress (18.5% versus 6.25% shared variance)
Gerstenberg, F.	Sensory-processing sensitivity predicts performance on a visual search task followed by an increase in perceived stress	2012	SPS in relation to other self-reporting scales, such as the behavioral inhibition and behavioral activation system scales, the Big Five scales, and other health-related self-report scales	Only a few studies have assessed the relation between HSPS and a behavioral test, this study aims to fill this gap.	Quantitative	SPS increases perceived stress. Results were independent of personality constructs and Big Five.
Grimen, H. L. & Diseth, A.	Sensory Processing Sensitivity: Factors of the Highly Sensitive Person Scale and Their relationships to Personality and Subjective Health Complaints	2016	Examines how SPS is related to personality traits of neuroticism, extraversion, and openness and to subjective health complaints.	The literature suggests a relationship between SPS, personality and common health complaints, this needs to be investigated by controlling for personality factor when investigating the relation between SPS and health. Furthermore, is their aim to future validate the measurement for SPS by using the Norwegian version.	Quantitative	SPS factor (EOE, LST and AES combined) is positively predicted by neuroticism and openness and negatively by extraversion. EOE and LST significantly correlated with neuroticism and AES was positively correlated with openness. EOE and LST were negatively correlated with extraversion, but the small, moderate and small respectively.
Jagiellowicz, J., Xu, X., Aron, A., Aron, E., Cao, G., Feng, T., & Weng, W.	The trait of sensory processing sensitivity and neural responses to changes in visual scenes	2011	Study examines the extent to which individual differences in SPS, are associated with neural response in visual areas in response to subtle changes in visual scenes.	The literature suggests that the way sensory information is processed is the key to the temperamental difference characterized as SPS suggests. This research is the first to examine the brain mechanisms that might underlie such a difference.	Qualitative (experiment, first HSP scale, then visual test while undergoing a fMRI)	SPS is associated with significantly greater activation in brain areas involved in high-order visual processing when detecting minor (vs. major) changes in stimuli. These remained significant after controlling for neuroticism and introversion
Jonsson, K., Grim, K., & Kjellgren, A.	Do highly sensitive persons experience more non-ordinary states of consciousness during sensory isolation?	2014	How do highly sensitive individuals perceive flotation tank therapy	To investigate whether or not highly sensitive persons experienced more non-ordinary/altered states of consciousness (ASC) during 45 minutes of	Quantitative	Main finding was that the highly sensitive individuals experienced significantly more ASC during flotation than did the individuals in the low sensitivity group.

				sensory isolation in a flotation tank, than did less sensitive persons.		
Lionetti, F., Aron, A., Aron, E. N., Burns, G. L., Jagiellowicz, J., & Pluess, M	Dandelions, tulips and orchids: evidence for the existence of low-sensitive, medium-sensitive and high-sensitive individuals	2018	Finding a common ground on the measurement and construction of SPS, as well as testing established hypotheses of different authors	The goal of this research is a) to investigate whether environmental sensitivity as measured with the HSP scale is indeed a unitary concept and b) whether HSP data supports the existence of distinct sensitivity categories in the general population as well as c) whether the detected groups to differ based on personality traits and emotional reactivity	Quantitative	A confirmatory factor analysis supported a bifactor structure, which means that the HSP scale consist of both a general sensitivity construct as well as three individual subscales. Both are simultaneously valid rather than mutually exclusive. Additionally, while some people are highly sensitive, vast majority have medium sensitivity and a substantial minority is characterized as particularly low sensitive. It was also found that individuals differ rather in the degree of sensitivity than in the relative composition of the HSP components
Liss, M., Mailloux, J., & Erchull, M. J.	The relationships between sensory processing sensitivity, alexithymia, autism, depression, and anxiety.	2008	Relating SPS' three recently developed factors of sensory processing sensitivity - ease of excitation (EOE), low sensory threshold (LST) and aesthetic sensitivity (AES), with alexithymia, autism symptoms, anxiety, and depression.	The goal is a better understanding of the relationships among sensory processing sensitivity, alexithymia, autistic symptoms, and the clinical outcomes of anxiety and depression.	Quantitative	The EOE and LST factors were related to anxiety and depression; poor social skills, attention to details, and poor communication (symptoms of autism); and difficulty describing and identifying feelings (symptoms of alexithymia). AES was also related to increased anxiety and greater attention to details. AES was related to anxiety but not depression.
Pazda, A. D., & Thorstenson, C. A.	Extraversion predicts a preference for high-chroma colors	2018	Relationship between extraversion and color preference along the chroma dimension	The goal of the research is to measure preferences for colors varying along the spectral property of chroma and test whether extraversion can predict individual differences in these preferences.	Quantitative	Extraversion is related to color preferences along the chroma dimension. This association was present when controlling for the effects of the other Big Five personality traits, sensory-processing sensitivity, positive/negative affect, and sex.
Şengül-İnal, G., & Sümer, N.	Exploring the Multidimensional Structure of Sensory Processing Sensitivity in Turkish Samples	2017	Comparing alternative models to explore the multidimensionality of the Highly sensitive person scale (HSPS).	Aimed to examine the factorial qualities of the HSPS scale, including its factor structure, internal consistency, and potential gender differences.	Quantitative	Multidimensionality of HSPS could be confirmed via two studies, results in a four-factor ESEM solution (sensitivity to external stimuli, aesthetic sensitivity, harm avoidance and sensitivity to overstimulation) which is superior to previously reported alternative models. External validation included the Big Five.
Smolewska, K. A., McCabe, S. B., & Woody, E. Z.	A psychometric evaluation of the Highly Sensitive Person Scale: The components of sensory-processing sensitivity and their relation to the BIS/BAS and “Big Five”	2006	Examines the psychometric properties of the HSPS, and its association with the behavioral inhibition system (BIS) and behavioral activation system (BAS)	Re-examine the psychometric properties of Aron and Aron's (1997) 27-item HSPS with a larger sample, offering more accurate parameter estimates and a reevaluation of its factor structure. Also, this study tries to test Aron & Aron's prediction that SPS is	Quantitative	HSPS is a valid and reliable measure of the construct of SPS. Results support a three-component structure consisting of Aesthetic Sensitivity (AES), Low Sensory Threshold (LST), and Ease of Excitation (EOE).

				associated with a number of personality and neurophysiological constructs.		
Yano, K., & Oishi, K.	The relationships among daily exercise, sensory-processing sensitivity, and depressive tendency in Japanese university students	2018	Investigates SPS and its three subscales to depressive tendencies and the frequency of regular physical exercise	The goal of this research is to report inter-relationships among the three sub-components (LST, EOE, AES) of SPS and bring them in relation to other psychological factors.	Quantitative	LST and EOE were positively related to depressive tendencies, AES was negatively related. Longitudinal approaches are needed to reveal the effect that physical exercise has on the relationships between LST or EOE and depressive tendencies.

II – Overview of all hypotheses

- H 1.1: Sensory Processing Sensitivity is negatively related to Entrepreneurial Intent
- H 1.2: Sensory processing sensitivity is positively related to opportunity recognition ability
- H 1.3: Opportunity recognition ability is positively related to entrepreneurial intent.

H2.1: The negative relationship between SPS and EI is moderated by the ETP, higher levels of ETP is weakening the negative relationship between SPS and EI.

H2.2: The positive relationship between SPS and OR is moderated by the ETP; higher levels of ETP is strengthening the positive relationship between SPS and OR.

H2.3: The positive relationship between OR and EI is moderated by the ETP; higher levels of ETP is strengthening the positive relationship between OR and EI.

H 3.1.1 The negative relationship between SPS and EI will be moderated by extraversion. The more extraverted, the weaker the negative the relationship between SPS and EI becomes.

H 3.1.2: The negative relationship between SPS and EI will be moderated by agreeableness. The more agreeable, the stronger the relationship between SPS and EI becomes.

H 3.1.3: The negative relationship between SPS and EI will be moderated by conscientiousness. The more conscientious, the weaker the negative the relationship between SPS and EI becomes.

H 3.1.4: The negative relationship between SPS and EI will be moderated by neuroticism. The more neurotic, the stronger the relationship between SPS and EI becomes.

H 3.1.5: The negative relationship between SPS and EI will be moderated by openness to new experiences. The more open, the weaker the negative the relationship between SPS and EI becomes.

H 3.2.1: The positive relationship between SPS and OR will be moderated by extraversion. The more extraverted, the stronger the relationship between SPS and OR becomes.

H 3.2.2: The positive relationship between SPS and OR will be moderated by agreeableness. The more agreeable, the weaker the relationship between SPS and OR becomes.

H 3.2.3: The positive relationship between SPS and OR will be moderated by conscientiousness. The more conscientious, the stronger the relationship between SPS and OR becomes.

H 3.2.4: The positive relationship between SPS and OR will be moderated by neuroticism. The more neurotic, the weaker the relationship between SPS and OR becomes.

H 3.2.5: The positive relationship between SPS and OR will be moderated by openness to new experiences. The more open, the stronger the relationship between SPS and OR becomes.

H 3.3.1: The positive relationship between OR and EI will be moderated by extraversion. The more extraverted, the stronger the relationship between OR and EI becomes.

H 3.3.2: The positive relationship between OR and EI will be moderated by agreeableness. The more agreeable, the weaker the relationship between OR and EI becomes.

H 3.3.3: The positive relationship between OR and EI will be moderated by conscientiousness. The more conscientious, the stronger the relationship between OR and EI becomes.

H 3.3.4: The positive relationship between OR and EI will be moderated by neuroticism. The more neurotic, the weaker the relationship between OR and EI becomes.

H 3.3.5: The positive relationship between OR and EI will be moderated by openness to new experiences. The more open, the stronger the relationship between OR and EI becomes.

III - 12-item version of the HSP scale developed by Pluess (Aron & Aron, 2018)

- Do you seem to be aware of subtleties in your environment?
- Are you easily overwhelmed by things like bright lights, strong smells, coarse fabrics, or sirens close by?
- Do you have a rich, complex inner life?
- Do you get rattled when you have a lot to do in a short amount of time?
- Are you deeply moved by the arts or music?
- Are you annoyed when people try to get you to do too many things at once?
- Do you make a point to avoid violent movies and TV shows?
- Do you find it unpleasant to have a lot going on at once?
- Do changes in your life shake you up?
- Do you notice and enjoy delicate or fine scents, tastes, sounds, works of art?
- Are you bothered by intense stimuli, like loud noises or chaotic scenes?
- When you must compete or be observed while performing a task, do you become so nervous or shaky that you do much worse than you would otherwise?

III – Factor analyses

Big Five

KMO and Bartlett's Test

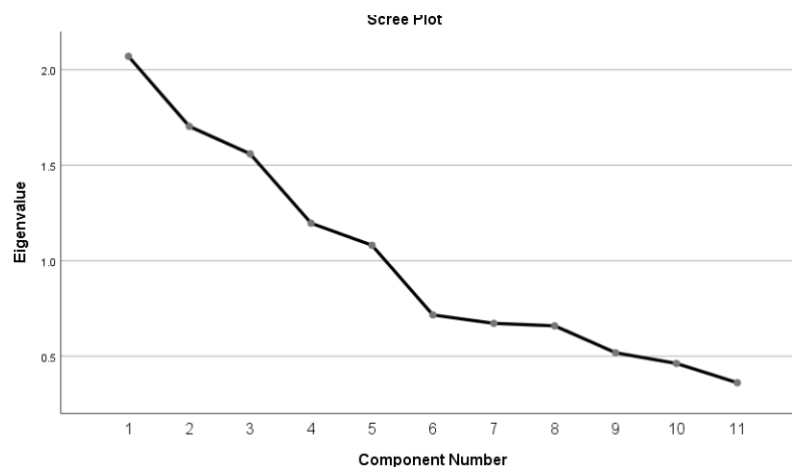
Kaiser-Meyer-Olkin Measure of Sampling Adequacy .532

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.747
Bartlett's Test of Sphericity	Approx. Chi-Square	337.976
	df	66
	Sig.	.000

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.070	18.820	18.820	2.070	18.820	18.820
2	1.703	15.486	34.306	1.703	15.486	34.306
3	1.560	14.178	48.483	1.560	14.178	48.483
4	1.196	10.877	59.360	1.196	10.877	59.360
5	1.081	9.826	69.187	1.081	9.826	69.187
6	.716	6.511	75.698			
7	.672	6.111	81.809			
8	.659	5.992	87.800			
9	.518	4.713	92.514			
10	.462	4.202	96.716			
11	.361	3.284	100.000			

Extraction Method: Principal Component Analysis.

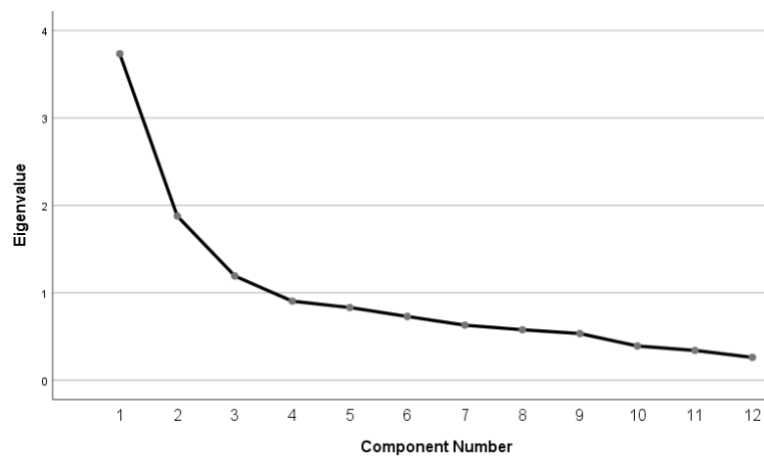


SPS

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.734	31.115	31.115	3.734	31.115	31.115
2	1.877	15.644	46.759	1.877	15.644	46.759
3	1.192	9.932	56.691	1.192	9.932	56.691
4	.904	7.535	64.225			
5	.831	6.923	71.149			
6	.729	6.076	77.224			
7	.630	5.246	82.471			
8	.577	4.809	87.279			
9	.534	4.447	91.727			
10	.391	3.259	94.986			
11	.340	2.836	97.822			
12	.261	2.178	100.000			

Extraction Method: Principal Component Analysis.



EI

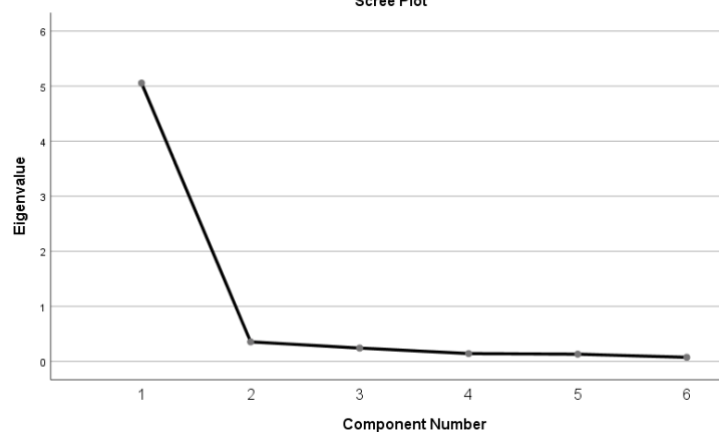
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.908
Bartlett's Test of Sphericity	Approx. Chi-Square	735.473
	df	15
	Sig.	.000

Total Variance Explained

Component	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.055	84.251	84.251	5.055	84.251	84.251
2	.355	5.916	90.167			
3	.242	4.038	94.206			
4	.142	2.367	96.573			
5	.132	2.196	98.768			
6	.074	1.232	100.000			

Scree Plot



OR 1

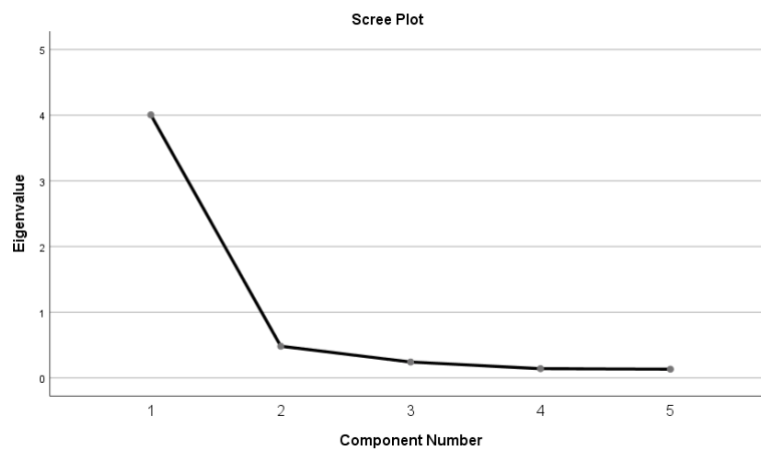
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.864
Bartlett's Test of Sphericity	Approx. Chi-Square	472.911
	df	10
	Sig.	.000

Total Variance Explained

Component	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.005	80.092	80.092	4.005	80.092	80.092
2	.482	9.631	89.723			
3	.242	4.832	94.555			
4	.140	2.803	97.357			
5	.132	2.643	100.000			

Extraction Method: Principal Component Analysis.



OR 2

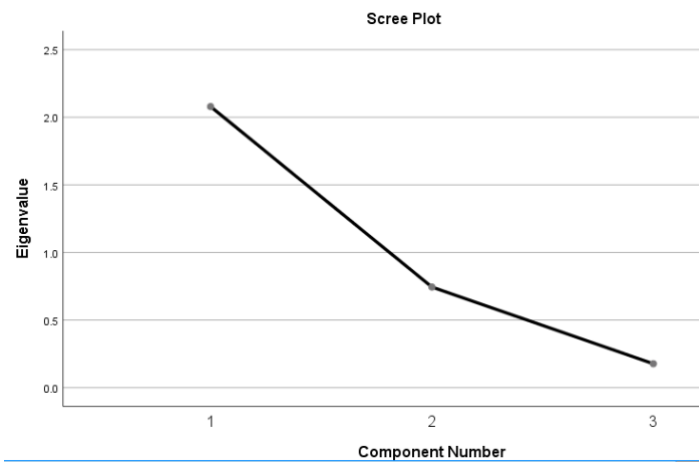
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.590
Bartlett's Test of Sphericity	Approx. Chi-Square	129.804
	df	3
	Sig.	.000

Total Variance Explained

Component	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.079	69.300	69.300	2.079	69.300	69.300
2	.744	24.804	94.104			
3	.177	5.896	100.000			

Extraction Method: Principal Component Analysis.



V – Hypotheses testing

Hypothesis 1.1: Sensory Processing Sensitivity is negatively related to Entrepreneurial Intent

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			
						F Change	df1	df2	Sig. F Change
1	,024 ^a	,001	–,009	1,90996	,001	,056	1	101	,813

a. Predictors: (Constant), SPS_Mean

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2,656	1,321		2,010	,047		
	SPS_Mean	,091	,195	,042	,468	,641	,955	1,047
	ENT_Proxy	,810	,617	,214	1,313	,192	,283	3,535
	Student_Entrepreneurship	1,462	,526	,293	2,780	,007	,674	1,484
	Parents_Entrepreneurship	,043	,405	,015	,106	,916	,354	2,823
	Ent_Education_2	–,804	,298	–,269	–2,698	,008	,756	1,323
	MINT	,917	,877	,236	1,046	,298	,147	6,797
	Social	1,269	,943	,318	1,346	,181	,135	7,424

a. Dependent Variable: EI_Mean

H2.1: The negative relationship between SPS and EI is moderated by the ETP, higher levels of ETP is weakening the negative relationship between SPS and EI.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,180 ^a	,032	,013	1,88883

a. Predictors: (Constant), Moderator_ETP, SPS_Mean

b. Dependent Variable: EI_Mean

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11,880	2	5,940	1,665	,194 ^b
	Residual	356,769	100	3,568		
	Total	368,649	102			

a. Dependent Variable: EI_Mean

b. Predictors: (Constant), Moderator_ETP, SPS_Mean

		Unstandardized Coefficients		Standardized Coefficients			Sig.	t	Beta
Model		B	Std. Error						
1	(Constant)	3,283	,934			3,515	,001		
	SPS_Mean	,041	,222			,183	,855		
	Moderator_ETP	-,362	,200			-1,809	,073		

a. Dependent Variable: EI_Mean

H2.3: The positive relationship between OR and EI is moderated by the ETP; higher levels of ETP is strengthening the positive relationship between OR and EI.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics				Durbin-Watson
						F Change	df1	df2	Sig. F Change	
1	,735 ^a	,541	,532	1,30092	,541	58,913	2	100	,000	1,595

a. Predictors: (Constant), OR1_ETP_centralized, OR1_Mean

b. Dependent Variable: EI_Mean

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	,555	,302		1,840	,069		
	OR1_Mean	,826	,077	,727	10,681	,000	,990	1,010
	OR1_ETP_centralized	,014	,017	,059	,865	,389	,990	1,010

a. Dependent Variable: EI_Mean

Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
		B	Std. Error	Beta			
1	(Constant)	,564	,299		1,888	,062	
	Moderator_ETP	-,223	,133	-,112	-1,670	,098	
	OR1_Mean	,821	,076	,723	10,731	,000	

a. Dependent Variable: EI_Mean

Hypothesis 3.1.1 The negative relationship between SPS and EI will be moderated by extraversion. The more extraverted, the weaker the negative the relationship between SPS and EI becomes.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			
						F Change	df1	df2	Sig. F Change
1	,035 ^a	,001	-,019	1,91885	,001	,061	2	100	,941

a. Predictors: (Constant), moderator_Extraversion, SPS_Mean

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,687	,931		3,959	,000
	SPS_Mean	-,040	,224	-,018	-,180	,857
	moderator_Extraversion	-,051	,199	-,026	-,258	,797

a. Dependent Variable: EI_Mean

Hypothesis 3.1.2: The negative relationship between SPS and EI will be moderated by agreeableness. The more agreeable, the stronger the relationship between SPS and EI becomes.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			
						F Change	df1	df2	Sig. F Change
1	,213 ^a	,046	,026	1,87581	,046	2,385	2	100	,097

a. Predictors: (Constant), moderator_Agreeableness, SPS_Mean

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,481	,902		3,859	,000
	SPS_Mean	,008	,216	,004	,038	,970
	moderator_Agreeableness	,350	,161	,214	2,171	,032

a. Dependent Variable: EI_Mean

Hypothesis 3.1.4: The negative relationship between SPS and EI will be moderated by neuroticism. The more neurotic, the stronger the relationship between SPS and EI becomes.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			
						F Change	df1	df2	Sig. F Change
1	,085 ^a	,007	-,013	1,91305	,007	,365	2	100	,695

a. Predictors: (Constant), moderator_Neuroticism, SPS_Mean

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,649	,918		3,976	,000
	SPS_Mean	-,012	,224	-,005	-,052	,958
	moderator_Neuroticism	-,149	,181	-,084	-,821	,413

a. Dependent Variable: EI_Mean

VI – EI among levels of SPS

