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The influence of regional personality traits on the income gap between employer entrepreneurs and solo self-entrepreneurs in Europe

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Abstract

This thesis investigates whether there exists a premium for employer entrepreneurs in case of effective leadership. Hereby, the research is based on the trait theory of leadership and makes use of a geopsychological approach: it was investigated whether there is a higher income advantage of employer entrepreneurs over solo self-entrepreneurs in regions where traits associated with effective leadership predominate versus in those where traits not associated with leadership effectiveness are dominating. In addition, it was analyzed if a potentially moderating effect of gender on this relationship can be found. The data analysis was conducted with a Propensity Score Matching as well as a Difference in Differences analysis. The findings of this thesis confirm the existence of a leadership premium in the most Extraverted/least Introverted as well as the most Assertive/least Turbulent countries. However, no evidence for a premium could be found in the most Intuitive/least Observant countries. Also, the findings do not support the assumption that this leadership premium depends on the gender of an entrepreneur.

Zusammenfassung

Diese Masterarbeit beschäftigt sich mit der Frage, ob es für Unternehmer*innen mit Mitarbeitenden eine monetäre Prämie für effektive Leadership gibt. Dabei basiert die Arbeit auf der Eigenschaftstheorie (auf Englisch „trait theory of leadership“) sowie einem geopsychologischen Ansatz: es wurde untersucht, ob es in Regionen, in denen Persönlichkeitsmerkmale vorherrschen, die mit effektiver Leadership assoziiert werden, für Unternehmer*innen mit Mitarbeitenden einen höheren Einkommensvorteil im Vergleich zu Unternehmer*innen ohne Mitarbeitenden gibt als in solchen Regionen wo die dominierenden Persönlichkeitsmerkmale nicht mit effektiver Leadership assoziiert werden. Die Datenanalyse wurde mithilfe eines Propensity Score Matchings sowie einer Difference in Differences Analyse durchgeführt. Die Ergebnisse der Datenanalyse bestätigen, dass es in den extravertiertesten/am wenigsten introvertierten Ländern sowie in den durchsetzungsfähigsten/am wenigsten stürmischen Ländern tatsächlich Hinweise auf eine monetäre Prämie für Leadership gibt. Allerdings scheint dies nicht für alle Persönlichkeitsmerkmale, die mit effektiver Leadership assoziiert werden, der Fall zu sein: in den intuitivsten/am wenigsten realistischen Ländern konnten keine Hinweise auf die Existenz einer solchen Prämie gefunden werden. Außerdem konnten die Ergebnisse der Untersuchung auch nicht bestätigen, dass die Höhe dieser Prämie vom Geschlecht der unternehmerisch Tätigen Person beeinflusst wird.

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List of abbreviations

ATE = Average Treatment Effect

ATT = Average Treatment Effect on the Treated Group

CEE = Central and Eastern European

CEO = Chief Executive Officer

CI = Confidence Interval

DID = Difference in Differences

EWCS = European Working Conditions Survey

FFM = Five Factor Model

H1 = Hypothesis 1

H2 = Hypothesis 2

H3 = Hypothesis 3

H4 = Hypothesis 4

H5 = Hypothesis 5

HEXACO = Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience

HEXACO-PI-R = Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience Personality Inventory

HEXACO-PI-R = Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience Personality Inventory Revised

ISCE = International Standard Classification of Education

MBTI = Myers-Briggs Type Indicator

META = Measure of Entrepreneurial Tendencies and Abilities

OCEAN = Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism

OLS = Ordinary Least Squares

PESH = political, economic, social and health characteristics

PSM = Propensity Score Matching

RAISEC = Realistic, Investigative, Artistic, Social, Enterprising, Conventional

1 Introduction

Entrepreneurship is considered as an important factor related to a country's socio-economic prosperity and progress – with a looped effect between entrepreneurship having an influence on economic development and economic development influencing entrepreneurship opportunities and outcomes (van Stel et al., 2014). Van Stel et al. (2014) found that whether this mutual relationship is a positive or a negative one also depends on the type of entrepreneurs inherent in a country. In fact, vast differences in entrepreneurship can be found across different countries, among others also due to their varying historical background: Večerník (2011, p. 360) for example stated that in the second half of the 20th century “there [...] [was] tremendous disparity [in entrepreneurship] between those countries that were able to develop freely under market conditions and those countries where socialist political and economic engineering was applied”. Cowling et al. (2019) confirmed this observation by investigating the differences between what they called the “old Europe” (i.e., older members of the European Union) and the “new Europe” (i.e., countries located in the former Soviet Bloc). Their findings demonstrated that people living in the “new Europe” are more likely to choose the path of self-employment than those living in the “old Europe” and that the gender gap in entrepreneurship is much higher in former Soviet countries (Cowling et al., 2019). Contrary to this, Fritsch et al. (2022) found a higher level of self-employment in former East Germany compared to former West Germany, thus indicating a higher self-employment tendency in the regions of Germany which have been under Soviet influence. In other words, the antecedents and effects of entrepreneurship differ depending on the country or region, not least as a consequence of historical influences. As a case in point, Sorgner et al. (2017), Hatfield (2015), Večerník (2011), and Dvouletý et al. (2019) highlighted the existence of income differences between entrepreneurs and employees, whereby Hatfield (2015) additionally discovered that said difference in income between employees and entrepreneurs varies across different countries. More specifically, Hatfield (2015) discovered differences in the income difference between Poland, the Netherlands, France, Spain, the United Kingdom and Germany. In addition to this, Hatfield (2015) moreover confirmed that there also are differences in the earnings of entrepreneurs across countries.

To investigate such differences in entrepreneurship, entrepreneurial income as well as in the impact of entrepreneurship one – in a first step – needs to fully understand the reasons

why people choose the path of self-employment. Van Gelderen & Jansen (2006) mentioned that gaining autonomy seems to be a particularly important argument for small business starters who decide to choose self-employment over being an employee. The underlying reasons for this desire for autonomy can be various: Decisional freedom, working towards one's own goals or not having to deal with unpleasant superiors are just some examples (van Gelderen & Jansen, 2006). Besides these reasons, a further aspect commonly mentioned as driver for becoming self-employed – which also is related to autonomy – is leadership or, more precisely, leading others instead of being led (van Gelderen & Jansen, 2006). Given this heterogeneity of the motivational backgrounds for founding a business, even if many of them can be summarized under the term “autonomy”, it might be reasonable to follow what some authors anyways deem as a necessary step: instead of – like in the two afore-mentioned studies by Hatfield (2015) and Večerník (2011) – solely differentiating between employees and entrepreneurs it should also be differentiated between different types of entrepreneurs. Some authors opt to form two different categories of entrepreneurs, namely one containing all employer entrepreneurs and one containing the solo self-entrepreneurs [e.g. van Stel et al. (2014), Sorgner et al. (2017) or Dvouletý et al. (2019)]. This categorization, however, leads to the question how the two groups of entrepreneurs differ from each other. Dvouletý & Orel (2020) argued that there is only limited research available on this topic. Nonetheless, Ciešlik & van Stel (2023) pointed out that the differences between employer entrepreneurs and solo self-entrepreneurs are significant enough that such differentiation should be taken into consideration even by policymakers.

Differences between employer entrepreneurs and solo self-entrepreneurs

Firstly, one difference between the two groups is that many solo self-entrepreneurs are motivated to become self-employed by their low skills and the consequent difficulty in finding paid employment, wherefore they were for example found to be at a higher risk of poverty as well as material deprivation (that is, a higher risk of not being able to afford what is necessary for societal participation) (Ciešlik & van Stel, 2023). Moreover, this group of solo self-entrepreneurs is prone to opt for a lower than necessary social protection, that is, they can be at a disadvantage when it comes to healthcare, pension plans, and other measures of social protection (Ciešlik & van Stel, 2023). Since, however, the spectrum of

the solo self-employed is highly heterogeneous and covering people from the lowest to the highest income levels, this risk is not omnipresent among all entrepreneurs of this group but only within part (Cieřlik & van Stel, 2023). Besides these risks at the lower-skilled end of solo self-entrepreneurs, a major finding emphasized by Cowling & Wooden (2021) is that employer entrepreneurship seems to often be a second step following solo-entrepreneurship, in part because entrepreneurs first want to find out whether they possess the entrepreneurial skills required to succeed. A further characteristic differentiating the two groups of entrepreneurs is that the effectiveness and success of entrepreneurship, according to Dvouletý & Orel (2020), depend for solo self-entrepreneurs on the skills (and in conclusion thus also on the education), willingness to take action, and motivation of the respective individual. In other words, since they hold the sole responsibility for their business and do not have anyone to share the accruing tasks with they need to compensate for this lack of a division of work by not only being motivated and ready to act but also by disposing of the necessary expertise and skills to compensate for the lack of employees. These findings are also supported in the Jack-of-all-trades hypothesis, which essentially states that humans want to maximize their lifetime income – whereby entrepreneurs need a broad knowledge to succeed in this maximization, whereas for employees expert knowledge is crucial for success (Tegtmeier et al., 2016). Tegtmeier et al. (2016) found in their study focusing on female entrepreneurs that for solo self-entrepreneurs a broad industry knowledge is especially important for success since as a solo self-entrepreneur it is hard to compensate for a lack of skills (Tegtmeier et al., 2016). Employer entrepreneurs, in contrast, need to delegate work to experts (employees) and coordinate the accruing tasks as well as their employees, which corresponds with the Cambridge Dictionary's definition leadership as "the job of being in control of a group, country, or situation" ("Leadership," 2022). Since this leadership aspect is only relevant for employer entrepreneurs but not for solo self-entrepreneurs this aspect is concluded to be another differentiating characteristic for the two groups of entrepreneurs. Finally, Dvouletý et al. (2019) discovered in a study conducted in the Visegrád countries that, on average, employers have 22 % higher earnings than solo self-employed individuals. They furthermore argued that, in comparison to employees, employers earn approximately 22 % more whereas for solo self-entrepreneurs it is only 6.7 % (Dvouletý et al., 2019). These results are also in accordance with Sorgner et al. (2017)'s findings which illustrated that the *mean* income per working hour of both groups of entrepreneurs is higher than that of an employee. However, Sorgner et al. (2017) emphasized that the *median* solo self-

employed earns about € 0.62 less per hour than the *median* employee, whereas the *median* employer earns € 2.25 more per hour than the *median* employee. In other words, entrepreneurs who are required to take on a leadership role (that is, employers) tend to earn more than those who are not in charge of anyone other than themselves, according to Dvouletý et al. (2019) and Sorgner et al. (2017)'s findings. Interestingly enough, Večerník (2011, p. 367 - 369) found that "[t]he income level of the self-employed varies substantially across and within countries. As for employers, they report almost triple the average income in Germany and almost double in the Czech Republic [sic!]. Own-account workers declare above-average income in the Czech Republic [sic!] and Slovakia but below-average income in other countries". In other words, Večerník (2011)'s findings not only support Dvouletý et al. (2019) and Sorgner et al. (2017)'s argumentation that employer entrepreneurs tendentially have a higher income than solo self-entrepreneurs but also show that said income gap also varies across countries.

The income gap between employer entrepreneurs and solo self-entrepreneurs

These findings lead to the questions why there exists an income gap between the two types of entrepreneurs and why employer entrepreneurs tend to earn more than solo self-entrepreneurs, especially when considering that employer entrepreneurs also need to pay the salaries of their employees. Sorgner et al. (2017) explained that the employer entrepreneurs' hourly income could be higher due to a) it being a premium for employers for being productive and having better managerial skills, or b) it being a compensation for a higher risk of being self-employed. In other words, the first possible explanation of Sorgner et al. (2017) implies that this income gap between employer entrepreneurs and solo self-entrepreneurs exists since this additional income is a premium for good leadership skills. As a case in point, this reasoning corresponds with the findings by Hopp & Pruschak (2023) who confirmed that – white males, at least – tend to earn more later in life if they have developed leadership skills in their youth by taking over multiple leadership positions in high school. In other words, they tend to earn a premium for their leadership skills which they gained through a variety of leadership experiences (Hopp & Pruschak, 2023). Thus, these findings suggest that Sorgner et al. (2017)'s first argument could hold true, meaning that a premium for leadership might be applicable for employers and that

this is therefore explaining part of the income difference between solo self-entrepreneurs and employer entrepreneurs.

Leadership premium for entrepreneurs

Looking further into the topic about a leadership premium for entrepreneurs, not a single study investigating whether employer entrepreneurs receive an additional bonus for taking over the responsibility of leading their employees could be found during the literature review. This also means that no research on whether being a better leader pays off financially for an entrepreneur – e.g. by resulting in a higher income for the entrepreneur – could be found. This is especially surprising given the large amount of research on executive compensation and compensation systems in general [see e.g. Berber et al. (2017) for a study on the differences in management compensation systems used across different CEE countries; van Essen et al. (2015) for an analysis on what factors determine CEO compensation; Combs & Skill (2003) for a study on executive premiums based on managerialism and human capital; or Brick et al. (2006) for a study on CEO-overcompensation]. This thesis therefore focuses on deepening the understanding of exactly this idea of a compensation for leadership in employer-entrepreneurship. In order to investigate further in this matter, however, an understanding what determines what makes a good/effective/successful leader is needed first. It is important to note that despite the existence of multiple terms to express that a leader is effective, leadership research normally refers to this as “effective” leadership, leadership “effectiveness”, etc. Thus, this same terminology will also be adapted for this thesis.

Trait theory of leadership

One theory available to help answer the question what makes an effective leader is the so-called trait theory of leadership. This approach – being one of several different leadership theories (see Chapter 2.1) – is trying to explain what makes an effective leader based on personality traits (Bertocci, 2009; Pinnow, 2011). Among others, Hogan et al. (1994) – who confirmed that there is a relationship between certain personality factors, effectiveness ratings, and compensation for leaders – supported the theory’s applicability in explaining leadership effectiveness with their findings. Furthermore, the findings of a

study by de Vries (2012) investigating the relationship between personality traits and leadership styles showed that leadership styles can be seen as a contextualized version of different personality traits. This again suggests that to verify the applicability of Sorgner et al. (2017)'s argumentation (that income differences between employer entrepreneurs and solo self-entrepreneurs could be explained by the existence of a premium for good managerial skills) one should look into whether this income gap is somehow connected to a leader's personality traits.

Regional income and personality trait differences

As highlighted before, (Večerník, 2011) discovered that there moreover exists a difference in the difference in this income gap across countries. This leads to the question whether – if there is a relationship between personality and leadership and if there is a premium for entrepreneurs having leadership roles – this difference in the income difference is ultimately also explainable by differences in personality traits. It hence is especially interesting for this research that personality features can, according to e.g. Rentfrow et al. (2013), who conducted a study in the United States of America, show geographical patterns of predominant features. In other words, certain personality traits are especially prominent in a specific region whereas in another region it might be different traits that predominate (Rentfrow et al., 2013). As a result, one can draw maps illustrating the respective regionally predominant personality traits, as can be seen in Rentfrow et al. (2013)'s study or the NERIS Country Personality Profiles. These regional personalities, according to Rentfrow et al. (2013), do not only have an influence on individual behavior but also get “expressed in macrolevel social and economic indicators” (Rentfrow et al., 2013, p. 996). This raises the question whether the afore-mentioned difference in the income difference of employers and solo self-entrepreneurs across countries could be rooted in the predominant personality traits in some regions: if some regions' predominating traits are more associated with effective leadership than the traits predominating in other regions this could result in a difference in the leadership premiums earned across regions/countries.

Therefore, the following research question is proposed to address the priorly described research gap:

How do regional personality traits drive a difference in the difference in income of solo-entrepreneurs and employer entrepreneurs in Europe?

To answer this research question this thesis will analyze whether entrepreneurs receive a leadership compensation/premium [as suggested by Sorgner et al. (2017)] by conducting a cross-country comparison of the correlation between the predominant regional personality traits and the respective income gaps between employer entrepreneurs and solo self-entrepreneurs. In doing so, this study aims at providing another motivational factor – namely a financial premium – for practitioners who are currently either thinking about becoming entrepreneurs or who are solo self-entrepreneurs who can see themselves as being successful leaders to take the next step and become employer entrepreneurs. This, in turn, can contribute to the creation of more jobs on the labor market.

Following, this thesis will first provide the reader with the necessary theoretical background by giving an overview of the existing literature on the topic. Thereafter, the hypotheses will be derived from the findings of the priorly conducted secondary research. Subsequently, an overview of the methodology applied as well as the data used for the analysis will be given. Finally, the findings of the research will be described and discussed and potential points of criticism as well as an overview of future research areas will be outlined.

2 Theoretical background

In order to answer the research question presented in Chapter 1, in a first step, a literature review was conducted to provide the necessary theoretical foundation for the following data analysis. This chapter will present the results of the secondary research to the reader. First, it shall be defined what leadership is and which leadership theories exist, whereby the focus will be on the afore-mentioned trait theory of leadership. In other words, it will be concentrated on the relation between personality traits and leadership effectiveness. This is due to the assumption that Sorgner et al. (2017)'s argumentation that a premium paid for good managerial skills as well as being productive can explain the income gap between employer entrepreneurs and solo self-entrepreneurs. Subsequently, different concepts of personality types and traits as well as different kinds of personality trait assessments will be presented. Lastly, the topic of geographical psychology will be looked at more in-depth, whereby here the focus will be on regional personalities.

2.1 Leadership

The Cambridge Dictionary defines the noun “leadership” as “the job of being in control of a group, country, or situation” (“Leadership,” 2022). In the Merriam Webster Dictionary, the definition of the verb “to lead” is i.a. “to guide on a way, especially by going in advance” (“Lead,” n.d.) or “to direct on a course or in a direction” (“Lead,” n.d.). This leadership aspect is – as already laid out in the introduction – one of the major differences between employer entrepreneurs and solo self-entrepreneurs: the prior have to take over a leadership role because they are in charge of leading their personnel; whereas the latter do not have such tasks simply for the reason that they themselves are the only ones working for the respective business. As Bertocci (2009) emphasized, being the leader of a business is getting more and more challenging, given the dynamic environment organizations operate in, which forces them to constantly adapt to change and thus requires them to be highly flexible. In other words, the responsibilities and challenges connected with being a leader are constantly increasing.

Pinnow (2011) as well as (Bertocci, 2009) highlighted, that there are different types of leadership theories. Until World War I, the genetic leadership theory – also known as the “great man theory” – was the predominant explanation for leadership (Bertocci, 2009).

According to this approach, leadership is inherited, as was (and in some cases still is) the case in royal families (Bertocci, 2009). However, with the rise of industrial leadership as well as the World War I also resulting in a significant reduction in royal houses across Europe a need for other theories to explain (good/successful) leadership arose (Bertocci, 2009). Some important examples of categories of these newer leadership theories are:

- The **trait** theories of leadership,
- The **behavioral** theories of leadership,
- The **charismatic** theories of leadership,
- The **transformational** theories of leadership,
- The **transactional** theories of leadership, and
- The **situational** theories of leadership (Bertocci, 2009).

The most relevant leadership theory for this research is the trait theory of leadership, as has been explained in Chapter 1.

2.1.1 Trait theory of leadership

Personality traits do not only influence which career path a person chooses [see e.g. Brandstätter (2010) or Simoes et al. (2016)] or help identify which candidate the ideal choice for a certain position is [see e.g. Hogan et al. (1996)] but they are also considered a precondition for effective leadership (Kirkpatrick & Locke, 1991). For this reason the so-called Trait Theory of Leadership is focusing on a leader's personality traits (Pinnow, 2011). While some criticism of this theory exists – for example that it is omitting other factors that might also have an impact on leadership effectiveness – some authors nonetheless identified personality as a precondition of effective leadership (Kirkpatrick & Locke, 1991; Horner, 1997): DeRue et al. (2011) summarized the literature existing at the point of writing their article in an Integrated Model of Leader Traits, Behaviors, and Effectiveness. This model reflects that leadership traits and characteristics influence leader behavior as well as attributions and rational associations, which in turn have an effect on leadership effectiveness (DeRue et al., 2011). Herein the authors further divide leadership traits and characteristics into three components, namely demographics – i.e. gender, age, etc.; task competence – i.e. intelligence, conscientiousness, openness to experience, technical knowledge, etc.; and interpersonal attributes – i.e. extraversion, agreeableness,

emotional intelligence, etc., whereby the category demographics solely focuses on characteristics, not on traits (DeRue et al., 2011).

Pinnow (2011) stated that this trait-focused approach, also known as personal-based theory, can also be divided into two sub-groups: one group focusing on the influence of the employee's personality on leadership and another one focusing on the respective leader's personality traits (Pinnow, 2011). This thesis will make use of the latter perspective. Hereby it is important to emphasize that this latter approach assumes that leadership skills cannot be learned but are rather inherent to the respective person (Pinnow, 2011). Pinnow (2011) however pointed out that this theory is "often shortsighted and ultimately simplistic" (Pinnow, 2011, p. 58) because a) the same character traits often have different names depending on the author, and b) the evaluation of another person's character traits is a subjective observation (Pinnow, 2011). To reduce the risk of such simplifications other potentially influential factors need to be considered when trying to argue with the trait theory of leadership in empirical studies. This is also important since as mentioned before personality is seen as a *precondition* for effective leadership which implies that other factors may play an important role as well (Kirkpatrick & Locke, 1991).

This leads to the question which personality traits exactly are considered to influence leadership effectiveness: According to Northouse (2020) there is a long list of character traits that can be considered as typical for effective leaders, whereby the ones relevant for this research will be covered in more detail in Chapter 2.3, since it is not feasible to provide the reader with an exhaustive list of leadership traits. To give some examples of traits having an influence on leadership effectiveness that are mentioned in the literature: Kirkpatrick & Locke (1991) emphasized that leaders need to dispose of emotional stability, or also – although to a lesser extend – be flexible and adaptive. Judge et al. (2002), who conducted a meta-analysis with the Five Factor Model (FFM; see Chapter 2.2.2) as an organizing framework, mentioned Extraversion as the most important trait, especially when it comes to leader emergence in groups. Furthermore, according to Judge et al. (2002) Conscientiousness as well as Openness to Experience seem to be correlated with leadership. Neuroticism and Agreeableness, however, seem to be the least important out of the five trait dimensions used in the Five Factor Model (Judge et al., 2002). As a final example, Northouse (2020, p. 27) identified six key traits a successful leader should have, namely "intelligence, confidence, charisma, determination, sociability, and integrity".

In order to provide a full understanding of the topic of leadership traits, there is a need to clarify what exactly said personality traits are and how they can be differentiated from personality types as well as which methods for personality measurement exist. Therefore, the next chapters will cover these topics and furthermore introduce the reader to the concept of geographical psychology, whereby the focus will be on the afore-mentioned research on regional personalities which has briefly been touched upon in Chapter 1 already.

2.2 Personality

Brandstätter (2010) emphasized that personality traits must play a role in entrepreneurship, and thus also in whether someone decides to choose the path of becoming self-employed, given that entrepreneurs need to display certain characteristics such as an openness to experience, extraversion or also emotional stability. Also, Fritsch & Rusakova (2010) pointed out that, according to several authors, there is a correlation between personality traits and who becomes an entrepreneur. This was also confirmed by Simoes et al. (2016), who too highlighted that personality traits are generally considered as having an influence on who becomes self-employed (e.g. people with a higher score on Conscientiousness, Openness to Experience and Extraversion according to the Five Factor Model, which will be described in more detail in Chapter 2.2.2). And as already stressed before, personality was found to play a role in leadership as well (Kirkpatrick & Locke, 1991).

One important differentiation is that between personality **types** and personality **traits**: according to Tyssen et al. (2007), personality types are essentially a combination of different personality traits that can give a more holistic picture of an individual's character due to also considering the interplay of certain traits instead of seeing them in isolation. On the other hand, NERIS Analytics Limited (2013) highlighted that focusing on traits instead of types allows to “reliably measure correlations between personality traits and other characteristics – for example, political attitudes” (NERIS Analytics Limited, 2013, n.p.). For this reason, and because the differences in the predominant personality types across countries are not too large (as can be seen when comparing different countries at <https://www.16personalities.com/country-profiles/global/world#global>), this research shall focus on personality traits rather than personality types.

2.2.1 Psychological instruments for personality assessment

There are several psychological instruments focusing on the identification of such personality traits and personality types. According to Hogan et al. (1996), a good personality measurement instrument should at least fulfill the following two characteristics: a) “scores on the measure should be temporally stable (i.e., scores will be reliable over time)” (Hogan et al., 1996, p. 470); and b) “there should be credible evidence that scores on the measure relate to indexes of meaningful nontest behavior (i.e., scores should predict real world performance)” (Hogan et al., 1996, p. 470).

Three of these personality assessment instruments are of particular importance for this research:

- The **Big Five Personality Test**, also known as **Five Factor Model (FFM)**,
- The **Myers-Briggs Type Indicator (MBTI)**, and
- The **NERIS Type Explorer**.

Since the first two (FFM and MBTI) build the basis for the NERIS Type Explorer (which includes a geopsychological viewpoint and thus is the personality test this research is building upon) these three will be explained in more detail in the sections below (NERIS Analytics Limited, 2013).

Other examples of personality assessments

However, the pallet of personality test instruments available is not limited to those three. In fact, there is a number of different personality assessment methods available, which, however, are not relevant for this research: another personality test method is for instance the **HEXACO Personality Inventory- Revised (HEXACO-PI-R)**, which is – as the name indicates – the revised version of the HEXACO Personality Inventory (HEXACO-PI) developed by the two authors Michael C. Ashton and Kibeom Lee (Lee & Ashton, 2009a). The acronym HEXACO stands for “Honesty-Humility (H), Emotionality (E), Extraversion (X), Agreeableness (A), Conscientiousness (C), and Openness to Experience (O)” (Ashton et al., 2014 p. 139), which together compose the Domain-Level Scale of the framework

(Lee & Ashton, 2009b). Each of these six domains can – on the Facet-Level Scale – further be divided into different components (Lee & Ashton, 2009b): e.g. the Honesty-Humility Domain is composed of a Sincerity scale, a Fairness scale, a Greed Avoidance scale, as well as a Modesty scale (Lee & Ashton, 2009b). The framework can be used as an alternative to the Five Factor Model (which will be described in more detail below in Chapter 2.2.2). Here, Ashton et al. (2014) argued, that the HEXACO-PI-R model's dimensions Honesty-Humility, Agreeableness, as well as Emotionality are not represented in the same way in the Five Factor Model (Ashton et al., 2014). Additionally, the Openness to Experience leaves out the intellectual ability component in the HEXACO-PI-R model (Ashton et al., 2014). An interesting fact about the HEXACO-PI-R model is, that its Honesty-Humility dimension explicitly includes two of the three components of the “Dark Triade” (Machiavellianism, Narcissism, psychopathy) as well as a variable that is closely parallel to the third component (Lee & Ashton, 2014). This “Dark Triade” allows to highlight “three manifestations of a common tendency to be exploitive and manipulative of others” (Lee & Ashton, 2014, p. 2). The HEXACO-PI-R model can be applied on a broad variety of topics in research, such as risk-taking, academic performance, vocational interests or schizotypy (Ashton et al., 2014).

Besides such models with a broad application, there are also other personality test instruments developed for a specific context such as e.g. a business one: specifically for the field of entrepreneurship there is for instance the **Measure of Entrepreneurial Tendencies and Abilities** (META), which, according to Leutner et al. (2014) is better suited to analyzing the connection between entrepreneurship and personality traits than e.g. the Big Five Model. This is the case since this narrower approach seems to lead to more accurate results (Leutner et al., 2014). To summarize it briefly, “META assesses entrepreneurial personality by measuring the degree to which individuals differ in their tendency to engage in entrepreneurial behaviors (opportunity recognition, opportunity exploration, innovation, and value creation)” (Leutner et al., 2014, p. 59) by assuming that entrepreneurship goes along with a set of different behaviors (Leutner et al., 2014). Moreover, there is e.g. the **RIASEC** (R = realistic, I = investigative, A = artistic, S = social, E = enterprising, C = conventional) theory of vocational personalities developed by John L. Holland, which is an example for a personality type assessment used to categorize people as well as environments like vocations or different educations (De Fruyt & Mervielde, 1999).

2.2.2 Big Five Personality Test/Five Factor Model (FFM)

The Big Five Model, or Five Factor Model (FFM), assesses the “characteristics of temperament as overarching style of a person’s experiences and actions” (Brandstätter, 2010, p. 223). This assessment is done by identifying five traits, or rather five trait dimensions (hence the names Big Five and Five Factor Model) – **Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism** – which are also known under the acronym **OCEAN** (Brandstätter, 2010).

Hogan et al. (1996) argued that these Big Five essentially summarize what most other personality assessments measure but often find different names for. According to Foscht & Swoboda (2017) and DeYoung et al. (2007) the FFM follows a hierarchy, i.e. each of those five trait dimensions summarizes various sub-traits. For instance, the trait category “Extraversion” also includes “specific patterns of behavior and experience” (DeYoung et al., 2007, p. 880), such as “talkative”, which are located at lower levels of the hierarchy (DeYoung et al., 2007). Still, Brandstätter (2010) highlighted that the FFM – despite being the most important personality trait assessment system – cannot accommodate all personality aspects (e.g. a willingness to take risks is a combination of different Big Five personality trait categories and thus cannot be assigned to one single trait dimension).

The five trait dimensions – OCEAN – assessed in the Big Five Personality Test are seen to be “partly heritable, develop in childhood, [...] [and] robust across cultures” (Bakker, 2017, p. 1026). Foscht & Swoboda (2017) also agreed on this applicability of the Big Five traits across cultures. However, while Bakker (2017) highlighted that those personality traits can moreover be seen as relatively stable over time, Fritsch & Rusakova (2010) found that this is not generally agreed upon by the research community: according to them, there is a number of authors who highlighted this stability over time – at least from a certain age on – while others argued that the personality traits’ rank-order correlation can change over time (or, in other words, the personality traits of a person can change over time); and a third group of authors promoted a mean between the prior two by stating that said rank-order stability rises up to a certain age where it reaches a peak after which it declines again (in other words, the personality traits and levels of these personality traits which a person displays stabilize more and more to the point where this stability reaches a peak and decreases again) (Fritsch & Rusakova, 2010).

To give some examples of the Big Five Personality Test's applications in research, it has e.g. been employed in the field of political psychology, where a correlation between personality traits and political ideology was discovered with the help of the Five Factor Model (Bakker, 2017). In the field of business, Bakker (2017) e.g. used the Big Five Model to research the relationship between personality traits and economic ideology, whereby they also found that, although there is a correlation, this relationship is also influenced by the income of the respective person. Furthermore, Brandstätter (2010) used a meta-analysis based on the FFM to confirm that a person's personality traits have an influence on whether they take the decision to become an entrepreneur. And finally, the Big Five are also e.g. used by Facebook in order to predict their users' personalities with the help of machine learning algorithms (Ontoum & Chan, 2022).

2.2.3 Myers-Briggs Type Indicator (MBTI)

The Myers-Briggs Type Indicator (MBTI) is a personality assessment instrument that focuses on the identification of 16 different personality types (Stein & Swan, 2019). Essentially, the MBTI assesses on which sides of a total of five spectra an individual is located, whereby this location on the spectra is depending on an individual's preferences and not their abilities or tendencies (Stein & Swan, 2019). To be more precise, the Type Indicator investigates whether a person prefers:

- **Extraverted (E)** or **Introverted (I)**,
- **Sensing (S)** or **Intuitive (N)**,
- **Feeling (F)** or **Thinking (T)**, and
- **Judging (J)** or **Perceiving (P)** (Stein & Swan, 2019; Zhao et al., 2020).

Notably, the different dimensions of this personality assessment instrument should not be seen as personality traits, but rather as defining the different personality types (Stein & Swan, 2019). To generate a better understanding of what this means it is reasonable to look into what *preferences* each of the dimensions indicates: **Extraversion** means a preference for *outwardly-focused* behavior – such as being outgoing and talkative; whereas **Introversion** signifies a preference for *inwardly-focused* behavior – that is, internal processes and experiences such as being reserved (Stein & Swan, 2019; Zhao et al., 2020). **Sensation** can be seen as a *bottom-up* process since it means that an individual

has a preference for perceiving the world through the *five senses* (auditory, olfactory, visual, gustatory and tactile) – in other words, the person is perceiving facts they experience in the physical world; whereas **Intuition** is a *top-down* process that indicates a preference for unconsciously or subliminally experiencing the world by *evaluating impressions, possibilities, relations, and patterns* (Stein & Swan, 2019; Zhao et al., 2020). **Feeling** indicates a preference for including *others' opinions, importance, values, and the like* when trying to make a judgement; whereas **Thinking** means that it is preferred to base one's judgement on *analytics, logic, and pragmatism* (Stein & Swan, 2019; Zhao et al., 2020). Finally, **Judging** indicates that an individual prefers to *organize and analyze* any received information and *make plans*; **Perceiving**, on the other hand, means that they prefer being *spontaneous* and do not evaluate received information (Stein & Swan, 2019; Zhao et al., 2020).

By making different combinations of these dimensions, a total of 16 different personality types can be identified, as can be seen in Figure 1 (Stein & Swan, 2019). Each of the combinations is labelled with an acronym that indicates which side of each of the dichotomies the respective person's personality can be placed on, whereby the acronym is composed of the letters given above (Stein & Swan, 2019).

However, there also exists some criticism regarding the reliability and validity of the MBTI, and although the Myer-Briggs Company, which is the business behind the MBTI, emphasized to have resolved issues with the test-retest reliability in newer versions of the MBTI, it is hard to verify this statement (Ontoum & Chan, 2022; Stein & Swan, 2019). Criticism also included e.g. that the inventors of the test do not give a reasoning why they measure preferences for the sides of the dichotomies instead of abilities or tendencies; the dichotomies are not mutually exclusive (e.g. usually an individual does display both, sensation and intuition); and many more – for further insights see e.g. Stein & Swan (2019)'s work (Stein & Swan, 2019).

According to Ontoum & Chan (2022) the Myer-Briggs Type Indicator is broadly applicable. Potential uses include “team and leadership development, conflict and stress management, and career transitioning/planning” (Stein & Swan, 2019, p. 1) but also to predict personality e.g. for online marketing purposes or dating apps by combining a machine learning algorithm with personality assessment instruments (Ontoum & Chan, 2022).

Figure 1: Myer-Briggs Personality Types (Ontoum & Chan, 2022, p. 2)

ISTJ Responsible, sincere, analytical, reserved, realistic, systematic. Hardworking and trustworthy with sound practical judgment.	ISFJ Warm, considerate, gentle, responsible, pragmatic, thorough. Devoted caretakers who enjoy being helpful to others.	INFJ Idealistic, organized, insightful, dependable, compassionate, gentle. Seek harmony and cooperation, enjoy intellectual stimulation.	INTJ Innovative, independent, strategic, logical, reserved, insightful. Driven by their own original ideas to achieve improvements.
ISTP Action-oriented, logical, analytical, spontaneous, reserved, independent. Enjoy adventure, skilled at understanding how mechanical things work.	ISFP Gentle, sensitive, nurturing, helpful, flexible, realistic. Seek to create a personal environment that is both beautiful and practical.	INFP Sensitive, creative, idealistic, perceptive, caring, loyal. Value inner harmony and personal growth, focus on dreams and possibilities.	INTP Intellectual, logical, precise, reserved, flexible, imaginative. Original thinkers who enjoy speculation and creative problem solving.
ESTP Outgoing, realistic, action-oriented, curious, versatile, spontaneous. Pragmatic problem solvers and skillful negotiators.	ESFP Playful, enthusiastic, friendly, spontaneous, tactful, flexible. Have strong common sense, enjoy helping people in tangible ways.	ENFP Enthusiastic, creative, spontaneous, optimistic, supportive, playful. Value inspiration, enjoy starting new projects, see potential in others.	ENTP Inventive, enthusiastic, strategic, enterprising, inquisitive, versatile. Enjoy new ideas and challenges, value inspiration.
ESTJ Efficient, outgoing, analytical, systematic, dependable, realistic. Like to run the show and get things done in an orderly fashion.	ESFJ Friendly, outgoing, reliable, conscientious, organized, practical. Seek to be helpful and please others, enjoy being active and productive.	ENFJ Caring, enthusiastic, idealistic, organized, diplomatic, responsible. Skilled communicators who value connection with people.	ENTJ Strategic, logical, efficient, outgoing, ambitious, independent. Effective organizers of people and long-range planners.

2.2.4 NERIS Type Explorer

Finally, the third personality assessment instrument is the so-called NERIS Type Explorer developed by NERIS Analytics Limited. This personality assessment method is based on both personality tests described in detail in the previous sections, namely the Big Five Personality Traits Model as well as the Myers-Briggs Type Indicator (NERIS Analytics Limited, 2013): it makes use of the same acronym format as Myers-Briggs, however, it also incorporates a revised version of the Big Five personality traits (NERIS Analytics Limited, 2013). Each of the letters used in NERIS Analytics Limited's acronym indicates the predominant one of the two sides of the spectrum of the respective personality trait (NERIS Analytics Limited, 2013).

The trait spectra and their subdimensions

Table 1 illustrates five different personality aspects identified by NERIS Analytics Limited, which combinedly define the personality type of an individual.

Table 1: NERIS Personality Aspects (NERIS Analytics Limited, 2013)

Personality Aspect	Description	Spectrum
<i>Mind</i>	Interaction with the surroundings	Introverted (I) – Extraverted (E)
<i>Energy</i>	Information processing and “how we see the world” (NERIS Analytics Limited, 2013, n.p.)	Observant (S)– Intuitive (N)
<i>Nature</i>	“[H]ow we make decisions and cope with emotions” (NERIS Analytics Limited, 2013, n.p.)	Thinking (T) – Feeling (F)
<i>Tactics</i>	The “approach to work, planning and decision-making” (NERIS Analytics Limited, 2013, n.p.)	Judging (J) – Prospecting (P)
<i>Identity</i>	Identity “underpins all others, showing how confident we are in our abilities and decisions” (NERIS Analytics Limited, 2013, n.p.)	Assertive (A) – Turbulent (T)

Equal to the FFM, each of the five personality aspects covers different subdimensions, which can be allocated anywhere within their spectrum – for instance, a person who is more rational and objective would rather be located on the Thinking-side of the of the Nature personality spectrum, whereas an individual who is less competitive and more empathetic would rather find themselves on the Feeling-side of the spectrum (NERIS Analytics Limited, 2013). In fact, NERIS Analytics Limited (n.d.-c) have divided each of the five trait dimensions into three further subdimensions/facets, as can be seen in Table 2.

Table 2: The five trait spectra and their subdimensions (NERIS Analytics Limited, n.d.-b)

Trait spectrum	Subdimensions
<i>Extraverted – Introverted</i>	Sociable vs. Intimate
	Initiating vs. Reacting
	Dynamic vs. Reserved
<i>Observant – Intuitive</i>	Practical vs. Imaginative
	Experiential vs. Theoretical
	Scanning vs. Envisioning
<i>Thinking – Feeling</i>	Rational vs. Emotional
	Individualistic vs. Harmonious
	Stoic vs. Expressive
<i>Judging – Prospecting</i>	Strategic vs. Spontaneous
	Deciding vs. Browsing
	Disciplined vs. Whimsical
<i>Assertive – Turbulent</i>	Confident vs. Doubtful
	Stable vs. Agitated
	Flowing vs. Linger

Following, this thesis will investigate what each of these five trait spectra entails. The **Extraversion – Introversion (Mind)** spectrum is part of all three personality assessment instruments introduced in this Chapter, but nonetheless, the different models do not necessarily have a common understanding of what it entails. NERIS Analytics Limited (2015c) highlighted that for their model, Extraversion and Introversion are not limited to social interactions and the like but rather also include how an individual reacts to the broader environment. More **Introverted** individuals tend to be more reserved, more humble, more careful listeners, and more sensitive to the environment (NERIS Analytics Limited, 2015c). They also tend to “enjoy more focused ‘alone time’” (NERIS Analytics Limited, 2015c, n.p.). Furthermore, they are rather approaching challenges in a slower and more cautious way (NERIS Analytics Limited, 2015c). As for the more **Extraverted** individuals, they tend to push limits, take the initiative, take over leadership roles voluntarily, engage with their surroundings, and seek validation; but are also more comfortable in expressing gratitude than more introverted individuals (NERIS Analytics Limited, 2015c). They are however easily bored and tend to overthink less but rather do

things for excitement (NERIS Analytics Limited, 2015c). In addition, Extraverted individuals also tend to seek attention and do not like being alone (NERIS Analytics Limited, 2015c). Furthermore, they are good at motivating others, e.g. during social gatherings (NERIS Analytics Limited, 2015c).

The Mind spectrum can be divided into three subdimensions, as has already been highlighted before (NERIS Analytics Limited, n.d.-b):

- **Sociable** (*Extraverted*) versus **Intimate** (*Introverted*): “the kinds of social interactions [...] [one prefers], and whether [...] [they] typically prioritize spending time alone or with others” (NERIS Analytics Limited, n.d.-c, n.p.)
- **Initiating** (*Extraverted*) versus **Reacting** (*Introverted*): “how [...] [someone tends] to act in social situations, including whether [...] [they] prefer to start interactions or react to what others decide to do and say” (NERIS Analytics Limited, n.d.-c, n.p.)
- **Dynamic** (*Extraverted*) versus **Reserved** (*Introverted*): the “normal level of activity and [...] [someone’s] desire for excitement and outside stimulation” (NERIS Analytics Limited, n.d.-c, n.p.)

For a better understanding of what each of those subcategories contains, Table 3 provides the reader with a more detailed description of how NERIS Analytics Limited depicted each of them. For example, they described an individual that can be allocated within the subcategory Sociable as a person who genuinely enjoys spending time with other people and is energized by spending time with others (NERIS Analytics Limited, n.d.-b).

Table 3: Description of the subfacets of the Extraversion – Introversion spectrum (NERIS Analytics Limited, n.d.-b)

Subfacet	Description
Sociable versus Intimate Sociable	• Take enjoyment in being around people and social interactions; social interactions actually energize them • Enjoy mingling and networking • Nonetheless can enjoy being alone or in smaller groups • Quality and quantity of social interactions both matter to them – if the quality is low, they prefer leaving • Join in activities • Not afraid of attention • Enjoy meeting close friends and new people alike

, Initiating versus Reacting		• Comfortable in diverse groups (perspectives and backgrounds) – tendency towards a diverse friend circle • Relaxing: prefer seeing friends over e.g. going for a walk by themselves • Thrive if a larger group of people has a great group dynamic
	Intimate	• Prefer alone-time or being in smaller groups • Consider social interactions as exhausting and are energized by solitude (and time to calm down, process, and reflect on the future), wherefore they prefer keeping interactions (in larger groups) short • Value close friends who they trust • Prefer mutual understanding over diversity, wherefore they tend to surround themselves with likeminded people who have similar backgrounds • In large groups: act as observers rather than participants • Associate big gatherings with interactions that are mainly of a superficial nature • Believe that the quality of social interactions decreases with an increasing amount of people • Display some Extraverted tendencies with people who they are close with
	Initiating	• Do not hesitate to take the lead/initiative (e.g. starting conversations, being the first ones to dance) • When joining a group: assume they are welcome; introduce themselves; add to ongoing conversations • Motivate/energize others • Easily make new friends and meet new people • Feel at ease in formal and informal settings • Confident that their efforts will be appreciated; not offended if their suggestions and initiative are unheard
	Reacting	• In larger groups: dislike taking the initiative; rather socialize with people they know; prefer being introduced to new people rather than making the first step themselves

Dynamic versus Reserved		• Do not always feel the need to meet new people at events • Listen to their counterpart's standpoint before expressing their own opinion • Tend to dislike speaking up in front of others, not least due to being afraid of an unfavorable reaction – especially if they are supposed to share information about themselves • In social situations: usually do not take the lead/initiative (e.g. being the first ones to dance at a party)
	Dynamic	• Seek excitement and stimulation • Can get bored by what others might consider peaceful • Enthusiastic • Enjoy an agile environment • Like exploring and being in motion • Need to change environments every once in a while to prevent feeling drained/sedated • Prefer a work with multifarious tasks over a monotonous job; the latter may tire/bore them – the same goes for activities • Busy settings help them focus (e.g. coffeehouse) • Enjoy trying new hobbies, seeing new places and meeting new people • Need occasional changes/a “breath of fresh air” (e.g. rearranging furniture, changing hair color) • Do not mind sharing personal matters openly → due to enjoying meeting new people
	Reserved	• Are rather in a stable environment with few external stimuli that could cause disruption • Can feel overwhelmed in certain social situations (e.g. crowded bar) • Rather focus on one activity than on multiple • Focus better in quiet places (e.g. library) • Feel comfortable when surrounded by people they know • Value home, family, and friendship ideals • Rather build trust with someone than rushing into new friendships

- | | |
|--|---|
| | <ul style="list-style-type: none"> • Enjoy little routines (e.g. taking a bath and reading a book every Sunday) • Big changes seem suspicious to them at first • Have a cautious approach to new things and mentally prepare for changes • Vacation: getting away without surprises |
|--|---|

The second scale, the **Energy scale**, of personality traits in the model developed by NERIS Analytics Limited indicates whether a person is more Intuitive or more Observant – which essentially shows how they process the world surrounding them (NERIS Analytics Limited, 2015a). If an individual shows a tendency to the **Intuitive** side of the spectrum, it is argued that they are more likely to use their imagination and imagine “the past and future potential of what they see” (NERIS Analytics Limited, 2015a, n.p.). They are likely to ask questions, create different scenarios about the future, try to create a bigger picture by connecting the dots, are theory-focused, and are innovative and able to provide new directions and perspectives (NERIS Analytics Limited, 2015a). If a person is rather **Observant**, this means that they avoid too much interpretation and “are [rather] more interested in observable facts and more straightforward outcomes” (NERIS Analytics Limited, 2015a, n.p.). Thus, more Observant individuals tend to take on a more practical, focused, hands-on, and straight-forward approach and prefer simplicity – however, this can result in a reluctance to look for new solutions (NERIS Analytics Limited, 2015a).

This spectrum can again be divided into three subfacets, as has been highlighted before (NERIS Analytics Limited, n.d.-b):

- **Practical** (*Observant*) versus **Imaginative** (*Intuitive*): “what kinds of ideas, events, and activities [...] [one finds] most compelling. It may be those with concrete outcomes and practical benefits or ones that will allow [...] [one] to use [...] [one’s] creativity and imagination with few limits” (NERIS Analytics Limited, n.d.-c, n.p.)
- **Experiential** (*Observant*) versus **Theoretical** (*Intuitive*): “how [...] [one prefers] to gain understanding. This may be by using common sense and [...] [their] own direct experience of tangible facts, or a preference to venture into more abstract theories in search of underlying explanations” (NERIS Analytics Limited, n.d.-c, n.p.)

- **Scanning** (*Observant*) versus **Envisioning** (*Intuitive*): “whether [...] [one tends] to accept the world as it is or focus on how it can be changed and improved” (NERIS Analytics Limited, n.d.-c, n.p.)

Again, a more detailed description of what NERIS Analytics Limited understands under each of these dimensions can be found in Table 4. To give an example, an individual who is rather skeptical of change and prefers to stick to tried and tested methods as long as these are working can be put into the subcategory Scanning, whereas a person who is actively promoting improving existing methods is located rather in the subcategory Envisioning (NERIS Analytics Limited, n.d.-b).

Table 4: Description of the subfacets of the Intuitive – Observant spectrum (NERIS Analytics Limited, n.d.-b)

Subfacet	Description
Practical versus Imaginative Practical Imaginative	• Prefer activities with a visible/concrete result, that ideally is useful (e.g. prefer knitting over dancing) • Try to measure the results of their efforts • Comfort and cost over sentiment and beauty • Tend to value utility/material things; and/or tend to value social responsibility/spirituality • Are not inclined to daydream • Lack understanding for people who are passionate about fantasy, merely theoretical things, art for art’s sake etc. – they have difficulties appreciating the worth of non-measurable things • Tend to find a reasonable justification when doing something for entertainment/pleasure (e.g. health benefits for going for a walk, improving language skills when travelling, etc.) • Try to apply their skills with the aim of achieving a practical result (e.g. selling their paintings for charity)
	• Enjoy imagining, fantasizing, letting their thoughts wander, and thinking through different scenarios • Appreciate people who try to explore what the limits of what is possible are

		• Enjoy activities where they can escape reality – e.g. reading, watching a movie – and things/places/events with non-tangible values (e.g. personal insights, creativity) • May engage in art/innovation – have a creative inclination • Experiences, aesthetics, etc. over success in the form of e.g. a high income • Purely practical thinking hinders enjoying life • Self-expression through different forms of art (e.g. fashion, DIY-projects, interior design, dancing, writing) • Enjoy envisioning ideas equally much as implementing them • Do not seek recognition • Creative processes are more important than results • Enjoy new experiences as well as experiencing beauty in both, nature and humanity
Experiential versus Theoretical	Experiential	• Trust their own observations and experiences and form their own opinion rather than e.g. abstract conjectures or theories – they rather test unfamiliar techniques/devices themselves than learning about the underlying principles and mechanisms • Appreciate common sense • Comprehend things by experiencing them themselves rather than e.g. hearing about them in some documentary • Rather discover new places by experiencing them than by reading everything about them • Try to compensate for an inability to have an experience themselves by searching trustworthy sources – experiences of others seem more trustworthy than theories • Skeptical about questions to which the answer cannot be verified (e.g. philosophy) • Outcome over circumstances and underlying motives • Judge people by what they do (actions) and how they do it (behavior)

Scanning versus Envisioning	Theoretical	• Aim for the big picture • Focus on underlying principles rather than surface-level details • Want to learn the “how” and “why” behind – ask questions and seek to understand the reasons and workings and are unsatisfied if they do not have the answers to these questions • Disapprove of orders that are given without an explanation of the underlying reason why • Read up on the cultural and historical background of places they travel to • Prefer basing their decisions/opinions on a comprehensive range of knowledge rather than narrow perspectives • Rather explore novel theories/ideas • Become enthusiastic when an explanation connects seemingly unrelated concepts which then lead to the emergence of priorly undiscovered patterns • Little appreciation for regular/daily occurrences • Enjoy discussing with like-minded individuals about philosophy, science, spirituality, etc. • Lack understanding for people who prioritize practical matters (experiential personality traits) over theoretical ones
	Scanning	• Prioritize the status quo over potential scenarios how things could be – rather focus on the present than the future • Accept the current state and focus on its positive aspects • Well-established over novel: cautious when it comes to replacing well-established ideas/practices/etc. • Hesitate to invest financially in novel ideas
	Envisioning	• Focused on potential future meanings • Enjoy imagining/speculating about the future e.g. discussing visions, imagining what improvements will be made and how they could be made, future discoveries, living on different planets

	• Desire to apply their knowledge to pursue progress • Show little understanding for people who prevent improvements or dismiss challenges like e.g. the climate crisis • Frustrated with outdated and inefficient things • Regard failure as an unavoidable part of making progress
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The third spectrum of the NERIS Type Indicator is the **Nature (Thinking – Feeling)** spectrum of personality traits. Persons who lie within the **Thinking** part of the scale tend to rely on objective and scientific information and logical analyses (NERIS Analytics Limited, 2015d). They furthermore focus on rationality, fairness, effectiveness and on how realistic something is; and are also more likely to take decisions independently (NERIS Analytics Limited, 2015d). Therefore, they also tend to be critical thinkers (NERIS Analytics Limited, 2015d). **Feeling** individuals, on the other hand, are characterized by NERIS Analytics Limited (2015d) as being more protective and caring, compassionate, warm, and generally more emotion-focused decision-makers, wherefore they also tend to base decisions on others' well-being.

Again, the Nature spectrum can – as already mentioned before – be divided into three different facets (NERIS Analytics Limited, n.d.-b):

- **Rational** (*Thinking*) versus **Emotional** (*Feeling*): “whether [...] [one tends] to apply logic and rationality in [...] [their] reactions and decisions, or whether [...] [their] emotional responses usually guide [...] [them]” (NERIS Analytics Limited, n.d.-c, n.p.)
- **Individualistic** (*Thinking*) versus **Harmonious** (*Feeling*): “how much emphasis [...] [someone places] on protecting and even uplifting other people’s feelings” (NERIS Analytics Limited, n.d.-c, n.p.)
- **Stoic** (*Thinking*) versus **Expressive** (*Feeling*): “whether [...] [one is] comfortable with openly displaying [...] [their] emotions, or if [...] [they] tend to hide them” (NERIS Analytics Limited, n.d.-c, n.p.)

Table 5 shows in more details what NERIS Analytics Limited understands under each of these subfacets of the Thinking – Feeling spectrum. For instance, a person who is rather hiding their emotions and tries to keep a “poker face” can be allocated on the Stoic side of the Stoic – Expressive subfacet, which belongs to the Thinking-side of the Nature

spectrum; whereas a person who openly shows their emotions is rather allocated on the Expressive side of this subfacet, which belongs to the Feeling-side of the Thinking – Feeling spectrum (NERIS Analytics Limited, n.d.-b).

Table 5: Description of the subfacets of the Thinking – Feeling spectrum (NERIS Analytics Limited, n.d.-b)

Subfacet	Description
Rational versus Emotional	Rational • Led by reason, logic and rationality • Refrain from basing their decisions on their emotions – and consider emotion-based decisions as a major reason why people make poor choices • Feel uncomfortable when experiencing strong emotions that could lead to a loss of self-control • Advocate for fairness and equal chances/rights • Attracted to consistent and honest people • Disapprove of hypocrisy/dishonesty and behavioral ambiguities towards them • Critically assess things/situations • Have a hard time appreciating/respecting anything illogical • Provide help by: suggesting solutions and pointing out blind spots and possible sources of the problem • Appreciate receiving clear feedback – but also provide others with such • Occasionally considered as judgmental – however, they have the same standards for themselves
	Emotional • Led by emotions – rather opt for anything and anyone that/who engages emotionally • Feelings, and passions make life exciting for them – consider a life without emotions as monotonous and boring and thus also lack understanding for people repressing/ignoring their emotions • Prefer personal connections over purely informational ones • Look for signs that might guide them and rely on their instincts

		• Appreciate deep connections based on emotional understanding • Tolerate ambiguity in people's behavior • Rather risk experiencing occasional lows than missing out on the highs they experience because of emotional vulnerability and inhibition • Others appreciate their empathy and ability to sympathize • Helping others by: providing empathy and validation instead of solutions
Individualistic versus Harmonious	Individualistic	• Do not take responsibility for people's feelings – e.g. celebrate their victory regardless of their opponents being upset • Do not protect others' feelings by trying to please all parties involved • Do not make an effort to support others • Do not adjust their level to that of a weaker competitor – e.g. when playing badminton with friends • Speak up if they see some potential for improvement or have some input • Expect people who disagree with them to respect and consider their opinion and to not get emotional • Speak facts – honesty is more important to them than someone's feelings • Objectively assess situations
	Harmonious	• Consider how others might feel – e.g. try to achieve a win-win situation and hear everyone's ideas out, no matter how (un)reasonable they are • Provide others with encouragement and support • Consider whether the other person might feel upset before expressing negative criticism/feedback – and generally try to express negative feedback cautiously in order not to hurt anyone • Strive for harmony • Tactful and considerate

Stoic versus Expressive		• Do not necessarily support the concept of competition since this means someone will be defeated • If a victory means more to another competitor, they might even let this person win or at least be subtle about their success
	Stoic	• Try to keep calm and emotionally balanced, regardless of their feelings – seem controlled and flat in their expressions (“poker face”) • Rather tend to show their emotions indirectly – e.g. ignoring a person due to being displeased or showing affection by helping someone • Desire to protect themselves from being hurt • Suppress strong emotions • Want to stay in control of their emotions • May feel like it is unacceptable for them to show their emotions
	Expressive	• Openly express their emotions • Have close relationships with their family and friends • Tend to talk about their feelings in deep conversations, hug, etc.

Fourthly, the **Tactics scale** can be divided into a Judging and a Prospecting side. Essentially, this spectrum includes personality traits that indicate “how people plan and deal with the options they have” (NERIS Analytics Limited, 2015e, n.p.). **Judging** persons tend to be more goal-oriented and enjoy planning ahead as well as having backup plans in case the original plan does not work out (NERIS Analytics Limited, 2015e). Furthermore, individuals who dispose of this personality trait prefer clarity, make checklists, set specific goals, prioritize their duties and responsibilities, need laws, rules and standards, and complete one task before starting the next, wherefore this can lead to them being more rigid than people with a stronger tendency towards the Prospecting side of the spectrum (NERIS Analytics Limited, 2015e). If a person disposes of more **Prospecting** traits, they tend to be more flexible and reactive to the environment, wherefore they also tend to take impulsive decisions and switch tasks instead of focusing on one thing until it is completed (NERIS Analytics Limited, 2015e). Thus, they also tend to have multiple passions (NERIS Analytics Limited, 2015e).

As has been the case for the spectra before, the Judging spectrum can too be divided into three subdimensions/subfacets (NERIS Analytics Limited, n.d.-b):

- **Strategic** (*Judging*) versus **Spontaneous** (*Prospecting*): “describes whether [...] [one is] more likely to plan things out ahead of time or take them as they come” (NERIS Analytics Limited, n.d.-c, n.p.)
- **Deciding** (*Judging*) versus **Browsing** (*Prospecting*): “whether [...] [one prefers] to make up [...] [their] mind as quickly as possible or keep [...] [their] options open as long as [...] [they] can” (NERIS Analytics Limited, n.d.-c, n.p.)
- **Disciplined** (*Judging*) versus **Whimsical** (*Prospecting*): “whether [...] [one tends] to stick to [...] [their] commitments and decisions, or [...] [changes their] mind and [...] [follows their] inclinations” (NERIS Analytics Limited, n.d.-c, n.p.)

A detailed description of what traits NERIS Limited Analytics understands as part of these subfacets of the Judging versus Prospecting spectrum can be found in Table 6. For example, an individual who prefers making considerate decisions after a thorough and detailed analysis of the relevant information and who dislikes uncertainty can be allocated on the Deciding side of the Deciding – Browsing subfacet, which is part of the Judging side of the Tactics scale (NERIS Analytics Limited, n.d.-b). On the other hand, if an individual prefers to keep their choice open rather than finalizing something and committing to a decision – meaning they can handle uncertainty well – is rather allocated on the Browsing side of this subspectrum, which is part of the Prospecting side of the Tactics spectrum (NERIS Analytics Limited, n.d.-b).

Table 6: Description of the subfacets of the Judging – Prospecting spectrum (NERIS Analytics Limited, n.d.-b)

Subfacet	Description
Strategic versus Spontaneous Strategic	• Prefer deliberate planning over improvising – e.g. schedule appointments well ahead • Try to meet deadlines/achieve goals/etc. by following methodological steps – use checklists and schedules, even if they might just have them in their head instead of written somewhere • Conduct thorough research and review all options beforehand to maximize their potential for success, take informed decisions, and minimize the risk of unpleasant surprises

Deciding versus Browsing		• Have an (at least general) understanding of what they want to achieve in life as well as the means required to reach these goals • Facing spontaneous decisions, changing objectives spontaneously or having to take over tasks spontaneously can stress them • Dislike having to adapt/change the system they have developed for delivering good results at work due to spontaneous changes
		• Dislike planning, and even more so making detailed plans – they feel like this is restricting them and their options (e.g. when an unforeseen opportunity arises) • Prefer solving problems as they occur instead of planning ahead for potential issues • Enjoy working on urgent/currently important matters – this increases their productivity • Prefer to let their inspiration guide them • Prefer flexible working hours, deadlines, etc. • Experience alternating periods of high productivity and disengagement • Rather risk potential future delays than losing time for planning in the beginning
	Spontaneous	• Prefer to pursue a chosen course of action • Do not mind making binding promises • Know their objectives and future actions • Base decisions on a thorough evaluation of the possible options • Dislike uncertainty, confusion and complication – prefer clear definitions and a clear outcome • Value clear signals and straightforwardness – and solve interpersonal problems by discussing them straightforwardly • Frustrated by others delaying decisions • Experience discomfort not knowing their position in a relationship

Disciplined versus Whimsical	Browsing	• Rather keep their options open than restricting their freedom by making decision/plans – thus they also tend to postpone decisions, often until close to/past the deadline • Disapprove of seemingly too early commitments • Struggle deciding on an option but nonetheless they are constantly on the lookout for new alternatives, even at the very moment of decision • Prefer to only proceed as far in a direction as they can still turn back/reverse course • Prefer others to choose for them • Feel pressured when having to take final decisions • Comfortable operating under uncertainty and in vague situations that leave room for interpretation
	Disciplined	• Stick with their plans, choices and goals, unless if they have a substantial reason to change them – and also their tendencies and preferences remain stable over time • Keep their promises and meet their obligations • Place value on an ordered life and professional environment (e.g. keeping up with deadlines, handling their savings, etc.) and keep their belongings and environment in order • Value responsibility and reliability more than experiencing fleeting pleasures – get frustrated easily with unreliable people • Disapprove of people who frequently change their minds • Can be perceived as rigid
	Whimsical	• Frequently change their priorities, plans, decisions, interests, and preferences • Prefer taking unexpected opportunities over following past commitments/plans – perceive following through with priorly-made plans to happen at the cost of the enjoyment of being able to take spontaneously arising chances • Live in the present and often disregard the future/past • Consider it pointless to perfect anything they do not get to enjoy or enhance

The fifth and final dimension is the **Identity spectrum** of the NERIS Type Indicator, that is, whether an individual is Assertive or Turbulent. These traits affect – as mentioned in Table 1 – all other trait dimensions (NERIS Analytics Limited, 2015b). This spectrum approaches how an individual reacts to certain circumstances and things (NERIS Analytics Limited, 2015b). More **Assertive** individuals tend to be stress-resistant, confident, and even-tempered (NERIS Analytics Limited, 2015b). Furthermore, they do not overthink past happenings and are tendentially more satisfied with their lives than their Turbulent counterparts (NERIS Analytics Limited, 2015b). **Turbulent** individuals, on the other hand, are highly success- and goal-oriented, careful, attentive and perfectionistic (NERIS Analytics Limited, 2015b). This also includes that they tend to be eager to improve and are sensitive to any potential problems that might arise (NERIS Analytics Limited, 2015b).

Also for the Identity spectrum, the trait spectrum scale can be divided into three subfacets, according to NERIS Analytics Limited (n.d.-c):

- **Confident** (*Assertive*) versus **Doubtful** (*Turbulent*): “describes how [...] [they] evaluate [...] [themselves] and [...] [their] abilities” (NERIS Analytics Limited, n.d.-c, n.p.)
- **Stable** (*Assertive*) versus **Agitable** (*Turbulent*): “describes [...] [someone’s] sensitivity to stress and anxiety” (NERIS Analytics Limited, n.d.-c, n.p.)
- **Flowing** (*Assertive*) versus **Lingering** (*Turbulent*): “how much time [...] [someone spends] thinking about things that occurred in the past” (NERIS Analytics Limited, n.d.-c, n.p.)

Table 7 contains a more detailed description of what NERIS Analytics Limited understands under those subdimensions. For instance, a person who trusts in their abilities without worrying much about what others think of them is rather located on the Confident side of the Confident – Doubtful subfacet, which is located on the Assertive side of the Identity spectrum (NERIS Analytics Limited, n.d.-b). In comparison, if a person is doubting themselves and their abilities and cares a lot about how they are perceived by others they are rather located on the Doubtful side of this subfacet, and thus, looking at the higher-ranked Identity spectrum, rather lies on the Turbulent side of this (NERIS Analytics Limited, n.d.-b).

Table 7: Description of the subfacets of the Assertive – Turbulent spectrum (NERIS Analytics Limited, n.d.-b)

Subfacet		Description
Confident versus Doubtful	Confident	• Have confidence in their knowledge and skills and believe in themselves and their success • Optimistic approach • Believe that they are seen positively by others (appearance, character, etc.) • Not discouraged by/afraid of disapproval • Believe in their value • Know they are worthy of respect/recognition • Stand up for themselves, their rights and their values and beliefs • Dare to speak up • Risk of overconfidence • Their confidence can be mistaken for arrogance
	Doubtful	• (Overly) aware of their weaknesses and unconfident about their abilities • Tend to have self-doubts – which can e.g. lead to a lack of confidence in pursuing goals or low trust in others • Low risk of hubris • Worry about others' opinions about them – sensitive to others' opinions/statements/reactions • Rather pessimistic view of their chances to succeed • Cautious approach: prepare thoroughly in advance and double-check their work before submission • Seek confirmation • Rather trust negative than positive feedback
Stable versus Agitable	Stable	• Able to regulate their emotions and rarely experience drastic mood swings – process intense emotions constructively instead of letting them run free • Optimistic and good at restoring their mental health • Capable of managing uncertainty and pressure – worry little about the future

Flowing versus Linging		• Low levels of anxiety/fear • Try to stay away from minor disputes – and tend to function as mediators for others' disagreements • Usually do not cause drama due to minor disagreements • Untouched by comments/the opinions of other people
	Agitable	• Anxious and commonly feel upset • Do not always feel in control of their emotions – can experience significant alterations of their emotional state • Pessimistic and tend to frequently experience negative feelings – often rely on other individuals as their source of stability/optimism instead • Worried about the future • Avoiding problems increases their anxiety rather than resulting in relief • Unable to function properly under pressure
	Flowing	• Live in the present rather than the past/future • Focus on things they can control rather than overthinking past happenings – rather make amends for past mistakes and move on • Able to forgive themselves and laugh about their mistakes/embarrassing stories • Share embarrassing stories from the past for entertainment purposes • Accept their imperfections
	Linging	• Tend to overthink past happenings and alternative scenarios for these, not least to learn from their mistakes • Unable to forgive/comfort themselves • Unable to forget bad memories – reexperience the same bad feeling whenever they think about them

Strategies and roles

Depending on the predominant side of each of these priorly described trait spectra, four different **strategies** (the outer part of the acronym) and four different **roles** (the inner part of the acronym) can be derived, whereby the specific letters indicating each of the predominant sides can be found in Table 1 (NERIS Analytics Limited, 2013). Strategies give insights into the “preferred ways of doing things and achieving goals” (NERIS Analytics Limited, 2013, n.p.). Roles on the other hand give insights into “goals, interests, and preferred activities” (NERIS Analytics Limited, 2013, n.p.). As can be seen in Figure 2 and Figure 3, there are four different categories of types, which are grouped according to the roles (horizontal grouping) of an individual:

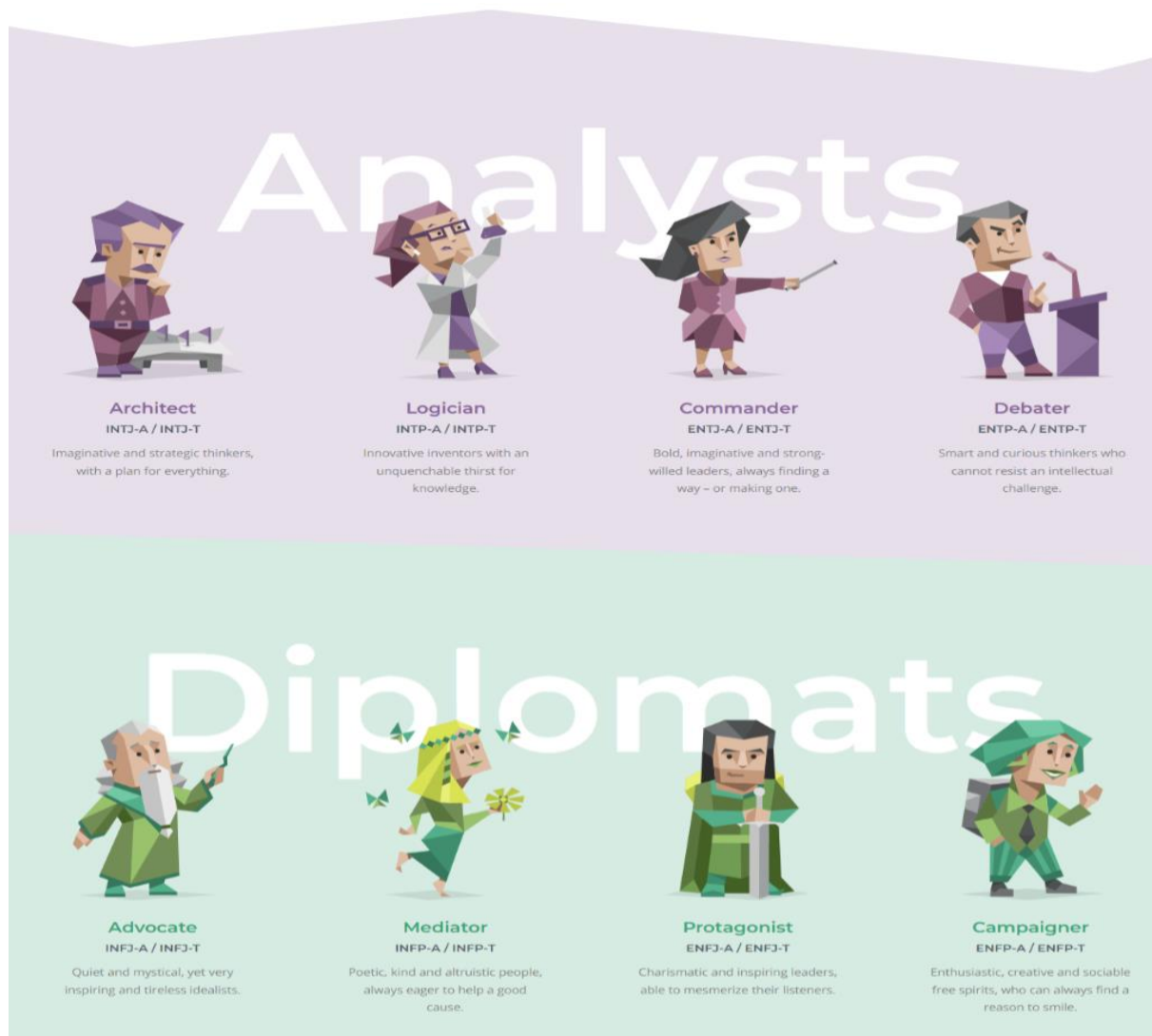
- **Analysts** (acronym: _NT_-_) are rather positioned on the Intuitive and Thinking sides of the respective spectra;
- **Diplomats** (acronym: _NF_-_) show characteristics from the Intuitive and Feeling sides of the respective spectra;
- **Sentinels** (acronym: _S_J_-_) can rather be located on the Observant and Judging sides; and
- **Explorers** (acronym: _S_P_-_) are more Observant and Prospecting individuals (NERIS Analytics Limited, 2013).

The different strategies on the other hand are reflected in the four vertical groups in in Figure 2 and Figure 3:

- **Confident Individualism** (acronym: I____-A) means that the individual rather has characteristics from the Introverted and the Assertive sides of the respective spectra;
- Those who fall into the category **People Mastery** (acronym E____-A) have higher scores for the trait dimensions Extraverted and Assertive of the respective spectra;
- **Constant Improvement** (acronym: I____-_) indicates that an individual is located on the Introverted and Turbulent sides of the two spectra; and finally,
- **Social Engagement** (acronym: E____-T) means the respective individual is rather Extraverted and Turbulent (NERIS Analytics Limited, 2013).

These different roles and strategies can then be combined, resulting – as the Myer-Briggs Type Indicator – in 16 different personality types with different characteristics, as is also visible in in Figure 2 and Figure 3.

Figure 2: NERIS Personality Types Part 1 (NERIS Analytics Limited, n.d.-c)



Since this thesis will – as stated before – only focus on personality traits, a more detailed description of the different personality types identified by NERIS Analytics Limited would not be reasonable and will thus be refrained from.

The following chapter gives insights into the regional differences in the level of presence of different personality traits. In other words, the reader will be introduced to geographical psychology, whereby the focus here will be on personality traits. In doing so, the Country

Personality Profiles developed by NERIS Analytics Limited shall furthermore be introduced.

Figure 3: NERIS Personality Types Part 2 (NERIS Analytics Limited, n.d.-c)



2.2.5 Geographical psychology

Regions can be characterized by certain political, economic, social and health (PESH) characteristics, like e.g. the amount of social capital available or also mortality rates (Rentfrow et al., 2013). The same way as according to a PESH characterization, regions can also be divided according to the predominant psychological characteristics (such as personality traits or configurations of such personality traits), as has already been mentioned in Chapter 1 (Rentfrow et al., 2013). This field of research is known as **geographical psychology** or **geopsychology**. In short, geographical psychology “aims to integrate psychology and the different levels of geographic analysis by focusing on the

spatial distribution of psychological phenomena and their relations to features of the macro environment” (Rentfrow & Jokela, 2016, p. 393) or – in other words – it is “concerned with the spatial organization of psychological phenomena and how individual characteristics, social entities, and physical features of the environment contribute to their organization” (Rentfrow & Jokela, 2016, p. 393). According to Rentfrow & Jokela (2016), these predominant psychological characteristics therefore are linked to the afore mentioned P, E and H component of the PESH characteristics – that is, the political, economic, and health indicators – and interact with the respective local environment. Instead of solely applying a narrow focus on the microenvironment, it is thus reasonable to moreover look into the macroenvironment in the respective area (Rentfrow & Jokela, 2016).

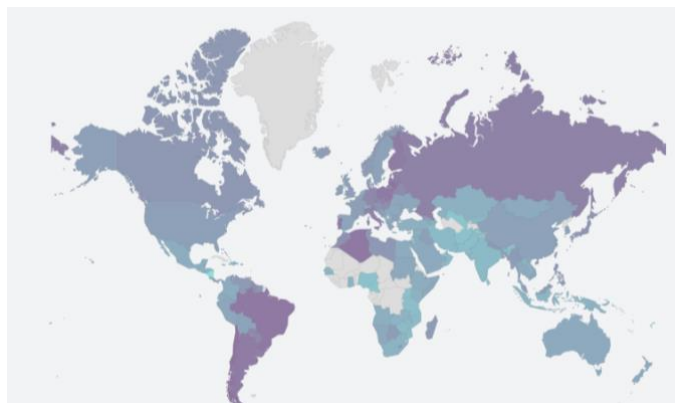
Rentfrow & Jokela (2016) identified three factors responsible for the existence of geographical clusters of certain psychological characteristics, namely:

- **Social** influences – i.e., influences from interactions with other people,
- **Ecological** influences – i.e., influences from the built and the natural environment, and
- **Selective** migration – i.e., the tendency of an individual to move to an environment that matches their psychological needs (Rentfrow & Jokela, 2016).

When taking on such geographical perspective to analyze the presence of personality traits and the degree to which they are present, findings show that differing regional personalities exist, or in other words, that, if a map showing the respective predominant personality traits is created, regional clusters of these will be visible on that map (Rentfrow et al., 2013). Rentfrow et al. (2013) pointed out that little research has been done when it comes to personality differences within countries: up until their 2013 study there had only been three prior research projects on this topic, which, however – despite methodological and conceptual differences between the studies – all proved that there are indeed differences in the mean level of personality traits depending on the region observed (Rentfrow et al., 2013). When it comes to comparing the mean levels of personality traits across broader regions (like e.g. Eastern Europe, South America, Asia, etc.), more literature is available (Rentfrow et al., 2013). Findings of the latter research area show for instance, that Asian cultures dispose of a lower overall level of Extraversion than other cultures, or that the overall level of Neuroticism seems to be particularly high in Southern and Eastern Europe when compared to the rest of Europe (Rentfrow et al., 2013).

As briefly mentioned in Chapter 1, NERIS Analytics Limited has too followed such geopsychological approach by developing **Country Personality Profiles** which are illustrated on a map (see <https://www.16personalities.com/country-profiles/global/world#global>) and which will serve as the basis for this research. The map has been developed based on anonymized data collected on the website over approximately three years from people all over the world who took the respective local version of the test, whereby it needs to be highlighted that all different local versions of the test have undergone reliability and validity testing (NERIS Analytics Limited, n.d.-a). That way, a total of 40,102,423 respondents were included in the global country map, whereby only countries with 1,000 and more respondents were included in the global map (NERIS Analytics Limited, n.d.-a). The personality map offers different choices on what to display (e.g. the predominant personality traits in certain regions or how much a certain trait is represented in a certain country) on a global/regional level as well as a general overview for every single country; and it is also possible to compare countries. Figure 4 shows as an example what the global map for the personality traits “Introverted” and “Extraverted” looks like, whereby the color-code goes from blue for the more Extraverted countries to purple for the more Introverted ones.

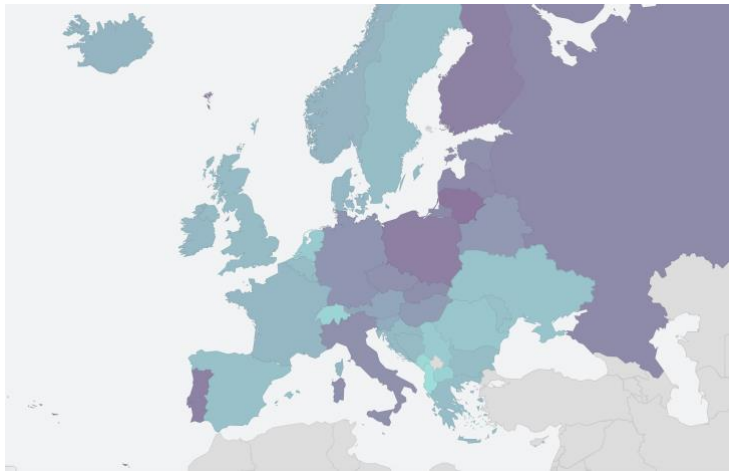
Figure 4: Introverted versus Extraverted countries (NERIS Analytics Limited, n.d.-d)



Applying such geopsychological perspective on Europe (including all Russia and Cyprus), the top five Introverted countries in Europe are Lithuania (+ 11.19 % Introverted), the Faroe Islands (+ 10.22 % Introverted), Poland (+ 9.66 % Introverted), Finland (+ 9.3 % Introverted) and Portugal (+ 9.3 % Introverted) (NERIS Analytics Limited, n.d.-a). The top five Extraverted countries in Europe on the other hand are Albania (+ 5.02 % Extraverted), Montenegro (+ 4.23 % Extraverted), Switzerland (+ 3.6 % Extraverted), Macedonia

(+ 3.25 % Extraverted) and Cyprus (+ 3.16 % Extraverted) (NERIS Analytics Limited, n.d.-a). As a case in point, Figure 5 is illustrating this positioning of the different countries on the Extraversion – Introversion spectrum. Regarding the Intuitive – Observant spectrum the top five most Intuitive countries are Italy (+ 20.17 % Intuitive), Bosnia and Herzegovina (+ 19.04 % Intuitive), Montenegro (+ 18.48 % Intuitive), Bulgaria (+ 18.16 % Intuitive) and Serbia (+ 18.1 % Intuitive) (NERIS Analytics Limited, n.d.-a). The most Observant countries in Europe (including all Russia and Cyprus) are the Ukraine (+ 8.53 % Intuitive), Jersey (+ 8.79 % Intuitive), the Faroe Islands (+ 8.9 % Intuitive), Belarus (+ 9.35 % Intuitive), as well as the United Kingdom (+ 10.07 % Intuitive) (NERIS Analytics Limited, n.d.-a). Thus, it can be observed that even the least Intuitive countries in Europe (including all Russia and Cyprus) can still be seen as being more Intuitive than Observant. Regarding the allocation of countries in Europe (including all Russia and Cyprus) on the Thinking – Feeling spectrum the most Thinking countries are Russia (+ 3.03 % Thinking), Belarus (+ 2.38 % Thinking), the Ukraine (+ 2.19 % Thinking), Moldova (+ 1.84 % Thinking), and Serbia (+ 1.74 % Thinking). (NERIS Analytics Limited, n.d.-a). On the contrary, the most Feeling ones are Jersey (+ 19.01 % Feeling), Guernsey (+ 17.98 % Feeling), Ireland (+ 17.22 % Feeling), Gibraltar (+ 17.14 % Feeling) and the Faroe Islands (+ 16.38 % Feeling) (NERIS Analytics Limited, n.d.-a). Looking at the Judging – Prospecting spectrum, the top five most Judging/least Prospecting countries are Albania (+ 1.37 % Judging), the Ukraine (+ 0.92 % Judging), Macedonia (+ 0.61 % Judging), Moldova (+ 0.19 % Prospecting) and Cyprus (+ 1.28 % Prospecting) (NERIS Analytics Limited, n.d.-a). As for the most Prospecting countries, these are the Faroe Islands (+ 11.27 % Prospecting), Lithuania (+ 9.86 % Prospecting), Iceland (+ 9.52 % Prospecting), Finland (+ 8.84 % Prospecting), and Latvia (+ 8.84 % Prospecting) (NERIS Analytics Limited, n.d.-a). Finally, for the Assertive – Turbulent spectrum it can be observed that the least Turbulent countries are the Ukraine (+ 1.51 % Turbulent), Serbia (+ 1.76 Turbulent), Montenegro (+ 2.14 % Turbulent), Switzerland (+ 2.35 % Turbulent), and the Netherlands (+ 3.01 % Turbulent) (NERIS Analytics Limited, n.d.-a). The most Turbulent ones on the other hand are Guernsey (+ 14.39 % Turbulent), the Isle of Man (+ 13.54 % Turbulent), Italy (+ 13.51 % Turbulent), Ireland (+ 13.51 % Turbulent), and the United Kingdom (+ 12.49 % Turbulent) (NERIS Analytics Limited, n.d.-a).

Figure 5: Europe (including all Russia and Cyprus)– Introverted versus Extraverted countries (NERIS Analytics Limited, n.d.-a)



After getting an insight into leadership, personality traits, personality trait assessment methods, and regional personalities, it can now be moved on to assessing the relationship between the presence of personality traits that have been found to be associated with effective leadership in a certain region and the existence of a potential compensation for such effective leadership (i.e., a larger income gap between employer entrepreneurs and solo self-employed) in the next section of this thesis.

2.3 Personality traits and leadership effectiveness

This chapter of the thesis will compare the personality traits that are part of each of the NERIS Analytics Limited trait spectra and personality traits mentioned in the literature in connection with leadership effectiveness. This comparison will be implemented by comparing the leadership traits found during the literature review with the subdimensions of NERIS Analytics Limited's five trait spectra. Thereafter, hypotheses will be derived where applicable based on the priorly made comparisons.

Referring back to what has been argued in Chapter 1 this thesis assumes that a premium is paid to compensate those employers who are good leaders since customers are assumed to opt for the provider that offers them the highest level of satisfaction: there is only a certain number of customers available in each region – and these customers presumably will buy more from those companies who provide the best offer. The advantages of a business with employees (i.e. a business led by an employer entrepreneur) are a division of work and a skill-based allocation of the tasks; moreover, their teams are able to complete more work than a single person alone could (firstly because the workload is distributed among several people and secondly also because of Aristoteles' argumentation that the whole is more than the sum of its parts). A solo self-employed person, on the other hand, needs to complete all tasks by themselves and thus a) needs to be the expert in everything they do/offer; b) cannot perform tasks simultaneously and also needs to take breaks wherefore they are slower than a team of people; and c) due to the fact that they also tend to be less likely to have proper health care plans and other measures of social security, as highlighted by Cieřlik & van Stel (2023) (see Chapter 1) as well as d) them not having anyone to take over their tasks when sick/on vacation, etc. It is therefore assumed that, if the employer entrepreneur is a good leader, a business with employees can achieve a higher customer satisfaction as a result of this teamwork/division of work and skill-based allocation of tasks. Thus, it is assumed that the income gap between a solo self-entrepreneur and an employer entrepreneur should be larger if the latter is disposing of leadership traits.

Hereby it is worth mentioning that according to Judge et al. (2009, p. 864) "[p]ersonality scores at the extremes could indicate borderline clinical or personality disorders, rather than 'normal' personality traits, and therefore limit [...] [the] discussion of this phenomena". To illustrate this with an example, Judge et al. (2009) mentioned, that a person who is

highly extraverted according to the definition used in the priorly described FFM (see Chapter 2.2.2) could tend to make hasty decisions and prematurely change the course of direction due to having a short-lived enthusiasm and constantly seeking new sensations. Since, however, no clarification of where the border of such “extreme” level of a personality score for the NERIS Analytics Limited trait spectra is lying was found during the literature research this factor will be left out of consideration in this thesis. Thus, findings regarding these extremes will be left out of consideration when determining which side of each of the trait spectra is more favorable for leadership effectiveness.

Extraversion versus Introversion spectrum

In the literature existing at the point of writing successful leaders are described for example as sociable, outgoing and talkative and are what one could call “people persons” (Bertocci, 2009; Hogan et al., 1994; Judge et al., 2009; Northouse, 2020). Looking into what NERIS Analytics Limited (n.d.-c) understands under each of the subfacets (see Chapter 2.2.4), these attributes can be categorized as belonging to the subfacet Sociable of the Sociable versus Intimate subspectrum of the Mind spectrum. Regarding the Intimate side, however, the literature review led to the conclusion that it can have a negative impact if a person is for instance a loner or is asocial (Northouse, 2020). This indicates that disposing of attributes that belong to the subfacet Sociable is more favorable for effective leadership than disposing of traits from the subcategory Intimate. Furthermore, it has been found that successful leaders tend to be, among others, initiative, good at motivating others and at getting their devotion, ready to take decisions, and to take the initiative (Bertocci, 2009; Hogan et al., 1994; Northouse, 2020). These attributes are concluded to belong to the second category of subfacets of the Extraversion – Introversion spectrum, namely the Initiating versus Reacting one – and more specifically to the Initiating side of this spectrum. The literature review did not lead to the identification of any traits typical for successful leaders which can be concluded to be part of the subcategory Reacting. Therefore, this indicates that successful leaders tend to dispose of traits from the subcategory Initiating rather than from the subcategory Reacting. Finally, authors mentioned that successful leaders tend to be energetic, active, upbeat, enthusiastic and open to new things (Bertocci, 2009; DeRue et al., 2011; Hogan et al., 1994; Judge et al., 2009; Northouse, 2020). These traits are concluded to be part of the subcategory of Dynamic personality traits. Thus, there

again seems to be a clear tendency towards Dynamic traits as a prerequisite for leadership effectiveness.

Since all three subcategories containing more traits associated with effective leadership (Sociable, Initiating, Dynamic) are belonging to the Extraversion side of the Mind spectrum, the first hypothesis (H1) for this thesis is the following:

H1: The income difference between employer entrepreneurs and solo self-entrepreneurs in more Extraverted countries is higher than in more Introverted ones.

Intuitive versus Observant spectrum

In order to develop the second hypothesis, it has been looked into which traits of successful leaders can be concluded to be part of the subcategories of the Observant – Intuitive spectrum. Judge et al. (2009) highlighted numerous times that a resistance to change and an unwillingness to adapt have a negative impact on leadership effectiveness. This reluctance to change can be placed on the Practical side of the Practical – Imaginative spectrum. However, no traits having a positive impact on leadership could be identified as belonging to the Practical side of this subdimension. Regarding the other – Imaginative – side of the Practical versus Imaginative spectrum the literature review conducted for this research showed that among others, a vivid imagination, curiosity, enjoying reflective thinking as well as thinking divergently are traits that can foster leadership effectiveness (DeRue et al., 2011; Judge et al., 2009). Overall, the literature thus indicates that the Imaginative side of the spectrum is more favorable for leaders to be located on in order for them to be successful. In regard to the second subfacet (Experiential versus Theoretical) no traits that could be located on the Experiential side of the spectrum which are seen as contributing to leadership effectiveness could be found. However, authors stated that i.a. being insightful, being aware of what is going on, having an interest in abstract ideas, thinking critically, and having a desire to learn about a certain subject are all traits of successful leaders (Bertocci, 2009; Judge et al., 2009; Northouse, 2020). These traits have been concluded to be located on the Theoretical side of the second subfacet, therefore indicating that people lying on the Theoretical side of the spectrum dispose of traits that are seen as more favorable for leadership effectiveness. Finally, the third subfacet contains the spectrum of Scanning versus Envisioning. As with the first subfacet, solely some traits found to have a negative effect on leadership effectiveness that could be

placed on the Scanning side (that is, the side of the subfacet which belongs to the Observant side of the Energy spectrum) could be found during the literature review: Judge et al. (2009) highlighted for instance, that avoiding innovation or resisting change are not favorable for a leader's successfulness. As for the Envisioning side of the spectrum, it was found that among others foresightedness, openness to new ways of working, and a passion to challenge conventional wisdom are considered as having a positive effect on leadership effectiveness in the existing literature (DeRue et al., 2011; Judge et al., 2009; Northouse, 2020). Therefore, successful leaders are in conclusion more prone to be located on the Envisioning side of the spectrum.

Looking at all three subfacets it can therefore be observed that there seems to be a tendency towards the sides of the subfacets belonging to the Intuitive side of the spectrum (namely Imaginative, Theoretical, as well as Envisioning). Due to said tendency towards the Intuitive side of the Energy spectrum the second hypothesis (H2) for this thesis will be the following:

H2: The income difference between employer entrepreneurs and solo self-entrepreneurs in more Intuitive countries is higher than in more Observant ones.

Assertive versus Turbulent spectrum

To develop the the third hypothesis (H3) an analysis which leadership traits found during the literature review can be identified as belonging to the different subfacets of the Assertive – Turbulent spectrum has been conducted. Various authors mentioned traits like self-acceptance, self-assurance, self-esteem, believing in themselves, and having a sense of certainty as favorable for leadership effectiveness (Bertocci, 2009; Hogan et al., 1994; Judge et al., 2009; Northouse, 2020). Comparing these traits with what NERIS Analytics Limited's description of the trait spectra this thesis concludes that these traits belong to the Assertive side, and more specifically to the Confident side of the Confident – Doubtful subfacet. As for the Doubtful side, the only aspect found with a potentially favorable effect on leadership effectiveness is that being located on this side of the subcategory can prevent hubris (Judge et al., 2009). Regarding the Stable – Agitable subdimension, authors mentioned that leadership effectiveness is also influenced by, i.a., emotional control and being able to stay calm in moments of crisis, a tolerance for uncertainty and stress, positivity as well as optimism (Bertocci, 2009; Hogan et al., 1994; Judge et al., 2009;

Northouse, 2020). These traits match the description of the Stable side of this subdimension. The Stable side is again part of the Assertive side of the Identity spectrum. As for the Agitable side, there again is only one aspect that might be partially related to this subfacet and have a positive influence on leadership effectiveness: namely that, according to Judge et al., (2009), displaying one's emotions can increase credibility, gain one respect, and help exert a meaningful influence. Here, however, a potential issue is that this side of the subfacet is prone to experiencing negative emotions (NERIS Analytics Limited, n.d.-b). This, again, contrasts with the priorly highlighted positive effect of optimism and positivity on leadership effectiveness (Judge et al., 2009; Northouse, 2020). Nonetheless, it might sometimes even be beneficial to show negative emotions instead of remaining completely calm. Finally, only few traits that could be allocated anywhere on the Flowing – Linging subspectrum have been found during the literature review that are mentioned to have a positive effect on leadership effectiveness: on the Flowing side, it being foresighted was found to have such positive effect; whereas for the Linging side an enjoyment for reflective thought could be mentioned (Judge et al., 2009; Northouse, 2020).

In conclusion, the literature analysis shows that for two out of the three subfacets there is a tendency towards the side of the subspectrum that is part of the Assertive side of the Assertive – Turbulent spectrum. Said tendency towards the Assertive side of the Identity spectrum leads to the following third hypothesis (H3):

H3: The income difference between employer entrepreneurs and solo self-entrepreneurs in more Assertive countries is higher than in more Turbulent ones.

Thinking versus Feeling spectrum

Following, the findings of the literature review on traits which have a positive impact on leadership effectiveness/success and can be allocated on the Thinking – Feeling spectrum of the NERIS Type explorer will be illustrated. More specifically, the next paragraphs will show the reader where those traits can be allocated on the subfacets of this spectrum that have been described before – namely Rational versus Emotional, Individualistic versus Harmonious, and Stoic versus Expressive. It was found during the literature review that i.a. reasonableness, an ability to provide constructive feedback but also to accept criticism, and encouraging a fair working environment match the description of the Rational side of

the Rational versus Emotional subfacet (Bertocci, 2009; Hogan et al., 1994; Judge et al., 2009; Northouse, 2020). For instance, being tactful or showing empathy can instead rather be allocated on the Emotional side of this subfacet (Bertocci, 2009; Hogan et al., 1994; Northouse, 2020). Regarding the second subfacet, Individualistic versus Harmonious, i.a. the leadership traits integrity, openness with others, and being believable and honest are concluded to be allocated on the Individualistic side of this spectrum (Bertocci, 2009; Hogan et al., 1994; Judge et al., 2009; Northouse, 2020). In contrast, e.g. empathy and tact, being thoughtful, promoting affiliation, and holding people together appear to rather be located on the Harmonious side of this subcategory (Bertocci, 2009; Hogan et al., 1994; Judge et al., 2009; Northouse, 2020). The final subfacet of this spectrum is the Stoic – Expressive one. Here, the traits of successful leaders mentioned in the literature that can be allocated on the Stoic side of this spectrum center around emotional stability, balance and control (Bertocci, 2009; DeRue et al., 2011; Hogan et al., 1994; Judge et al., 2009). As for the Emotional side of this spectrum, it was concluded that i.a. social nearness as well as expressing positive emotions can be allocated on this side (Hogan et al., 1994; Judge et al., 2009).

Overall, both sides of the Thinking – Feeling spectrum seem to include some traits that are seen as important contributors to leadership effectiveness. Thus, no hypothesis will be derived for this spectrum since attributes from both sides seem to be necessary, which leads to the conclusion that successful leaders should likely strike a balance between those two sides. For instance, Northouse (2020) pointed out that it is important to balance being open (Thinking) with a thorough consideration of what should be disclosed (Feeling) in a certain situation since sometimes telling the truth might actually have a counterproductive effect. In other words, it sometimes might be necessary to adapt to a certain situation and react accordingly.

Judging versus Prospecting spectrum

Lastly, it shall be investigated which traits of successful leaders found during the literature review can be allocated on the Judging – Prospecting spectrum. I.a. planning ahead, structuring, and being foresighted – all traits that are concluded to be located on the Strategic side of the Strategic versus Spontaneous subfacet – contribute to effective leadership (DeRue et al., 2011; Northouse, 2020). Being flexible and dynamic are equally

seen as contributors to leadership effectiveness, whereby these are concluded to be allocated rather on the Spontaneous side of this subfacet (Bertocci, 2009; Northouse, 2020). As for the second subdimension, the Deciding versus Browsing one, authors mentioned that for example being decisive and ready to take decisions or having a sense of direction are traits associated with leadership effectiveness (Bertocci, 2009; Hogan et al., 1994; Judge et al., 2009; Northouse, 2020). These traits are concluded to be part of the Deciding side of this subfacet. However, Hogan et al. (1994) moreover pointed out a tolerance for uncertainty as a trait of successful leaders, which can rather be allocated on the Browsing side of this subspectrum. Furthermore, authors emphasized that i.a. a strong determination and focus to reach one's goals, being persistent, as well as being disciplined are favorable for leadership effectiveness (Bertocci, 2009; Judge et al., 2009; Northouse, 2020). These traits match the descriptions of NERIS Analytics Limited's Disciplined side of the Disciplined – Whimsical subfacet of the Tactics spectrum. Lastly, the literature review suggests that for instance flexibility, adaptability, an openness to try out different ways of working or being able to cope with organizational change are also associated with leadership effectiveness (Bertocci, 2009; DeRue et al., 2011; Judge et al., 2009). These traits are concluded to be located on the Whimsical side of this last subfacet.

Looking at these findings there again appears to be no clear tendency towards one side of the Tactics spectrum: both sides seem to contain some highly important traits for effective leadership. Thus, it will again be refrained from developing a hypothesis for this spectrum, since – just like with the Feeling spectrum – it is assumed that leadership effectiveness requires balancing the two sides of the spectrum.

2.3.1 The influence of gender on the effect of personality traits on leadership effectiveness – biological gender as a moderating variable

This section will focus on the influence gender has on the effect of personality traits on the income gap between employer entrepreneurs and solo self-entrepreneurs. First, it will be looked into the general connection of a person's gender and entrepreneurship. Thereafter, it will be investigated in detail how a person's gender affects the effect personality traits have on the income gap between the two types of entrepreneurs or – in other words - the

possible existence/height of a leadership compensation. Finally, hypotheses for each of the five trait spectra will be derived based on the findings of the literature research.

It was found that across different countries – besides the age and education – there are also differences in the gender of who becomes an entrepreneur (Cowling et al., 2019). But the question whether to choose the path of self-employment and become an entrepreneur is not the only aspect of entrepreneurship that seems to somehow be related to gender: for example, Dvouletý et al. (2019) emphasized that income differences between different entrepreneurs depend, among others, also on the entrepreneurs' gender. Another example is that, according to Bari et al. (2021), self-employed women were found to tendentially work less hours and to work more from home than their male counterparts. In other words: they have a higher tendency towards opting for a more flexible work schedule/setting. This difference between entrepreneurs of the opposite gender is especially large for self-employed who's children are attending preschool (Bari et al., 2021).

Importantly for this research, the effect of gender on i.a. leadership effectiveness has also frequently been investigated (Ayman & Korabik, 2010): here, gender was found to lead to i.a. differences in the interactions with others or differences in the ascribed roles and the ascribed social status (Ayman & Korabik, 2010). This ascription of such gender roles is happening due to the existence of socially shared expectations which are assigned to each gender (Eagly & Karau, 2002). Eagly & Karau (2002) argued that there are two different types of such expectations, namely a) descriptive norms, that is “consensual expectations about what members of a group actually do” (Eagly & Karau, 2002, p. 574) or in other words the “stereotypes of group members” (Eagly & Karau, 2002, p. 574); and b) injunctive norms, that is “consensual expectations about what a group of people ought to do or ideally would do” (Eagly & Karau, 2002, p. 574). Stereotypes, i.e. descriptive norms, lead to the believe that there are typical traits and behaviors for each gender (Eagly & Karau, 2002). More simply said, “[g]ender stereotypes affect people's perceptions of appropriate male and female behavior” (Wang et al., 2013, p. 101). The majority of these ideas of typical traits and behaviors pertain a) communal attributes/characteristics and b) agentic attributes/characteristics (Eagly & Karau, 2002). Communal attributes “describe primarily a concern with the welfare of other people—for example, affectionate, helpful, kind, sympathetic, interpersonally sensitive, nurturant, and gentle” (Eagly & Karau, 2002, p. 574). Agentic attributes, on the other hand, “describe primarily an assertive, controlling,

and confident tendency — for example, aggressive, ambitious, dominant, forceful, independent, self-sufficient, self-confident, and prone to act as a leader” (Eagly & Karau, 2002, p. 574). In general, communal characteristics are more ascribed to women whereas agentic ones are more ascribed to men – this is not only the case when asking which ideals people have about men and women and which roles and responsibilities men and women have but also when asking people about their ideal selves (Eagly & Karau, 2002). In case of a misfit between the ascribed gender role and the characteristics perceived as typical for a certain role a person should take on – e.g. a leadership role – this incongruence can have negative consequences for instance when it comes to others’ perceptions of this person (Wang et al., 2013).

Eagly & Karau (2002) argued in their congruity theory of prejudice towards female leaders that female leaders generally face two major disadvantages: firstly, they are perceived as having less leadership ability than male individuals (which is rooted in the descriptive aspect of the gender role) (Eagly & Karau, 2002). And secondly, if a woman disposes of such leadership ability this does not align with the female gender role, wherefore it tends to be evaluated more negatively than for their male counterparts (which is rooted in the injunctive norms of the gender roles and the tendency that deviations from these result in disapproval) (Eagly & Karau, 2002). As a result, female leaders might adopt a different leadership style than their male counterparts which corresponds more with their gender role (Eagly & Karau, 2002). Furthermore, the existence of behavioral stereotypes in connection with gender roles also influences the behavior of the person who is assigned such role (Eagly & Karau, 2002). However, this role congruity theory does not take the effect of leadership behaviors on subordinate performance into consideration (Wang et al., 2013): Wang et al. (2013) found that several studies indicated that subordinates generally evaluated gender role congruent leadership styles of female leaders less positively than favorable agentic behaviors, wherefore they argued that role congruity theory “cannot provide an adequate understanding of the relationship between gender and leadership roles” (Wang et al., 2013, p. 101). Notably, Eagly & Karau (2002) also argued that the gap between leadership abilities and the female gender role might differ depending on the societal/organizational context. This is somehow reflected by Wang et al. (2013)’s findings that in different contexts/settings (e.g. a more male work environment/setting versus a more female one) leadership behavior incongruent with the assigned gender role expectations can have a strong effect on subordinate performance, both, in a positive or in a negative way. Wang et al. (2013) moreover highlighted that a leader’s gender

moderates the relationship between the respective person's leadership style and subordinate performance. However, it is important to note that this study by Wang et al. (2013) was conducted in Taiwan and that there is little research on the existence of potential cultural differences in the definition of gender roles (Eagly & Karau, 2002; Wang et al., 2013). Thus, it is concluded that these findings might not necessarily be applicable for Europe. Furthermore, Wang et al. (2013)'s study has only investigated the effect of gender on the relationship between leadership style and subordinate performance but has not taken leadership effectiveness into account. Thus, this thesis shall investigate for the NERIS Analytics Limited trait spectra whether such moderating role of the leader's gender on the relationship between personality traits and leadership effectiveness exists. Thereby, leadership effectiveness will be measured based on the income gap between solo self-entrepreneurs and employer entrepreneurs since this gap is assumed indicate the existence of a leadership premium. This thesis will follow the concept of the congruity theory to test its applicability for this particular case. More specifically, it shall be investigated whether it is of disadvantage if there is an incongruence between a person's disposition of traits that tendentially are connected to leadership effectiveness and the expected leadership behavior according to their gender role. In other words, it shall be investigated whether gender is a moderating factor for the hypotheses derived before.

As for the Extraversion – Introversion spectrum, it was hypothesized in H1 that the income difference between employer entrepreneurs and solo self-entrepreneurs in more Extraverted countries is higher than in more Introverted ones. Looking at the description of the spectrum and which subcategories and attributes it contains (see Chapter 2.2.4) it is concluded that Extraversion corresponds at least partially with the male gender role (e.g. confidence, comfortable taking over the lead in a group, not afraid of talking to others and meeting new people which can be seen as self-confidence, etc.) (Eagly & Karau, 2002). Thus, the fourth hypothesis (H4) will be as follows:

H4: There will be a bigger income advantage for more Extraverted male employer entrepreneurs than for more Extraverted female entrepreneurs.

Regarding the Intuitive – Observant spectrum, H2 is looking into whether the income difference between employer entrepreneurs and solo self-entrepreneurs in more Intuitive countries is higher than in more Observant ones. Comparing what the male and female gender roles comprise according to Eagly & Karau (2002) and how the Intuitive – Observant trait spectrum is defined, no connection between the gender roles and this

spectrum could be made since the personality traits in this spectrum do not seem to correspond with any of the gender role specific stereotypes. Thus, no hypothesis can be derived for this trait spectrum.

Finally, for the Assertive – Turbulent spectrum the third hypothesis (H3) hypothesized that the income difference between employer entrepreneurs and solo self-entrepreneurs in more Assertive countries is higher than in more Turbulent ones. Comparing this spectrum with the traits ascribed to the male and female gender roles, it can be concluded, that some of the traits lying on the Assertive side of the spectrum are stereotypically considered as male attributes (e.g. assertive, confident, speak up and stand up for their rights and believes etc.) (Eagly & Karau, 2002). Hence, the fifth and final hypothesis (H5) of this thesis shall be:

H5: There will be a bigger income advantage for more Assertive male employer entrepreneurs than for more Assertive female entrepreneurs.

3 Methodology

The following chapter shall provide the reader with an overview of the methodological approach used in this thesis in order to test the hypotheses (see Chapter 2.3) and subsequently answer the research question (see Chapter 1). First, the datasets used in order to implement the statistical testing will be described. Next, the applied scientific approach will be described in more detail. Lastly, the variables (dependent variable, independent variables, and matching variables) used in the data analysis shall be described.

3.1 Datasets

The data analysis for this thesis is based on the combination of two sources of data: a) the sixth European Working Conditions Survey (EWCS) from 2015; and b) the NERIS Analytics Limited's analysis on regional personality traits.

European Working Conditions Survey (EWCS)

The EWCS is conducted once every five years since 1990 by the European Foundation for the Improvement of Living and Working Conditions, in short Eurofunds (UK Data Service, n.d.). The study aims at depicting the working conditions in Europe for employees and entrepreneurs, different trends and developments, relations between different aspects as well as the impact policy development has on the working conditions (UK Data Service, n.d.). Due to the potential effects of the COVID-19 pandemic in the 2021 edition it has been decided to base this research on the data of the Sixth European Working Conditions Survey conducted in 2015.

The data for the sixth edition of the survey was sourced in 35 different countries, namely the – in 2015 still – 28 EU Member States, the – in 2015 – five EU Candidate Countries (Albania, North Macedonia, Montenegro, Serbia, and Turkey) as well as Norway and Switzerland (Eurofound, n.d.-b). Depending on the country, between 1,000 and 3,300 individuals were included in the sample (Eurofound, n.d.-c). Overall, interviews with a total of 43,850 workers (employees and self-employed) were conducted a) in the EU 28,

Norway and Switzerland between February and September 2015; and b) in Albania, North Macedonia – in 2015 still known as the Former Yugoslav Republic of Macedonia – Montenegro, Serbia and Turkey between September and December 2015 (Eurofound, n.d.-b, n.d.-a; Eurofund, 2017). All respondents were at least 15 years old (in Bulgaria, Norway, Spain, and the United Kingdom at least 16), in employment (that is, they had worked for pay or profit for a minimum of one hour in the week prior to the interview) and the sampling was based on a “multi-stage, stratified clustered sampling design” (Eurofound, n.d.-a, n.p.).

For this study, only the data of self-employed respondents (Q7 “Are you working as an employee or are you self-employed?” equals 2) was included (7,567 observations). The sample has further been reduced by also dropping the observations of those 35 entrepreneurs who were not answering to the question whether they have employees (Q9c “Regarding your business do you have employees (working for you)? equals 8 or 9). Thus, in the end a total of 7,532 respondents were included in the sample.

NERIS Personality Map

The second source, the NERIS Personality Map, is based on the data retrieved from an online-based free personality test (NERIS Type Explorer) available in 36 different languages, which is – as has been mentioned before (see Chapter 2.2.4) - based on the Big Five Personality Test as well as the Myers-Briggs Type Indicator (NERIS Analytics Limited, n.d.-a, 2013). In order to obtain the data and develop the Personality Map, NERIS Analytics Limited (n.d.-b) has aggregated and analyzed the results from their Type Explorer over a timespan of approximately three years. In total, the Personality Map includes data from over 40 million – to be precise 40,102,423 – respondents from all over the world (NERIS Analytics Limited, n.d.-a). Countries with fewer than 1,000 respondents were excluded from the country study and the Type Explorer has undergone reliability and validity testing in all different local versions (NERIS Analytics Limited, n.d.-a, 2013). More specifically, NERIS Analytics Limited (2017) has analyzed Cronbach’s alpha, the test-retest reliability as well as the discriminant validity of their Type Explorer.

The combined dataset

In order to be able to analyze the data, however, one combined dataset was needed. Thus, the two datasets had to be merged: this was done by firstly analyzing for which countries there was data available in both studies and thereafter matching the two datasets according to the country variables, thus appending the data from the NERIS Personality Map dataset to the EWCS one. As a result, and after dropping the data for not self-employed persons as well as the data for those who did not answer the question whether they have employees, a combined dataset with a total of 7,532 observations (including respondents from all 35 countries in the EWCS) could be obtained.

3.2 Statistical Analysis

In order to test the hypotheses of this thesis, the data was analyzed with the help of a matching approach combined with a Difference in Differences (DID) analysis. A matching approach was chosen i.a. because Dvouletý et al. (2019) discovered in their research that a Nearest Neighbor Matching approach led to more accurate results than applying an Ordinary Least Squares (OLS) regression approach, since the latter overestimated the returns of entrepreneurship in their research. One way to conduct such matching would be to form a treatment group as well as a control group and compare the individuals from both groups in order to find two individuals that have similar characteristics, thus making them a comparable match for the analysis – however, for larger groups and multiple characteristics to match this is usually unfeasible (Becker & Ichino, 2002). By applying a Propensity Score Matching (PSM) approach – the approach chosen for this thesis – however, this issue can be circumvented: “pretreatment characteristics of each subject [are summarized] into a single-index variable (the propensity score) that makes the matching feasible” (Becker & Ichino, 2002, p. 358). In other words: according to this approach a causal effect is calculated based on propensity scores [that is, “the likelihood of study participants receiving a treatment based on observed covariates” (Li, 2013, p. 193)] as well as matching algorithms (Li, 2013). For this thesis it means that instead of manually looking for pairs of entrepreneurs who display similar characteristics (like gender, age, etc.) a propensity score can be calculated based on the characteristics of each entrepreneur. This propensity score can then be used to compare whether the income gap

between employers and solo self-entrepreneurs differs depending on which traits they dispose of. Becker & Ichino (2002) argued that for observational studies, such propensity score matching approach can help reducing the bias created “by the existence of confounding factors” (Becker & Ichino, 2002, p. 358). Thus, it can be avoided that the results are influenced by “baseline conditions rather than a real treatment effect” (Benedetto et al., 2018, p. 1112). The authors, however, highlighted, that the success of this bias reduction depends highly on the selection of the control variables used, but that the bias can generally not be eliminated completely nonetheless (Becker & Ichino, 2002).

Applying a Propensity Score Matching approach leads to receiving a Treatment Effect as the result, whereby Li (2013) emphasized that due to it being impossible to calculate treatment effects on an individual level, an aggregated treatment effect needs to be calculated. Hereof, two different kinds exist:

- The Average Treatment Effect (ATE) and
- The Average Treatment Effect on the Treated Group (ATT) (Li, 2013).

For this thesis, the propensity score matching was conducted using the “psmatch2” command in the statistical software STATA, whereby the results will be interpreted based on the ATTs, that is, the Treatment Effects calculated of the entrepreneurs who have been subject to a treatment. Moreover, the bias reduction was tested by using the “pstest” command in STATA in order to investigate whether the treatment and the control groups could successfully be balanced during the matching process (Hopp & Pruschak, 2023). The matching as well as the test of the bias reduction have been carried out for both, the analysis of the complete sample as well as the analysis of the sample separated according to respondents’ gender.

Thereafter, an analysis of the Differences in ATTs was conducted for the not-gender-separated sample by comparing the differences between the ATTs for each trait dimension for employer entrepreneurs versus those of the solo self-entrepreneurs. This has been done with the help of an unpaired t-test, for which an online calculator has been used (<https://www.graphpad.com/quickcalcs/ttest1/?format=SD>). In case of a p-value lower than 0.05, this means that the income difference is significant. If the p-value is lower than 0.1, the income difference is marginally significant.

For the gender-separated analysis, the unpaired t-test has been conducted for each group, separated by gender. Thereafter, it has been checked whether the Confidence Intervals

(CIs) for the two genders in comparison are overlapping. If yes, the Difference in Differences in ATTs is significant.

The next section of this thesis will explain in more detail which variables of the combined dataset (see Chapter 3.1) were used in this analysis.

3.2.1 Variables

This research is using three types of variables for the data analysis:

- Treatment variables,
- An outcome variable, and
- Matching variables.

The **treatment variables** for this thesis are the variables indicating which category of each personality trait a person is located in. The **outcome variable** for this research is the logarithmized income variable, labelled as "ln_income_combined" in the dataset. Finally, an overview of the **matching variables** can be found in Table 8.

Table 8: Matching variables

Content of the variable	Variable name(s) in the dataset	Variable name(s) in the thesis
Gender	y15_Q2a_female	Gender
Age	y15_Q2b_new	Age
Full-time or part-time	y15_Q2d_fulltime	Work schedule
Country of birth	y15_4_born	Country of birth
Spouse or no spouse	y15_Q3c_spouse	Marital status
Main paid job	y15_Q8b_1_soledirector	Sole director
	y15_Q8b_2_partnerinbusiness	Partner in business
	y15_Q8b_3_workforthemselves	Work for themselves
	y15_Q8b_4_subcontractor	Subcontractor
	y15_Q8b_5_freelancer	Freelancer

Sector	y15_Q14_privatesector	Private sector
	y15_Q14_publicsector	Public sector
Years in business	y15_Q17_new	Years in business
Other paid job	y15_Q27_paidjob	Paid jobs
Qualifications/skills	y15_Q64_skills	Skill level
Years of education	y15_Q106_edsum	Education

This section will focus on the coding of the variables used for the matching. The aim is to provide the reader with an understanding where the variables used for the analysis are coming from and how they were created. It will be started off with the treatment variable, thereafter the outcome variable will be described, and finally the matching variables will be investigated.

Treatment variable: trait spectra

The NERIS Personality Map dataset used in this study was created with the available country data. More precisely, the dataset includes data about the degree to which each of the trait spectra is represented in each country. For this purpose, one side of each of the spectra (e.g. the Extraversion side of the Extraversion – Introversion spectrum) was assigned a positive number, whereas the second side (e.g. the Introversion side of the Extraversion – Introversion spectrum) is represented with a negative number (see Figure 6). As a second step, the tendency for each country's orientation on the trait spectra (that is, the sides of the spectra which the country lies on) was documented as a percentage (for how many percent is this country allocated more on side X of this spectrum?) with the respective algebraic sign (that is, positive or negative). To illustrate this with an example: if a country is 1.2 % more Extraverted this means it was noted as 0.012; whereas if a country was 10 % more Introverted, this would be - 0.1 in the dataset.

Figure 6: Coding of the NERIS Personality Map



Thereafter, the quartiles of the scores for the data on each of the trait spectra were calculated. In other words, it was calculated until which score a country belongs to the lowest-scoring 25 % of the countries on the trait spectra, from which score on a country belongs to the highest-scoring 25 % of countries and which countries (the remaining 50 % of countries) are lying in between these two borders. In a next step, three categories were formed depending on the affiliation with these quartiles (up to 25 %, between 25 % and 75 % and equal to or above 75 %). Thereafter, each of the countries was allocated to one of these three categories (see variables “exincategories”, “intobscategories”, “thifecategories”, “judproscategories”, and “assturcategories” in the dataset) according to where they lie on the spectrum in comparison to the other countries (see Table 9).

Table 9: Trait spectra - category variables

Category	Percentiles
1	$\leq 25 \%$
2	$> 25 \%$ and $< 75 \%$
3	$\geq 75 \%$

Table 10 illustrates as an example what these percentiles look like for the Extraversion – Introversion spectrum. Since e.g. the 25 % percentile means that 25 % of the observations are located lower than or equal to that number on the spectrum, category 2 is containing twice the number of observations than both, category 1 or category 3. Therefore, this size difference needed to be taken into consideration later in the Propensity Score Matching by setting the number of nearest neighbors to two instead of one for all instances where a matching with Category 2 was conducted.

Table 10: Percentiles Extraversion - Introversion spectrum

% of the observations in the sample	Value
1 %	-0.1119
5 %	-0.093
10 %	-0.0798
25 %	-0.0617
50 %	-0.0068
75 %	0.0045
90 %	0.0322
95 %	0.036
99 %	0.0502

Finally, binary variables (1 or 0) based on these percentiles were created for each of the trait spectra. This step was necessary in order to be able to later use the variables for the calculation of the Treatment Effects. First, three different comparison variables were developed, whereby each of these variables compares two of the percentile categories found in Table 9 (i.e., Categories 1 and 2; Categories 1 and 3; and Categories 2 and 3). Second, it was defined which category is represented by the value 1 and which by the value 0 for each of the three comparisons (e. g. for the comparison of Categories 1 and 2, Category 1 is represented by the value 0 and Category 2 by the value 1). In case a country is not part of either of the two categories, a missing value was added instead. In a third step, this process was repeated for each trait spectra, resulting in 15 binary comparison variables that function as treatment variables for this thesis. An overview of these variables can be found in Table 11.

Table 11: Trait spectra - coding of the treatment variables (category comparisons)

Trait spectrum	Categories	Name in the dataset	1	0
<i>Extraversion</i>	1 and 2	comparison_exin_12	Category 2	Category 1
<i>versus</i>	1 and 3	comparison_exin_13	Category 3	Category 1
<i>Introversion</i>	2 and 3	comparison_exin_23	Category 3	Category 2

<i>Intuitive</i>	1 and 2	comparison_inob_12	Category 2	Category 1
<i>versus</i>	1 and 3	comparison_inob_13	Category 3	Category 1
<i>Observant</i>	2 and 3	comparison_inob_23	Category 3	Category 2
<i>Thinking</i>	1 and 2	comparison_thfe_12	Category 2	Category 1
<i>versus</i>	1 and 3	comparison_thfe_13	Category 3	Category 1
<i>Feeling</i>	2 and 3	comparison_thfe_23	Category 3	Category 2
<i>Judging</i>	1 and 2	comparison_jupr_12	Category 2	Category 1
<i>versus</i>	1 and 3	comparison_jupr_13	Category 3	Category 1
<i>Prospecting</i>	2 and 3	comparison_jupr_23	Category 3	Category 2
<i>Assertive</i>	1 and 2	comparison_astu_12	Category 2	Category 1
<i>versus</i>	1 and 3	comparison_astu_13	Category 3	Category 1
<i>Turbulent</i>	2 and 3	comparison_astu_23	Category 3	Category 2

Outcome variable: income

Since the dataset included two different income variables (one in absolute numbers – “y15_Q104_euro” in the dataset; and a second one in income categories – “y15_Q105” in the dataset) it was necessary to combine the data from both variables in one combined income variable (“income_combined”). While the variable in absolute numbers could be adopted without any further adaptations (except for replacing the “don’t know” and “refusal” answers with missing values), for the categorical variable an average of the income ranges had to be calculated. This was done by firstly adding the value marking the lower end of the category to the value marking the upper end of the category and then dividing the outcome by two to, thus receive the average for each category (see Table 12). For the lowest income category, the lower end of the category was set to 0, thus resulting in an average of 400 euros. For the highest income category, the maximum of the category was assumed to be equal to the highest value in the variable in absolute numbers (“y15_Q104_euro”), wherefore the average is assumed to be at 24,500 euros. In a final step, a new variable (“ln_income_combined”) calculating the natural logarithms (ln) of the incomes was created. This variable is also the outcome variable of this thesis.

Table 12: Income - category average

Category	Average
Up until € 800	400
€ 801 to € 1,100	905.5
€ 1,101 to € 1,400	1,250.5
€ 1,401 to € 1,700	1,550.5
€ 1,701 to € 2,000	1,850.5
€ 2,001 to € 2,300	2,150.5
€ 2,301 to € 2,600	2,450.5
€ 2,601 to € 3,000	2,800.5
€ 3,001 to € 3,500	3,250.5
€ 3,501 to € 4,000	3,750.5
€ 4,001 to € 4,500	4,250.5
€ 4,501 or more	24,500.5

Matching variables

Next, the matching variables listed in Table 8 will be explained in more detail. Regarding the **Gender** variable, Sorgner et al. (2017) found that men receive on average a higher hourly income. Furthermore, and as already described in detail in Chapter 2.3.1, there are also various other studies confirming that differences between male and female entrepreneurs exist (see e. g. Bari et al., 2021; M. Cowling et al., 2019; Dvouletý et al., 2019). In conclusion, it has been decided to include this dimension as a matching variable in the Propensity Score Matching of this thesis. Moreover, this variable also serves as a basis for splitting the sample according to gender, as is required for the analysis of H4 and H5 (see Chapter 2.3.1). In order to prepare the variable for the analysis, the original gender variable (Question 2a, variable “y15_Q2a” in the EWCS dataset) was translated into a binary “gender” variable (Eurofund, 2015). The value 1 represents “female” in this new variable, the value 0 signifies “male”. Furthermore, non-responses (9 – “don’t know”) were replaced with missing values (Eurofund, 2015).

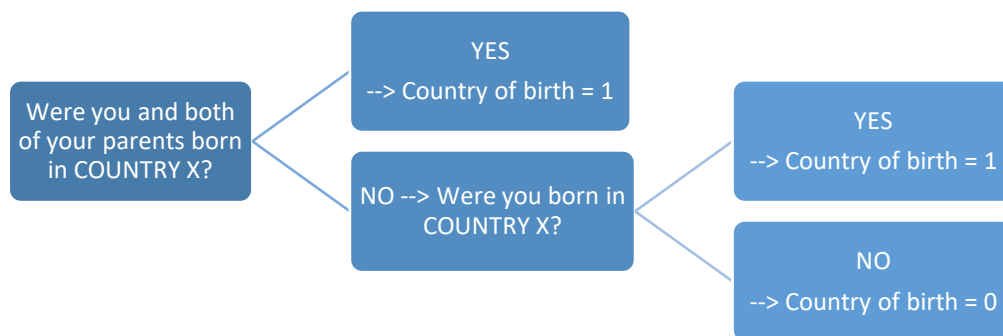
The second variable looked into is the **Age** one. Sorgner et al. (2017)'s analysis on the income differences between entrepreneurs and employees mentioned age as a potentially influential factor – for example, younger solo self-employed (under 35 years old) were found to earn approximately the same as employees, whereas the gap for older solo self-employed is turning negative. Dvouletý & Orel (2020) argued that the relationship between whether a respondent is becoming an employer entrepreneur and the respondent's age can be illustrated as an inverted u-shape. A possible explanation for this is that younger entrepreneurs might first try to overcome any uncertainties about their entrepreneurial skills before opting to hire employees, wherefore they become employers only after having gained some experience as entrepreneurs (Cowling & Wooden, 2021). Sorgner et al. (2017) moreover discovered that there is a u-shaped relationship between a person's age and their income. Since age seems to be able to influence a person's income – and also entrepreneurship in general – this variable was also included in the list of matching variables which this thesis will control for. In order to be prepare the data in the age variable in the data set (Question 2b, variable "y15_Q2b" in the EWCS dataset) for this analysis it was necessary to replace the no-replies (values 888 or 999) with missing values in order not to falsify the results (Eurofund, 2015). Thus, a new "age" matching variable has been created in which these values have been replaced with a missing value.

In addition, the respondent's **work schedule** was chosen as a matching variable for this thesis, too. This variable investigates whether a person is working part time or full time. Since a full-time job is supposed to result in a higher income than a part time job, it is assumed that this variable also has an impact on the outcome of this analysis. Hence, this thesis will also control for this difference to avoid falsified results. Since the documented answers to the question whether one is working full time or part time (variable "y15_Q2d" in the EWCS dataset) were coded with the values 1 or 2 in the original work schedule variable, also this variable needed to be translated into a new, binary one called "work schedule" (Eurofund, 2015). In this new variable, the value 1 represents full-time employment; the value 0 represents part-time employment.

Next, also the respondent's **country of birth** was chosen as a matching variable: Dvouletý & Orel (2020) highlighted that migration seems to have a positive effect on the likelihood of becoming an employer entrepreneur in the Visegrád countries, although the authors also pointed out that more research on the migration background is needed in this area. Furthermore, Jonsson & Ouyang (2023)'s findings illustrated for instance that a so-called

“culturally inherited risk appetite”, that is, a culturally rooted tendency to seek risks, has an impact on an entrepreneur’s personal income, whereby the income for entrepreneurs with parents from more risk-seeking countries was found to be lower than for those with a more risk-averse cultural background. In conclusion, it is therefore assumed that whether a person was born in a certain country can indeed have an influence on entrepreneurship and entrepreneurial income. Hence, this variable is also included in the list of matching variables. In order to evaluate whether the interviewee was born in the respective country it first was checked whether the answer to the question “Were you and both of your parents born in [COUNTRY X?]” (Eurofund, 2015, p. 4) (variable “y15_Q4a” in the EWCS dataset) was “yes”. If this was not the case, it was further investigated what the answer to the question “Were you born in [COUNTRY X?]” (Eurofund, 2015, p. 5) (variable “y15_Q4b” in the EWCS dataset), which was only asked in case the answer to the prior question was “no”, was. If either of the two questions was answered with “yes”, this would mean that the person was born in the respective country. Based on the answers to this question, a binary “country of birth” variable was created, whereby the value 1 means that an individual was born in the respective country and the value 0 represents that this is not the case. Figure 7 is graphically explaining the process of coding this variable.

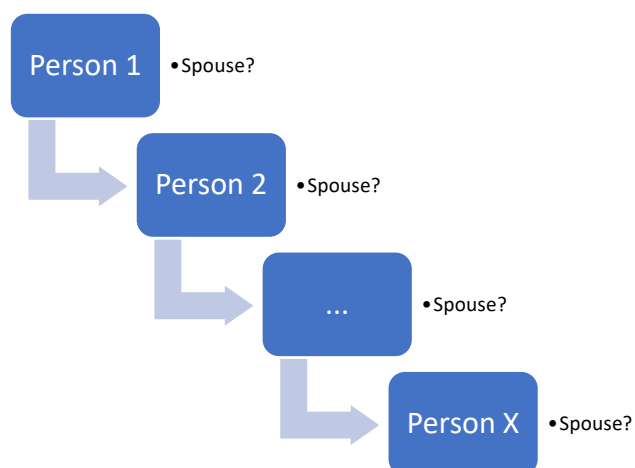
Figure 7: Coding of the “Country of birth” variable (Eurofund, 2015, p. 4)



A further aspect that shall be taken into consideration is the respondents’ **marital status**. Sorgner et al. (2017, p. 257) found that “incomes of married persons are significantly higher in the medium ranges but significantly lower for high and low incomes”. This is assumed to be rooted in one of the following three possible scenarios: a) if the respondent’s spouse is e.g. a stay-at-home spouse the respondent needs to earn a higher amount of money in order to be able to provide for them and their spouse/family, thus having a higher income since one income needs to suffice to pay the expenses of two or more persons or b) the

respondent does not need to make that much money due to their spouse also having an income and bills being split between the partners or c) both spouses have to work due to their low incomes. Therefore, it is concluded that whether the respondents have a spouse might have an impact on their income. In order to determine in one variable whether or not the respondents have a spouse, the answers to Question 3, which aims at collecting more information about other household members, needed to be investigated (Eurofund, 2015). More precisely, it needed to be checked whether in any of the cases (persons) mentioned in the replies to Question 3 in the EWCS [“Now thinking about the other members of your household, starting with the oldest...” (Eurofund, 2015, p. 2)], which is comprising several sub-questions that are to be repeatedly asked for all household members, one of the individuals mentioned was labelled as a spouse. It therefore had to be checked for each repetition of the loop if one of the replies to the sub-question investigating the relationship between the respondent and a person living in the same household (Question 3c) has been yes (Eurofund, 2015). This iteration loop of checking the answer to Question 3c for every single person mentioned in Question 3 is illustrated graphically in Figure 8.

Figure 8: Coding of the “Marital status” variable



Moreover, the respondents’ role in their **main paid job** was chosen as a set of matching variables: Question 8b of the EWCS questionnaire investigates whether the main paid job of a respondent is for instance a role as a sole director (meaning that they are the only director of the business) or whether they e.g. function as a subcontractor (Eurofund, 2015). This variable was chosen as matching variable since it is assumed that the business environment can differ vastly depending on which role the respondent takes on, wherefore

this aspect is assumed to potentially alter the relationship between personality traits and income. Based on the responses to this question, the following binary variables were created: “sole director” (whereby the value 1 represents that the respondent is a sole director; and 0 signifies that the respondent is not a sole director), “partner in business” (whereby 1 stands for the respondent being a partner; and 0 means that they are not), “work for themselves” (whereby 1 signifies that the respondent is working for themselves; and 0 signifies that they do not), “subcontractor” (whereby the value 1 represents that the respondent is a subcontractor; and the value 0 represents that they are not), and “freelancer” (whereby 1 means that they are working as a freelancer in their main paid job; and 0 stands for them not working as a freelancer in their main paid job).

Moreover, Sorgner et al. (2017) emphasized that the industry a person is working in also impacts their income. For reasons of simplification this thesis shall be limited to controlling for whether the respondent is working in the public or the private **sector** instead of covering all industries separately. The new variables “private sector” and “public sector” are both binary variables based on Question 14 in the EWCS (variable “y15_Q14” in the EWCS dataset) (Eurofund, 2015). In the “private sector” variable the value 1 stands for the private sector; in the “public sector” one, however, 1 stands for the public sector.

In addition, the **years** the respective entrepreneur has been **in this business** were also chosen as a matching variable for the data analysis: Cowling & Wooden (2021) argued that many entrepreneurs start off by working by themselves since in the beginning they do not know whether they dispose of the entrepreneurial abilities needed. Besides this, Sorgner et al. (2017) found an inverted u-shaped relationship between income and the years a person holds their current occupation, meaning that the income rises only until a certain point of experience in the same position before it is starting to decrease again. Therefore, it is assumed that the years a person has been operating in a business can have a major impact on the results of this thesis. For this “years in business” variable the value 00, which was originally signifying “less than one year” has been recoded to the value 0. Furthermore, the “refusal”, “not applicable”, and “don’t know” answers have been replaced with missing values.

Furthermore, whether the respondent has more than one or more **paid jobs** was also chosen as a matching variable. Question 27 of the EWCS (variable “y15_Q27” in the EWCS dataset) illustrates whether the respondents have another paid job and if so, whether this is an occasional or a regular one (Eurofund, 2015). Since it is assumed that

a person with more than one paid job has an additional source of income it is supposed that the more regularly the other paid job(s) is/are practiced the less this person is earning in their main paid job. This is based on two possible reasonings, namely that a) they either do not have a need to earn more money in their main paid job because they have a second source of income anyways or b) they have another paid job since their income from their main paid job is low. Therefore, also this variable was included in the list of matching variables. Since this value is illustrating a hierarchy (the respondent has a regular other paid job, the respondent has an occasional other paid job, the respondent does not have any other paid job) the variable has been recoded into an ordinal “paid jobs” variable (Eurofund, 2015). The value 1 in this new variable represents that the respondent has a regular other paid job, the value 0 signifies that they have an occasional other paid job and the value - 1 means that the respondent has no other paid job. Furthermore, “other” (4), “don’t know/no opinion” (8) and “refusal” (9) replies have been transformed into missing values in the new matching variable.

The pre-last moderating variable listed in Table 8 illustrates the respondents’ **skill level**. This variable (variable “y15_Q64” in the EWCS dataset) investigates whether an individual is disposing of the skills necessary to carry out their tasks or whether their skill level is too low or too high for the job they are doing (Eurofund, 2015). The variable has been chosen as a matching variable since it is assumed that an underqualified person will not be able to achieve equally good results as a person whose skills correspond with their job. At the same time, a person who is overqualified is assumed to be bored by their job due to a lack of stimulation, wherefore they also are assumed to deliver a worse performance than a person whose skills match the skills required for the job. This match or mismatch is assumed to also be reflected e.g. in a leadership premium since even if a person is disposing of a high level of leadership skills their success might still depend on factors like whether their skills match their job or whether they just dispose of leadership traits but lack the needed technical knowledge. For this thesis, a new ordinal “skill level” variable has therefore been created. In this variable the value 1 signifies the respondent is overqualified, the value 0 means their skills correspond with their tasks, and the value - 1 represents that they are underqualified. Again, non-responses in the original variable (coded as 8 or 9 in this original variable) have been replaced with missing values.

Table 13: Education - ISCED classification, years in education ((European Commission, 2023b, 2023a, 2024; Eurostat, 2023c, 2023b, 2023a)

ISCE	y15_Q106	Years – y15_Q106_edsum
<i>Early childhood education</i>	1	3.5
<i>Primary education</i>	2	8.5
<i>Lower secondary education</i>	3	13
<i>Upper secondary education</i>	4	17
<i>Post-secondary non-tertiary education</i>	5	19
<i>Short-cycle tertiary education</i>	6	19
<i>Bachelor or equivalent</i>	7	20.5
<i>Master or equivalent</i>	8	22
<i>Doctorate or equivalent</i>	9	26

Lastly, it was looked into the number of **years** a respondent has spent **in education**: Dvouletý & Orel (2020) argued that for solo self-entrepreneurs a balanced skill set as well as the quality of their education have a major impact on their success and the effectiveness of their work, wherefore their success/ability to work effectively is depending on the availability of the necessary education. In Poland for example, the availability of entrepreneurial education has had a positive impact on entrepreneurial intentions (Dvouletý & Orel, 2020). Sorgner et al. (2017) moreover discovered that increasing education levels result in higher average hourly incomes. Therefore, a variable showing how many years of education the respondents have completed was constructed. The basis for this new “education” variable were Question 106 (variable “y15_Q106” in the EWCS dataset) – that is a question including country-specific educational levels – as well as a variable that essentially is Question 106 translated into the International Standard Classification of Education (ISCE) framework (variable “y15_ISCED” in the EWCS dataset) (Eurofund, 2015). The number of years needed to complete each educational level were then based on secondary research and thereon based estimations. The results of this estimation can be seen in Table 13. In order to correctly read the table, it is important to keep in mind that the years are not the respondent’s age but the sum of:

- The average years for this level of education and
- The average years of education until the lower-level educational level is completed.

In other words: Table 13 shows the average years a person in Europe who has completed this level of education has spent in education.

4 Results

This chapter will present and describe of the findings from the data analysis. Firstly, insights into the descriptive statistics from the analysis shall be given. Thereafter, the results of the data analysis will be presented for each of the five hypotheses (see Chapter 2.3): it will be started off by analyzing the outcomes of the Propensity Score Matching as well as investigating the findings from the Difference in Differences analysis (which is based on the outcome of the Propensity Score Matching) for the employer entrepreneurs versus the solo self-entrepreneurs. Thereafter, it will be moved on to the presentation of the results for the gender-separated data analysis, again following these same steps.

4.1 Descriptive statistics

Before presenting the findings of the Propensity Score Matching as well as of the analysis of the Differences in the Treatment Effects, this chapter will look into the general composition of the sample. Herby, Table 14 and Table 15 provide a detailed overview of the matching variables. Thereafter, the

The dataset contains a total of 7,532 entrepreneurs. Out of these, a total of 2,061 are employers. The remaining 5,471 indicated that they do not have employees working for them. In total, the sample consists of 2,867 women and 4,665 men. – This means, that approximately 38 % of the sample are women and about 62 % are men. The mean age of the sample is 47.99 years, with the youngest person being 15 years old and the oldest one 87. A total of 7,016 of the respondents were found to be born in the country they are living in; 494 instead were not born in that country. 5,306 of the participants indicated that they have a spouse, versus 2,226 who do not. This means, that approximately 70 % of the entrepreneurs are married. The average (mean) years the entrepreneurs included in the sample spent in education is approximately 16 years – which corresponds approximately to what has been estimated as the average time to complete an upper secondary education (see Chapter 3.2.1). 79.07 % of the respondents indicated that they work full time (5,279 out of 6,676 respondents), whereby 92.7 % of the respondents (6,953 out of 7,498 respondents) do not have another paid job and only 2.85 % of them (214 out of 7,498) exercise another paid job regularly. Regarding the skill level, the majority of respondents, namely 4,452 persons, answered that they perceive that their skills

correspond with the skills required for their job. This amounts to 60 % of the respondents. Approximately 31 % of the respondents (in absolute numbers 2,295) stated that they are overqualified. Only 673 people, that is 9.1 % of the respondents, claimed that they are actually underqualified. The mean of the years the respondents spent working in the same business is 14.22 years. 35.26 % of the respondents (2,656 out of 7,532 respondents) are the sole director of their business and 53.03 % indicated they work for themselves (3,994 out of 7,532 respondents). A total of 9.04 % were found to work as freelancers (681 out of 7,532 respondents). 9.12 %, or, in absolute numbers 687 out of the 7,532 respondents, have a partner in business; and 2.26 % stated to be subcontractors (170 out of 7,532 respondents). Regarding the sector the respondents are operating in, the statistics of the dataset show that 6,462 of the respondents are working in the private sector and only 138 in the public sector. Finally, the average (mean) logarithmized monthly income in Euros for the total sample is 6.63.

Table 14: Summary table of the numeric variables

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Age	7,514	47.98749	13.24183	15	87
Years in business	7,035	14.22388	12.22892	0	75
Education	7,510	16.36465	4.124884	3.5	26

Table 15: Frequency table of the categorical and binary variables

Variable	Value	Frequency	Percent	Cumulated
Gender	Female	4,665	61.94	61.94
	Male	2,867	38.06	100.00
Work schedule	Part-time	1,397	20.93	20.93
	Full-time	5,279	79.07	100.00
Country of birth	Not born in this country	494	6.58	6.58
	Born in this country	7,016	93.42	100.00
Marital status	Unmarried	2,226	29.55	29.55

	Married	5,306	70.45	100.00
Sole director	Not a sole director	4,876	64.74	64.74
	Sole director	2,656	35.26	100.00
Partner in business	No partner	6,845	90.88	90.88
	Partner	687	9.12	100.00
Work for themselves	Not working for themselves	3,538	46.97	46.97
	Working for themselves	3,994	53.03	100.00
Subcontractor	No subcontractor	7,362	97.74	97.74
	Subcontractor	170	2.26	100.00
Freelance	Not a freelancer	6,851	90.96	90.96
	Freelancer	681	9.04	100.00
Private sector	Not operating in the private sector	299	4.42	4.42
	Operating in the private sector	6,462	95.58	100.00
Public sector	Not operating in the public sector	6,623	97.96	97.96
	Operating in the public sector	138	2.04	100.00
Paid jobs	No other paid job	6,953	92.73	92.73
	Occasional other paid job	331	4.41	97.15
	Regular other paid job	214	2.85	100.00
Skill level	Underqualified	673	9.07	9.07
	Skills correspond	4,452	60.00	69.07
	Overqualified	2,295	30.93	100.00

Regarding the NERIS trait spectra, 46.11 % of the respondents are from countries located on the Extraversion side of the Extraversion – Introversion spectrum (3,473 out of 7,532

respondents). 53.89 % are from countries located on the Introversion side (4,059 out of 7,532 respondents). 10.12 % of the respondents are from countries categorized as Thinking on the Thinking – Feeling spectrum (762 out of 7,532). This implies that the remaining 89.88 % are from Feeling countries (6,770 out of 7,532 respondents). Regarding the Judging – Prospecting spectrum, 9.16 % of the respondents (690 out of 7,532 respondents) are from Judging countries, 90.84 % of them from Prospecting ones (6,842 out of 7,532 respondents). Finally, all respondents are from countries located on the Intuitive side of the Intuitive – Observant spectrum, meaning that none of the respondents is from an Observant country. The same is the case for the Assertive – Turbulent spectrum, with 100 % of the respondents being from Turbulent countries and none of them being from Assertive ones.

4.2 Propensity Score Matching: employer entrepreneurs versus solo self-entrepreneurs

After having gained an overview of the general composition of the sample, this chapter will now focus on the analysis of the results from the Propensity Score Matching. As a first step it will be investigated in how far the selected matching variables contribute to the bias reduction in the sample. Thereafter, the ATTs will be compared within each trait spectrum. Hereby it is important to mention that the following analyses will be conducted separated according to the type of entrepreneur (employers versus solo self-employed).

4.2.1 Employer entrepreneurs

The first group of entrepreneurs to be analyzed are the employer entrepreneurs. Following, it will be looked into the Propensity Score Matching's results for each of the trait spectra. In doing so, it will first be analyzed how successful the matching has been by investigating the bias reduction for each of the matching variables. This shall help determine how well the treated and the control group could be balanced with the help of the matching variables chosen (Hopp & Pruschak, 2023). Thereafter, the Average Treatment Effects on the Treated Groups (ATTs) will be presented. These ATTs will be taken as the basis for the thereafter conducted Difference in Differences analysis. Since the presentation of the

results will be limited solely to the three trait dimensions included in Hypothesis 1, 2 and 3 the additional data of the remaining trait dimensions can be found in the appendix of this thesis.

Extraversion – Introversion

The first trait spectrum that is analyzed is the Extraversion – Introversion one. In a first step, the bias reduction (see Table 16) resulting from the matching process during the Propensity Score Matching will be presented. Thereafter, the ATTs will be described.

For the comparison of *Categories 1 and 2*, “skill level” (100 % bias reduction), “gender” (96.6 % bias reduction), “sole director” (93.7 % bias reduction), “education” (81.9 %) as well as “country of birth” (80.7 % bias reduction) especially contribute to the reduction of biases in the analysis, as is reported in the first balancing model in Table 16. Overall, the findings show that the balancing model contributes in most variables to balancing the Treated and Controls group. Negative bias reduction values can only be observed with the variables “work schedule” (- 169.4 % bias reduction), “public sector” (- 217.5 % bias reduction), “paid jobs” (- 26.1 % bias reduction), “marital status” (- 378.1 % bias reduction), as well as “years in business” (- 5 % bias reduction). Here, the conclusion is similar to what Hopp & Pruschak (2023) argued, namely that the negative bias reductions can be rooted in the treated and the control sample being already close in values before the matching, wherefore the matching leads to a higher rather than a lower bias. One example for this effect is the variable marital status, where the mean of the Treated group (employer entrepreneurs) amounts to 0.7847 and that for the Controls group (solo self-entrepreneurs) to 0.7463. With a bias reduction of - 378.1 % the bias (bias = Treated group minus Controls group) has increased from 0.0080 to 0.0384. All in all, it is thus concluded that the matching was successful in reducing the bias despite some of the bias reduction values being negative.

Regarding the comparison of *Categories 1 and 3* the detailed results of the second balancing model can be found in Table 16. In general, a bias reduction can be observed in most variables included in the matching. For this balancing model, especially strong bias reductions were reported in the matching variables “age” (95.4 % bias reduction), “education” (88.7 % bias reduction), “skill level” (82.9 % bias reduction) and “country of birth” (80.5 % bias reduction). Again, it is concluded that the negative bias reduction results

in the variables “public sector” (- 5,423.3 % bias reduction) “private sector” (- 310 % bias reduction), and “work schedule” (- 2.2 % bias reduction) are due to the small differences between the Treated and the Controls group before the matching in all three instances. Thus, it is again concluded that the matching has been successful in reducing the bias and balancing the Treated and Control samples.

For the comparison of the *Categories 2 and 3*, the matching was successfully reducing the bias in almost all variables in balancing model 3 (see Table 16). The variables with the largest reduction in bias were “work schedule” (97.0 % bias reduction), “paid jobs” (96.4 % bias reduction), “partner in business” (96.1 % bias reduction), “work for themselves” (95.0 % bias reduction), “years in business” (94.0 % bias reduction), “education” (93.1 % bias reduction), “age” (89.0 % bias reduction), as well as “subcontractor” (84.1 % bias reduction). And also for this comparison the matching had the opposite (that is, a negative) effect in some variables and thus actually lead to a slight increase in the bias in these. However, this is again concluded to be the case due to the high similarity in values between the treated and the control sample already before the matching process: for “freelancer” (- 514.6 % bias reduction), “public sector” (- 160.0 % bias reduction), “gender” (- 21.4 % bias reduction) as well as “private sector” (- 9.5 % bias reduction) the bias reduction was a negative one. Thus, the matching is nonetheless considered as successful also for this category comparison.

Table 16: Balancing models 1 to 3: bias reduction regarding the relationship between an employer entrepreneur's income and the positioning of the respective country on the Extraversion - Introversion spectrum

	Balancing model 1 (Treatment: Extraversion – Introversion; Categories 1 + 2)			Balancing model 2 (Treatment: Extraversion – Introversion; Categories 1 +3)			Balancing model 3 (Treatment: Extraversion – Introversion; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Gender	0.28909	0.28687	96.6%	0.25145	0.23988	76.4%	0.24586	0.26519	-21.4%
Work schedule	0.90265	0.86136	-169.4%	0.90462	0.93642	-2.2%	0.90608	0.9047	97.0%
Country of birth	0.9056	0.91888	80.7%	0.96243	0.95954	80.5%	0.96133	0.97238	79.5%
Sole director	0.46165	0.46608	93.7%	0.51156	0.48266	25.3%	0.52762	0.51657	65.0%
Partner in business	0.23304	0.22935	63.9%	0.11272	0.14451	47.7%	0.10773	0.1105	96.1%
Work for themselves	0.34513	0.37979	64.9%	0.43931	0.45376	62.6%	0.45856	0.45166	95.0%

Subcontractor	0.01622	0.01991	52.5%	0.01445	0.01156	69.9%	0.01657	0.01381	84.1%
Freelancer	0.04867	0.0354	65.9%	0.02601	0.04046	64.7%	0.04972	0.06215	-514.6%
Private sector	0.95428	0.94395	22.3%	0.97399	0.95087	-310.0%	0.97514	0.95442	-9.5%
Public sector	0.02065	0.04056	-217.5%	0.01445	0.02023	-5423.3%	0.01381	0.03039	-160.0%
Paid jobs	-0.88643	-0.90782	-26.1%	-0.91329	-0.92197	59.3%	-0.91436	-0.91298	96.4%
Skill level	0.16519	0.16519	100.0%	0.2948	0.27168	82.9%	0.32044	0.33287	45.9%
Education	17.79	17.915	81.9%	17.095	17.23	88.7%	17.109	17.239	93.1%
Marital status	0.78466	0.74631	-378.1%	0.76012	0.74566	72.2%	0.74862	0.71961	33.9%
Age	47.035	47.673	71.1%	42.798	42.59	95.4%	42.26	42.003	89.0%
Years in business	15.519	16.176	-5.0%	11.231	11.702	57.5%	11.055	11.026	94.0%

After confirming that the matching was successful for all three comparisons it can now be moved on to an analysis of the ATTs for the three groups. A detailed overview of these results can be found in Table 17. The Propensity Score Matching shows that the Treatment Effect (Average Treatment Effect on the Treated Group = ATT) for the comparison of Categories 1 and 2 (ATT = 0.2044) is significant, meaning that the p-value is lower than 0.05. This means, that there is a significant positive relationship between Extraversion and income. The results for the comparison of Categories 1 and 3 (ATT = - 0.5125) and Categories 2 and 3 (ATT = - 0.6346) are both highly significant, with a p-value of less than 0.001 each. Interestingly, the ATTs for Categories 1 and 3 as well as Categories 2 and 3 are both negative.

Table 17: Average Treatment Effect on the Treated of the Extraversion - Introversion spectrum for employer entrepreneurs

Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	0.204391589*	0.02166
(N=970)	(0.08892293)	
Categories 1 and 3	-0.512502568***	0.00001582
(N=644)	(0.117749123)	
Categories 2 and 3	-0.634642218***	< 0.00001
(N=1,050)	(0.101711861)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Intuitive - Observant

The second NERIS trait spectrum of interest for this thesis is the Intuitive – Observant spectrum, whereby it will again be started off with an analysis of the bias reduction in the matching variables during the Propensity Score Matching, or in other words how much the matching succeeded in balancing the Treated and the Controls group. The detailed results of the balancing models 4, 5 and 6 can be found in Table 18.

For the comparison of *Categories 1 and 2* in balancing model 4, the model helped reduce the biases considerably in most matching variables. The variables in which the bias reduction was most substantial were “freelancer” (100 % bias reduction), “public sector” (100 % bias reduction), “country of birth” (95.9 % bias reduction), “age” (94.9 % bias reduction), “paid jobs” (93.8 % bias reduction), “private sector” (91.5 % bias reduction), “education” (88.2 % bias reduction), “work for themselves” (87.6 % bias reduction), “years in business” (87.5 % bias reduction), and “work schedule” (85.5 % bias reduction). A negative bias reduction can only be observed in the matching variable “skill level” (- 91.0 % bias reduction), whereby it is again assumed that this negative effect is rooted in the Treated and Controls group having been close in values already before the matching was conducted. Therefore, the matching is considered as successful for this comparison.

For the second comparison – that of *Categories 1 and 3* – balancing model 5 (see Table 18) reports an especially large bias reduction in the variables “partner in business” (100 % bias reduction), “age” (99.0 % bias reduction), “country of birth” (94.5 % bias reduction), “private sector” (88.1 % bias reduction), “work for themselves” (87.3 % bias reduction), “education” (87.1 % bias reduction), and also for the variable “work schedule” (84.0 % bias reduction). All in all, the model led to a reduction in bias in all but four instances. In the mentioned four cases the balancing model reported a negative bias reduction, whereby in all four instances this negative bias reduction value is rooted in the differences between the Treated and the Controls group being fairly small already before the matching: the four matching variables in which a negative bias reduction could be observed are “gender” (- 124.2 % bias reduction), “freelancer” (- 103.0 % bias reduction), “marital status” (- 53 % bias reduction), as well as “skill level” (- 18.5 % bias reduction). Overall, it is again concluded that the findings presented in balancing model 5 indicate that the matching was successful.

Finally, for the comparison of *Categories 2 and 3* the bias reduction documented in balancing model 6 was especially substantial in the variables “years in business” (98.9 % bias reduction), “gender” (95.3 % bias reduction), “sole director” (94.9 % bias reduction), “country of birth” (90.7 % bias reduction), “work for themselves” (90.8 % bias reduction), “paid jobs” (88.4 % bias reduction), “marital status” (87.1 % bias reduction), “work schedule” (84.8 % bias reduction), “age” (84.2 % bias reduction) and “private sector” (80.5 % bias reduction). In fact, the bias reduction is positive in all but one cases in balancing model 6: the only negative bias reduction was found in in the matching variable “skill level” (- 638 % bias reduction). However, as has been the case in the prior balancing models, it is concluded that the matching led to a slight increase in the bias due to the high similarity in values of the Treated and the Controls sample prior to the matching. Looking at the overall success in balancing the Treated and the Controls group for this category comparison, it is therefore concluded that the matching was successful.

Table 18: Balancing models 4 – 6: bias reduction regarding the relationship between an employer entrepreneur's income and the positioning of the respective country on the Intuitive – Observant spectrum

	Balancing model 4 (Treatment: Intuitive – Observant; Categories1 + 2)			Balancing model 5 (Treatment: Intuitive – Observant; Categories 1 +3)			Balancing model 6 (Treatment: Intuitive – Observant; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Gender	0.27786	0.24122	26.2%	0.31366	0.2764	-124.2%	0.31875	0.32188	95.3%
Work schedule	0.90992	0.89847	85.5%	0.9441	0.95342	84.0%	0.94375	0.94688	84.8%
Country of birth	0.95115	0.94809	95.9%	0.93789	0.94099	94.5%	0.94063	0.94219	90.7%
Sole director	0.54198	0.53053	75.2%	0.42857	0.45963	70.8%	0.43125	0.43906	94.9%
Partner in business	0.20611	0.22137	58.5%	0.15839	0.15839	100.0%	0.15937	0.14375	22.7%
Work for themselves	0.29771	0.29084	87.6%	0.46584	0.45342	87.3%	0.4625	0.44844	90.8%
Subcontractor	0.02137	0.02366	73.2%	0.00621	0.01553	58.2%	0.00625	0.01094	65.8%
Freelancer	0.0458	0.0458	100.0%	0.04037	0.02484	-103.0%	0.04063	0.04375	50.0%
Private sector	0.96183	0.96336	91.5%	0.98137	0.98447	88.1%	0.98125	0.97969	80.5%
Public sector	0.01679	0.01679	100.0%	0.00621	0.00932	78.3%	0.00625	0.00781	28.4%
Paid jobs	-0.9084	-0.9145	93.8%	-0.92547	-0.95652	75.3%	-0.925	-0.92812	88.4%
Skill level	0.18931	0.11679	-91.0%	0.19255	0.24534	-18.5%	0.19375	0.14531	-638.0%
Education	17.843	17.973	88.2%	17.104	16.913	87.1%	17.227	17.105	67.9%

Marital status	0.76489	0.77252	66.0%	0.80435	0.85714	-53.0%	0.80312	0.80156	87.1%
Age	44.55	44.479	94.9%	45.742	45.761	99.0%	45.413	45.916	84.2%
Years in business	13.602	13.476	87.5%	14.245	13.59	71.0%	14.141	14.155	98.9%

Table 19: Average Treatment Effect on the Treated of the Intuitive - Observant spectrum for employer entrepreneurs

Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2 (N=1,007)	-0.21199337 † (0.112989439)	0.06039686
Categories 1 and 3 (N=670)	-0.149572247 (0.145474672)	0.3033822
Categories 2 and 3 (N=987)	-0.149247728 † (0.084302705)	0.07703614

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Assertive – Turbulent

The third trait dimension investigated is the Assertive – Turbulent spectrum. As with the other two trait spectra it will again be started by looking into whether the matching model used in the Propensity Score Matching was able to reduce the bias and balance the treated and the control group before analyzing the ATTs.

Balancing model 7 in Table 20 illustrates the comparison between *Categories 1 and 2*. Overall, the model shows a bias reduction in most variables. An especially large reduction in bias can be observed in the variables “age” (94.7 % bias reduction), “sole director” (90.2 % bias reduction), “years in business” (86.3 % bias reduction) and “work schedule” (83.4 % bias reduction). For the variables “subcontractor” (- 282.6 % bias reduction), “private sector” (- 131.2 % bias reduction), “paid jobs” (- 101.6 % bias reduction), and “skill level” (- 9.9 % bias reduction) the bias reduction is negative. However, also in this case these negative values are concluded to be a result of the difference between the Treated

and Controls group being neglectable already before the matching was conducted. Thus, it is concluded that the matching illustrated in this balancing model was successful as well.

As for balancing model 8 in Table 20, which is investigating whether the Treated and Controls group for the comparison of *Categories 1 and 3* is balanced, it can again be observed that the bias could be reduced in most variables. This bias reduction is particularly considerable in “freelancer” (87.6 % bias reduction) and “marital status” (82.3 % bias reduction). Regarding the negative bias reductions in “country of birth” (- 373.9 % bias reduction), “private sector” (- 266.9 % bias reduction), “subcontractor” (- 133.7 % bias reduction), “partner in business” (- 36.4 % bias reduction), “public sector” (- 11.0 % bias reduction) it is again concluded that this is due to the two groups being similar in values prior to the matching already. Hence, also this matching is considered as successful since the negative bias reductions are very small in absolute numbers: the biggest negative bias reduction in absolute numbers was e.g. reached in the “country of birth” variable, with an absolute bias increase of 0.0340.

Finally, in balancing model 9 the comparison of the *Categories 2 and 3* was analyzed in terms of bias reduction (see Table 20). As has been the case in the above-described balancing models a positive bias reduction can be observed in most variables. This achieved bias reduction is particularly large in the variables “work for themselves” (96.8 % bias reduction), “work schedule” (96.7 % bias reduction) and “skill level” (80.4 % bias reduction). On the other hand, the bias reduction is negative in the variables “public sector” (- 245.3 % bias reduction), “country of birth” (- 106.9 % bias reduction), “private sector” (- 58.9 % bias reduction), “subcontractor” (- 0.8 % bias reduction) and “partner in business” (- 0.7 % bias reduction). However, it again is concluded that the values of the groups before the matching were already very similar wherefore the bias reduction turned out negative. Thus, it is overall still concluded that the matching has been successful.

Table 20: Balancing models 7 – 9: bias reduction regarding the relationship between an employer entrepreneur's income and the positioning of the respective country on the Assertive – Turbulent spectrum

	Balancing model 7 (Treatment: Assertive – Turbulent; Categories 1 + 2)			Balancing model 8 (Treatment: Assertive – Turbulent; Categories 1 +3)			Balancing model 9 (Treatment: Assertive – Turbulent; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Gender	0.30223	0.30026	63.3%	0.24806	0.26744	59.2%	0.24354	0.21587	34.2%
Work schedule	0.9343	0.92116	83.4%	0.86822	0.87597	75.3%	0.88192	0.88561	96.7%
Country of birth	0.92247	0.92707	21.7%	0.93411	0.95349	-373.9%	0.92251	0.9262	-106.9%
Sole director	0.50591	0.51314	90.2%	0.42636	0.45349	29.7%	0.45756	0.41882	65.5%
Partner in business	0.19842	0.20828	12.7%	0.18217	0.13178	-36.4%	0.18081	0.20664	-0.7%
Work for themselves	0.3364	0.31537	57.2%	0.44186	0.49612	56.2%	0.46494	0.47048	96.8%
Subcontractor	0.01708	0.01577	-282.6%	0.02326	0.0155	-133.7%	0.02583	0.02952	-0.8%
Freelancer	0.04731	0.05979	69.5%	0.01938	0.02326	87.6%	0.02214	0.02583	62.2%
Private sector	0.96715	0.95861	-131.2%	0.95736	0.94961	-266.9%	0.95572	0.94649	-58.9%
Public sector	0.01708	0.02234	30.1%	0.0155	0.02326	-11.0%	0.01476	0.01661	-245.3%
Paid jobs	-0.90145	-0.91064	-101.6%	-0.8876	-0.89922	65.9%	-0.86347	-0.84871	61.9%
Skill level	0.17477	0.13666	-9.9%	0.25194	0.1938	19.7%	0.25092	0.24354	80.4%
Education	17.796	17.996	70.3%	17.442	17.343	72.5%	17.476	17.642	47.0%
Marital status	0.77267	0.77595	67.2%	0.77907	0.77132	82.3%	0.7786	0.74723	7.2%
Age	44.912	45.122	94.7%	46.337	47.748	48.0%	46.048	45.566	62.6%
Years in business	13.838	14.161	86.3%	13.019	13.764	75.2%	12.941	13.188	62.2%

Since also for this trait spectrum the matching was overall successful in balancing the treated and control group and therefore reducing the bias it can be proceeded with an analysis of the ATTs resulting from the Propensity Score Matching. Table 21 gives an overview of the resulting ATTs. For the comparison of Categories 1 and 2, the ATT amounts to - 0.1556, whereby it is marginally significance due to the p-value not exceeding the 10 % significance level. As for the comparison of Categories 1 and 3, the ATT is with - 0.4037 again negative. This finding is significant, with $p < 0.01$. For the final comparison, namely that of Categories 2 and 3, the Propensity Score Matching again resulted in a negative ATT of - 0.4037, whereby this result is highly significant ($p < 0.001$).

Table 21: Average Treatment Effect on the Treated of the Assertive – Turbulent spectrum for employer entrepreneurs

Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2 (N=1,055)	-0.155648608† (0.080957451)	0.05512756
Categories 1 and 3 (N=559)	-0.467005813** (0.145201263)	0.00135646
Categories 2 and 3 (N=1,050)	-0.403689946*** (0.111061477)	0.00029710

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

4.2.2 Solo self-entrepreneurs

Having learned about the results of the Propensity Score Matching for the sample of employer entrepreneurs, this chapter will now focus on analyzing the outcomes for the second group of entrepreneurs, namely the solo self-entrepreneurs. Similar to the sample of employer entrepreneurs, the results of the Propensity Score Matching will be analyzed for each of the three trait spectra included in the Hypothesis 1, 2 and 3. The data for the final two spectra can, however, again be found in the appendix for the sake of completeness.

As a first step, it will be investigated how successful the model was in reducing the bias between the Treated and the Controls group. Thereafter, the Average Treatment Effects on the Treated Group (ATTs) will be analyzed for each of the three trait spectra. Like in the previous chapter on employer entrepreneurs, these ATTs will later serve as a basis for a Difference in Differences Analysis.

Extraversion – Introversion

Starting with the Extraversion – Introversion spectrum, the first step is again to investigate whether the matching could balance the Treated and the Controls group during the

Propensity Score Matching. The results for this bias reduction test can be seen in balancing models 10 to 12 in Table 22.

Balancing model 10 reports that for the comparison of *Categories 1 and 2* the bias could be reduced by the model in all but one variable. This balancing effect is especially prominent in the variables “country of birth” (100 % bias reduction), “age” (98.3 % bias reduction), “education” (97.7 % bias reduction), “years in business” (96.9 % bias reduction), “gender” (94.4 % bias reduction), “work for themselves” (93.4 % bias reduction), “skill level” (89.7 % bias reduction) and “sole director” (88.2 % bias reduction). Only one matching variable reports a negative bias reduction: in the variable “marital status” (- 147.6 %) the bias experienced an increase compared to before the matching. Since, however, already prior to the matching process the two groups (Treated and Controls group) have been close in values it is assumed that this negative bias reduction is rooted in this initial similarity. All in all, it is therefore concluded that the matching has successfully contributed to reducing the overall bias and balancing the Treated and the Controls group.

As for the second comparison (*Categories 1 and 3*), the results of the bias reduction are reported in balancing model 11 in Table 22. Again, a positive reduction in bias could be observed in most variables. As a case in point, this bias reduction was particularly substantial in “age” (98.6 % bias reduction), “years in business” (97.0 % bias reduction), “education” (92.4 % bias reduction) and “partner in business” (91.7 % bias reduction). In the variables “public sector” (- 12,422.2 % bias reduction), “private sector” (- 221.8 % bias reduction), as well as “country of birth” (- 62.8 % bias reduction) the reported bias reduction was a negative one. However, as with the previously described balancing models, the cause of this negative effect is ascribed to be the small difference in values of the treated and the control group before the matching. Again, it can therefore be concluded that the matching was successful in reducing the overall bias.

Lastly, the success of the matching for the comparison of *Categories 2 and 3* is described in balancing model 12. In line with the findings of the previous balancing models, also in this case the findings indicate a balancing effect in most variables. The effect is especially strong in the variables “paid jobs” (96.1 % bias reduction), “partner in business” (93.7 % bias reduction), “work schedule” (91.5 % bias reduction), “work for themselves” (90.3 % bias reduction), “age” (83.4 % bias reduction), and “education” (82.4 % bias reduction). In three instances, the bias reduction was reported as negative: “skill level” (- 61.2 % bias

reduction), “freelancer” (- 46.4 % bias reduction), and “sole director” (- 20.3 % bias reduction). This, however, is again concluded to be due to the rather equal values of the Treated and Controls group before the matching. In sum, it is therefore again concluded that the model is successfully reducing the bias, thus balancing the values for the Treated and Controls group.

Table 22: Balancing models 10 – 12: bias reduction regarding the relationship between a solo self-entrepreneur's income and the positioning of the respective country on the Extraversion – Introversion spectrum

	Balancing model 10			Balancing model 11			Balancing model 12		
	(Treatment: Extraversion – Introversion; Categories 1 + 2)			(Treatment: Extraversion – Introversion; Categories 1 + 3)			(Treatment: Extraversion – Introversion; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Gender	0.35812	0.35451	94.4%	0.38206	0.35383	42.3%	0.37808	0.36426	13.2%
Work schedule	0.78195	0.78664	69.4%	0.73085	0.71774	57.9%	0.7305	0.72655	91.5%
Country of birth	0.89242	0.89242	100.0%	0.96472	0.94052	-62.8%	0.9615	0.94916	77.1%
Sole director	0.35884	0.36715	88.2%	0.35484	0.33065	37.4%	0.36525	0.32725	-20.3%
Partner in business	0.09242	0.08339	11.7%	0.03024	0.03528	91.7%	0.02962	0.03406	93.7%
Work for themselves	0.50181	0.5083	93.4%	0.60181	0.61996	53.1%	0.59625	0.60958	90.3%
Subcontractor	0.04043	0.03394	16.3%	0.00605	0.01512	5.5%	0.00592	0.01086	71.6%
Freelancer	0.11769	0.10794	74.9%	0.10585	0.09577	75.4%	0.10661	0.10365	-46.4%
Private sector	0.95668	0.96354	48.4%	0.97177	0.95363	-221.8%	0.97038	0.97532	73.9%
Public sector	0.01949	0.01408	13.6%	0.01815	0.03125	-12422.2%	0.01974	0.0153	30.3%
Paid jobs	-0.85704	-0.86101	76.6%	-0.92036	-0.91331	66.9%	-0.92201	-0.92053	96.1%
Skill level	0.22094	0.23249	89.7%	0.23488	0.26714	76.2%	0.24383	0.20681	-61.2%
Education	17.266	17.281	97.7%	15.242	15.333	92.4%	15.128	14.797	82.4%
Marital status	0.67004	0.65018	-147.6%	0.71169	0.72681	70.9%	0.71273	0.6999	70.8%
Age	47.234	47.197	98.3%	44.622	44.556	98.6%	44.373	44.761	83.4%
Years in business	12.791	12.81	96.9%	13.304	13.271	97.0%	13.215	13.686	2.8%

After confirming that the matching was successful for all three comparisons, it can now be moved on to analyzing the ATTs of the Extraversion – Introversion spectrum for the solo self-entrepreneurs (see Table 23). For the comparison of Categories 1 and 2 the Average Treatment Effect on the Treated of 0.1229 is positive and significant with a p-value lower

than 0.05. For the comparisons of Category 1 and 3 (ATT = - 0.7001) as well as for Category 2 and 3 (ATT = - 0.8162), on the other hand, the Average Treatment Effects on the Treated are both negative and highly significant with a p-value below 0.001.

Table 23: Average Treatment Effect on the Treated of the Extraversion – Introversion spectrum for solo self-entrepreneurs

Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	0.122904904*	0.04784142
(N=1,986)	(0.061932424)	
Categories 1 and 3	-0.70006545***	< 0.00001
(N=1,605)	(0.082658338)	
Categories 2 and 3	-0.816164444***	< 0.00001
(N=2,409)	(0.063646148)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Intuitive – Observant

Also for the Intuitive – Observant spectrum the first step is to analyze whether the matching process of the Propensity Score Matching was successful in balancing the Treated and the Controls group before moving over to investigating the ATTs for the spectrum.

For the comparison of *Categories 1 and 2*, the matching led to a positive bias reduction in the majority of variables, as can be seen in balancing model 13 in Table 24. In fact, the balancing effect was particularly large in the variables “education” (96.6 % bias reduction), “public sector” (93.0 % bias reduction), “paid jobs” (92.2 % bias reduction), “gender” (90.7 % bias reduction), “work schedule” (88.8 % bias reduction) and also in “private sector” (80.8 % bias reduction). Regarding the negative bias reductions in “freelancer” (- 775.0 % bias reduction), “marital status” (- 142.8 % bias reduction) and “subcontractor” (- 97.1 % bias reduction) it is again concluded that this adverse effects of the matching are caused by the small numbers before the matching, so that slight absolute changes lead to

large percentual changes. All in all, the matching is thus seen as successful in balancing the Treated and Controls group.

Next, the bias reduction of the comparison between *Categories 1 and 3* shall be investigated. The results of the balancing efforts during the matching process are accumulated in balancing model 14 (see Table 24). A bias reduction can be observed in all but two instances, whereby it was especially effective in “work schedule” (87.3 % bias reduction), “country of birth” (91.3 % bias reduction), “sole director” (88.4 % bias reduction), “partner in business” (84.9 % bias reduction), “work for themselves” (95.0 % bias reduction), “paid jobs” (83.4 % bias reduction). Regarding the negative bias reduction in “freelancer” (- 189.8 % bias reduction) and “marital status” (- 17.8 % bias reduction) it is again concluded that – in line with the previous balancing models – this bias-reduction-countering effect is rooted in the small numbers and the closeness in values for the Treated and Controls group prior to the matching. Thus, also this model is considered as successful in reducing the bias.

Finally, the last balancing model for this trait spectrum – balancing model 15 in Table 24 – depicts the bias reduction for the comparison of *Categories 2 and 3*. The balancing model shows that also in this case a bias reduction was achieved in most variables by the matching. A substantial reduction in bias can be observed e.g. in the variables “skill level” (100 % bias reduction), “marital status” (100 % bias reduction), “gender” (96.3 % bias reduction), “years in business” (98.9 % bias reduction), “age” (95.6 % bias reduction), “sole director” (91.2 % bias reduction), “work for themselves” (88.0 % bias reduction) and “education” (82.6 % bias reduction). A negative bias reduction was reported in “public sector” (- 152.5 % bias reduction) as well as “work schedule” (- 4.2 % bias reduction). However, this is again attributed to the Treated and Controls group being close in values prior to the matching. In conclusion, also this matching successfully has contributed to increasing the balance between the treated and the control group.

Since it could again be confirmed that the matching was successful for all three comparisons, the next step is to investigate the ATTs resulting from the Propensity Score Matching. Table 25 gives a detailed overview of these findings. The ATT of the comparison of Categories 1 and 2 amounts to - 0.1195, whereby the respective p-value is greater than 0.1. This means, that the ATT is not significant. As for the comparison of Categories 1 and 3, the ATT is - 0.2611. For this second comparison, the p-value is smaller than 0.05 – in other words, the ATT is significant. Finally, for the comparison of Categories 2 and 3 the

resulting ATT is - 0.1667, whereby the p-value is smaller than 0.01, which indicates that also this result is significant.

Table 24: Balancing models 13 – 15: bias reduction regarding the relationship between a solo self-entrepreneur's income and the positioning of the respective country on the Intuitive – Observant spectrum

	Balancing model 13			Balancing model 14			Balancing model 15		
	(Treatment: Intuitive – Observant; Categories 1 + 2)			(Treatment: Intuitive – Observant; Categories 1 + 3)			(Treatment: Intuitive – Observant; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Gender	0.3589	0.35429	90.7%	0.40887	0.39655	25.9%	0.41004	0.40759	96.3%
Work schedule	0.77301	0.78183	88.8%	0.77956	0.77217	87.3%	0.78213	0.76071	-4.2%
Country of birth	0.95245	0.93558	77.1%	0.93596	0.93103	91.3%	0.93758	0.92717	37.9%
Sole director	0.37577	0.42063	2.8%	0.25	0.26232	88.4%	0.24847	0.23501	91.2%
Partner in business	0.06825	0.0763	78.1%	0.06158	0.05296	84.9%	0.0612	0.07344	39.5%
Work for themselves	0.5184	0.47508	21.8%	0.64409	0.64901	95.0%	0.64259	0.62424	88.0%
Subcontractor	0.02761	0.04448	-97.1%	0.01847	0.0234	77.9%	0.01836	0.01469	73.2%
Freelancer	0.10429	0.09202	-775.0%	0.10099	0.12315	-189.8%	0.10404	0.11016	2.0%
Private sector	0.96549	0.96204	80.8%	0.96798	0.95936	66.9%	0.9694	0.96389	31.4%
Public sector	0.0138	0.01495	93.0%	0.01847	0.02217	74.2%	0.01714	0.02264	-152.5%
Paid jobs	-0.90261	-0.89494	92.2%	-0.91872	-0.89778	83.4%	-0.91922	-0.90453	45.6%
Skill level	0.19402	0.18021	63.6%	0.22783	0.18719	8.7%	0.22766	0.22766	100.0%
Education	16.574	16.536	96.6%	16.305	16.302	99.8%	16.25	16.185	82.6%
Marital status	0.68405	0.6296	-142.8%	0.66379	0.62315	-17.8%	0.66095	0.66095	100.0%
Age	45.456	44.974	65.6%	47.265	48.554	27.7%	47.367	47.226	95.6%
Years in business	12.605	12.102	49.9%	14.202	15.562	39.8%	14.431	14.417	98.9%

Table 25: Average Treatment Effect on the Treated of the Intuitive – Observant spectrum for solo self-entrepreneurs

Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2 (N=2,182)	-0.119463033 (0.077448822)	0.12370542
Categories 1 and 3 (N=1,616)	-0.26106615* (0.117691748)	0.02655716
Categories 2 and 3 (N=2,202)	-0.166729566** (0.059956703)	0.00548212

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Assertive – Turbulent

Finally, the Assertive – Turbulent spectrum will be investigated. Similar as for the two previously described trait spectra it will again be started by analyzing the bias reduction achieved through the matching process of the Propensity Score Matching before proceeding with the analysis of the resulting ATTs. The results for the bias reduction test (balancing models 16, 17 and 18) can be found in Table 26.

As for the comparison of *Categories 1 and 2*, balancing model 16 shows that the matching led to a bias reduction in most variables. The achieved bias reduction is especially large in the variables “freelancer” (100 % bias reduction), “sole director” (97.9 % bias reduction), “work schedule” (97.3 % bias reduction), “age” (95.6 % bias reduction), “skill level” (91.1 % bias reduction), “work for themselves” (83.6 % bias reduction) and “public sector” (83.5 % bias reduction). On the other hand, a negative bias reduction could be discovered in “subcontractor” (- 2,609.6 % bias reduction), “gender” (- 477.0 % bias reduction), “country of birth” (- 84.8 % bias reduction), “marital status” (- 73.2 % bias reduction), as well as “paid jobs” (- 49.5 % bias reduction). These negative values, however, are again ascribed to the neglectable difference in and smallness of the values of the treated and the control group already before the matching. In conclusion, the matching is seen as successful in reducing the bias.

Balancing model 17 analyzes the effectiveness of the matching in balancing the Treated and the Controls group for the comparison of *Categories 1 and 3*. Again, a positive bias reduction can be observed in the majority of variables. Particularly large effects were reported in the variables “country of birth” (100 % bias reduction), “age” (97.5 % bias reduction), “gender” (91.1 % bias reduction), “work for themselves” (89.8 % bias reduction), “freelancer” (86.5 % bias reduction), “partner in business” (84.8 % bias reduction) and also in “public sector” (80.0 % bias reduction). On the other hand, negative effects were reported in four cases, namely in the variables “private sector” (- 165.2 % bias reduction), “subcontractor” (- 153.4 % bias reduction), “paid jobs” (- 39.5 % bias reduction) and “education” (- 19.6 % bias reduction). However, it is again concluded that these negative reductions in bias are due to the fairly small numbers as well as the values of the Treated and Control group being close to each other already before the matching. Thus, the model is nonetheless seen as successful in reducing the bias, therefore contributing to balancing the Treated and the Control group.

Lastly, the results for the comparison of *Categories 2 and 3* can be found in balancing model 18. It can be seen in Table 26 that the bias reduction is positive in all but two instances. This positive reduction was particularly substantial in the variables “work schedule” (98.8 % bias reduction), “age” (98.2 % bias reduction), “sole director” (94.5 % bias reduction), “marital status” (91.9 % bias reduction), “work for themselves” (91.3 % bias reduction) and “education” (90.2 % bias reduction). The two negative bias reduction values were found in “public sector” (- 799.8 % bias reduction) as well as “country of birth” (- 15.6 % bias reduction). This is again concluded to be a result of the small values and the neglectable difference in the values of the Treated and the Controls group. Overall, the model is therefore considered as successful in reducing the bias.

Table 26: Balancing models 16 – 18: bias reduction regarding the relationship between a solo self-entrepreneur's income and the positioning of the respective country on the Assertive – Turbulent spectrum

	Balancing model 16			Balancing model 17			Balancing model 18		
	(Treatment: Assertive - Turbulent; Categories 1 + 2)			(Treatment: Assertive – Turbulent; Categories 1 + 3)			(Treatment: Assertive – Turbulent; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Gender	0.36787	0.33685	-477.0%	0.43557	0.43978	91.1%	0.44093	0.4581	59.2%
Work schedule	0.81141	0.81359	97.3%	0.67647	0.65406	28.5%	0.67582	0.67445	98.8%

Country of birth	0.9299	0.91904	-84.8%	0.94258	0.94258	100.0%	0.94505	0.94712	-15.6%
Sole director	0.38772	0.38617	97.9%	0.27871	0.27031	78.2%	0.29533	0.30151	94.5%
Partner in business	0.07134	0.06514	45.1%	0.05042	0.04482	84.8%	0.05082	0.04396	73.2%
Work for themselves	0.49814	0.5062	83.6%	0.65686	0.64426	89.8%	0.66484	0.64973	91.3%
Subcontractor	0.0273	0.0366	-2609.6%	0.01681	0.02521	-153.4%	0.01511	0.01648	62.5%
Freelancer	0.10732	0.10732	100.0%	0.09664	0.10084	86.5%	0.11126	0.1092	78.9%
Private sector	0.96588	0.96929	7.7%	0.95798	0.96359	-165.2%	0.95879	0.95742	76.3%
Public sector	0.01179	0.01303	83.5%	0.02521	0.02661	80.0%	0.02473	0.01992	-799.8%
Paid jobs	-0.90695	-0.91377	-49.5%	-0.83053	-0.78291	-39.5%	-0.83516	-0.82761	80.5%
Skill level	0.20285	0.19975	91.1%	0.2395	0.21429	65.2%	0.23764	0.22802	74.5%
Education	16.507	16.786	58.6%	16.507	16.937	-19.6%	16.558	16.527	90.2%
Marital status	0.68859	0.70596	-73.2%	0.70868	0.7381	32.9%	0.71154	0.71429	91.9%
Age	45.657	45.479	95.6%	46.218	46.15	97.5%	46.163	46.187	98.2%
Years in business	13.099	12.576	77.7%	11.985	11.333	78.3%	11.846	11.277	13.1%

Since the results of the balancing models illustrate that overall the matching has led to a reduction in the bias for all three category comparisons it now will be investigated which ATTs the Propensity Score Matching has resulted in (see Table 27): the ATTs are negative and highly significant ($p < 0.001$) for all three of the category comparisons. In the case of the comparison of Categories 1 and 2, the ATT amounts to -0.2794. For the second comparison, namely that of Categories 1 and 3, the ATT is -0.7203. And finally, for the last comparison (Categories 2 and 3), the ATT amounts to -0.5048.

Table 27: Average Treatment Effect on the Treated of the Assertive – Turbulent spectrum for solo self-entrepreneurs

Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.279368478***	< 0.00001
(N=2,270)	(0.055347696)	
Categories 1 and 3	-0.72027141***	< 0.00001
(N=1,372)	(0.080025043)	
Categories 2 and 3	-0.504802193***	< 0.00001
(N=2,358)	(0.067246927)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

4.3 Differences in ATTs: employer entrepreneurs versus solo self-entrepreneurs

This chapter will focus on the results from the analysis of the Differences in ATTs between employer entrepreneurs and solo self-entrepreneurs for all three trait spectra. For the sake of completeness, the findings for the remaining two dimensions can be found in the appendix. The Difference in ATTs is essentially a comparison of the ATTs of the employer entrepreneurs and the solo self-entrepreneurs from the Propensity Score Matching; whereby the Difference in ATTs is the result of a simple subtraction of these (ATT employer entrepreneurs minus ATT solo self-entrepreneurs). Besides this, a t-test was conducted to determine the significance of the calculated Differences in ATTs. It is important to note that the comparison of Categories 1 and 3, being located on the opposing ends of the country spectrum, will be most important for this thesis. The comparisons of Category 1 and 2 as well as of Category 2 and 3 will function as robustness tests, thus serving as indicators whether the relationship between personality traits and the income gap is a consistent one. Table 28 depicts the findings of this analysis.

Table 28: Difference in ATTs of employer entrepreneurs versus solo self-entrepreneurs

	Cat.	two-tailed p-value	Mean Employer Entrepreneurs minus Solo Self- Entrepreneurs	95-% Confidence Interval (CI)		t-value	df	standard error of differenc e
				from	to			
Extraversion versus Introversion	12	<0.0001	0.081486685	0.075952231670	0.087021138330	28.9276	2954	0.003
	13	<0.0001	0.187562882	0.178943849160	0.196181914840	42.7552	2247	0.004
	23	<0.0001	0.181522226	0.175912829280	0.187131622720	63.579	3457	0.003
Intuitive versus Observant	12	<0.0001	-0.092530337	-0.099281184020	-0.085779489980	26.9294	3187	0.003
	13	<0.0001	0.111493903	0.100077101190	0.122910704810	19.187	2284	0.006
	23	<0.0001	0.017481838	0.012332540270	0.022631135730	6.6702	3187	0.003
Assertive versus Turbulent	12	<0.0001	0.12371987	0.118992118340	0.128447621660	51.4144	3323	0.002
	13	<0.0001	0.253265597	0.243091653210	0.263439540790	48.9088	1929	0.005
	23	<0.0001	0.101112247	0.095044933520	0.107179560480	32.7422	3406	0.003

Extraversion – Introversion

Firstly, the results for the Extraversion – Introversion spectrum will be investigated. For the comparison of Categories 1 and 3 the Difference in ATTs is 0.1876, whereby this value is highly significant ($p < 0.001$). In order to test the robustness of this effect, the comparisons of Categories 1 and 2 as well as of Categories 2 and 3 were analyzed as well: the Difference in ATTs for the comparison of Categories 1 and 2 amounts to 0.0815, whereby it is highly significant ($p < 0.001$). Regarding the comparison of Categories 2 and 3, the – again highly significant ($p < 0.001$) – Difference in ATTs is 0.1815. Since for both comparisons, the Differences in ATTs are positive and significant, this supports the findings of the comparison of Category 1 and 3. Thus, there seems to be a consistent positive effect for the Extraversion – Introversion spectrum.

Intuitive – Observant

Next, the Differences in ATTs for the Intuitive – Observant spectrum will be presented. For the comparison of Categories 1 and 3 the highly significant ($p < 0.001$) Difference in ATTs amounts to 0.1115. In the robustness test the Difference in ATTs for the comparison of

Categories 1 and 2 is with - 0.0925 a negative, highly significant ($p < 0.001$) one. This speaks against the consistency of the positive effect observed in the comparison of Categories 1 and 3. The Difference in ATTs for the comparison of Categories 2 and 3 on the other hand is a positive one (0.0175), thus supporting the trend of the Difference in ATTs for the comparison of Categories 1 and 3. Again, the p-value for this Difference in ATTs is highly significant ($p < 0.001$). Since, however, the comparison of Categories 1 and 2 is not in line with these findings, no consistent positive effect could be found.

Assertive – Turbulent

Lastly, also the ATTs for the Assertive – Turbulent spectrum shall be analyzed. The comparison of Categories 1 and 3 shows a highly significant ($p < 0.001$) positive Difference in ATTs of 0.2533. In order to verify if this effect is a consistent positive one it is necessary to conduct a robustness test by comparing the Difference in ATTs of Categories 1 and 2 as well as Categories 2 and 3. As for the prior category comparison (1 and 2) the Difference in ATTs amounts to 0.1237, whereby the result is highly significant ($p < 0.001$). As for the latter category comparison (2 and 3), the Difference in ATTs is 0.1011, whereby the Difference again is highly significant ($p < 0.001$). Thus, this robustness test supports the findings of the comparison of Categories 1 and 3 in both instances, therefore suggesting that the positive effect discovered in the comparison of Categories 1 and 3 is a consistent one.

4.4 Gender as a moderating variable

Following the presentation of the findings for the combined sample, this chapter will focus on reporting the results for the data analysis in relation to the two gender-related hypotheses (H4 and H5). The gender-separated results for all other trait dimensions can – for the sake of completeness – be found in the appendix of this thesis.

Like in the non-gender-separated sample, it shall be started by analyzing the results of the Propensity Score Matching. Due to the high similarity of the balancing models with the priorly described not gender-separated ones it will be refrained from elaborating in detail why the bias reduction has been successful and instead directly moved on to analyzing

the ATTs. The detailed balancing models can instead be found in appendix. Based on the ATTs, the Difference in ATTs will be calculated in a next step, whereby the significance of these differences will again be determined with the help of a t-test. In order to analyze whether the Difference in the Differences in ATTs between male and female entrepreneurs is significant, it will be investigated whether the Confidence Intervals (CIs) of these Differences in ATTs overlap.

For the analysis of the ATTs, it will be started with an overview of the female sample, whereby a further separation of this sample into employer entrepreneurs and solo self-entrepreneurs will be conducted. Thereafter, the same structure will be followed for the reporting of the results for the male sample.

Female sample

The first trait spectrum analyzed is the **Extraversion – Introversion** one. For *female employer entrepreneurs* the comparison between Categories 1 and 2 results in a negative, not significant ($p > 0.1$) ATT of - 0.2110, as can be seen in Table 29. For the comparison of Categories 1 and 3, the ATT is with - 0.4057 also a negative one. However, as opposed to the first comparison's ATT, this result is significant ($p < 0.05$). Finally, for the comparison of Categories 2 and 3 the marginally significant ($p < 0.1$) ATT of - 0.3114 is again negative.

Table 29: Average Treatment Effect on the Treated of the Extraversion – Introversion spectrum for female employer entrepreneurs

Extraversion – Introversion: female employer entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2 (N=282)	-0.210990952 (0.146951299)	0.15098056
Categories 1 and 3 (N=180)	-0.405737293* (0.194046231)	0.03803088
Categories 2 and 3 (N=287)	-0.311434602† (0.185792729)	0.09404924

*** $p < 0.001$ | ** $p < 0.01$ | * $p < 0.05$ | † $p < 0.1$

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Regarding the sample of *female solo self-entrepreneurs*, the results in Table 30 show that the ATT for the comparison of Categories 1 and 2 of the Extraversion – Introversion spectrum amounts to 0.0670. However, this result is not significant ($p > 0.05$). For the two other category comparisons, the ATTs are both highly significant ($p < 0.001$) and negative, with an ATT of - 0.5148 for Categories 1 and 3 and an ATT of - 0.7227 for the comparison of Categories 2 and 3.

Table 30: Average Treatment Effect on the Treated of the Extraversion – Introversion spectrum for female solo self-entrepreneurs

Extraversion – Introversion: female solo self-entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	0.067000895	0.4656142
(N=764)	(0.091650699)	
Categories 1 and 3	-0.514760947***	< 0.00001
(N=652)	(0.115476296)	
Categories 2 and 3	-0.722675607***	< 0.00001
(N=880)	(0.111360718)	

*** $p < 0.001$ | ** $p < 0.01$ | * $p < 0.05$ | † $p < 0.1$

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

The second trait spectrum analyzed separated according to the respondents' gender is the **Assertive – Turbulent** one. Table 31 reports the ATTs for the *female employer entrepreneurs* for this trait spectrum. The ATT for the comparison of Categories 1 and 2 is 0.0204, whereby the result is not significant ($p > 0.1$). As for the second comparison, namely that of Categories 1 and 3, a negative ATT of - 0.5684 was found. Due to the p-value being greater than 0.05 but smaller than 0.1 this ATT is marginally significant. Finally, also for the comparison of Categories 2 and 3 the ATT of - 0.3707 is marginally significant due to the p-value again exceeding the 5 % threshold but being smaller than the 10 % one.

Table 31: Average Treatment Effect on the Treated of the Assertive - Turbulent spectrum for female employer entrepreneurs

Assertive – Turbulent: female employer entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	0.020393658	0.9124842
(N=296)	(0.180176887)	
Categories 1 and 3	-0.568444932†	0.0804878
(N=148)	(0.323494043)	
Categories 2 and 3	-0.370657487†	0.08646716
(N=300)	(0.214955341)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Lastly, Table 32 shows the ATTs of the Assertive – Turbulent spectrum for the *female solo self-entrepreneurs*. The comparison of Category 1 and 2 results in a negative, not significant ($p>0.1$) ATT of - 0.0463. Regarding the comparisons of Categories 1 and 3 and Categories 2 and 3 the ATTs are negative and highly significant ($p<0.001$) in both cases: for the comparison of Categories 1 and 3 the ATT amounts to - 0.6282; the resulting ATT for the comparison of Categories 2 and 3 is - 0.6723.

Table 32: Average Treatment Effect on the Treated of the Assertive - Turbulent spectrum for female solo self-entrepreneurs

Assertive – Turbulent: female solo self-entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.046336106	0.6384793
(N=826)	(0.097581083)	
Categories 1 and 3	-0.628226197***	< 0.00001

(N=550)	(0.126269253)	
Categories 2 and 3	-0.67229741***	< 0.00001
(N=920)	(0.100984716)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Male sample

In order to analyze the results for the male sample it will again be started with a presentation of the ATTs of the **Extraversion – Introversion** spectrum. Table 33 depicts the findings for the *male employer entrepreneurs*. For the comparison of Categories 1 and 2 a positive ATT of 0.0893 was discovered. However, with a p-value that is exceeding 0.1 this result is not significant. For the comparison of Categories 1 and 3, the ATT is - 0.4204, whereby the value is significant due to the p-value being smaller than 0.05. Finally, the ATT for the comparison of Categories 2 and 3 amounts to - 0.8363 and is highly significant (p<0.001).

Table 33: Average Treatment Effect on the Treated of the Extraversion - Introversion spectrum for male employer entrepreneurs

Extraversion – Introversion: male employer entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	0.089353625	0.37378346
(N=675)	(0.100847549)	
Categories 1 and 3	-0.420363275**	0.00657808
(N=458)	(0.153810783)	
Categories 2 and 3	-0.836334349***	< 0.00001
(N=763)	(0.11016167)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

For the *male solo self-entrepreneurs*, the results of the Propensity Score Matching for the Extraversion – Introversion spectrum are summarized in Table 34. The ATT for the comparison of Categories 1 and 2 is 0.1338, whereby this Average Treatment Effect on the Treated is marginally significant due to the p-value being greater than 0.05 but smaller than 0.01. The ATT resulting from the comparison of Categories 1 and 3 amounts to - 0.8075 and is highly significant ($p < 0.001$). Finally, the ATT resulting from the comparison of Categories 2 and 3 is with - 0.8053 again a negative one. Since the p-value for this ATT is smaller than 0.001 the result is highly significant.

Next, it will the results of the Propensity Score Matching of the **Assertive – Turbulent** spectrum for the male sample will be analyzed. Table 35 reports the findings of this matching for the *male employer entrepreneurs*. The Treatment Effect for the comparison of Categories 1 and 2 amounts to - 0.1291, whereby it is not significant ($p > 0.1$). Secondly, the matching of Categories 1 and 3 has resulted in a highly significant ($p < 0.001$) and negative ATT of -0.7821. Lastly, the ATT resulting from the matching of Categories 2 and 3 amounts to - 0.4434. This value is significant too since the p-value is smaller than 0.05.

Table 34: Average Treatment Effect on the Treated of the Extraversion – Introversion spectrum for male solo self-entrepreneurs

Extraversion – Introversion: male solo self-entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2 (N=1,222)	0.133807429† (0.079455665)	0.09321312
Categories 1 and 3 (N=953)	-0.80745118*** (0.099445756)	< 0.00001
Categories 2 and 3 (N=1,529)	-0.805328968*** (0.075710368)	< 0.00001

*** $p < 0.001$ | ** $p < 0.01$ | * $p < 0.05$ | † $p < 0.1$

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table 35: Average Treatment Effect on the Treated of the Assertive – Turbulent spectrum for male employer entrepreneurs

Assertive – Turbulent: male employer entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2 (N=737)	-0.129143335 (0.093450698)	0.1680057
Categories 1 and 3 (N=409)	-0.782135859*** (0.163280084)	< 0.00001
Categories 2 and 3 (N=750)	-0.443355126** (0.135182427)	0.00108608

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Finally, Table 36 outlines the ATTs for the sample of *male solo self-entrepreneurs* for the Assertive – Turbulent trait spectrum. For all three category comparisons, the ATTs calculated in the Propensity Score Matching are highly significant (p<0.001) and negative: the ATT for the comparison of Categories 1 and 2 is -0.4194; that for the comparison of Categories 1 and 3 amounts to - 0.7053; and lastly the ATT for the comparison of Categories 2 and 3 is - 0.4215.

Table 36: Average Treatment Effect on the Treated of the Assertive – Turbulent spectrum for male solo self-entrepreneurs

Assertive – Turbulent male solo self-entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2 (N=1,444)	-0.419400549*** (0.067366958)	< 0.00001
Categories 1 and 3 (N=822)	-0.705332562*** (0.101880741)	< 0.00001

Categories 2 and 3	-0.421523937***	< 0.00001
(N=1,438)	(0.092177328)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

4.4.1 Difference in the Differences in ATTs of the female versus male entrepreneurs

As a final step, the results for the Difference in the Differences in ATTs analysis will be analyzed. The aim of this Difference in the Differences in ATTs analysis is to test the gender hypotheses (H4 and H5). First, the Difference in ATTs of Categories 1 and 3 of the female versus the male sample will be compared: as opposed to the analyses conducted to test Hypothesis 1, 2 and 3, it will however not only be investigated whether the Differences are positive or negative but also whether the Difference is bigger for the female or the male sample. The comparison of Categories 1 and 2 as well as that of Categories 2 and 3 will thereafter again serve as a robustness test in order to analyze whether the discovered effect is a consistent one. Thereafter, the significance of the resulting Differences will be analyzed by comparing the Confidence Intervals (CIs) of the female comparisons to those of the male comparisons. In case of an overlap, the Difference in the Differences in ATTs is not significant. The results for this Difference in Differences in ATTs analysis that are relevant to test the hypotheses of this thesis can be found in Table 37. For the sake of completeness the results for the three other trait dimensions can be found in the appendix.

Starting with the comparison of Categories 1 and 3 of the **Extraversion – Introversion** spectrum the Difference in ATTs for the female sample amounts to 0.1090, whereby it is highly significant ($p<0.001$). The 95-% CI for this category comparison reaches from 0.0865 to 0.1316. Regarding the male sample the – again highly significant ($p<0.001$) – Difference in ATTs is 0.3871. In other words, the Difference in ATTs is greater for the male than the female sample. The 95-% Confidence Interval for the male sample reaches from 0.3737 to 0.4005. This leads to the conclusion that the CIs for the female versus the male sample do not overlap which in turn indicates a significant difference between the Differences in ATTs of the two samples. Moving on to the robustness test, the comparison

of employer versus solo self-entrepreneurs located in Categories 1 and 2 for the female sample resulted in a highly significant ($p < 0.001$) Difference in ATTs of - 0.2780 and a 95-% CI reaching from - 0.2930 to - 0.2630. For the male sample, on the other hand, the resulting Difference in ATTs is - 0.0445, whereby this value again can be considered as highly significant ($p < 0.001$). For this sample, the 95-% CI reaches from - 0.0527 to - 0.0362. This means that, since the Confidence Intervals of the Differences in ATTs for the female versus the male sample are not overlapping, the difference between the two sample groups is significant for this comparison. As the male entrepreneurs' Difference in ATTs is greater than the female entrepreneurs' one this Difference in Differences in ATTs supports the trend discovered in the first category comparison. Lastly, the comparison of Categories 2 and 3 for the Extraversion – Introversion spectrum for the female entrepreneurs resulted in a highly significant ($p < 0.001$) positive Difference in ATTs of 0.4112. The Confidence Interval for this sample spans from 0.3934 to 0.4291. For the male sample, on the other hand, the Difference in ATTs is a highly significant ($p < 0.001$), negative one with a value of - 0.0310. The 95-% CI for this sample reaches from - 0.0387 to - 0.0233. This means that again, the Difference in the Differences in ATTs is a significant one, due to the CIs not being overlapping. However, since for this last category comparison (Category 2 and 3) the Difference in ATTs for the female sample is greater than that for the male sample, this is not in line with the effect discovered in the first and second category comparisons. Thus, overall, no consistency of this effect can be assumed.

For the second spectrum, the **Assertive – Turbulent** one, the female sample's Difference in ATTs for the comparison of Categories 1 and 3 is 0.0598, whereby this value is again highly significant ($p < 0.001$). The 95-% CI for this comparison reaches from 0.02590 to 0.0937. Regarding the male sample, the highly significant ($p < 0.001$) Difference in ATTs for the comparison of Categories 1 and 3 amounts to - 0.0768, whereby the 95-% Confidence Interval for this category comparison lies between - 0.0917 and - 0.0619. Thus, due to the CIs not being overlapping, the differences between the male and the female sample's Difference in ATTs is significant – and the female sample's Difference in ATTs is greater than the male sample's. In a second step there again will be a robustness test conducted to see whether the priorly discovered effect is of a consistent nature. The category comparison of Categories 1 and 2 amounts to 0.0667 and is highly significant ($p < 0.001$). For this comparison, the 95-% CI reaches from 0.0501 to 0.0833. For the male sample, on the other hand, the Difference in ATTs is 0.2903, whereby also this Difference is highly significant ($p < 0.001$). The 95-% Confidence Interval for this sample spans from

0.2834 to 0.2971, which means that there is no overlap with the CI of the female sample, and thus, the Difference in Differences in ATTs is significant. For this category comparison, the male sample's Difference in ATTs is greater than that of the female sample, which denies the existence of a consistent effect of the findings from the comparison of Categories 1 and 3. Thirdly, the Difference in ATTs for the comparison of Categories 2 and 3 of the female sample is 0.3016, whereby also this Difference in ATTs is highly significant ($p < 0.001$). The Confidence Interval for this comparison lies between 0.2836 and 0.3197 for the female sample. When analyzing the findings for the male sample the Difference in ATTs of - 0.0218 is again significant ($p < 0.001$). The 95-% Confidence Interval for this sample reaches from - 0.0314 to - 0.0122. This again means that the CIs for the female and the male sample are not overlapping, in other words: the Difference in the Difference in ATTs is again significant. This second robustness test supports the effect found in the first comparison of Categories 1 and 3 – namely that the Difference in ATTs is higher for females than for males. However, due to this effect not being supported by the comparison of Categories 1 and 2, no consistent effect was found.

The next chapter will focus on the interpretation and discussion of these findings. In addition, the next chapter shall also assess whether the hypotheses of this thesis can be supported.

Table 37: Difference in ATTs of employer entrepreneurs versus solo self-entrepreneurs separated by the entrepreneurs' gender (

		Female							
		95-% Confidence Interval (CI)						standard error of difference	
		Cat.	two-tailed p-value	Mean Employer Entrepreneurs minus Solo Self-Entrepreneurs	from	to	t-value		
Extraversion versus Introversion	12	<0.0001	-0.2779918470	-0.292957751190	-0.263025942810	36.4947	1044	0.008	
	13	<0.0001	0.109023654	0.086475088760	0.131572219240	9.4995	830	0.011	
	23	<0.0001	0.411241005	0.393407332430	0.429074677570	45.306	1165	0.009	
Assertive versus Turbulent	12	<0.0001	0.066729764	0.050125044330	0.083334483670	7.8957	1120	0.008	
	13	0.0006	0.059781265	0.025900870400	0.093661659600	3.4667	696	0.017	
	23	<0.0001	0.301639923	0.283616881990	0.319662964010	32.8822	1218	0.009	

				Male					standard error of difference
				95-% Confidence Interval (CI)			t-value	df	
				Mean Employer Entrepreneurs minus Solo Self-Entrepreneurs	from	to			
Extraversion versus Introversion	Cat.	two-tailed p-value							
	12	<0.0001	-0.044453804	-0.052713602650	-0.036194005350	10.574	1895	0.004	
	13	<0.0001	0.387087905	0.373703845870	0.400471964130	56.8227	1409	0.007	
	23	<0.0001	-0.031005381	-0.038727406900	-0.023283355100	7.8887	2290	0.004	
Assertive versus Turbulent	12	<0.0001	0.290257214	0.283393529640	0.297120898360	83.0856	2179	0.003	
	13	<0.0001	-0.076803297	-0.091739738470	-0.061866855530	10.1026	1229	0.008	
	23	<0.0001	-0.021831189	-0.031463147290	-0.012199230710	4.4531	2186	0.005	

5 Interpretation of the findings

This chapter will summarize and interpret the significant findings presented in the previous sections. The focus hereof will be to analyze whether the hypotheses of this thesis can be supported. Table 38 provides a summary of these results. Thereafter, the theoretical implications of the findings will be discussed, followed by a discussion of the practical implications of this research. Next, potential limitations of the study will be pointed out. Lastly, this chapter will also look into potential areas for future research.

Table 38: Overview of the hypotheses testing

Hypothesis	Spectrum	Results
Hypothesis 1	Extraversion – Introversion	Supported
Hypothesis 2	Intuitive – Observant	Not supported
Hypothesis 3	Assertive – Turbulent	Supported
Hypothesis 4	Extraversion – Introversion for the gender-separated sample	Not supported
Hypothesis 5	Assertive – Turbulent for the gender separated sample	Not supported

The **first hypothesis** of this thesis is investigating the relationship between where a country is located on the Extraversion – Introversion trait spectrum and the income gap in the respective country:

H1: The income difference between employer entrepreneurs and solo self-entrepreneurs in more Extraverted countries is higher than in more Introverted ones.

The findings of the Difference in ATTs analysis between employer entrepreneurs and solo self-entrepreneurs (see This chapter will focus on the results from the analysis of the Differences in ATTs between employer entrepreneurs and solo self-entrepreneurs for all three trait spectra. For the sake of completeness, the findings for the remaining two dimensions can be found in the appendix. The Difference in ATTs is essentially a comparison of the ATTs of the employer entrepreneurs and the solo self-entrepreneurs from the Propensity Score Matching; whereby the Difference in ATTs is the result of a simple subtraction of these (ATT employer entrepreneurs minus ATT solo self-entrepreneurs). Besides this, a t-test was conducted to determine the significance of the

calculated Differences in ATTs. It is important to note that the comparison of Categories 1 and 3, being located on the opposing ends of the country spectrum, will be most important for this thesis. The comparisons of Category 1 and 2 as well as of Category 2 and 3 will function as robustness tests, thus serving as indicators whether the relationship between personality traits and the income gap is a consistent one. Table 28 depicts the findings of this analysis.

Table 28) indicate that employer entrepreneurs located in the most Extraverted/least Introverted countries (Category 3) have an 18.75 % higher income advantage over their solo self-employed counterparts in the same countries versus the income advantage employer entrepreneurs located in the least Extraverted/most Introverted countries (Category 1) have over solo self-entrepreneurs in these countries. In short: they earn more more than solo self-entrepreneurs than their employer entrepreneur counterparts in Category 1 countries do. Since the robustness test conducted confirmed the existence of a consistent positive effect and all Differences in ATTs are highly significant, this therefore indicates that **Hypothesis 1 is supported** by the findings of the data analysis (see Table 38). Thus, this means that employer entrepreneurs have a bigger income advantage over solo self-employed in more Extraverted/less introverted countries than in less Extraverted/more Introverted ones. In other words: for employers it would pay more off to be located in more Extraverted/less Introverted countries than for solo self-entrepreneurs who do not experience the same increase in income.

Looking briefly into the ATTs for *employer entrepreneurs*, it seems like the relationship between income and the location on the Extraversion – Introversion spectrum of the country an employer entrepreneur is living in is of a u-shaped character. This is because the findings of the matching conducted show that employer entrepreneurs from both, the least Extraverted/most Introverted countries (Category 1) and the most Extraverted/least Introverted countries (Category 3) tend to earn less than those located in the category lying in between those two (Category 2) (see Table 17). Regarding the *solo self-entrepreneurs* the relationship between income and the location of the country they are in on the Extraversion – Introversion scale too is of a u-shaped nature: the matching conducted shows that solo self-entrepreneurs in a country located in one of the least Extraverted/most Introverted countries (Category 1) and solo self-entrepreneurs in a country that is part of the most Extraverted/least Introverted countries (Category 3) tend to earn less than similar

solo self-entrepreneur located in a country in the intermediate category (Category 2) (see Table 23).

The **second hypothesis** is focusing on the relationship between where the country an entrepreneur is in is located on the Intuitive – Observant trait spectrum and the income gap between employers and solo self-entrepreneurs:

H2: The income difference between employer entrepreneurs and solo self-entrepreneurs in more Intuitive countries is higher than in more Observant ones.

The analysis of the Differences in the ATTs between employer entrepreneurs and solo self-entrepreneurs for the Intuitive – Observant spectrum (see This chapter will focus on the results from the analysis of the Differences in ATTs between employer entrepreneurs and solo self-entrepreneurs for all three trait spectra. For the sake of completeness, the findings for the remaining two dimensions can be found in the appendix. The Difference in ATTs is essentially a comparison of the ATTs of the employer entrepreneurs and the solo self-entrepreneurs from the Propensity Score Matching; whereby the Difference in ATTs is the result of a simple subtraction of these (ATT employer entrepreneurs minus ATT solo self-entrepreneurs). Besides this, a t-test was conducted to determine the significance of the calculated Differences in ATTs. It is important to note that the comparison of Categories 1 and 3, being located on the opposing ends of the country spectrum, will be most important for this thesis. The comparisons of Category 1 and 2 as well as of Category 2 and 3 will function as robustness tests, thus serving as indicators whether the relationship between personality traits and the income gap is a consistent one. Table 28 depicts the findings of this analysis.

Table 28) does not indicate the that the positive effect found in the comparison of Categories 1 and 3 is consistent since the robustness test only points towards such consistency of the effect in one out of two instances. Thus, despite the Differences in ATTs all being highly significant, **Hypothesis 2 is not supported** by the findings of the data analysis (see Table 38). This means that it could not be confirmed that the income gap between employers and solo self-employed in more Intuitive/less Observant countries is on average bigger than in less Intuitive/more Observant ones.

Investigating the findings for the ATTs of the *employer entrepreneurs* of the Intuitive – Observant spectrum (see Table 19) marginally findings show that an employer located in

a country that is part of Category 1 earns on average more than one located in a country that is part of Category 2. Moreover, an employer located in a Category 2 country earns on average more than one in a country in Category 3. This means that in both cases employer entrepreneurs in less Intuitive/more Observant countries earn on average more than in more Intuitive/less Observant ones. For the *solo self-entrepreneurs* (see Table 25), the findings illustrate that solo self-entrepreneurs in countries assigned to Category 1 earn on average more than those located in countries belonging to Category 3. Also, solo self-entrepreneurs located in Category 2 tend to earn more than those located in countries in Category 3. In other words, the results show that in both cases solo self-entrepreneurs located in less Intuitive/more Observant countries tend to earn more than those in more Intuitive/less Observant ones.

The **third hypothesis** is assessing the relationship between the position on the Assertive – Turbulent spectrum of a country an entrepreneur is in and their income:

H3: The income difference between employer entrepreneurs and solo self-entrepreneurs in more Assertive countries is higher than in more Turbulent ones.

The results of the analysis of the Difference in ATTs (see This chapter will focus on the results from the analysis of the Differences in ATTs between employer entrepreneurs and solo self-entrepreneurs for all three trait spectra. For the sake of completeness, the findings for the remaining two dimensions can be found in the appendix. The Difference in ATTs is essentially a comparison of the ATTs of the employer entrepreneurs and the solo self-entrepreneurs from the Propensity Score Matching; whereby the Difference in ATTs is the result of a simple subtraction of these (ATT employer entrepreneurs minus ATT solo self-entrepreneurs). Besides this, a t-test was conducted to determine the significance of the calculated Differences in ATTs. It is important to note that the comparison of Categories 1 and 3, being located on the opposing ends of the country spectrum, will be most important for this thesis. The comparisons of Category 1 and 2 as well as of Category 2 and 3 will function as robustness tests, thus serving as indicators whether the relationship between personality traits and the income gap is a consistent one. Table 28 depicts the findings of this analysis.

Table 28) show a highly significant positive Difference in ATTs for the comparison of the employer entrepreneurs and solo self-entrepreneurs in countries that can be located in the

two categories located on the outer sides of the Assertive – Turbulent spectrum (Categories 1 and 3). The effect is supported by the two robustness tests (Categories 1 and 2; Categories 2 and 3). Thus, the analysis indicates that there is a consistent positive effect. This means that the income advantage for employer entrepreneurs in more Assertive/less Turbulent countries tends to be higher than in less Assertive/more Turbulent ones. In conclusion, the Difference in ATTs analysis suggests that **Hypothesis 3 is supported** by the findings of the data analysis (see Table 38).

Investigating the results of the matching of the *employer entrepreneurs* for the Assertive – Turbulent spectrum (see Table 21), there seems to be a negative linear relationship between their income and how Assertive the country they are located in is. In fact, it seems to be most favorable to be located in one of the least Assertive/most Turbulent countries: employers in a Category 1 country tend to earn more than those in a Category 2 or 3 country; and employers in a Category 2 country tend to earn more than those in a Category 3 country. Regarding the *solo self-entrepreneurs* (see Table 27) the results too indicate that the more Turbulent a country is, the higher the solo self-entrepreneur's income will be, meaning that also for the solo self-entrepreneurs there seems to be a negative linear effect between their income and how Assertive a country is: they also tend to earn more when located in countries classified as belonging to Category 1 than similar solo self-entrepreneurs in countries that belong to Category 2 or 3 do. Also, their earnings are on average higher in Category 2 countries than in Category 3 countries. This means that for both, employer entrepreneurs and solo self-entrepreneurs, it seems financially more favorable to be in a less Assertive/more Turbulent country.

The **fourth hypothesis** is at the same time the first one out of two gender-related hypotheses. It aims at investigating if gender moderates the relationship between a country's location on the Extraversion – Introversion spectrum and the income advantage an employer entrepreneur has in that respective country:

H4: There will be a bigger income advantage for more Extraverted male employer entrepreneurs than for more Extraverted female entrepreneurs.

The comparison of the Difference in ATTs (see As a final step, the results for the Difference in the Differences in ATTs analysis will be analyzed. The aim of this Difference in the Differences in ATTs analysis is to test the gender hypotheses (H4 and H5). First, the Difference in ATTs of Categories 1 and 3 of the female versus the male sample will be

compared: as opposed to the analyses conducted to test Hypothesis 1, 2 and 3, it will however not only be investigated whether the Differences are positive or negative but also whether the Difference is bigger for the female or the male sample. The comparison of Categories 1 and 2 as well as that of Categories 2 and 3 will thereafter again serve as a robustness test in order to analyze whether the discovered effect is a consistent one. Thereafter, the significance of the resulting Differences will be analyzed by comparing the Confidence Intervals (CIs) of the female comparisons to those of the male comparisons. In case of an overlap, the Difference in the Differences in ATTs is not significant. The results for this Difference in Differences in ATTs analysis that are relevant to test the hypotheses of this thesis can be found in Table 37. For the sake of completeness the results for the three other trait dimensions can be found in the appendix.

Starting with the comparison of Categories 1 and 3 of the **Extraversion – Introversion** spectrum the Difference in ATTs for the female sample amounts to 0.1090, whereby it is highly significant ($p < 0.001$). The 95-% CI for this category comparison reaches from 0.0865 to 0.1316. Regarding the male sample the – again highly significant ($p < 0.001$) – Difference in ATTs is 0.3871. In other words, the Difference in ATTs is greater for the male than the female sample. The 95-% Confidence Interval for the male sample reaches from 0.3737 to 0.4005. This leads to the conclusion that the CIs for the female versus the male sample do not overlap which in turn indicates a significant difference between the Differences in ATTs of the two samples. Moving on to the robustness test, the comparison of employer versus solo self-entrepreneurs located in Categories 1 and 2 for the female sample resulted in a highly significant ($p < 0.001$) Difference in ATTs of - 0.2780 and a 95-% CI reaching from - 0.2930 to - 0.2630. For the male sample, on the other hand, the resulting Difference in ATTs is - 0.0445, whereby this value again can be considered as highly significant ($p < 0.001$). For this sample, the 95-% CI reaches from - 0.0527 to - 0.0362. This means that, since the Confidence Intervals of the Differences in ATTs for the female versus the male sample are not overlapping, the difference between the two sample groups is significant for this comparison. As the male entrepreneurs' Difference in ATTs is greater than the female entrepreneurs' one this Difference in Differences in ATTs supports the trend discovered in the first category comparison. Lastly, the comparison of Categories 2 and 3 for the Extraversion – Introversion spectrum for the female entrepreneurs resulted in a highly significant ($p < 0.001$) positive Difference in ATTs of 0.4112. The Confidence Interval for this sample spans from 0.3934 to 0.4291. For the male sample, on the other hand, the Difference in ATTs is a highly significant ($p < 0.001$),

negative one with a value of - 0.0310. The 95-% CI for this sample reaches from - 0.0387 to - 0.0233. This means that again, the Difference in the Differences in ATTs is a significant one, due to the CIs not being overlapping. However, since for this last category comparison (Category 2 and 3) the Difference in ATTs for the female sample is greater than that for the male sample, this is not in line with the effect discovered in the first and second category comparisons. Thus, overall, no consistency of this effect can be assumed.

For the second spectrum, the **Assertive – Turbulent** one, the female sample's Difference in ATTs for the comparison of Categories 1 and 3 is 0.0598, whereby this value is again highly significant ($p < 0.001$). The 95-% CI for this comparison reaches from 0.02590 to 0.0937. Regarding the male sample, the highly significant ($p < 0.001$) Difference in ATTs for the comparison of Categories 1 and 3 amounts to - 0.0768, whereby the 95-% Confidence Interval for this category comparison lies between - 0.0917 and - 0.0619. Thus, due to the CIs not being overlapping, the differences between the male and the female sample's Difference in ATTs is significant – and the female sample's Difference in ATTs is greater than the male sample's. In a second step there again will be a robustness test conducted to see whether the priorly discovered effect is of a consistent nature. The category comparison of Categories 1 and 2 amounts to 0.0667 and is highly significant ($p < 0.001$). For this comparison, the 95-% CI reaches from 0.0501 to 0.0833. For the male sample, on the other hand, the Difference in ATTs is 0.2903, whereby also this Difference is highly significant ($p < 0.001$). The 95-% Confidence Interval for this sample spans from 0.2834 to 0.2971, which means that there is no overlap with the CI of the female sample, and thus, the Difference in Differences in ATTs is significant. For this category comparison, the male sample's Difference in ATTs is greater than that of the female sample, which denies the existence of a consistent effect of the findings from the comparison of Categories 1 and 3. Thirdly, the Difference in ATTs for the comparison of Categories 2 and 3 of the female sample is 0.3016, whereby also this Difference in ATTs is highly significant ($p < 0.001$). The Confidence Interval for this comparison lies between 0.2836 and 0.3197 for the female sample. When analyzing the findings for the male sample the Difference in ATTs of - 0.0218 is again significant ($p < 0.001$). The 95-% Confidence Interval for this sample reaches from - 0.0314 to - 0.0122. This again means that the CIs for the female and the male sample are not overlapping, in other words: the Difference in the Difference in ATTs is again significant. This second robustness test supports the effect found in the first comparison of Categories 1 and 3 – namely that the Difference in ATTs is higher for

females than for males. However, due to this effect not being supported by the comparison of Categories 1 and 2, no consistent effect was found.

) between employer entrepreneurs and solo self-entrepreneurs in Categories 1 and 3 shows that the Difference in ATTs for the male sample is bigger than that for the female sample, whereby this Difference in the Differences in ATTs is a significant one. The first robustness test, namely that comparing Categories 1 and 2, further supports the findings of the comparison of Categories 1 and 3 since the Difference in ATTs for male entrepreneurs is again larger than that for female ones: for the male entrepreneurs the resulting value is a less negative one than for the female ones. More precisely, the findings indicate that for a female employer entrepreneur the income advantage in a country located in the group of the least Extraverted/most Introverted countries (Category 1) is leading to a higher income advantage than a similar female solo self-entrepreneur located in a country from Category 2 (countries in the middle) has; whereas for a male employer entrepreneur, this advantage is not so much bigger in a country located in Category 1 (least Extraverted/most Introverted countries) than in a country located in Category 2 (countries in the middle). Finally, the second robustness test is analyzing the comparison of the Differences in ATTs for Categories 2 and 3. Here, however, the female sample's Difference in ATTs is larger than the male sample's one, meaning that in these categories, the income advantage of a female employer entrepreneur is increasing more with rising Extraversion/decreasing Introversion levels of a country than that of a male employer entrepreneur. For a male employer, on the other hand, the income advantage is actually bigger when located in a country that is part of Category 2 (countries in the middle) than in a Category 1 country. Thus, the findings do not support initially found effect. This means that no consistent positive trend could be discovered. Thus, **Hypothesis 4 cannot be supported** by the findings of this thesis (see Table 38).

Looking at the ATTs for the Extraversion – Introversion spectrum for the *female employer entrepreneurs* (see Table 29), the results indicate that employers have on average higher earnings in countries that are in Category 1 than in Category 3 ones; moreover, they tend to have higher earnings in countries in Category 2 than in countries located in Category 3. Thus, it seems to be least favorable for female employer entrepreneurs to be located in a Category 3 country. For the male *employer entrepreneurs* (see Table 33), the findings too indicate that it is least favorable to be located in a Category 3 country: those located in countries that are part of this category earn on average less than a similar male employer

in a country that is part of Category 1 or 2. This same trend can also be observed for the *female solo self-entrepreneurs* (see Table 30): findings imply that female solo self-entrepreneurs in countries located in Category 3 too earn on average less than those in countries that are part of Categories 1 or 2. Thus, it is least favorable also for female solo self-entrepreneurs to be located in one of the most Extraverted/least Introverted countries. For the *male solo self-entrepreneurs* (see Table 34) the (marginally) significant findings indicate that it is most favorable for male solo self-entrepreneurs to be based in a country that is neither too Extraverted nor too Introverted. In other words, the relationship between the income of a male solo self-entrepreneur and a country's location on the Extraversion – Introversion spectrum is of a u-shaped nature. Furthermore, the findings indicate that – when comparing at the most Extraverted/least Introverted countries with the least Extraverted/most Introverted ones – a male solo self-entrepreneur is better off financially when located in a country that is part of Category 1, meaning that also for them it is least favorable to be located in a Category 3 country.

Finally, the **fifth hypothesis** aims at investigating if there are gender-related differences in the relationship between a country's location on the Assertive – Turbulent spectrum and the income advantage of an employer entrepreneur in the respective country:

H5: There will be a bigger income advantage for more Assertive male employer entrepreneurs than for more Assertive female entrepreneurs.

The Difference in ATTs (see Table 37) for Categories 1 and 3 is greater for the female sample, where the Difference is of a positive nature. For the male sample the Difference in ATTs is negative. Due to the CIs of the two samples not overlapping this Difference in the Differences in ATTs between the female and the male sample is significant. Thus – if the robustness test confirms this trend – the income advantage of a female employer entrepreneur in more Assertive countries is greater than that of a male employer entrepreneur. Moving on to the first the robustness test, the Difference in ATTs for the comparison of Categories 1 and 2 is greater for the male sample. Hence, this first robustness test does not support that the effect found in the comparison of Categories 1 and 3 is consistent. The second robustness test shows that the Difference in ATTs for the comparison of Categories 2 and 3 is again larger for the female sample than for the male one. Thus, the second robustness test would support the findings from the analysis of the Difference in the Differences in ATTs of Categories 1 and 3. Since however, the first

robustness test does not support this trend, no consistent positive effect could be discovered. Therefore, **Hypothesis 5 is not supported** by the findings (see Table 38).

The matching results for the *female employer entrepreneurs* for the Assertive – Turbulent spectrum (see Table 31) show that a female employer entrepreneur earns on average less when located in a country that is part of Category 3 than a similar entrepreneur in a Category 1 or in a Category 2 country. In contrast, the ATTs for the *male employer entrepreneurs* (see Table 35) show that also for this group of entrepreneurs it is least favorable to be located in a Category 3 country since their earnings are on average lower in these countries than in countries that are part of Category 1 or Category 2. Regarding the *female solo self-entrepreneurs* matching results for this spectrum (see Table 32), it can be observed that female solo self-entrepreneurs again earn on average less in countries located in Category 3 than in countries that are part of Category 1 or Category 2. Thus, Category 3 countries are the least favorable ones for them to be located in, too. Finally, for a *male solo self-entrepreneur* (see Table 36) countries located in Category 1 seem to be most favorable in terms of income, whereas countries located in Category 3 seem to be the least favorable. Thus, there seems to be a negative relationship between the Assertiveness level of a country and the income for a male solo self-entrepreneur in this respective country.

5.1 Theoretical implications

This section will focus on the theoretical implications of this research. In other words: it will be investigated how this research can contribute to an advancement of the existing literature. Hereby, the implications for the results of the hypothesis analysis will be presented in a first step. Thereafter, it will be moved on to the theoretical implications for selected findings from the Propensity Score Matching.

Since Hypotheses 1 and 3 are supported by the findings of this thesis, this means that employer entrepreneurs have a bigger income advantage in more Extraverted/less Introverted (Hypothesis 1) and in more Assertive/less Turbulent (Hypothesis 3) countries over solo self-entrepreneurs in the same country. – In other words: the income gap between employer entrepreneurs and solo self-entrepreneurs in more Extraverted/less Introverted countries is bigger than in less Extraverted/more Introverted ones. Also, the

income gap is bigger in more Assertive/less Turbulent countries versus less Assertive/more Turbulent ones. This also means that the findings support Sorgner et al. (2017)'s assumption that good managerial skills can lead to a higher income for employer entrepreneurs versus solo self-entrepreneurs. Hence, the findings indicate that a premium for effective leadership could indeed exist.

In addition, no consistent effect could be found when comparing the income gap of male and female employer entrepreneurs in the most Extraverted/least Introverted and in the most Assertive/least Turbulent countries with one another (Hypotheses 4 and 5). This means that for these most Extraverted/least Introverted and most Assertive/least Turbulent countries the findings of this thesis do not support Eagly & Karau (2002)'s argumentation that female leaders face disapproval because skills associated with effective leadership are often incongruent with the female gender role. To give some examples, a willingness to take the initiative or being confident are associated with leadership effectiveness but not with the female gender role (Bertocci, 2009; Eagly & Karau, 2002; Hogan et al., 1994; Judge et al., 2009; Northouse, 2020). In other words: there does not seem to be a punishment for such role-incongruent traits in countries that generally dispose of higher levels of traits that are not corresponding with the female gender role. Since the role congruity theory seems not to be applicable for this case, the height of the premium for effective leadership does not seem to be moderated by the gender of the employer entrepreneur.

However, Hypothesis 2 cannot be supported by the findings of this research. Therefore, it seems that not for all trait spectra where one side is associated with leadership effectiveness this leadership premium is being paid if an employer is in a country with a predominance of the side of the trait spectrum that is associated with effective leadership. These findings also imply that for the Intuitive – Observant spectrum Sorgner et al. (2017)'s assumption that good managerial skills can explain higher earnings for employer entrepreneurs versus solo self-entrepreneurs cannot be supported. Thus, while there seems to be a leadership premium for the dimensions Extraversion – Introversion (Hypothesis 1) and Assertive – Turbulent (Hypothesis 3), the existence of such premium could not be confirmed for the Intuitive – Observant spectrum (Hypothesis 2). This means, that while the answer to the research question of this thesis, namely whether a premium for effective leadership exists (see Chapter 1), can be confirmed in two cases it needs to be negated in the third.

Regarding the analysis of the ATTs the findings show a u-shaped relationship between a country's location on the Extraversion – Introversion spectrum and the income of a) an employer entrepreneur as well as b) a solo self-entrepreneur. One possible explanation for such a u-shaped relationship could be what Judge et al. (2009) mentioned in their research, namely that extreme values could e.g. indicate a personality disorder or similar (see Chapter 2.3). Therefore, even if traits belonging to the Extraversion side of this trait spectrum are e.g. generally considered as more favorable for leadership effectiveness [see Chapter 2.3 as well as e. g. Bertocchi (2009) or Northouse (2020)] it seems like there is a limit to this positive effect: it seems that when a level of too much Extraversion/too little Introversion is reached, this level then marks the turning point of the income curve.

Finally, a negative relationship between the income of employer entrepreneurs and how Assertive a country is was observed in the Propensity Score Matching. This means that the less Assertive/more Turbulent a country is the lower an employer entrepreneur's earnings in this respective country will be. These findings might support what Judge et al. (2009) labeled as a paradoxical utility of traits: they highlighted that a predisposition of certain traits – despite being beneficial for leadership effectiveness in most contexts – might in some cases actually be counterproductive (Judge et al., 2009). This could e.g. be the case if employees consider Assertive traits like self-acceptance, self-assurance, self-esteem, believing in themselves, or having a sense of certainty (see Chapter 2.3) in their employer as unfavorable for the organization's or the respective team's survival (Bertocchi, 2009; Hogan et al., 1994; Judge et al., 2009; Northouse, 2020).

5.2 Practical implications

Besides the theoretical implications, the findings of this thesis also have some practical implications. Therefore, this section will analyze how the findings of this research can be useful for practitioners. Hereby, it will again first be focused on the implications of the findings from the hypothesis analysis before moving on to the theoretical implications for selected results from the Propensity Score Matching.

The findings show that it seems to be more favorable for an employer entrepreneur than for a solo self-entrepreneur to be located in more Extraverted/less Introverted countries (Hypothesis 1) as well as in more Assertive/less Turbulent ones (Hypothesis 3) as there

indeed seems to be a premium paid for effective leadership. This also means that for solo self-entrepreneurs in these countries it could be worth considering hiring employees; and for those persons who are contemplating to choose the path of entrepreneurship it means that it can pay off to take the risk of becoming an employer entrepreneur from the beginning on. Also, the results of the analyses of Hypotheses 4 and 5 show that in more Extraverted/less Introverted as well as more Assertive/less Turbulent countries there does not seem to be a gender-related difference in these income advantages of employer entrepreneurs, wherefore it is equally advisable for male and female future- and solo self-entrepreneurs to consider becoming employers rather than (remaining) solo self-entrepreneurs when located in these countries.

However, the findings for Hypothesis 2 show that while it may pay off to take the decision to become an employer entrepreneur instead of a solo self-entrepreneur for those located in more Extraverted/less Introverted or more Assertive/less Turbulent countries, this might not necessarily be the case in more Intuitive/less Observant countries. This is because the income gap between employer entrepreneurs and solo self-entrepreneurs is not necessarily bigger in these countries. – In other words: no premium paid for effective leadership could be associated with more Intuitiveness/less Observance. Thus, in these countries an alternative incentive system should be established in order to make it more attractive to become an employer, which ultimately can contribute to the generation of more jobs on the labor market.

Finally, one interesting finding from the Propensity Score Matchings shall also be analyzed in terms of its practical implications: the u-shaped relationship between entrepreneurial incomes and a country's location on the Extraversion – Introversion scale means for entrepreneurs and people thinking about stepping into entrepreneurship that even though it might be contributing to leadership effectiveness if they dispose of a certain level of Extraversion, too much Extraversion is not favorable either. In fact, the right balance between Extraversion and Introversion needs to be stricken.

5.3 Limitations

The following paragraphs will give an overview of the identified limitations of this research. It will be started off with some general criticism about the theory and personality test this

analysis is based upon. Thereafter, possible limitations in the data, the analysis as well as the findings will be outlined.

Firstly, as mentioned in Chapter 2.1.1, there is some general criticism that the trait theory of leadership which this research is based on is too simplistic (Pinnow, 2011). In addition, critics of this theory also argued that personality can reveal if a person is acting like a leader, not, however, if they are successful (Judge et al., 2009). Furthermore, as highlighted in Chapter 2.2, personality traits do not generate an as holistic picture of a person's personality as personality types do (Tyssen et al., 2007). This is due to personality types considering how different personality trait combinations interact (Tyssen et al., 2007).

Besides this the question is moreover whether the personality trait test chosen is covering enough relevant traits or whether more aspects would have to be included in order for this research to be useful for practitioners. One example of a trait that has been mentioned by several authors [see e.g. Bertocci (2009), DeRue et al. (2011), Judge et al. (2009), and Northouse (2020)] as being very important for leadership effectiveness which however is not included in any of NERIS Analytics Limited's trait spectra is intelligence. Also, another point is that Leutner et al. (2014) pointed out that narrower personality traits were found to be more accurate predictors of entrepreneurial success than broader ones such as the Big Five. Thus, a further potential limitation is that the results of an analysis based on the NERIS personality test's trait dimensions are potentially less accurate than they would be if based on more narrow traits.

Furthermore, two possible limitations in the data which this research is based on were identified: firstly, NERIS Analytics Limited is a private company and the algorithm behind the personality test is not publicly available. Therefore, despite the statistical metrics on reliability and validity testing being available on the website of the personality test, it would still be more beneficial for the research community if the exact workings were publicly available since this would allow to better verify the quality of the personality test. The second limitation of the data used in this research is that the gender question in the questionnaire of the European Working Conditions Survey only allows to choose between the genders female, male and a "don't know" option. Thus, no alternative gender can be selected. Hereby, the gender is coded by the interviewer (Eurofund, 2015). This limits this study's potential contribution to research on male and female entrepreneurs and disregards gender-diverse people.

Regarding the data analysis one further issue could be identified: for reasons of simplification, it could solely be differentiated between the public and the private sector in the set of matching variables. Finally, also in the findings of this thesis a limitation was identified: not all Propensity Score Matchings have resulted in significant outcomes (see Chapter 4). This needs to be taken into account since it can limit the interpretation of the findings of the ATTs.

5.4 Future research

This section will give an outlook on potential future research areas. More precisely, it will be illustrated in which areas more/more specific research is needed.

First of all, there still is little research in the field of geopsychology when it comes to smaller geographical areas, as is pointed out by Rentfrow et al. (2013) (see Chapter 1). This lack of research renders it difficult to find a personality test that includes traits that are associated with leadership effectiveness and at the same time also offers a geopsychological perspective. Thus, future research should focus more on this field of geopsychology, ideally investigating the geographical accumulation of trait dimensions from popular personality tests like the Five Factor Model. This would in turn be beneficial for further future research since it would allow to opt for a personality assessment method that tests for traits that are relevant for the respective research.

Moreover, future research should investigate the impact of intelligence on entrepreneurial income. In addition to this, more research on the interplay of different personality traits is needed since – referring once again to what Aristoteles said – the whole is more than the sum of its parts. In other words, considering the interplay of different personality traits might lead to a different outcome compared to when looking at the traits in isolation and trying to draw conclusions from each one separately. In addition, there also seems to be a lack of research – as well as data – regarding gender-diverse people. Future research should thus also try to gather more insights on this aspect. This could e.g. be done by simply including a gender-diverse option in questionnaires of future research and analyzing the data not only for female and male respondents but also for gender-diverse ones. Besides this more in-depth perspective on gender, it is also left to future researchers to analyze differences across industries and sectors. To be precise, future research should investigate whether it makes a difference to include a more in-detailed sector separation in similar research.

Also, future research should consider replicating this study with a bigger sample in order to minimize the number of not significant findings. This could lead to more clarity when analyzing the results and checking for patterns, thus preventing similar limitations in interpreting the findings as were encountered in this thesis.

Finally, it is also left to future research to investigate the underlying reason because of which employer entrepreneurs were not found to receive a premium in more Intuitive/less Observant countries. Likewise, future research should also verify why employer entrepreneurs earn on average less in more Assertive/less Turbulent countries than in less Assertive/more Turbulent ones.

6 Conclusion

Overall, this thesis found that employer entrepreneurs seem to receive a premium for effective leadership in the most Extraverted/least Introverted as well as in the most Assertive/least Turbulent countries. The existence of such premium could however not be confirmed for the most Intuitive/least Observant countries. Furthermore, the findings of this research do not support the role congruity's applicability for this case, meaning that there is no evidence that the height of this leadership premium depends on the employer entrepreneur's gender.

In order to deepen the understanding of the interplay between effective leadership and the payment of a leadership premium for this, the main focus of potential future research should be: a) to expand the research available in geopsychology in order to give similar future research a wider choice of personality tests as well as a broader base of secondary research to build upon; and b) to test the suggested explanations for the findings of this thesis in order to find out more about the underlying reasons.

7 Bibliography

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Table A-1: Balancing models 19 – 21: bias reduction regarding the relationship between an employer entrepreneur's income and the positioning of the respective country on the Thinking – Feeling spectrum:

	Balancing model 19 (Treatment: Thinking – Feeling; Categories 1 + 2)			Balancing model 20 (Treatment: Thinking – Feeling; Categories 1 +3)			Balancing model 21 (Treatment: Thinking – Feeling; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Gender	0.31017	0.32881	57.3%	0.26727	0.29129	-3.6%	0.26686	0.28446	14.0%
Work schedule	0.92881	0.92373	-3.8%	0.87988	0.84084	35.6%	0.88856	0.87683	82.1%
Country of birth	0.91525	0.91186	28.1%	0.96697	0.96697	100.0%	0.96774	0.95455	73.5%
Sole director	0.52542	0.51441	65.0%	0.5015	0.43844	17.2%	0.5044	0.48974	86.4%
Partner in business	0.22373	0.24661	13.4%	0.08408	0.08709	97.1%	0.08211	0.08944	90.6%
Work for themselves	0.30678	0.31695	49.9%	0.47147	0.51351	69.1%	0.46921	0.48094	92.5%
Subcontractor	0.02373	0.01356	5.3%	0.01502	0.03003	-139.1%	0.01466	0.0088	65.5%
Freelancer	0.05085	0.03475	45.3%	0.03003	0.07207	21.6%	0.05572	0.06891	45.4%
Private sector	0.96441	0.95932	80.5%	0.99099	0.97598	65.7%	0.9912	0.9956	75.1%
Public sector	0.01864	0.01525	84.9%	0	0	100.0%	0	0	100.0%
Paid jobs	-0.89153	-0.89492	85.5%	-0.91592	-0.91291	94.1%	-0.91789	-0.92522	73.7%
Skill level	0.1678	0.20085	-59.4%	0.26727	0.24324	44.3%	0.28446	0.32405	38.0%
Education	18.137	18.534	69.8%	17.138	17.399	70.2%	17.226	17.611	82.4%
Marital status	0.77119	0.78136	36.5%	0.77778	0.7958	55.6%	0.77419	0.77126	94.8%
Age	47.249	47.324	90.5%	42.441	43.628	60.4%	42.17	41.938	89.5%
Years in business	14.908	15.694	52.8%	10.628	10.637	99.6%	10.501	9.8211	-34.8%

Table A-2: Average Treatment Effect on the Treated of the Thinking – Feeling spectrum for employer entrepreneurs

Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2 (N=987)	-0.236701922** (0.073930487)	0.00141816
Categories 1 and 3 (N=726)	-1.18881681*** (0.121489625)	< 0.00001
Categories 2 and 3 (N=928)	-0.96410733*** (0.098181491)	< 0.00001

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-3: Balancing models 22 – 24: bias reduction regarding the relationship between an employer entrepreneur's income and the positioning of the respective country on the Judging – Prospecting spectrum

	Balancing model 22 (Treatment: Judging – Prospecting; Categories 1 + 2)			Balancing model 23 (Treatment: Judging – Prospecting; Categories 1 +3)			Balancing model 24 (Treatment: Judging – Prospecting; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Gender	0.27734	0.28764	86.5%	0.25952	0.24567	60.8%	0.2585	0.2517	83.3%
Work schedule	0.90491	0.91125	43.7%	0.88581	0.88927	96.0%	0.88095	0.88435	95.5%
Country of birth	0.93978	0.92472	-139.7%	0.91696	0.91003	-303.6%	0.91837	0.92177	57.5%
Sole director	0.49287	0.48732	71.5%	0.49481	0.48789	79.2%	0.5	0.4949	90.3%
Partner in business	0.20127	0.19731	88.3%	0.13495	0.19377	5.3%	0.13265	0.09864	-20.3%
Work for themselves	0.3645	0.37005	34.5%	0.41869	0.39792	69.5%	0.42177	0.45578	55.5%
Subcontractor	0.01743	0.01347	63.0%	0.01384	0.01038	-3.1%	0.01701	0.0085	39.5%
Freelancer	0.03962	0.04041	93.4%	0.04844	0.07266	2.2%	0.06463	0.06463	100.0%
Private sector	0.95404	0.95166	-551.5%	0.97232	0.9654	63.0%	0.97279	0.97109	91.1%
Public sector	0.02219	0.02456	-106.9%	0.00692	0.00346	60.4%	0.0068	0.0017	48.4%
Paid jobs	-0.90967	-0.91442	61.0%	-0.91003	-0.92042	77.9%	-0.91156	-0.94218	11.9%
Skill level	0.20127	0.20048	98.3%	0.2872	0.27682	93.4%	0.29932	0.26361	68.2%
Education	17.769	17.838	49.6%	17.272	17.784	8.9%	17.281	17.344	85.2%
Marital status	0.74326	0.73772	30.0%	0.82007	0.79931	62.3%	0.81293	0.78061	31.4%
Age	46.534	46.746	78.4%	44.024	43.152	75.0%	43.772	43.218	77.8%
Years in business	14.826	15.151	-159.5%	12.121	11.429	47.3%	12.02	11.884	90.5%

Table A-4: Average Treatment Effect on the Treated of the Judging - Prospecting spectrum for solo self- entrepreneurs

Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2 (N=1,036)	0.08833931 (0.077130798)	0.25040954
Categories 1 and 3 (N=696)	-0.721013015*** (0.106253997)	< 0.00001
Categories 2 and 3 (N=932)	-0.807068944*** (0.102650048)	< 0.00001

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-5: Balancing models 25 – 27: bias reduction regarding the relationship between a solo self- entrepreneur's income and the positioning of the respective country on the Thinking – Feeling spectrum

	Balancing model 25 (Treatment: Thinking – Feeling; Categories 1 + 2)			Balancing model 26 (Treatment: Thinking – Feeling; Categories 1 +3)			Balancing model 27 (Treatment: Thinking – Feeling; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Gender	0.32941	0.33564	91.8%	0.42328	0.42989	81.3%	0.42252	0.4298	82.1%
Work schedule	0.78131	0.78616	57.0%	0.70106	0.73148	64.7%	0.70199	0.70199	100.0%
Country of birth	0.92249	0.9301	-21.2%	0.92857	0.93783	-440.0%	0.92848	0.92252	25.5%
Sole director	0.39446	0.38512	52.0%	0.26587	0.24471	36.4%	0.26623	0.27815	77.4%
Partner in business	0.06159	0.05952	93.9%	0.05159	0.05556	93.6%	0.05166	0.04503	76.6%
Work for themselves	0.51142	0.50761	55.0%	0.6455	0.63889	90.3%	0.64503	0.64834	95.7%
Subcontractor	0.03668	0.03356	70.9%	0.00926	0.01058	60.6%	0.00927	0.0106	90.6%
Freelancer	0.10035	0.12076	-71.1%	0.13624	0.14286	73.3%	0.1351	0.1351	100.0%
Private sector	0.95571	0.96332	-1986.2%	0.98016	0.97619	78.8%	0.98013	0.97947	96.5%
Public sector	0.02422	0.0218	-110.8%	0.00926	0.00794	84.9%	0.00927	0.01126	79.9%
Paid jobs	-0.8699	-0.8654	63.1%	-0.92328	-0.92857	88.7%	-0.92318	-0.92185	96.2%
Skill level	0.209	0.18374	44.5%	0.26984	0.2963	83.2%	0.2702	0.24834	80.5%
Education	16.388	16.089	-119.7%	16.183	16.306	78.1%	16.177	16.218	90.6%
Marital status	0.68304	0.6782	38.9%	0.68651	0.74735	-10.6%	0.68742	0.70861	55.0%
Age	47.22	47.782	42.8%	43.962	43.614	90.0%	43.988	43.722	89.4%
Years in business	13.442	13.382	52.0%	12.292	11.648	50.9%	12.301	12.234	95.3%

Table A-6: Average Treatment Effect on the Treated of the Thinking – Feeling spectrum for solo self-entrepreneurs

Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.272214616***	< 0.00001
(N=2,010)	(0.054247834)	
Categories 1 and 3	-1.1196231***	< 0.00001
(N=1,881)	(0.067079756)	
Categories 2 and 3	-0.885658382***	< 0.00001
(N=2,109)	(0.071894005)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-7: Balancing models 28 – 30: bias reduction regarding the relationship between a solo self- entrepreneur's income and the positioning of the respective country on the Judging – Prospecting spectrum

	Balancing model 28 (Treatment: Judging – Prospecting; Categories 1 + 2)			Balancing model 29 (Treatment: Judging – Prospecting; Categories 1 +3)			Balancing model 30 (Treatment: Judging – Prospecting; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Gender	0.31017	0.32881	57.3%	0.26727	0.29129	-3.6%	0.26686	0.28446	14.0%
Work schedule	0.92881	0.92373	-3.8%	0.87988	0.84084	35.6%	0.88856	0.87683	82.1%
Country of birth	0.91525	0.91186	28.1%	0.96697	0.96697	100.0%	0.96774	0.95455	73.5%
Sole director	0.52542	0.51441	65.0%	0.5015	0.43844	17.2%	0.5044	0.48974	86.4%
Partner in business	0.22373	0.24661	13.4%	0.08408	0.08709	97.1%	0.08211	0.08944	90.6%
Work for themselves	0.30678	0.31695	49.9%	0.47147	0.51351	69.1%	0.46921	0.48094	92.5%
Subcontractor	0.02373	0.01356	5.3%	0.01502	0.03003	-139.1%	0.01466	0.0088	65.5%
Freelancer	0.05085	0.03475	45.3%	0.03003	0.07207	21.6%	0.05572	0.06891	45.4%
Private sector	0.96441	0.95932	80.5%	0.99099	0.97598	65.7%	0.9912	0.9956	75.1%
Public sector	0.01864	0.01525	84.9%	0	0	100.0%	0	0	100.0%
Paid jobs	-0.89153	-0.89492	85.5%	-0.91592	-0.91291	94.1%	-0.91789	-0.92522	73.7%
Skill level	0.1678	0.20085	-59.4%	0.26727	0.24324	44.3%	0.28446	0.32405	38.0%
Education	18.137	18.534	69.8%	17.138	17.399	70.2%	17.226	17.611	82.4%
Marital status	0.77119	0.78136	36.5%	0.77778	0.7958	55.6%	0.77419	0.77126	94.8%
Age	47.249	47.324	90.5%	42.441	43.628	60.4%	42.17	41.938	89.5%
Years in business	14.908	15.694	52.8%	10.628	10.637	99.6%	10.501	9.8211	-34.8%

Table A-8: Average Treatment Effect on the Treated of the Judging – Prospecting spectrum for solo self-entrepreneurs

Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.164886891**	0.00247346
(N=2,244)	(0.054418548)	
Categories 1 and 3	-0.782970502***	< 0.00001
(N=1,550)	(0.072462618)	
Categories 2 and 3	-0.563199838***	< 0.00001
(N=2,206)	(0.068798088)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-9: Difference in ATTs of employer entrepreneurs versus solo self-entrepreneurs

	Cat.	two-tailed p-value	Mean	95-% Confidence Interval (CI)		t-value	df	standard error of difference
			Employer Entrepreneurs minus Solo Self-Entrepreneurs	from	to			
Thinking versus Feeling	12	<0.0001	0.035512694	0.030821823560	0.040203564440	14.8741	2995	0.002
	13	<0.0001	-0.06919371	-0.076555856280	-0.061831563720	18.4656	2605	0.004
	23	<0.0001	-0.078448948	-0.084705141800	-0.072192754200	24.6364	3035	0.003
Judging versus Prospecting	12	<0.0001	0.253226201	0.248614702280	0.257837699720	107.8864	3278	0.002
	13	<0.0001	0.061957487	0.054392435520	0.069522538480	16.091	2244	0.004
	23	<0.0001	-0.243869106	-0.250036536950	-0.237701675050	77.6878	3136	0.003

Table A-10: Balancing models 31 – 33: bias reduction regarding the relationship between a female employer entrepreneur's income and the positioning of the respective country on the Intuitive - Observant spectrum

	Balancing model 31 (Treatment: Intuitive – Observant, female; Categories 1 + 2)			Balancing model 32 (Treatment: Intuitive – Observant, female; Categories 1 +3)			Balancing model 33 (Treatment: Intuitive – Observant, female; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.84	0.83429	92.7%	0.93939	0.89899	0.305	0.93617	0.94681	48.3%
Country of birth	0.96	0.96857	88.4%	0.94949	0.9596	0.823	0.94681	0.95745	36.5%
Sole director	0.44571	0.39143	-17.6%	0.35354	0.33333	0.81	0.3617	0.36702	96.5%
Partner in business	0.25143	0.26857	53.4%	0.17172	0.10101	-0.24	0.18085	0.26064	-294.7%
Work for themselves	0.32571	0.34571	63.9%	0.44444	0.46465	0.794	0.42553	0.3617	58.4%
Subcontractor	0.01714	0.01429	66.6%	0.0101	0.0404	-0.361	0.01064	0.01064	100.0%
Freelancer	0.04571	0.07143	-1733.7%	0.0404	0.06061	-1.641	0.04255	0.02128	-240.6%
Private sector	0.96	0.96571	68.3%	0.9798	0.9596	0.224	0.97872	0.97872	100.0%
Public sector	0.02286	0.01714	65.3%	0.0101	0.0202	0.294	0.01064	0.01064	100.0%
Paid jobs	-0.87429	-0.90286	71.1%	-0.92929	-0.9596	0.759	-0.92553	-0.95745	-18.2%
Skill level	0.15429	0.09143	-65.5%	0.20202	0.27273	-0.588	0.19149	0.09043	-1439.7%
Education	18.491	18.43	94.4%	17.359	16.758	0.595	17.771	17.535	37.2%
Marital status	0.72571	0.67714	-116.6%	0.80808	0.77778	0.122	0.79787	0.80319	55.9%
Age	43.943	43.977	97.6%	45.01	46.323	0.263	43.989	43	68.9%
Years in business	12.257	11.8	54.4%	12.818	14.566	0.226	12.5	12.255	80.5%

Table A-11: Average Treatment Effect on the Treated of the Intuitive – Observant spectrum for female employer entrepreneurs

Intuitive – Observant: female employer entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.398275393†	0.07136784
(N=281)	(0.219967324)	
Categories 1 and 3	0.392139011	0.22389436
(N=202)	(0.322329491)	
Categories 2 and 3	-0.079308829	0.6315969
(N=285)	(0.164226716)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-12: Balancing models 34 – 36: bias reduction regarding the relationship between a female solo self-entrepreneur's income and the positioning of the respective country on the Intuitive - Observant spectrum

	Balancing model 34 (Treatment: Intuitive – Observant, female; Categories 1 + 2)			Balancing model 35 (Treatment: Intuitive – Observant, female; Categories 1 +3)			Balancing model 36 (Treatment: Intuitive – Observant, female; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.68387	0.66989	82.2%	0.71154	0.70192	83.5%	0.72289	0.70934	34.1%
Country of birth	0.94839	0.94516	95.6%	0.9391	0.94551	88.7%	0.94578	0.96235	1.1%
Sole director	0.33763	0.32151	65.1%	0.21795	0.27564	45.8%	0.21084	0.22741	89.1%
Partner in business	0.06882	0.06559	91.2%	0.0609	0.04167	66.3%	0.05723	0.04066	18.0%
Work for themselves	0.53763	0.52151	70.9%	0.63462	0.61218	77.2%	0.64157	0.64608	97.1%
Subcontractor	0.02366	0.01613	12.1%	0.02244	0.00321	13.6%	0.02108	0.03163	23.1%
Freelancer	0.10323	0.13333	-2047.0%	0.11538	0.11859	58.1%	0.11747	0.11596	75.9%
Private sector	0.95484	0.95484	100.0%	0.95192	0.9391	50.8%	0.95482	0.96988	-87.5%
Public sector	0.02151	0.02043	93.5%	0.02564	0.02244	77.6%	0.0241	0.01807	-176.2%
Paid jobs	-0.89677	-0.89247	95.6%	-0.91026	-0.91987	92.4%	-0.91566	-0.89157	10.8%
Skill level	0.12258	0.17097	-27.4%	0.1891	0.20513	64.0%	0.18976	0.22139	-381.8%
Education	17.223	17.392	84.7%	16.954	17.135	87.8%	16.539	16.413	66.5%
Marital status	0.65591	0.59785	-158.9%	0.70192	0.65064	-48.7%	0.68373	0.6988	-24.7%
Age	44.071	43.024	25.2%	46.013	44.654	23.8%	46.822	46.848	99.2%
Years in business	10.069	9.1398	7.4%	11.519	11.237	87.5%	13.105	13.351	80.4%

Table A-13: Average Treatment Effect on the Treated of the Intuitive – Observant spectrum for female solo self-entrepreneurs

Intuitive – Observant: female solo self-entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	0.097691823	0.36309286
(N=812)	(0.107066598)	
Categories 1 and 3	0.241446975†	0.0540249
(N=677)	(0.125127729)	
Categories 2 and 3	-0.011583356	0.904513
(N=807)	(0.095918315)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-14: Balancing models 37 – 39: bias reduction regarding the relationship between a male employer entrepreneur's income and the positioning of the respective country on the Intuitive - Observant spectrum

	Balancing model 37 (Treatment: Intuitive – Observant, male; Categories 1 + 2)			Balancing model 38 (Treatment: Intuitive – Observant, male; Categories 1 +3)			Balancing model 39 (Treatment: Intuitive – Observant, male; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.93895	0.94632	90.6%	0.9457	0.95928	76.7%	0.94495	0.93578	55.4%
Country of birth	0.95158	0.94947	97.1%	0.93213	0.8914	28.5%	0.93578	0.94266	58.9%
Sole director	0.57684	0.59158	68.1%	0.46154	0.54751	19.2%	0.46789	0.3945	51.9%
Partner in business	0.19158	0.19368	94.3%	0.15385	0.1629	84.1%	0.15596	0.16514	54.6%
Work for themselves	0.27789	0.26	67.7%	0.47511	0.41629	40.1%	0.46789	0.48394	89.5%
Subcontractor	0.02316	0.02	63.1%	0.00452	0	79.7%	0.00459	0.00917	66.5%
Freelancer	0.04421	0.04526	24.9%	0.04072	0.04072	100.0%	0.04128	0.05275	-83.6%
Private sector	0.96211	0.96316	94.2%	0.9819	0.98643	82.6%	0.98165	0.97018	-42.8%
Public sector	0.01474	0.01579	93.6%	0.00452	0.00905	68.4%	0.00459	0.00688	-5.2%
Paid jobs	-0.92632	-0.92316	96.8%	-0.92308	-0.88688	71.2%	-0.92202	-0.9289	74.5%
Skill level	0.19579	0.09158	-174.4%	0.19005	0.11765	-62.6%	0.19266	0.13532	-773.6%
Education	17.542	17.896	68.0%	17.068	17.419	76.4%	17.209	17.061	60.8%
Marital status	0.78105	0.78316	90.6%	0.8009	0.80543	86.9%	0.79817	0.78899	24.0%
Age	44.743	45.576	40.5%	46.149	44.462	5.3%	45.862	45.599	91.7%
Years in business	14.126	14.757	37.2%	14.905	15.068	92.8%	14.835	14.44	68.6%

Table A-15: Average Treatment Effect on the Treated of the Intuitive – Observant spectrum for male employer entrepreneurs

Intuitive – Observant: male employer-entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.195373156	0.15603752
(N=726)	(0.137560746)	
Categories 1 and 3	-0.511776145**	0.00115496
(N=468)	(0.156419366)	
Categories 2 and 3	-0.222622109*	0.04172466
(N=702)	(0.109382988)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-16: Balancing models 40 – 42: bias reduction regarding the relationship between a male solo self-entrepreneur's income and the positioning of the respective country on the Intuitive - Observant spectrum

	Balancing model 40 (Treatment: Intuitive – Observant, male; Categories 1 + 2)			Balancing model 41 (Treatment: Intuitive – Observant, male; Categories 1 +3)			Balancing model 42 (Treatment: Intuitive – Observant, male; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.81559	0.82178	92.1%	0.82083	0.825	92.8%	0.82158	0.83402	39.5%
Country of birth	0.95421	0.93069	68.1%	0.93125	0.94375	78.0%	0.93154	0.93568	75.2%
Sole director	0.41089	0.43874	39.7%	0.27708	0.28542	92.2%	0.27593	0.25311	85.0%
Partner in business	0.06807	0.07611	78.1%	0.06458	0.03125	41.5%	0.06432	0.06328	94.9%
Work for themselves	0.49629	0.47092	54.2%	0.64375	0.68958	53.3%	0.64108	0.64004	99.3%
Subcontractor	0.03094	0.0427	-37.4%	0.01667	0.01042	71.9%	0.0166	0.01245	69.7%
Freelancer	0.1052	0.10396	11.7%	0.09167	0.14583	-608.2%	0.09544	0.10788	-99.3%
Private sector	0.9703	0.96411	65.6%	0.97708	0.975	92.0%	0.97718	0.98133	48.3%
Public sector	0.00866	0.013	73.7%	0.01458	0.00625	41.8%	0.01452	0.0083	-185.4%
Paid jobs	-0.90223	-0.86139	58.7%	-0.92083	-0.87917	66.9%	-0.92116	-0.91494	77.0%
Skill level	0.22896	0.20668	41.3%	0.25625	0.23542	53.2%	0.25726	0.26556	-26.4%
Education	16.467	16.147	71.0%	16.096	16.086	99.4%	16.063	16.103	89.4%
Marital status	0.69183	0.6547	-65.6%	0.64583	0.5875	-69.1%	0.64523	0.64938	65.6%
Age	46.005	45.829	87.4%	47.502	48.927	20.1%	47.568	46.933	80.0%
Years in business	13.359	14.571	-20.8%	14.877	15.721	62.6%	15.002	14.287	43.1%

Table A-17: Average Treatment Effect on the Treated of the Intuitive – Observant spectrum for male solo self-entrepreneurs

Intuitive – Observant: male solo self-entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.284226701**	0.0041678
(N=1,370)	(0.099106622)	
Categories 1 and 3	-0.462114819***	0.0004694
(N=939)	(0.131841597)	
Categories 2 and 3	-0.26188891***	0.0006212
(N=1,395)	(0.076327364)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-18: Balancing models 43 – 45: bias reduction regarding the relationship between a female employer entrepreneur's income and the positioning of the respective country on the Thinking – Feeling spectrum

	Balancing model 43 (Treatment: Thinking – Feeling, female; Categories 1 + 2)			Balancing model 44 (Treatment: Thinking – Feeling, female; Categories 1 +3)			Balancing model 45 (Treatment: Thinking – Feeling, female; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.89266	0.92655	-592.2%	0.86047	0.96512	-72.7%	0.82418	0.84615	66.4%
Country of birth	0.93785	0.93785	100.0%	0.95349	0.94186	78.7%	0.95604	0.95055	89.0%
Sole director	0.42373	0.38136	-34.7%	0.45349	0.37209	-6.9%	0.45055	0.48352	69.4%
Partner in business	0.29379	0.31073	35.8%	0.11628	0.05814	44.4%	0.10989	0.08791	71.9%
Work for themselves	0.32203	0.36158	-94.7%	0.46512	0.56977	23.0%	0.43956	0.40659	78.9%
Subcontractor	0	0	100.0%	0	0	100.0%	0.01099	0.00549	67.7%
Freelancer	0.0452	0.01977	13.6%	0.02326	0.05814	34.9%	0.04396	0.08242	-59.2%
Private sector	0.9548	0.98305	-8.1%	0.98837	1	73.5%	0.98901	1	37.9%
Public sector	0.02825	0.01695	49.8%	0	0	100.0%	0	0	100.0%
Paid jobs	-0.88701	-0.86158	-9.1%	-0.90698	-0.90698	100.0%	-0.91209	-0.7967	-313.8%
Skill level	0.15819	0.12994	-36.2%	0.23256	0.25581	46.1%	0.27473	0.22527	22.6%
Education	18.266	18.513	81.2%	17.89	17.297	32.4%	17.896	18.286	82.2%
Marital status	0.75706	0.75706	100.0%	0.73256	0.66279	-71.8%	0.71429	0.65934	3.0%
Age	46.119	46.345	71.3%	42.523	44.581	31.3%	42.011	40.148	15.7%
Years in business	13.35	13.472	92.7%	10.326	9.9884	84.4%	10.055	9.4231	-25.2%

Table A-19: Average Treatment Effect on the Treated of the Thinking – Feeling spectrum for female employer entrepreneurs

Thinking – Feeling: female employer-entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.103355684	0.4243702
(N=289)	(0.129182413)	
Categories 1 and 3	-0.875418036***	0.00002124
(N=192)	(0.200695774)	
Categories 2 and 3	-0.652734285**	0.00158996
(N=272)	(0.204858727)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-20: Balancing models 46 – 48: bias reduction regarding the relationship between a female solo self-entrepreneur's income and the positioning of the respective country on the Thinking – Feeling spectrum

	Balancing model 46 (Treatment: Thinking – Feeling, female; Categories 1 + 2)			Balancing model 47 (Treatment: Thinking – Feeling, female; Categories 1 +3)			Balancing model 48 (Treatment: Thinking – Feeling, female; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.69296	0.69296	100.0%	0.64384	0.64932	91.0%	0.64058	0.62609	77.9%
Country of birth	0.90192	0.89659	-13.1%	0.97534	0.9726	95.0%	0.97391	0.95072	53.4%
Sole director	0.32836	0.28252	-45.7%	0.18356	0.16438	74.8%	0.1971	0.17101	75.8%
Partner in business	0.08955	0.10128	55.6%	0.02192	0.02192	100.0%	0.02319	0.03188	88.9%
Work for themselves	0.52452	0.52345	94.8%	0.71507	0.74521	77.8%	0.71014	0.6971	91.6%
Subcontractor	0.02772	0.01493	-19.1%	0.01644	0.00274	-118.1%	0.01739	0.01739	100.0%
Freelancer	0.11087	0.13433	20.3%	0.13151	0.09863	38.7%	0.13623	0.16232	-8.0%
Private sector	0.95309	0.96695	47.0%	0.9726	0.98356	75.0%	0.97681	0.96522	34.4%
Public sector	0.01706	0.01493	90.5%	0.01644	0.0137	91.1%	0.01159	0.02464	-59.4%
Paid jobs	-0.88913	-0.89979	54.3%	-0.92603	-0.96986	14.4%	-0.92174	-0.91304	68.8%
Skill level	0.08742	0.08529	89.7%	0.21918	0.1726	-7.9%	0.2058	0.18551	68.3%
Education	17.946	18.2	80.6%	15.692	15.367	63.0%	16.165	15.86	86.1%
Marital status	0.65885	0.63966	-19.8%	0.69863	0.73151	19.0%	0.68696	0.65652	46.3%
Age	45.678	45.953	65.0%	44.279	44.852	80.9%	44.035	45.719	23.8%
Years in business	10.113	10.022	94.6%	11.542	11.833	86.6%	11.009	11.396	23.3%

Table A-21: Average Treatment Effect on the Treated of the Thinking – Feeling spectrum for female solo self-entrepreneurs

Thinking – Feeling: female employer entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2 (N=776)	0.028195359 (0.098652236)	0.7718938
Categories 1 and 3 (N=674)	-1.14910259*** (0.112043153)	< 0.00001
Categories 2 and 3 (N=846)	-1.01283948*** (0.097062122)	< 0.00001

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-22: Balancing models 49 – 51: bias reduction regarding the relationship between a male employer entrepreneur's income and the positioning of the respective country on the Thinking – Feeling spectrum

	Balancing model 49 (Treatment: Thinking – Feeling, male; Categories 1 + 2)			Balancing model 50 (Treatment: Thinking – Feeling, male; Categories 1 + 3)			Balancing model 51 (Treatment: Thinking – Feeling, male; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.94815	0.94074	-51.3%	0.89627	0.89627	100.0%	0.92308	0.92308	100.0%
Country of birth	0.90617	0.88148	-423.7%	0.97095	0.97925	84.8%	0.97166	0.97166	100.0%
Sole director	0.57531	0.60864	-5.9%	0.51452	0.42324	-19.9%	0.53036	0.52227	92.5%
Partner in business	0.19506	0.21358	29.9%	0.07469	0.09544	80.2%	0.07287	0.07085	97.4%
Work for themselves	0.29877	0.27284	-27.6%	0.47303	0.51037	72.5%	0.47368	0.46964	97.4%
Subcontractor	0.02469	0.02222	77.0%	0.0166	0.0083	-32.1%	0.01619	0.01012	64.3%
Freelancer	0.04691	0.04815	95.8%	0.0332	0.07469	22.6%	0.06073	0.11336	-117.8%
Private sector	0.9679	0.96296	81.1%	0.9917	0.99585	90.5%	0.9919	0.98988	88.6%
Public sector	0.01481	0.01235	89.0%	0	0	100.0%	0	0	100.0%
Paid jobs	-0.8963	-0.92593	-27.1%	-0.92116	-0.88797	35.2%	-0.92308	-0.94332	27.4%
Skill level	0.1679	0.20494	-78.6%	0.26556	0.26141	90.4%	0.2915	0.26923	65.2%
Education	18.073	18.14	94.9%	16.892	17.351	47.7%	16.984	17.511	75.9%
Marital status	0.78025	0.77284	53.8%	0.79668	0.87552	-94.1%	0.80162	0.78543	71.4%
Age	47.627	46.996	19.8%	42.656	44.187	48.9%	42.364	41.194	47.0%
Years in business	15.565	16.685	32.7%	10.867	11.564	67.8%	10.733	10.119	-21.6%

Table A-23: Average Treatment Effect on the Treated of the Thinking – Feeling spectrum for male employer entrepreneurs

Thinking – Feeling: male employer entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.281837122**	0.00409948
(N=694)	(0.097730645)	
Categories 1 and 3	-1.11761143***	< 0.00001
(N=533)	(0.152145751)	
Categories 2 and 3	-1.07712662***	< 0.00001
(N=656)	(0.118504022)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-24: Balancing models 52 – 54: bias reduction regarding the relationship between a male solo self-entrepreneur's income and the positioning of the respective country on the Thinking – Feeling spectrum

	Balancing model 52 (Treatment: Thinking – Feeling, male; Categories 1 + 2)			Balancing model 53 (Treatment: Thinking – Feeling, male; Categories 1 +3)			Balancing model 54 (Treatment: Thinking – Feeling, male; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.81988	0.8587	-692.7%	0.78418	0.72323	-0.6%	0.78078	0.73272	26.6%
Country of birth	0.90373	0.91149	-64.7%	0.97858	0.97199	87.9%	0.97808	0.96796	79.7%
Sole director	0.40528	0.37811	13.6%	0.37727	0.40527	63.2%	0.37943	0.31788	42.8%
Partner in business	0.0823	0.10714	5.9%	0.01977	0.01647	96.9%	0.02024	0.02782	90.3%
Work for themselves	0.50311	0.49922	80.9%	0.58155	0.55025	77.0%	0.5801	0.65177	54.1%
Subcontractor	0.04658	0.04969	71.1%	0.00824	0.01483	-4.9%	0.00843	0.01096	85.1%
Freelancer	0.10714	0.10248	84.2%	0.11203	0.1318	63.1%	0.11298	0.10455	65.1%
Private sector	0.96894	0.96817	97.0%	0.98682	0.99012	92.5%	0.98651	0.98314	80.9%
Public sector	0.00932	0.00543	82.7%	0.00329	0.00659	89.3%	0.00337	0.00506	79.4%
Paid jobs	-0.86335	-0.8191	-89.9%	-0.91928	-0.9374	64.6%	-0.91737	-0.94098	15.3%
Skill level	0.24534	0.23447	47.6%	0.24547	0.22405	50.4%	0.24452	0.16863	-18.7%
Education	17.49	17.702	83.9%	14.693	14.573	86.4%	14.869	14.99	94.5%
Marital status	0.65839	0.64829	37.0%	0.73641	0.72982	83.8%	0.73019	0.68044	12.2%
Age	48.323	47.543	0.8%	44.526	45.568	65.2%	44.663	43.797	60.8%
Years in business	13.925	13.806	92.8%	14.437	14.764	84.9%	14.444	14.397	90.8%

Table A-25: Average Treatment Effect on the Treated of the Thinking – Feeling spectrum for male solo self-entrepreneurs

Thinking – Feeling: male employer entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.403562898***	< 0.00001
(N=1,234)	(0.067828987)	
Categories 1 and 3	-1.20556972***	< 0.00001
(N=1,207)	(0.079398228)	
Categories 2 and 3	-0.828463629***	< 0.00001
(N=1,263)	(0.089844634)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-26: Balancing models 55 – 57: bias reduction regarding the relationship between a female employer entrepreneur's income and the positioning of the respective country on the Judging – Prospecting spectrum

	Balancing model 55 (Treatment: Judging – Prospecting, female; Categories 1 + 2)			Balancing model 56 (Treatment: Judging – Prospecting, female; Categories 1 +3)			Balancing model 57 (Treatment: Judging – Prospecting, female; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.87059	0.82941	-265.9%	0.83784	0.86486	68.6%	0.83784	0.87838	45.9%
Country of birth	0.95882	0.95882	100.0%	0.89189	0.91892	-1476.2%	0.89189	0.88514	15.5%
Sole director	0.38824	0.38824	100.0%	0.39189	0.22973	-387.0%	0.39189	0.41892	48.8%
Partner in business	0.25294	0.27941	21.8%	0.21622	0.22973	78.2%	0.21622	0.18243	-19.5%
Work for themselves	0.38824	0.33529	-525.5%	0.40541	0.5	-39.1%	0.40541	0.44595	47.0%
Subcontractor	0.01176	0.00588	45.0%	0.01351	0.02703	-302.8%	0.01351	0.01351	100.0%
Freelancer	0.03529	0.04118	50.7%	0.06757	0.09459	-9.1%	0.06757	0.06081	47.4%
Private sector	0.95294	0.94706	-1512.1%	0.97297	0.94595	-44.6%	0.97297	0.99324	-6.4%
Public sector	0.02941	0.03529	-412.0%	0	0	100.0%	0	0	100.0%
Paid jobs	-0.85882	-0.85588	75.9%	-0.85135	-0.94595	-101.4%	-0.87838	-0.88514	80.6%
Skill level	0.17647	0.13529	9.6%	0.31081	0.25676	65.8%	0.32432	0.26351	45.9%
Education	18.244	18.582	-148.6%	17.865	17.385	14.7%	17.919	17.713	51.6%
Marital status	0.72353	0.71765	25.8%	0.81081	0.87838	-22.8%	0.81081	0.82432	71.3%
Age	46.541	45.621	6.4%	42.257	42.041	93.8%	42.446	41.919	78.9%
Years in business	13.576	12.576	-697.0%	11.068	10.378	47.5%	11.122	11.851	49.3%

Table A-27: Average Treatment Effect on the Treated of the Judging – Prospecting spectrum for female employer entrepreneurs

Judging – Prospecting: female employer entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	0.149308844	0.23106756
(N=307)	(0.123910748)	
Categories 1 and 3	-0.557006308***	0.00068176
(N=204)	(0.161409831)	
Categories 2 and 3	-0.5511262**	0.00223168
(N=247)	(0.178352706)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-28: Balancing models 48 – 60: bias reduction regarding the relationship between a female solo self-entrepreneur's income and the positioning of the respective country on the Judging – Prospecting spectrum

	Balancing model 58 (Treatment: Judging – Prospecting, female; Categories 1 + 2)			Balancing model 59 (Treatment: Judging – Prospecting, female; Categories 1 +3)			Balancing model 60 (Treatment: Judging – Prospecting, female; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.69247	0.67742	-33.8%	0.83784	0.86486	68.6%	0.83784	0.87838	45.9%
Country of birth	0.92043	0.91828	65.8%	0.89189	0.91892	-1476.2%	0.89189	0.88514	15.5%
Sole director	0.29462	0.25806	-88.0%	0.39189	0.22973	-387.0%	0.39189	0.41892	48.8%
Partner in business	0.07312	0.08925	52.3%	0.21622	0.22973	78.2%	0.21622	0.18243	-19.5%
Work for themselves	0.56774	0.56774	100.0%	0.40541	0.5	-39.1%	0.40541	0.44595	47.0%
Subcontractor	0.02151	0.02688	49.8%	0.01351	0.02703	-302.8%	0.01351	0.01351	100.0%
Freelancer	0.11398	0.10645	36.9%	0.06757	0.09459	-9.1%	0.06757	0.06081	47.4%
Private sector	0.94194	0.93978	-489.4%	0.97297	0.94595	-44.6%	0.97297	0.99324	-6.4%
Public sector	0.04301	0.04086	-87.2%	0	0	100.0%	0	0	100.0%
Paid jobs	-0.85591	-0.84731	29.5%	-0.85135	-0.94595	-101.4%	-0.87838	-0.88514	80.6%
Skill level	0.16129	0.2172	-22.8%	0.31081	0.25676	65.8%	0.32432	0.26351	45.9%
Education	17.326	17.588	-92.4%	17.865	17.385	14.7%	17.919	17.713	51.6%
Marital status	0.66882	0.63763	-293.4%	0.81081	0.87838	-22.8%	0.81081	0.82432	71.3%
Age	46.099	45.867	76.4%	42.257	42.041	93.8%	42.446	41.919	78.9%
Years in business	10.406	10.137	-115.1%	11.068	10.378	47.5%	11.122	11.851	49.3%

Table A-29: Average Treatment Effect on the Treated of the Judging – Prospecting spectrum for female solo self-entrepreneurs

Judging – Prospecting: female solo self-entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.080192229	0.34749206
(N=828)	(0.085656107)	
Categories 1 and 3	-0.820033225***	< 0.00001
(N=672)	(0.12310992)	
Categories 2 and 3	-0.766489602***	< 0.00001
(N=796)	(0.105249981)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-30: Balancing models 61 – 63: bias reduction regarding the relationship between a male employer entrepreneur's income and the positioning of the respective country on the Judging – Prospecting spectrum

	Balancing model 61 (Treatment: Judging – Prospecting, male; Categories 1 + 2)			Balancing model 62 (Treatment: Judging – Prospecting, male; Categories 1 +3)			Balancing model 63 (Treatment: Judging – Prospecting, male; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.92998	0.93873	22.2%	0.90741	0.93056	73.1%	0.91244	0.92396	84.6%
Country of birth	0.93217	0.93326	82.6%	0.92593	0.97685	-2869.9%	0.92627	0.94009	-72.9%
Sole director	0.53611	0.54376	60.6%	0.53241	0.50926	30.5%	0.53917	0.57143	38.8%
Partner in business	0.18162	0.17505	80.6%	0.10648	0.12963	62.7%	0.10599	0.10138	83.7%
Work for themselves	0.3523	0.36214	-16.3%	0.4213	0.36111	11.5%	0.41935	0.38018	48.8%
Subcontractor	0.01969	0.02735	28.5%	0.01852	0.03241	-313.9%	0.01843	0.01613	83.6%
Freelancer	0.03939	0.04376	63.3%	0.05093	0.05556	81.3%	0.05991	0.07143	10.2%
Private sector	0.95624	0.94967	-1699.0%	0.97222	0.97685	75.2%	0.97235	0.97696	75.8%
Public sector	0.01751	0.03829	-1709.5%	0.00926	0.00463	47.0%	0.00922	0.00691	76.7%
Paid jobs	-0.91904	-0.94092	-79.3%	-0.93056	-0.93056	100.0%	-0.93088	-0.91935	66.9%
Skill level	0.21007	0.20897	97.6%	0.28241	0.31944	76.5%	0.29493	0.25346	63.1%
Education	17.557	17.395	-19.0%	17.051	16.907	74.5%	17.124	16.98	66.2%
Marital status	0.75274	0.77352	-162.2%	0.8287	0.8287	100.0%	0.82028	0.82488	90.2%
Age	46.527	46.871	65.1%	44.588	43.431	66.8%	44.442	43.809	74.7%
Years in business	15.302	15.461	-26.4%	12.495	13.005	61.2%	12.47	12.41	95.8%

Table A-31: Average Treatment Effect on the Treated of the Judging – Prospecting spectrum for male employer entrepreneurs

Judging – Prospecting: male employer entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	0.152386903	0.10353406
(N=729)	(0.093399258)	
Categories 1 and 3	-0.668889589***	0.00008612
(N=489)	(0.168749571)	
Categories 2 and 3	-0.790926963***	< 0.00001
(N=678)	(0.117053768)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-32: Balancing models 64 – 66: bias reduction regarding the relationship between a male solo self-entrepreneur's income and the positioning of the respective country on the Judging - Prospecting spectrum

	Balancing model 64 (Treatment: Judging - Prospecting, male; Categories 1 + 2)			Balancing model 65 (Treatment: Judging - Prospecting, male; Categories 1 +3)			Balancing model 66 (Treatment: Judging - Prospecting, male; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.82744	0.82277	58.4%	0.75688	0.73624	76.1%	0.76389	0.76968	92.3%
Country of birth	0.92412	0.89501	-363.3%	0.93807	0.95413	-836.3%	0.9375	0.94444	13.2%
Sole director	0.44075	0.44075	100.0%	0.29358	0.30046	79.3%	0.2963	0.30324	86.8%
Partner in business	0.05509	0.07692	35.5%	0.05734	0.07339	74.2%	0.05787	0.0544	87.7%
Work for themselves	0.48753	0.45738	-256.2%	0.62156	0.6055	76.4%	0.61806	0.62384	92.4%
Subcontractor	0.03742	0.03898	85.4%	0.01147	0.00917	31.6%	0.01157	0.01042	91.8%
Freelancer	0.09148	0.10967	-52.5%	0.13073	0.15826	-11.1%	0.13194	0.12731	63.9%
Private sector	0.96881	0.95634	-3318.5%	0.97936	0.99083	38.6%	0.97917	0.98148	87.9%
Public sector	0.00936	0.01507	-397.7%	0.01147	0.00688	47.5%	0.01157	0.01273	88.3%
Paid jobs	-0.87734	-0.85759	-61.8%	-0.89908	-0.85321	2.3%	-0.89815	-0.89236	83.3%
Skill level	0.23077	0.21933	74.9%	0.29817	0.27064	82.6%	0.29167	0.30324	89.7%
Education	15.944	15.834	18.6%	16.149	16.404	54.7%	16.133	16.399	37.7%
Marital status	0.68815	0.67152	-109.8%	0.68578	0.69954	75.0%	0.69213	0.69329	97.5%
Age	47.857	48.023	83.0%	44.704	43.984	79.3%	44.928	45.361	82.7%
Years in business	14.933	14.491	-252.9%	13.195	12.337	34.7%	13.285	14.073	45.2%

Table A-33: Average Treatment Effect on the Treated of the Judging – Prospecting spectrum for male solo self-entrepreneurs

Judging – Prospecting: male solo self-entrepreneurs		
Treatment	Average Treatment Effect on the Treated	p-value
Categories 1 and 2	-0.18394844**	0.00701658
(N=1,416)	(0.068005215)	
Categories 1 and 3	-0.628567521***	< 0.00001
(N=878)	(0.083919837)	
Categories 2 and 3	-0.690315104***	< 0.00001
(N=1,410)	(0.080745331)	

*** p<0.001 | ** p<0.01 | * p<0.05 | † p<0.1

The table reports the number of observations for each category as well as the ATTs, standard error, and the p-value.

Table A-34: Difference in ATTs of employer entrepreneurs versus solo self-entrepreneurs separated by the entrepreneurs' gender (part 1: female entrepreneurs)

Female								
	Cat.	two-tailed p-value	Mean Employer Entrepreneurs minus Solo Self- Entrepreneurs	95-% Confidence Interval (CI)		t-value	df	standard error of difference
				from	to			
Intuitive versus Observant	12	<0.0001	-0.495967216	-0.515644230020	-0.476290201980	49.5215	1091	0.01
	13	<0.0001	0.150692036	0.120855100940	0.180528971060	9.9228	877	0.015
	23	<0.0001	-0.067725473	-0.083646406810	-0.051804539190	8.3576	1090	0.008
Thinking versus Feeling	12	<0.0001	-0.131551043	-0.146143847120	-0.116958238880	17.7115	1063	0.007
	13	<0.0001	0.273684554	0.251716146400	0.295652961600	24.4766	864	0.011
	23	<0.0001	0.360105195	0.342080048790	0.378130341210	39.251	1116	0.009
Assertive versus Turbulent	12	<0.0001	0.229501073	0.216703573120	0.242298572880	35.2338	1133	0.007
	13	<0.0001	0.263026917	0.242139707640	0.283914126360	24.7412	874	0.011
	23	<0.0001	0.215363402	0.197275752930	0.233451051070	23.3932	1041	0.009

Table A-35: Difference in ATTs of employer entrepreneurs versus solo self-entrepreneurs separated by the entrepreneurs' gender (part 2: male entrepreneurs)

	Male							
	Cat.	two-tailed p-value	Mean Employer Entrepreneurs minus Solo Self- Entrepreneurs	95-% Confidence Interval (CI)				standard error of difference
				from	to	t-value	df	
Intuitive versus Observant	12	<0.0001	0.088853545	0.078580746470	0.099126343530	16.9936	2094	0.005
	13	<0.0001	-0.049661326	-0.065279599400	-0.034043052600	6.2472	1405	0.008
	23	<0.0001	0.039266801	0.031196214250	0.047337387750	9.5592	2095	0.004
Assertive versus Turbulent	12	<0.0001	0.121725776	0.114278529180	0.129173022820	32.1135	1926	0.004
	13	<0.0001	0.08795829	0.077019948030	0.098896631970	15.7988	1738	0.006
	23	<0.0001	-0.248662991	-0.258171415110	-0.239154566890	51.381	1917	0.005
Assertive versus Turbulent	12	<0.0001	0.336335343	0.329388115550	0.343282570450	95.1177	2143	0.004
	13	<0.0001	-0.040322068	-0.053765816340	-0.026878319660	5.8928	1365	0.007
	23	<0.0001	-0.100611859	-0.109250148120	-0.091973569880	22.8835	2086	0.004

Table A-36: Balancing models 67 – 69: bias reduction regarding the relationship between a female employer entrepreneur's income and the positioning of the respective country on the Extraversion – Introversion spectrum

	Balancing model 67 (Treatment: Extraversion – Introversion, female; Categories 1 + 2)			Balancing model 68 (Treatment: Extraversion – Introversion, female; Categories 1 +3)			Balancing model 69 (Treatment: Extraversion – Introversion, female; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.84242	0.91212	-354.6%	0.89474	0.88158	57.7%	0.89157	0.89157	100.0%
Country of birth	0.99394	0.98485	86.8%	0.97368	1	-77.1%	0.95181	0.96988	66.4%
Sole director	0.38788	0.37273	78.4%	0.47368	0.48684	66.0%	0.42169	0.39157	4.7%
Partner in business	0.28485	0.28788	70.3%	0.11842	0.07895	35.1%	0.10843	0.12651	74.6%
Work for themselves	0.38182	0.39394	87.7%	0.44737	0.44737	100.0%	0.45783	0.49398	73.7%
Subcontractor	0.01212	0	-56.1%	0.01316	0.03947	-174.2%	0.01205	0.00602	65.3%
Freelancer	0	0	100.0%	0	0	100.0%	0.04819	0.05422	-197.8%
Private sector	0.95758	0.96061	77.2%	0.97368	0.94737	-366.7%	0.98795	0.9759	36.3%
Public sector	0.0303	0.03333	51.7%	0.01316	0.03947	-25045.7%	0	0.01807	-183.5%
Paid jobs	-	-	-	-	-	-	-	-	-
Paid jobs	0.87273	0.93333	-257.4%	0.92105	0.89474	-23.4%	0.89157	0.90361	68.5%
Skill level	0.14545	0.2303	24.6%	0.28947	0.27632	90.3%	0.28916	0.38554	-319.7%
Education	18.267	18.598	52.0%	17.664	17.217	62.5%	17.657	17.922	85.9%
Marital status	0.77576	0.80303	-240.0%	0.75	0.81579	-26.7%	0.71084	0.72892	58.8%
Age	45.703	45.936	89.4%	44.132	45.316	73.9%	43.072	43.681	73.9%
Years in business	13.527	13.752	64.1%	10.947	9.5526	-25.7%	10.771	10.56	56.5%

Table A-37: Balancing models 70 – 72: bias reduction regarding the relationship between a female solo self-entrepreneur's income and the positioning of the respective country on the Extraversion – Introversion spectrum

	Balancing model 70 (Treatment: Extraversion – Introversion, female; Categories 1 + 2)			Balancing model 71 (Treatment: Extraversion – Introversion, female; Categories 1 +3)			Balancing model 72 (Treatment: Extraversion – Introversion, female; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.71613	0.72903	15.8%	0.6392	0.6108	8.7%	0.62434	0.62434	100.0%
Country of birth	0.93118	0.90968	68.7%	0.97159	0.97443	80.9%	0.96296	0.95503	85.3%
Sole director	0.32258	0.29892	66.3%	0.25	0.19318	-46.9%	0.25661	0.21164	-42.4%
Partner in business	0.09032	0.08817	79.0%	0.02557	0.04545	67.3%	0.02646	0.02249	94.4%
Work for themselves	0.53118	0.56882	61.8%	0.67614	0.72727	-32.2%	0.6746	0.70106	80.7%
Subcontractor	0.03226	0.01505	-121.6%	0.00852	0.0142	40.8%	0.00794	0.00794	100.0%
Freelancer	0.10323	0.0828	47.5%	0.11364	0.09091	44.5%	0.12434	0.1045	-880.9%
Private sector	0.94839	0.96452	-21.4%	0.96591	0.95455	-101.5%	0.96825	0.95767	44.1%
Public sector	0.02796	0.01828	-54.3%	0.02557	0.03977	-13473.0%	0.02381	0.0291	17.0%
Paid jobs	0.86237	0.90968	-179.0%	0.93182	0.92898	86.7%	0.93651	0.94312	82.7%
Skill level	0.14624	0.17097	78.0%	0.2017	0.33239	3.5%	0.22751	0.22487	88.5%
Education	17.834	17.755	88.6%	16.065	15.813	78.8%	15.866	15.659	89.0%
Marital status	0.68172	0.64731	-329.0%	0.68466	0.60511	-53.2%	0.68254	0.66799	66.9%
Age	45.778	46.902	49.2%	44.199	46.688	45.2%	43.54	44.708	49.9%
Years in business	10.865	10.942	87.6%	11.054	11.813	31.6%	10.72	10.552	65.3%

Table A-38: Balancing models 73 – 75: bias reduction regarding the relationship between a male employer entrepreneur's income and the positioning of the respective country on the Extraversion – Introversion spectrum

	Balancing model 73 (Treatment: Extraversion – Introversion, male; Categories 1 + 2)			Balancing model 74 (Treatment: Extraversion – Introversion, male; Categories 1 +3)			Balancing model 75 (Treatment: Extraversion – Introversion, male; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.92975	0.94215	19.1%	0.91667	0.93651	36.2%	0.91209	0.94505	29.0%
Country of birth	0.89876	0.94215	36.9%	0.96429	0.97619	19.9%	0.96337	0.96886	89.8%
Sole director	0.5062	0.51446	88.2%	0.53571	0.49603	-2.6%	0.55678	0.48718	-120.3%
Partner in business	0.21074	0.22934	-82.0%	0.11508	0.15476	34.8%	0.10623	0.12271	76.8%
Work for themselves	0.33471	0.31612	81.1%	0.4127	0.41667	89.7%	0.45055	0.47619	81.3%
Subcontractor	0.02066	0.01136	-19.7%	0.01587	0.0119	58.6%	0.01832	0.02381	68.4%
Freelancer	0.04752	0.04132	84.1%	0.02778	0.04365	61.2%	0.04396	0.05861	-624.4%
Private sector	0.96074	0.97314	6.7%	0.97619	0.96825	-40.7%	0.97436	0.96337	41.9%
Public sector	0.01446	0.01343	83.5%	0.01587	0.02778	-11275.4%	0.01465	0.02381	-43.6%
Paid jobs	-0.90909	-0.92355	14.7%	-0.91667	-0.94444	-30.3%	-0.92308	-0.91941	90.4%
Skill level	0.17562	0.2469	36.6%	0.28968	0.37302	38.5%	0.32234	0.31136	52.1%
Education	17.58	17.269	55.1%	16.901	17.204	74.6%	16.907	16.978	96.2%
Marital status	0.79752	0.80682	-15.9%	0.78175	0.78571	92.4%	0.76557	0.74725	58.3%
Age	47.68	47.633	97.9%	43.155	43.762	86.6%	42.209	41.667	76.7%
Years in business	16.318	18.431	-237.9%	11.647	11.976	70.3%	11.227	10.723	-4.0%

Table A-39: Balancing models 76 – 78: bias reduction regarding the relationship between a male solo self-entrepreneur's income and the positioning of the respective country on the Extraversion – Introversion spectrum

	Balancing model 76 (Treatment: Extraversion – Introversion, male; Categories 1 + 2)			Balancing model 77 (Treatment: Extraversion – Introversion, male; Categories 1 +3)			Balancing model 78 (Treatment: Extraversion – Introversion, male; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.82307	0.83483	23.3%	0.7971	0.74557	-65.7%	0.79524	0.77143	48.7%
Country of birth	0.89922	0.92217	66.6%	0.96296	0.9211	-181.8%	0.96032	0.95714	94.1%
Sole director	0.38186	0.38578	94.4%	0.42673	0.44283	58.4%	0.43333	0.36508	-116.0%
Partner in business	0.09183	0.10414	-20.5%	0.03221	0.03382	97.4%	0.03175	0.03651	93.3%
Work for themselves	0.48264	0.44625	63.1%	0.55072	0.52818	41.7%	0.54603	0.62302	43.9%
Subcontractor	0.04591	0.04367	71.2%	0.00483	0.00322	83.2%	0.00476	0.00476	100.0%
Freelancer	0.1187	0.09518	39.6%	0.09501	0.17069	-84.9%	0.09524	0.07857	-724.0%
Private sector	0.96305	0.95857	66.3%	0.97424	0.96779	-14.2%	0.9746	0.98095	66.4%
Public sector	0.01344	0.02576	-96.4%	0.01449	0.01932	-4516.1%	0.01429	0.01429	100.0%
Paid jobs	-0.85554	-0.8505	70.3%	-0.91143	-0.89533	24.5%	-0.9127	-0.91508	93.8%
Skill level	0.2542	0.29731	61.7%	0.24477	0.20129	67.9%	0.25079	0.24921	93.1%
Education	16.915	16.805	84.0%	14.837	14.882	96.2%	14.738	14.724	99.3%
Marital status	0.66405	0.6019	-674.9%	0.72947	0.72464	90.7%	0.73016	0.69603	22.3%
Age	48.125	48.415	86.9%	45.124	47.222	53.8%	44.956	44.675	88.0%
Years in business	13.984	13.982	99.6%	14.816	16.763	-75.5%	14.714	13.785	-91.9%

Table A-40: Balancing models 79 – 81: bias reduction regarding the relationship between a female employer entrepreneur's income and the positioning of the respective country on the Assertive – Turbulent spectrum

	Balancing model 79 (Treatment: Assertive – Turbulent, female; Categories 1 + 2)			Balancing model 80 (Treatment: Assertive – Turbulent, female; Categories 1 +3)			Balancing model 81 (Treatment: Assertive – Turbulent, female; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.91192	0.90415	90.2%	0.81481	0.74074	-136.2%	0.83333	0.80303	72.6%
Country of birth	0.96373	0.93523	-385.2%	0.96296	0.98148	-352.8%	0.93939	0.90909	-1599.4%
Sole director	0.44041	0.4715	57.9%	0.33333	0.33333	100.0%	0.31818	0.33333	86.5%
Partner in business	0.23834	0.28756	-335.9%	0.2037	0.24074	-0.3%	0.18182	0.18182	100.0%
Work for themselves	0.33679	0.25907	-58.2%	0.46296	0.53704	40.2%	0.5303	0.51515	91.2%
Subcontractor	0	0	100.0%	0	0	100.0%	0.01515	0.01515	100.0%
Freelancer	0	0	100.0%	0	0	100.0%	0.01515	0.0303	-55.2%
Private sector	0.95855	0.97927	-460.9%	0.96296	0.92593	-1653.2%	0.95455	0.96212	-30.5%
Public sector	0.03109	0.01295	-141.1%	0.01852	0.03704	-165.1%	0.01515	0.01515	100.0%
Paid jobs	-0.90155	-0.92746	-467.7%	-0.85185	-0.94444	-171.2%	-0.80303	-0.7803	41.3%
Skill level	0.1658	0.16062	85.1%	0.16667	0.05556	-53.5%	0.16667	0.14394	39.7%
Education	18.363	18.326	94.6%	17.843	18.343	-39.1%	17.924	17.572	-12.4%
Marital status	0.78756	0.73057	-468.3%	0.74074	0.83333	-111.3%	0.71212	0.69697	55.2%
Age	44.228	44.088	96.5%	46.407	45.444	64.5%	45.561	44.652	29.4%
Years in business	12.793	11.72	54.3%	11.648	14.204	14.8%	10.909	9.947	-47.0%

Table A-41: Balancing models 82 – 84: bias reduction regarding the relationship between a female solo self-entrepreneur's income and the positioning of the respective country on the Assertive – Turbulent spectrum

	Balancing model 82 (Treatment: Assertive – Turbulent, female; Categories 1 + 2)			Balancing model 83 (Treatment: Assertive – Turbulent, female; Categories 1 +3)			Balancing model 84 (Treatment: Assertive – Turbulent, female; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.72474	0.74216	78.1%	0.60772	0.57556	-2.5%	0.61371	0.60903	95.8%
Country of birth	0.91986	0.87805	-611.9%	0.94855	0.91961	-607.6%	0.95016	0.94393	-249.4%
Sole director	0.30662	0.32143	79.9%	0.19936	0.18006	50.0%	0.22118	0.28037	47.3%
Partner in business	0.07491	0.07666	84.6%	0.05145	0.05788	82.6%	0.05296	0.03583	33.2%
Work for themselves	0.54007	0.50348	25.6%	0.69775	0.69453	97.4%	0.70717	0.69159	91.0%
Subcontractor	0.02091	0.02265	-407.3%	0.01608	0.02894	-287.8%	0.01869	0.01869	100.0%
Freelancer	0.10627	0.12979	42.6%	0.09003	0.09968	69.1%	0.11215	0.08879	-139.3%
Private sector	0.95122	0.93554	-324.4%	0.95498	0.93891	-661.0%	0.9595	0.96106	73.2%
Public sector	0.02091	0.03397	-73.7%	0.03215	0.02894	54.0%	0.02804	0.03271	-774.6%
Paid jobs	-0.90418	-0.9216	-281.8%	-0.89711	-0.86817	15.2%	-0.90031	-0.88941	71.8%
Skill level	0.13415	0.02875	-204.0%	0.209	0.13826	2.3%	0.20561	0.24299	0.9%
Education	17.322	17.493	74.6%	16.405	16.614	41.8%	16.488	16.426	80.4%
Marital status	0.66551	0.64721	-82.4%	0.7074	0.791	-90.7%	0.7134	0.72741	58.5%
Age	44.821	44.775	98.9%	45.103	44.032	60.5%	45.125	44.903	82.8%
Years in business	10.707	11.642	60.2%	10.939	9.3569	47.3%	10.829	10.997	74.3%

Table A-42: Balancing models 85 – 87: bias reduction regarding the relationship between a male employer entrepreneur's income and the positioning of the respective country on the Assertive – Turbulent spectrum

	Balancing model 85 (Treatment: Assertive – Turbulent, male; Categories 1 + 2)			Balancing model 86 (Treatment: Assertive – Turbulent, male; Categories 1 +3)			Balancing model 87 (Treatment: Assertive – Turbulent, male; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.94981	0.93822	85.4%	0.89305	0.87166	31.8%	0.90196	0.90931	93.4%
Country of birth	0.92278	0.90541	-195.8%	0.92513	0.91979	-30.8%	0.91667	0.86765	-2649.1%
Sole director	0.53475	0.52606	88.2%	0.46524	0.48663	44.6%	0.5	0.51961	82.6%
Partner in business	0.18533	0.15637	-156.4%	0.17647	0.2139	-1.3%	0.18137	0.17892	90.4%
Work for themselves	0.31274	0.33398	56.8%	0.41176	0.37968	74.1%	0.44118	0.46078	88.7%
Subcontractor	0.01737	0.0251	-2148.6%	0.02674	0.01604	-222.5%	0.02941	0.02696	33.0%
Freelancer	0.04054	0.05116	74.1%	0.0107	0.07487	-105.7%	0.02451	0.03922	-50.6%
Private sector	0.97104	0.97394	21.6%	0.95722	0.91444	-1925.1%	0.95588	0.94363	-111.0%
Public sector	0.01351	0.01255	87.2%	0.01604	0.03743	-206.2%	0.01471	0.01961	-817.5%
Paid jobs	-0.91313	-0.92375	-132.7%	-0.90374	-0.8984	84.3%	-0.89216	-0.8701	43.0%
Skill level	0.17375	0.16216	66.6%	0.27273	0.25668	77.8%	0.27941	0.22059	-56.0%
Education	17.56	17.577	97.5%	17.302	17.345	88.1%	17.333	17.55	30.8%
Marital status	0.78958	0.79826	13.4%	0.80749	0.82888	51.2%	0.79902	0.7549	-30.5%
Age	45.585	45.626	99.0%	46.781	47.412	76.7%	46.127	46.48	72.6%
Years in business	14.732	14.374	84.7%	13.524	14.406	70.6%	13.525	12.637	-35.6%

Table A-43: Balancing models 88 – 90: bias reduction regarding the relationship between a male solo self-entrepreneur's income and the positioning of the respective country on the Assertive – Turbulent spectrum

	Balancing model 88 (Treatment: Assertive – Turbulent, male; Categories 1 + 2)			Balancing model 89 (Treatment: Assertive – Turbulent, male; Categories 1 +3)			Balancing model 90 (Treatment: Assertive – Turbulent, male; Categories 2 + 3)		
	Mean		Bias Reduction in %	Mean		Bias Reduction in %	Mean		Bias Reduction in %
	Treated	Controls		Treated	Controls		Treated	Controls	
Work schedule	0.857	0.86876	85.2%	0.72772	0.7104	44.7%	0.72482	0.7027	80.0%
Country of birth	0.9334	0.92899	25.0%	0.93812	0.96535	-565.7%	0.94103	0.90541	-1898.0%
Sole director	0.42409	0.43976	78.8%	0.34406	0.41337	-79.6%	0.35135	0.31695	69.4%
Partner in business	0.07052	0.06954	91.3%	0.0495	0.05446	86.6%	0.04914	0.06388	42.5%
Work for themselves	0.47698	0.45788	61.1%	0.62624	0.51485	10.1%	0.63145	0.62654	97.2%
Subcontractor	0.03134	0.03526	-1040.8%	0.01485	0.01238	25.4%	0.01229	0.01106	66.4%
Freelancer	0.1097	0.09109	54.6%	0.10149	0.08168	36.5%	0.11057	0.13882	-189.4%
Private sector	0.9716	0.96866	20.5%	0.9604	0.94802	-485.8%	0.96069	0.97052	-69.2%
Public sector	0.00881	0.01371	34.9%	0.0198	0.0396	-183.5%	0.01966	0.01843	-129.9%
Paid jobs	-0.905	-0.90353	67.8%	-0.77723	-0.81683	-16.0%	-0.77887	-0.81204	14.3%
Skill level	0.24388	0.24633	92.9%	0.26485	0.31683	28.2%	0.26536	0.25676	77.2%
Education	16.032	16.33	55.6%	16.588	17.12	-48.1%	16.613	16.926	0.2%
Marital status	0.70029	0.70715	31.6%	0.70792	0.7005	83.1%	0.71007	0.68059	12.8%
Age	46.459	46.056	89.9%	47.005	45.012	26.6%	47.037	46.907	89.9%
Years in business	14.599	14.099	78.7%	12.73	11.998	75.6%	12.644	11.661	-50.2%