# Exploring the Role of Cultural Differences in the Use of Intuition in Strategic Decision-Making

*"The intuitive mind is a sacred gift and the rational mind is a faithful servant. We have created a society that honours the servant and has forgotten the gift."*

**Albert Einstein**


**Personal information**

Ruud van der Heijden
S4151275


**Supervisor:**
Prof. Dr. A.M.A. van Deemen

**Second examiner:**
Prof. Dr. A.U. Saka-Helmhout

*Master thesis*
*Business Administration (International Management)*

Radboud Universiteit

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## Abstract

In this article the relation between national culture and the use of intuition in strategic decision-making by managers is researched. A random sample of 450 respondents with 26 different nationalities was used to research the relation between Hofstede's cultural dimensions (2010) and intuition in strategic decision-making. A multiple regression analysis was used in order to analyse the data. No significant relationships were found between intuition and the cultural dimensions of Hofstede, however the use of rationality in strategic decision-making processes appears to be influenced by the degree of power distance of national culture. Another important finding of this study is the relationship between gender and the use of intuition in strategic decision-making processes, females have the tendency to rely more on intuition than male counterparts.

## 1. Introduction

Intuition is a remarkable phenomenon in ordinary life, with corresponding curious results. Intuition can be defined as "affectively charged judgements that arise through rapid, non-conscious, and holistic associations" (Dane & Pratt, 2007, p. 40). Every person is aware of the existence of intuition or bases decision upon intuition or 'gut feelings' consciously or unconsciously, however if one would ask them to explain this phenomenon or apply it to certain situations it leads to confusion. This is not only the case for ordinary people, but also for academics. On the other hand globalisation has been an increasingly hot topic for the last decades, with countless effects. Involving the increase in communication among nations all over the world and with this increase of communication cultural differences arise. Two interesting subjects, which are even more interesting when combined. When is intuition used and does this have a cultural influence? This is exactly the key problem what this paper will try to remedy, in order to take away confusion around the concept of intuition.

Likewise intuition in ordinary life, intuition is present in business life. Managers or entrepreneurs are often confronted with their intuition when deciding or judging in their business activities. There are many examples of successful managers who say to rely on their intuition when making decisions. Richard Branson, founder of the Virgin Group: "I rely far more on gut instinct than researching huge amounts of statistics," (Branson, 1999) and former CEO Steve Jobs was also known to be advocate of intuition: "Intuition is a very powerful thing, more powerful than intellect" (Isaacson, 2011). However, as intuition is claimed to be frequently used in the business environment, this concept is still only very little understood: "Intuition has been given so many different meanings … that it makes one wonder whether the term has any meaning at all" (Epstein 2008, p. 23). An unambiguously, concisely defined definition of intuition in the managerial world cannot be given as previously stated by Epstein (2008, p. 23), however commonalities can be identified between the many existing definitions (Baldachinno, Ucbasaran, Cabantous & Lockett (2015, p. 23), on these will be elaborated in the theoretical framework (chapter 2).

The question remains how do these successful managers succeed; what helps them in their success? Are they specialized in multiple industrial contexts, is it their range of analytical and professional skills, or does intuition help in their success? Perhaps it is a combination of all

these aspects, however what is most interesting, and is the central issue of this article, is the influence of managerial intuition on the strategic decisions of managers. How does the use of intuition in strategic decision-making processes differ between managers? It is known that experience and expertise are likely to affect intuitive processing (Epstein, 2010), as well as the uncertainty in the context in which this takes place (Agor, 1986; Burke & Miller 1999; Elbanna, Child & Braga Rodriguez, 2010).

These two antecedents of entrepreneurial intuition, experience and expertise, and uncertainty, are the only identified antecedents so far (Baldachinno et al., 2015, p. 220). Although the identification of these antecedents and their significant effect on intuition, the exact nature of their effects are still ambiguous. The study of what effect 'experience and expertise' has on intuition has led to mixed results so far. The role of 'uncertainty' is strongly related to 'experience and expertise', as well as to intuition itself (Baldachinno et al., 2015, p. 220-221), the three-way relationship. This conclusion of Baldachinno et al. (2015) is closely related to the study of Dane and Pratt (2007) who studied the underlying factors of effective intuitive decision-making and came to similar results. Although a relationship between experience and expertise with intuition seems clear, the exact nature of this relationship is not; Baron and Ensley (2006) found that inexperienced professionals were significantly more likely to refer to intuition in contrast Dew, Read, Sarasvathy and Wiltbank (2009) who did not find any significant differences between experienced and inexperienced professionals. Besides these antecedents, research has also been performed towards the international aspect of a potential antecedent of intuition. Research in this area is of increasing importance, due to the increase of global activities in the business environment. Could the cultural background of managers affect the behaviour of strategic decision-making, more specifically the use of intuition in these situations?

As time becomes more scarce in contemporary business life when it comes to making decisions, the importance of intuition increases. Under extreme time pressure managers rely more on intuitive thought processes when making decisions (De Dreu, 2003; Edland & Svenson, 1993; Kaplan, Wanshula & Zanna, 1993; Kruglanski & Freund, 1983; Maule, Hockey & Bdzola, 2000; Suri & Monroe, 2003). From the academic area there is an eagerness to understand how to make high-quality decisions relatively quickly. (Eisenhardt, 1989; Hitt, Keats & DeMarie, 1998; Perlow, Okhuysen & Repenning, 2002) As this previous example could also be of great importance to the managerial area, in fact this may even be more

imperative in organisations embedded in turbulent environments (Khatri & Ng, 2000), which are constantly increasing. The increasing time pressures in strategic decision-making while operating in increasingly turbulent environments result in more frequently use intuitive thought processes by managers. Alongside this trend, the trend on increasingly international operations is present, where cultural differences play an important part.

The continuation of the limiting decision speed as related to the increase of globalisation. The increasing speed in which firms internationalise is an interesting factor which contemporary enterprises have to manage. An important aspect of globalisation are the cultural differences worldwide with which organisations have to deal. Cultural differences can be defined as fundamental differences in the way people in different countries perceive and interpret the world and therefore is becoming increasingly important in the current business environment where cultural differences become more intertwined.

The research objective of this article reads:

- The aim of this research is to identify the role of national culture in intuitive strategic decision-making.

This research objective is beneficial for the research area of strategic decision-making processes, especially considering the increasing velocity of business environments. Eisenhardt (1989; 1990) and Bourgeois and Eisenhardt (1988) showed that intuition plays a significant role in increasing the speed of strategic decisions, especially in high-velocity industries. This will assist the managerial environment in the explanation of strategic decision-making processes in particular regions. Superiorly, "managers with good intuition can see new possibilities in any given situation. They have a sense or vision of the future and thus are better equipped to move their organisation in response to it" (Agor, 1986, p. 6). While at the same time it will fill a research gap proposed by Dane and Pratt (2007), as they are curious towards the relation between national culture and the use of intuitive processing.

Intuition is characterized as emotional: "We further clarify that intuitive judgments as "affectively charged," given that such judgments often involve emotions" (Dane & Pratt, 2007, p. 38). Hofstede (1991, p. 5) defines culture as "the collective programming of the mind that distinguishes the members of one group or category of people from others" and "it operates on an emotional not on an intellectual level" (Powell, 2006, p. 14). Cultural values

provide preferences or priorities for one behaviour over another (Ghemawat & Reiche, 2011, p. 2). Therefore these concepts seem presumably related at first, as both of constructs are partially based on emotional roots. This interesting connection arouses the central question of this article about how cultures affects intuitive behaviour in strategic decision-making. The central question of this study therefore reads:

- How does national culture influence intuitive strategic decision-making?

Answering this question is beneficial for the managerial area as previously discussed due to the increasingly rapidly changing environment, with corresponding time pressures. There is even a shift from the managerial world towards intuiting as not only taken for granted, but due to its speed being consciously developed and employed at work (Agor, 1986; Burke & Miller, 1999; Khatri & Ng, 2000; Klein, 2003). "(…) the rapid rate of change that characterizes current organizational environments makes intuitive decision-making more necessary today than it has been in the past" (Dane & Pratt, 2007, p. 49). Additionally to this better understanding of intuition, it is beneficial for organisations as it is "perhaps better suited than rational methods to integrate wide-ranging stimuli into usable categories of information" (Dane & Pratt, 2007, p. 37-38), this is due to the fact that this "nonconscious ability is greater than our ability to mimic it consciously". The relationship of intuition in strategic decision-making processes and cultural differences could provide managerial benefits as well. If an significant relationship is found between intuitive behaviour and cultural aspects this may help organisations in operating in different cultures. As well as they are able to estimate behaviour of their (international) employees more accurately.

This research question also provides decent relevance to the academic area. As proposed by Dane and Pratt (2007, p. 48) the relationship between culture and intuitive behaviour in strategic decision-making processes is an important point on the research agenda. This research, considering the use of intuition in strategic decision-making processes in different cultures, will address this. Furthermore, previously performed research on intuition concluded mixed results, universal understanding of this phenomenon is therefore yet to be understood (Baldacchino et al., 2015; Dane & Pratt 2007). Cultural aspects which encourage or hinder intuitive behaviour will assist in a better universal understanding of intuition. The contradiction in results of studies, for example some scholars have found particular cultures to be more intuitive than others, while other scholars found the exact opposite, these particular

cultures less intuitive than others, on which will be elaborated later on. This has multiple causes, for example the variation in the conceptualisation of entrepreneurial intuition theories and the relating concepts. This is one of the main deficiencies in this field, which also leads to more confusion in the theories around intuition (Baldachinno et al., 2015, p. 220; Dane & Pratt, 2007, p. 34). In the following chapter, 2. Theoretical framework, the primary concepts of this research will be elaborately described in order to prevent confusion among these concepts. Accordingly, decisions made in the conceptualisation of these theories will be defined in detail with corresponding supportive arguments.

## 2. Theoretical framework

As the managerial and academic relevance of this article was described in the previous chapter, this chapter will centre around the elaborate descriptions of the concepts and their relations. The formerly introduced concepts are: culture, strategic decision-making and intuition. First, culture will be described with its corresponding dimensions, subsequently strategic decision-making and third intuition. After the theoretical descriptions of these concepts, interrelations are described. Based upon these interrelations corresponding hypotheses will be formed which will serve as the foundation of this article.

### 2.1 National culture

Culture is an abstract phenomenon which is present in, and specific to, every society. Definitions of culture vary greatly, however several common elements are present in all of them (Taras, Rowney & Steel, 2009). Scientists agreed with culture being a complex multi-level construct, which is shared amongst individuals belonging to a group or society, is formed over a relatively long period and culture is seen as relatively stable (Taras, et al., 2009). Despite common elements in the definition of national culture, operationalisations and measurement instruments diverge. Therefore it is key to select an appropriate theoretical framework and measurement model for this particular research.

Various measurement models of national culture have been created over the past decades. Some have been used more frequently by researchers than others. The most dominant models who gained recognition and popularity are the following: Hofstede's (1983), Trompenaars' (1993), Schwartz' (1994), Maznevski and Di Stefano's (1995), Inglehart's (1997) and the GLOBE (House, Hanges, Javidan, Dorfman & Gupta, 2004) model. All these models seem different at first and seem to have their own specific point of focus.

However after analysis all these models seem to overlap more than expected. Taras et al. (2009) studied 121 measurement instruments of national culture. From these 121 measurement 26 dimensions arouse. They concluded out of their data that nearly all 26 identified facets of national culture could be grouped to all major blocks of Hofstede's dimensions: "A thorough comparison of dimension definitions and items in the reviewed instruments and those offered by Hofstede, as well as very high correlations between Hofstede's scores and those obtained using other instruments (…) confirmed their close conceptual and empirical correspondence" (Taras et al., 2009, p. 361). Of all 121 different

reviewed instruments, “97,5% contain at least some dimensions that are conceptually similar to those introduced by Hofstede” (Taras et al., 2009, p. 361).

Although this model has also received negative criticism as for example by McSweeney (2002) and Spector, Cooper and Sparks (2001), which was later personally countered by Hofstede itself (2002a; 2002b), the findings of Taras et al. (2009) suggest otherwise and claim none are superior to Hofstede’s, although it has its restrictions. Additionally this model is the most commonly used measurement instrument by cross-cultural researchers due to limited availability of alternatives, convenience, popularity and simply habit (Taras et al., 2009). Another argument for the use of Hofstede’s model of measuring national culture is the limited amount of dimensions, this is beneficial for cross-cultural research (Taras et al., 2009). Correlations between dimensions are harmful for cross-cultural studies, as relationships between a particular dimension and the researched phenomenon are to be analysed.

The overall conclusion of Taras et al. (2009, p. 375) which is that “existing measures of culture are fairly consistent in terms of their approach and closely resemble the methodology used by Hofstede (1980)”, justifies the decision for the selection of Hofstede’s model for this research. With taken in regard the previously mentioned benefits due to it being the most popular measurement instrument, the availability of data and all other instruments being based on Hofstede’s model legitimizes the use of this model.

Additionally, from a methodological perspective Hofstede’s measurement model of national culture is also most appropriate for this research. As an illustration, the availability of the dimensions scores provide the opportunity to incorporate a wide variety of nationalities. More elaborate support on this claim will follow in chapter 3 – Methodology. The decision for the use of Hofstede model is supported due to the data availability of a large amount of nations. This enhances the amount of cultures which can be included in this research and therefore enhances the validity of this study. A complete list of nations is stated in Appendix A.

As Hofstede (1991, p. 5) states: “the collective programming of the mind which distinguishes the members of one group or category of people from another”. This distinction affects ordinary and business life as it influences their actions and thinking. Hofstede, Hofstede and Minkov (2010a) distinguish six dimensions on which will be elaborated in the next paragraphs: power-distance, collectivism vs. individualism, femininity vs. masculinity, uncertainty avoidance, long- vs. short-term orientation and indulgence vs. restraint.

### 2.1.1 Power distance

Power distance is the first dimension presented by Hofstede (1983). This term can be concisely described as: "the extent to which the less powerful members of organisations and institutions accept and expect that power is distributed unequally" (Hofstede, n.d.). All societies can be characterised as unequal, however some are even more unequal than others and therefore have a larger power distance. The social inequality of power distance can be perceived as the amount of authority one person has over others (Hofstede & Bond, 1984, p. 419). Therefore, power distance seems at first to be a negative concept; as the relationship with inequality seems to create inequalities and tensions between people in a society, however it is not. Power distance is a vital aspect of societies, which without, societies would not be able to run, as there needs to be acceptance of leadership by powerful entities (Hofstede et al., 2010a).

### 2.1.2 Uncertainty avoidance

Uncertainty avoidance can be concisely defined as dealing with a society's tolerance for uncertainty and ambiguity (Hofstede et al., 2010a). This is often related to risk avoidance, however this is incorrect and should not be done. "Uncertainty avoidance has nothing to do with risk avoidance, nor with following rules" (Hofstede, n.d.), but "it has to do with anxiety and distrust in the face of the unknown, and conversely, with a wish to have fixed habits and rituals and to know the truth" (Hofstede, n.d.). Therefore this could be more linked to rationality and wisdom, and it is not related to risk taking. Another important aspect is that societies characterised with a high degree of uncertainty avoidance, have created beliefs and institutions that help to avoid ambiguous situation where people feel threatened (Hofstede & Bond, 1984, p. 419).

### 2.1.3 Individualism vs. collectivism

The third dimension is individualism, which is opposed by collectivism on the other side. "Individualism is the extent to which people feel independent, as opposed to being interdependent as member of larger wholes" (Hofstede, n.d.). Individualism is different from egoism and should therefore not be seen as interrelating concepts in this matter, "individualism means that individual choices and decisions are expected" (Hofstede, n.d.). On the opposite side collectivism "means that one "knows one's place" in life, which is determined socially". On top of this individualistic societies are defined as "a situation in which people are supposed to look after themselves, and their immediate family only" (Hofstede & Bond, 1984, p. 419), on the contrary collectivistic societies are characterised by

situations in which people belong to in-groups or collectivities which are supposed to look after them, in exchange for loyalty. Along with those definitions, he (Hofstede, n.d.) illustrates the difference with an example from physics: “people in an individualistic society are more like atoms flying around in a gas while those in collectivist societies are more like atoms fixed in a crystal.”

### 2.1.4 Masculinity vs. femininity

The fourth dimension of national culture is masculinity vs. femininity. “Masculinity is the extent to which the use of force in endorsed socially” (Hofstede, n.d.), more precisely masculinity can be defined as: “a situation in which the dominant values in society are success, money and things” (Hofstede & Bond, 1984, p. 419-420). Quantity is important in masculine cultures and big is beautiful (Hofstede, n.d.). Opposed to masculinity is femininity, which centres around “a situation in which the dominant values in society are caring for others and quality of life”. Additionally, in feminine cultures there is sympathy for the underdog and competing is not so openly endorsed (Hofstede et al., 2010a). Therefore these typologies of cultures should not be confused with individual roles of either being male or female, but are about expected emotional gender roles (Hofstede et al., 2010a). As an illustration: in masculine societies males and females are both expected to be materialistic oriented, towards money, success and objects, whereas males and females in feminine cultures are expected to have different dominant values: caring for others and quality of life. This is an important note as the dimension masculinity vs. femininity should not be entangled with human gender itself.

### 2.1.5 Long- vs. short-term orientation

Long- versus short-term orientation is the fifth dimension of national culture according to Hofstede (1991). This dimension was not presented in the original, first framework of Hofstede (1983) on national culture, but was found by Hofstede in 1991. Long- vs. short-term orientation is closely related to change. “In a long-time-oriented culture, the basic notion about the world is that it is in flux, and preparing for the future is always needed” (Hofstede, n.d.). Long term orientation is about perseverance and thrift. A short-time-oriented culture is characterised by a closely look upon the past which is “a moral compass” and is defined as “adhering to it is morally good” (Hofstede, n.d.). Additionally in short-time-oriented cultures the world is seen as it was essentially created and therefore is looked upon the past (Hofstede, 2010a). Short-term oriented cultures are characterised by respecting traditions, fulfilling social obligations and one’s ‘face’.

### 2.1.6 Indulgence vs. restraint

The sixth, and latest added dimension by Hofstede is indulgence, "which is about the good things in life" (Hofstede, n.d.). This is the latest added dimension and appears to be related to the use of intuition, on which will be elaborated later on. Indulgent cultures are characterised by doing what your impulses, want you to do (Hofstede, n.d.). According to Hofstede (n.d.) "it is good to be free", and indulgent cultures centre around friends and relationships. People in indulgent societies see 'fun, laugh, leisure, freedom' as "words with positive connotation" and seem to be always in a good mood (Hofstede, 2010b, p. 1). Individuals from more indulgent societies can be characterised as "like to chat, and talk in a lively way", "are undisciplined and evade your space" and "will not get stressed" (Hofstede, 2010b, p. 1). "On the opposite end, where no indulgence is found, these cultures are defined as 'restrained', with the feeling of life being hard, and duty, not freedom is the normal state of being (Hofstede, n.d.). Words with positive connotation in their eyes are: duty, serious, have to, prohibit, discipline (Hofstede, 2010b, p. 2), people from more restrained societies are characterised as "soft-spoken and serious", "keep distance and do not show emotions", are stressed and under time pressure, and "seem to be always in a bad mood" (Hofstede, 2010b, p. 2).

## 2.2 Strategic Decision-Making

Strategic decision-making has been widely conceptualised and described. Mintzberg, Raisinghani and Theoret (1976) illustrated strategic decision-making as ill-structured, non-routine and complex, due to its ad hoc nature and as it resembles the interrelationship between the organisation and the environment (Ginsberg, 1988). According to Pennings (1985) strategic decisions can be formal and informal, as well as intended and emergent. These decisions have its roots in psychological, structural, cultural and political factors, the inner context, and the outer context, for example competitive forces (Pettigrew, 1992). An important distinction of strategic decision-making from routine decision-making are that strategic decisions deal with organisational survival and viability, involve large parts of the organisation and addresses unusual issues (Stahl & Grinsby, 1992).

An important aspect which was raised by Wilson (2003) which is the high levels of uncertainty that strategic decision-making carries, as it rarely has one best solution and made decisions are hard to reverse. When comparing this to intuition, similarities in either conceptualisations are revealed: as uncertainty is an essential characteristic in intuition as well. Additionally the dilemma of strategic decision-making of having rarely one best solution

is an aspect where the use of intuition takes part. According to Elbanna (2006) three processes in strategic decision-making can be distinguished, which are all complementary and interrelated; procedural rationality, intuitive synthesis and political behaviour. Elbanna (2006, p. 12) concluded, based on his study, that strategic decisions are never based completely on one of the above mentioned processes, but are derived from all three processes. On top of this Hendry (2000) suggested that strategic decision-making processes should be examined in parallel and integrating features by researchers in contrast to rival interpretations. Therefore Elbanna (2006, p. 12) proposes for an integration of these processes. This resembles the important view this paper, that the use of intuition and rationality in strategic decision-making processes, does not exclude another, however are complementary to one another. This evidence enhances the validity of this study, as intuitive behaviour will examined in the dualistic perspective, which is aligned with the perspective in which strategic decision-making processes should be viewed. Further elaboration on the dualistic perspective of intuition will follow in the next chapter.

In order to get a better understanding on the conceptualisation of strategic decision-making processes (SDMP), the framework of Elbanna (2006) will be concisely discussed. As previously stated strategic decision-making processes have three fundamental building blocks: rationality, intuition and political behaviour. Rationality can be defined as "the reason for doing something and to judge a behaviour as reasonable is to be able to say that the behaviour is understandable within a given frame of reference" (Butler, 2002, p. 226). In SDMP bounded rationality is no longer seen as a debate, but as a universal presence (Elbanna, 2006, p. 3-4). Bounded rationality is often bypassed by managers through the use of "satisficing, simple decisions rules, incrementalism and the nutshell briefing rule" (Elbanna, 2006, p. 4). As the relationship between rationality and the results of strategic decision-making processes have been contradictory, rationality should not be seen as solely affecting these processes. Political behaviour in SDMP centres around the interaction between interests, conflicts and power, which can be characterised as political in nature (Wilson, 2003). Elbanna (2006, p. 4) "This view assumes that decisions are the result of a process in which decision-makers have different goals, form alliances to achieve their goals, and the preferences of the most powerful prevail." Therefore political behaviour in SDMP can result in undermining of strategic decision effectiveness, due to power bases and positions and as a result of excluding some feasible alternatives because they are conflicting the interests of powerful individuals (Elbanna, p. 8). As some researchers have seen this as an attack on the rational process in

SDMP, they should be viewed as interlinked and complementary, according to Elbanna (2006). Finally, intuition is the third building block of Elbanna's (2006) framework of SDMP. As the evidence of using the intuition is clear, the concept itself is still poorly understood. The most important aspect of Elbanna's (2006) framework on strategic decision-making processes is the use on intuitive synthesis. This concept centres around the dualistic use of intuition and rationality in a simultaneous process. As this conceptualisation is based on empirical evidence of Fredrickson (1985) that managers could be simultaneously rational and intuitive, which has been confirmed by multiple studies (e.g. Eisenhard, 1989).

A note should be made when taken the perspective of rational strategic decision-making, Elbanna and Child (2007, p. 582) claim that strategic decision-making processes are "largely free of cultural effects". This is an interesting claim which at first seems to be contrary to the perspective of this study, as this excludes any cultural effect on strategic decision-making processes. However Elbanna and Child (2007) regard the absence of a relation between cultural effects and strategic decision-making, from a rational perspective. The role of intuition in the strategic decision-making process takes no part in this claim and therefore holds it suspected role in intuitive strategic decision-making. Additionally this position of Elbanna and Child (2007) is a contribution to the validity of this study, as cultural effects are expected to solely affect intuition in strategic decision-making processes. Again this is closely related to the approach of how strategic decision-making process is examined in this study, as described in the previous paragraph.

## 2.3 Intuition

Intuition is as previously stated a "remarkable phenomenon", which has lacked acceptance in the past, however since the eighties "(…) intuition finally gained acceptance as a powerful tool guiding executive decision-making" (Agor, 1986, p. 5). However although its acceptance, the concept has not reached consensus yet. Over the years numerous of definitions have been derived with corresponding operationalisations. Therefore this chapter is important in order to make proper distinctions between these different theories and define the appropriate operationalisation for this study.

### 2.3.1 Dual process perspective

An important aspect in the theoretical conceptualisation of intuition are the contradictory views in which intuition has been researched. Basically these contradictory views are divided

among two camps: the unitary view and the dual-process view (Baldacchino et al., 2015, p. 217). “The unitary view postulates that analysis and intuition are the opposite poles of a single dimension, whereas the dual-process view proposes that they are independent constructs.” (Hodgkinson, Sadler-Smith, Sinclair & Ashkanasy, 2009, p. 342) The unitary view can be described as a the way that people perceive information and decide by relying on one single psychological process (Allinson & Hayes, 1996; Hayes, Allinson, Hudson & Keasey, 2003). The unitary view suggests that analysis (rationality) and intuition are opposite poles of one single dimension, this implicates that one excludes the other (Hodgkinson et al., 2009, p. 342). This can be categorised as a more traditional perspective, as since the mid-eighties, dual-process theories have been developed centring around human cognition (Baldacchino et al., 2015, p. 217). As the unitary suggests one can not make a decision based on intuition when rationality is used, as one excludes the other. However when critically reflecting on this matter, the use of rationality managers can reject available solutions. From the remaining solutions an intuitive decision can be made, this is also claimed by Sauter (1999). This logical reasoning discourages the unitary perspective, due to its unitary dimension perspective. This was also one of the main critiques Gustafsson’s (2006) study regarding the use of intuition received (Baldacchino et al., 2015, p. 220), as it was analysed from the unitary perspective.

As the term dual-process suggests this concept relies on two complementary cognitive systems. One system can be characterized with processes that are ‘unconscious, rapid, automatic, and high capacity’ and the other system is connected to ‘conscious, slow, and deliberative’ processes. (Evans, 2010, p. 7) This article centres around the dual-process of intuition which has gained considerably more legitimacy (Baldacchino et al., 2015, p. 217). According to Dane and Pratt (2007, p. 34) dual processing is favoured among decision-making theorists, and therefore lends itself best for this study around strategic decision-making. On top of all this, dual-process theories from management and psychology research are supported by neuroscience research that has also identified two neurological systems (Lieberman, 2007). In summary, the dual process theory on intuition suggests that intuitive and rational thinking can be achieved, and one does not exclude the other. Corresponding to the example presented at the end of the previous paragraph, this perspective of examining the relationship between intuitive and rational decision-making is far more valid.

As intuition will be viewed from the dual process perspective in this study, a more elaborate description of this view is made. The first system of the dual process can be concisely described as automatic and effortless processing and learning of information (Stanovich &

West, 2000). This system has been characterized as experiential (Epstein, 1990, 1994, 2002; Epstein, Pacini, Denes-Raj & Heier, 1996; Pacini & Epstein 1999), automatic (Bargh, 1996; Bargh & Chartrand, 1999), tacit (Hogarth, 2001), natural (Tversky & Kahneman, 1983), associative (Sloman, 1996) and system 1 (Kahneman, 2003; Stanovich & West, 2000). Furthermore it can be described as individuals having the ability to learn from experience and reach perceptions of knowing without conscious attention (Hogarth, 2001). This system is closely related to intuition.

The second system can be described as a system that "(…) enables individuals to learn information deliberately, to develop ideas, and to engage in analyses in an attentive manner" (Dane & Pratt, 2007, p. 36). This system has also been characterized as rational (Epstein, 2002; Epstein et al., 1996; Pacini & Epstein, 1999), intentional (Bargh & Chartrand, 1999), deliberate (Hogarth, 2001), extensional (Tversky & Kahneman, 1983), rule based (Sloman, 1996), and system 2 (Kahneman, 2003; Stanovich & West, 2000). This system is utilized by rational decision-making models for information processing (Dane & Pratt, 2007, p. 36). The selection for the use of the dualistic view has consequences for the rest of the study, as a corresponding, suitable operationalisation will be presented further on.

### 2.3.2 Pillars of intuition

When defining intuition besides some researchers who claim it to be something mystical, most researchers from the areas of managements and psychology are in accordance that culture is based on heuristics, expertise and nonconscious information processing (Dane & Pratt, 2007, p. 34). Therefore they (Dane & Pratt, 2007, p. 36) converged the various literature on intuition to the core of the construct: "intuition is a (1) nonconscious process (2) involving holistic associations (3) that are produced rapidly, which (4) result in affectively charged judgments."

As intuiting has been characterized as "unconscious", "subconscious", "preconscious" and "nonconscious", (Epstein, 1994; Hogarth, 2001; Jung, 1933; Reber, 1992; Simon, 1987) which all are very closely related terms, the umbrella term for this characteristic is "nonconscious – it occurs outside of conscious thought" (Dane & Pratt, 2007, p. 36). Although nonconsciousness was originally first referred to as a "psychological function which transmits perceptions in an unconscious way" (Jung, 1933, p. 567-568) it is much more. Epstein and Pacini (1999; 2002) elaborated on this characteristic as it being of 'experiential' nature. The addition of 'experiential' to the original idea of transmitting perceptions is

essential as it integrates the aspect of experiential learning. In addition experiential learning involves the ability to process more complex information than perceptions can (Dane & Pratt, 2007, p. 36). An important condition of experiential learning in this setting is nonconsciousness, as Epstein and Pacini (1999, p. 463) state: "(…) is relatively crude, albeit efficient, system for automatically, rapidly, and effortlessly processing information while placing minimal demands on cognitive resources. At higher reachers (…) the experiential system can be a source of intuitive wisdom and creativity." Unconsciousness in this matter is vital as this suggests intuitive thought processes, purposely considering experiences in order to make decisions is not as it is more related to rationality. The significant importance experience of the characteristic nonconsciousness has on the concept of intuition will be illustrated in chapter 2.3.4 Effectiveness of intuition, where the relation with experience will be described more elaborately.

The second pillar we can distinguish in the conceptualisation of intuition is "involving holistic associations" (Dane & Pratt, 2007, p. 36). In short this "(…) involves a process in which environmental stimuli are matched with some deeply held (nonconscious) category, pattern or feature." (Dane & Pratt, 2007, p. 37). Before Dane and Pratt's (2007) description of "holistic associations", Raidl and Lubart (2000-2001, p. 219) defined this same process of intuition as "linking disparate elements of information". These linking activities were earlier referred to as "associative" (Epstein, 1994; Epstein et al., 1996; Kahneman, 2003). In order to link it to nonconsciousness it is important to state that intuition involves recognizing features or patterns (Dane & Pratt, 2007, p. 37) it should be noted that making connections through logical considerations is not part of this. The use of logic is closely related to rationality as previously stated. The nonconscious recognition of features and patterns has been conceptualised as 'holistic' (Epstein 1990; Shapiro & Spence, 1997), and due to associations in intuition is eventually referred to as 'holistic associations' (Dane & Pratt, 2007, p. 37). Scholars in the area of decision-making suggest that in making holistic associations, individuals nonconsciously map stimuli onto cognitive structures or frameworks." (Dane & Pratt, 2007, p. 37) An important feature of making holistic associations is the advantage it has over other decision-making approaches: our nonconscious ability to make such categorical connections is greater than our ability to mimic it consciously (Dane & Pratt, 2007, p. 37). This is closely related to one of the bottlenecks of rationality, as this may prevent people from "seeing the obvious" (Pirsig, 1974, p. 196). Additionally, logic, rationality and conscious thinking seems to rely on connection made through a slow and effortful analysis (Epstein,

1990; 1994; Kihlstrom, 1987). The holistic associations are intertwined with the experiential system itself and which was elaborately described at the dualistic perspective. The importance of describing the essence of holistic associations is that this implies that "intuiting is perhaps better suited than rational methods to integrate wide-ranging stimuli into usable categories of information" (Dane & Pratt, 2007, p. 38).

"That are produced rapidly" is the third feature of the intuition process. Locke (1964) and Hume's (1981) reflection of the speed of intuition relates closely to the previously described features nonconscious and holistic associations, as they state: "the immediate perception of connection between ideas." The speed of intuiting is often referred to as an information processing system that responds quickly to environmental stimuli (Epstein, 1994; Haidt, 2001; Reber, 1992). Speed is the most fascinating aspect of the construct for managers and academics (Bastick, 1982; Burke & Miller, 1999; Kahnemann, 2003; Khatri & Ng, 2000; Myers, 2002), as this is the decisive factor for the use intuition. Managers do not take the speed for granted but regard this as the primary motivator for developing and employing intuition at work (Agor, 1986; Burke & Miller, 1999; Khatri & Ng, 2000; Klein, 2003). This is the result of the observed speed of intuiting by researchers, which is studied as far quicker than rational decision-making processes (Dane & Pratt, 2007, p. 38). Eighty years ago Barnard (1938, p. 305) already emphasized the speed of intuition, as he defined these "non-logical mental processes" as being able to cope with: "mass of experience or a complex of abstractions in a flash". Another important feature of speed can be seen as the inability "to report a sequence of steps leading to the result" (March & Simon, 1993, p. 11). As one can see speed is the most aspect of intuition, however is strongly connected with the other features nonconsciousness and holistic associations.

The fourth feature that intuiting "results in affectively charged judgments" centres around the differences between the intuitive process and the intuition outcome. With referring to 'intuiting' the process of intuition is described, reference to 'intuition' is related to the outcome (Dane & Pratt, 2007, p. 38). Affectively charged judgements can be concisely described as the outcome of intuition. The definition of judgments is strongly associated with decision-making and problem treatment (Dane & Pratt, 2007, p. 38). The outcome of intuiting processes are found to 'affectively charged', as these judgements involve emotions (Dane & Pratt, 2007, p. 38). These emotions derive from the heuristic processes which are used in the presence of "cognitive feelings" (Chen & Chaiken, 1999, p. 87). Additionally to this intuition is often linked to relating concepts as "gut feelings", "gut instincts" (Hayashi, 2001; Shapiro

& Spence, 1997) and "feeling in our marrow". However Baldacchino et al. (2015, p. 219) claim that linking these concepts completely with intuition should be done with great caution, as these shouldn't be confused with guessing, this is also in line with Dane and Pratt's attitude towards guessing (2007, p. 40). Besides the warning of Baldacchino et al. (2015), they do not deny the affiliation between intuition and these concepts, as they regard intuition as "affectively charged" as well (Baldacchino et al, 2015, p. 214). Agor (1986) states that executives often experience excitement and harmony when making intuitive judgments, Shirley and Langan-Fox (1996, p. 564) describe intuition as "feelings of knowing". Epstein (1990; 1994; 2002) suggests that emotions and intuition are strongly correlated as through the interrelationship with previously discussed aspects, as experiential information processing and nonconscious processes, which are all emotionally driven. On top of this an important argument comes from a different academic area, neuroscience (Lieberman, 2000) where a link was found between affect and intuition in the human brain. In conclusion affectively charged judgments are associated with both intuiting process as with intuition as an outcome (Dane & Pratt, 2007, p. 39). The term affectively charged indicates that judgments are of affective nature, while the process in order to generate these judgments are also performed affectively.

Therefore "intuitions are affectively charged judgments that arise through rapid, nonconscious, and holistic associations" (Dane & Pratt, 2007, p. 40). Intuition is thus highly dissimilar from rational decision-making, as rationality involves "systematic procedures to thoroughly assess all pertinent information, evaluate costs and benefits and ultimately, make a decision based on conscious deliberation" (Dane & Pratt, 2007, p. 40).

### 2.3.3 Use of intuition in strategic decision-making

The particular use of intuition in strategic decision-making is the main concept of this research as the relationship with national culture will be examined. In this chapter the conditions will be discussed in which individuals tend to rely on their intuitions.

Previously performed research towards the use of intuition has proven that reliance on intuition over rational analysis is mostly present in positive moods. (Bless, Bohner, Schwarzer & Strack, 1990; Elsbach & Barr, 1999; Isen, Means, Patrick & Nowicki, 1982; Ruder & Bless, 2003; Schwarz, Bless & Bohner, 1991)

Little research has been performed considering the actual use of intuition. The research area of intuition has mainly been centring around antecedents of intuition, such as 'experience and expertise' and 'uncertainty'. The actual use of intuition has often been neglected. Gustafsson

(2006) performed an analysis on the use of intuition however from an unitary perspective, as previously discussed the validity of this research is questionable. If critically reflected on the operationalisation of intuition Gustafsson (2006) used, the bipolar construct with two opposite ends: intuition and rational analysis, is a deficient analysis. The exclusion of one of the two modes suggests that rationality and intuition can't be used simultaneously, as previously discussed in 2.3.1 Dual Process this is a problematic perspective to this study. This reflection is in line with the critique of Baldacchino et al., (2015, p. 220) on Gustafsson's article. Baldacchino's research (2013) validated the use of intuition alongside rational analysis and neither of them operating merely in isolation. Individuals are able to engage in high levels of both intuition and analysis when performing a particular task (Baldacchino et al., 2015, p. 220). However despite the use of the unitary perspective, Gustafsson's (2006) findings of 'experience and expertise' and 'uncertainty' should be taken into account.

Two other important identified antecedents for engaging intuition in strategic decision-making are 'uncertainty' and 'experience and expertise'. Uncertainty can be concisely described as the uncertainty that is associated with the task (Baldacchino et al., 2015, p. 220). Most studies concerning intuitive decision-making in uncertain environments have concluded that these environments are more likely to trigger intuitive decisions (Agor, 1986; Burke & Miller 1990; Elbanna et al., 2010), this is due to the significant absence of information in uncertain environments. In these situations rational strategic decision-making is complicated due to the lack of information. Gustafsson (2006) has found that intuition was more likely to be deployed in uncertain environments, while rational, analytical decision-making was more common in stable environments. Baldacchino (2013) did not find any significant differences among the process used of strategic decision-making when considering uncertainty. However Baldacchino did find that experts were more cognitive versatile (engaging both high levels of intuition and rationality), this in contrast to less experienced professionals. This suggests also a relationship between uncertainty and experience and expertise. However if taken the research of Gustafsson (2006) and Baldacchino (2013) in comparison, it can be criticised that the use of operationalisation may have affected the results. Due to Gustafsson's (2006) use of the unitary perspective his research excludes the use of both intuition and rational analysis simultaneously, while Baldacchino's (2013) dualistic perspective does not affect its validity. Therefore the conclusions of Gustafsson (2006) should be interpreted carefully.

The effect of experience and expertise on the use of intuition has been researched multiple times now, however have yielded mixed results so far. Although several studies have been

performed researching ‘experience and expertise’ triggering intuitive processes in strategic decision-making, “it is difficult to derive definitive conclusions from these studies” (Baldacchino et al., 2015, p. 220). This dilemma has again its roots partially in the disagreement of operationalisating intuition. For example Baron and Ensley (2006) found that inexperienced professionals were more likely to refer to intuition, this in contrast to Gustafsson (2006) opposite conclusions mentioned results in the previous paragraph. Baldacchino (2013) concluded that prior experience in a familiar industry was a decisive antecent of intuition, while Dew et al. (2009) did not find any significant differences at all. In sum can be concluded “that studies relying on methods that capture attributions in intuition fail to support the view that experience and expertise trigger intuitive processing”, whereas studies capturing the actual use of intuition “reported a significant and positive relationship between domain-specific experience and intuition”.

Besides the mentioned factors above, academics have been wondering about the impact of national culture (Dane & Pratt, 2007, p. 48). This is also the part where Hofstede et al. (2010a) dimensions of national culture come into play. This area is still to be discovered, which will be done in this study. The relationship between national culture and the use of intuition in strategic decision-making will be drawn on in the next chapter 2.4, with which appropriate hypotheses will be made.

## 2.4 Interrelationships between the constructs

As all constructs have been elaborately discussed in the previous chapters, interlinkages can be highlighted between one another. When relating culture and the use of intuition, Norenzayan, Smith, Kim and Nisbett (2002, p. 678) concluded interesting differences in the use of intuitions among individuals with different culture backgrounds. Although not all their studies unambiguously confirmed these results, the overall conclusion could be made that Chinese and Koreans relied more on intuition than European Americans. Underlying structures in the cultural differences which exactly affect the cognitive thinking styles in decision-making processes are not yet found. As Eastern cultures are mostly viewed by scholars as more intuitive in contrast to the more rational Western cultures (Varnum, Grossmann, Kitayama & Nisbett, 2010), Allison and Hayes (2000) concluded Western cultures to be more intuitive over Eastern cultures. This emphasize the importance to identify deeper underlying structures of cultural effects. Therefore the theoretical framework of Hofstede et al. (2010a) will be used in order to find if underlying cultural dimensions affect

intuitive processing. The interrelationships between the dimensions of national culture, as proposed by Hofstede et al. (2010a), and the use of intuition in strategic decision-making by managers will serve as the foundation of the proposed hypotheses later in this chapter.

The cultural dimensions will be discussed and analysed in relation to the use of intuition in strategic decision-making, separately from each other. This is imperative as the main aim of this research is to reveal the cultural dimension(s) which affect the use of intuition in strategic decision-making processes. An important note should be made first that if a dimension of national culture seems to interrelate with the use of rationality in strategic decision-making processes, this does not exclude any relationship between the particular cultural dimension and the use of intuition in this process. This is due to the use of the contemporary dualistic approach on intuition, where rationality and intuition can be performed simultaneously, in the process of strategic decision-making. More precisely, interrelationships found between dimensions of national culture and rationality in strategic decision-making processes, do not propose the absence of an effect of this particular dimension on the use of intuition in strategic decision-making processes.

In the research of finding significant relations between national cultural dimensions and intuition it is important to state that not every dimension may affect the use of intuition in strategic decision-making processes. Hofstede (2001b, p. 16) declares that researcher should not hesitate choosing among the dimensions when searching for relations with their phenomena. This imperative statement of Hofstede (2001b, p. 16) should be taken with great care and decisions regarding the research should be based on this. Therefore only hypotheses will be drawn from the dimensions which seem to have an evident relation with the use of intuition. This is in line with Hofstede (2001b, p. 16) idea about its cultural framework, as it should not be an aim for researchers to link every dimension. All potential interrelationships between a particular dimension and intuition are carefully analysed, before a hypothesis is drawn. Quality over quantity prevails in this matter, as Hofstede's (2001b, p. 16) model's strength is to detect which dimension is responsible for a particular effect. In the following paragraphs the cultural dimensions are discussed which are hypothesised to have relation with the use of intuition in strategic decision-making processes.

### 2.4.1 Uncertainty avoidance and intuition

Uncertainty avoidance is characterised as a society's tolerance for uncertainty and ambiguity (Hofstede, n.d.). This seems to match closely with an aspect of the use intuition, because

"intuitive judgments are, by their very nature, difficult to justify rationally and often involve unknown levels of risk" (Dane & Pratt, 2007, p. 48). It should be noted that uncertainty avoidance has nothing to do with following rules (Hofstede et al., 2010a; Hofstede, n.d.), and therefore this apparent relation between uncertainty and intuition can not be grounded on this particular argument. Nor should uncertainty avoidance be confused with risk avoidance or risk taking (Hofstede, n.d.), and therefore a relationship between this dimension and intuition can not be grounded on this argument either. However a low score on this dimension, which results in a high degree of the society's tolerance for uncertainty and ambiguity, does propose the willingness to take "unknown risks" and "are comfortable with ambiguity and chaos" (Hofstede, 2001a, p. 161), which may therefore do affect the use of intuition. Individuals from these society are found to be more comfortable in environments of chaos and ambiguity and therefore do not fear engaging intuitive processes. Whereas individuals avoiding uncertainty tend to make decisions in order to protect stability and provide stableness when they encounter an uncertain and unusual situation, as they are not willing to take unknown risks (Guss, Fadil & Strohschneider, 2012). Moreover Ayoun and Moreo (2008) found that managers coming from cultures with high levels of uncertainty-avoidance refrain from acting, where managers coming from cultures with very low uncertainty-avoidance, were able to make quick decisions. As discussed in chapter 2 intuitive processing is closely linked to speed. The speed of their decision-making in these particular environments provide support for the relation between uncertainty-avoidance and intuition. Therefore an apparent relationship between the national culture dimension uncertainty avoidance and intuition is noticed and should be researched. Therefore the following hypothesis can be stated, which was also proposed by Dane and Pratt (2007, p. 48):

H1: *An individual from a society with a lower score on the cultural dimension uncertainty avoidance results in a higher use of intuition in strategic decision-making processes.*

The important note should be made that this hypothesis should not be confused with the antecedent 'uncertainty' as studied by Gustafsson (2006), which is different from Hofstede's (1983) dimension 'uncertainty avoidance'. For example the dimension 'uncertainty avoidance' is based on a society's tolerance for uncertainty and ambiguity, which is different from Gustafsson's (2006) and Baldacchino's (2013) descriptions of uncertainty which was found to enhance intuitive processing for expert entrepreneurs. Although these two concepts regarding uncertainty do not match, they do support the theory for hypothesis 1. Gustafsson

(2006) and Baldacchino (2013) found that experienced professionals significantly use more intuitive processes when making strategic decisions, this in contrast to novice professionals where no relation was found. Their experience makes them more tolerant for chaos and ambiguity, and therefore use more intuitive processing in times of uncertainty. This is in correspondence with hypothesis 1, where society's being more tolerant to uncertainty and ambiguity results in more intuitive processing in strategic decision-making.

### 2.4.2 Masculinity vs. femininity and intuition

The second important dimension from Hofstede's (1983) framework, which predictably relates to intuitive processing, is the characterisation of national culture in the degree of masculinity or femininity. As described previously this dimension centres around the dominant values in societies, masculine cultures being centred around "success, money and things" (Hofstede & Bond, 1984, p. 419-420) and feminine cultures being centred around "caring and quality of life" (Hofstede, n.d.). As was previously elaborated on this concept should not be mistaken with particular behaviour by gender type in a society, but characterises society itself. Therefore intuitive processing is not linked to gender in this research, but to the masculinity or femininity of the particular culture. An instant overlay between intuition and masculinity/femininity as they are considered dominant mental programs (Hofstede, Hofstede & Arrindell, 1998, p. 5; Dane & Pratt, 2007). Feminine cultures have dominant values as caring for others and quality of life, and are closely intertwined with emotional behaviour. Feminine cultures "emphasize the importance of feelings over logic" (Dane & Pratt, 2007, p. 48). Intuition "are affectively charged judgments" (Dane & Pratt, 2007, p. 38), 'affectively charged' meaning these judgements involve emotions, which is vital in this matter. Therefore clear overlay between the aspects of the cultural dimension masculinity and femininity, and a main driver behind intuitive processing can be noticed. The conceptualisation of intuition and its attributes as previously described in this article are imperative in this debate, as relationships are hypothesized on these foundations. This is supported by Epstein's (1990; 1994; 2002) perspective which suggests emotions and intuition are strongly correlated. Additional support comes from a different academic area; neuroscientist Lieberman (2000) even found a link between affect and intuition in the human brain. The evidence of the relation between intuition and affection proposes a substantial argument for a relation between femininity and intuition. Apparent relationships found in neuroscience are based on more concrete evidence than in social sciences as psychology and managerial science. On top of this, support for the relationship originates from distinct academic areas. Another important

support for the relation between intuitive reasoning and femininity, was the conclusion drawn by Norenzayan, et al. (2002, p. 679). Norenzayan et al. (2002) regard intuitive reasoning as experience-based, resists decontextualizing or separating form from content, this closely matches the description of feminine cultures, as they view dilemmas more holistically and do not decontextualize dilemmas due to the frequent use of emotions in decision-making processes. Additionally, Hofstede (2001a, p. 318) personally notes that he expects managers in feminine cultures to use intuition and deal with feelings. Therefore the following hypothesis is derived:

H2: *An individual from a society with a higher score on the cultural dimension femininity results in a higher use of intuition in strategic decision-making processes.*

A similar hypothesis was derived by Lamba and Ozdaski (2015, p. 351), in their search to find relationships between intuitive decision-making processes and this particular cultural dimension of Hofstede's model. Their hypothesis was rejected, as the total results did not find a significant effect, as this was not present at Turkish managers in contrast to the UK population. So due to the indications of the UK population and formerly presented arguments, Hofstede's (2001a) expectation and the previously mentioned arguments, this hypothesis will be re-tested on a larger scale with multiple cultural backgrounds. Incorporating more cultures and their respective scores will results in more valid and reliable conclusions regarding femininity and the use of intuition in strategic decision-making when taken Lamba and Ozdaski's (2015) conclusion into account.

Although the note has been made that this dimension of a nation culture has nothing to do with gender itself, but is a characterisation of the particular culture, it may have minor effects on the differences in behaviour between the genders in the particular setting. Hofstede et al. (1998, p. 11) found that the masculinity/femininity dimension is the only one that produces consistently different scores for female and male respondents (more ego for males), except in very feminine cultures. This is a key remark that should be taken into account and will be discussed in combination with the analysed data.

### 2.4.3 Other dimensions and intuition

Power distance, which regards the acceptance and expectation of unequally distributed power, is less related to intuition in strategic decision-making processes. One could regard a higher power distance, which means more inequalities between members of an organisation, resulting in less influence and input from lower employees in strategic decision-making, with

cognitive styles in decision-making. Although subordinates have less influence in the decision-making processes, it does not imply that this leads to a higher authority in intuitive processing. It has not been proven that more solitary leaders or managers are found to differ from one another in their cognitive processes when make decisions. An individual with more authority than one with less more interactions regarding decision-making has not been found to be behave more intuitively. Therefore no hypothesis is derived between these two concepts.

The cultural dimension individualism vs. collectivism is an interesting one when putting this into perspective with intuition in strategic decision-making processes, as this dimension concerns itself with interdependency and the expectation of individual choices and decisions (Hofstede, n.d.). At a glance one may perceive this dimension to be closely related to holism and independent modes, which are found to affect respectively intuitive processing and analytic modes by managers (Norenzayan, Choi & Peng, 2007). However deeper analysis in the actual conceptualisation of individualism vs. collectivism shows this interpretation is false. This form of interdependency may not be related with the defined holistic thinking conceptualised by Dane and Pratt's (2007) theory on intuition. Many research articles found significant relationships between interdependency and holistic thinking, known as the social orientation theory (Varnum et al., 2010), however the personal perception of one's independency or interdependency should not be confused with cognitive decision-making styles. The deductive reasoning of a manager from a more or less collectivistic cultural background engaging more intuitive processing, because of one's place in society does not make sense, nor is there evidence. Managers from a more individualistic culture does not suggest that this affects his intuition, just because he or she is more solitary. Therefore no relationship between individualism vs. collectivism and intuition in strategic decision-making processes is hypothesized.

The cultural dimension long-term vs. short-term orientation does not relate much to the theory around intuitive processing in strategic decision-making. Although intuition is much quicker than rational processes in decision-making (Dane & Pratt, 2007, p. 38), decision-making speed does not propose to be related with term orientation. Long-term orientation, characterised by continuous preparation for the future, perseverance and thrift contrasts (Hofstede, n.d.) with intuition's characterisations of rapidly produced decisions and nonconscious process (Dane & Pratt, 2007, p. 36). An interesting factor of short-term orientation is looking in the past, as intuition has its roots in experience learning (Norenzayan, et al., 2002, p. 678), which affects the use of intuitive processing. Although this characteristic

of either concepts, referring and relying on experience, this is the only similarity of these concepts. This relating concept is not expected to be of sufficient impact to suggest a significant effect between short-time orientation and intuition. According to the theories on intuition and term orientation no clear relationship seems valid, therefore no hypothesis is derived.

Indulgence vs. restraint, the latest dimension added by Hofstede (2010b). Indulgent cultures have a key characteristic: doing what your impulses, want you to do. This aspect seems to refer openly to intuitive behaviour, following your impulses, however these impulses are closely intertwined with 'fun, laugh, leisure and freedom'. Accordingly, these impulses should not be confused with intuitive reasoning, intuition is not seen as an aspect of 'positive mood', impulsive behaviour and most importantly 'undisciplined', intuition has not been regarded as undisciplined impulsive behaviour. Although it is nonconscious due its unconsciously derive of potential solutions for decision-making, it is not an impulse in behaviour. Impulse by Hofstede (2010b), is characterised as impulse in behaviour and therefore impulsively making a decision. Intuition is about unconsciously deriving a potential solution for a dilemma based on holistic associations. The dimension indulgence vs. restraint only showed one main feature in its conceptualisation to be plausibly related to intuition in strategic decision-making processes, analysing the concept resulted in the conclusion that the cultural dimension should not be defined to be connected intuition, therefore no hypothesis is derived.

As no noteworthy relationships were found in the literature considering the cultural dimensions: power distance, individualism vs. collectivism, long- vs. short-term orientation and indulgence vs. restraint, the main focus in the analysis will lie on the dimensions uncertainty avoidance and masculinity vs. femininity. In the next chapter the methodology for study will be presented and described.

# 3. Methodology

In this chapter the methodology for researching this topic is discussed. First the data collection method will presented. Consequently, the careful selection of measurement instruments for the use of intuitive processing in strategic decision-making and national culture will be described and supported. Furthermore an examination of the respondent group will be discussed, with corresponding limitations that emerge from the measurement instrument. In these paragraphs the validity and reliability is highlighted and measurements are presented to ensure their quality.

## 3.1 Quantitative data collection

For this study the decision has been made to collect data quantitatively. Quantitative data collection is most appropriate for this research design as will be elaborated on below. Studying preliminary research regarding intuition it can be found that in general most research relied on quantitative data collection and little on qualitative research (Baldacchino et al., 2015, p. 219). Especially when it comes to researching the preference of intuitive processing this is predominantly researched in a quantitative research design. Attribution to intuition and the actual use of intuition (which should be researched in an experimental design) are more researched from a qualitative research design.

Additionally the resources are not present to study multiple international cultures qualitatively. As national culture is a complicated construct, qualitative data collection on national culture is very time consuming, besides interviews may not be sufficient and observations should be necessary. This is due to the nature of national culture, which is not simply verbal, but is also present in attitudes, actions, symbols and artefacts, as previously mentioned. Observations are not plausible in this concise time frame and resources. Furthermore an entire culture can not be analysed with a limited amount of respondents, a valid representation of respondents should be taken from every culture (50) (Hofstede, 2001b, p.14). Therefore this extensive research is not achievable, this limitation of this research should be taken into account.

Another advantage for the use of quantitative analysis is the generalization of the results. By examining through quantitative data collection with Hofstede's (2001a; 2010a) model it may be possible to find relationships between cultural dimensions and the use of intuition. A conclusion regarding this relationship will provide arguments for predicting the use of

intuition in a particular culture. Finally, cross-cultural research with the use of Hofstede's model is designed for quantitative research designs.

In order to find the relationships between the cultural dimensions and the use of intuition in strategic decision-making, the previously collected scores by Hofstede et al. (2010a) itself are used. Due to Hofstede's large amount of respondents the reliability of his scores increased. Additionally researching the scores on the dimensions is not possible due to the demand for large group of respondents per single culture (Hofstede, 2001b, p. 14), this would again limit the amount of cultures which can be studied, nor should a personal sample be used in comparison with results in the book. Therefore likewise multiple other studies like Murphy (1999) and Leng and Botelho (2010), the scores found by Hofstede are used.

The use of quantitative data collection also provides the opportunity to incorporate respondents from a large number of nations. This extensive variety of nations enhances the validity and generalisability of this study, as this is more closely related to the actual situation in the environment. Focus on the a selection of cultures would decrease these factors.

In this quantitative research design a questionnaire will be used for this study. A survey is the only plausible research measurement in this situation, as previously discussed. The data of this survey will later be analysed in SPSS. This research method has the possibility to capture data from a broad capability and more flexibility, this is suitable as the aim is to research a large amount of different cultures. Another benefit of the use of surveys is the high degree of anonymity, which helps in more valid results as respondents tend to answer more honestly. This helps in achieving the most accurate data.

## 3.2 Hofstede's multi-dimensional model of national culture

This model was elaborately discussed in the previous chapter where the contents of the dimensions were described. In this chapter some methodological aspects of the model are discussed. The scores of the multi-dimensional model by Hofstede et al. (2010a) will be taken from his study and matched with the collected data on intuition, no personal research will be performed in the area of culture. It is impossible given the resources of this study to perform an equivalent study on national culture. Additionally, as demanded by Hofstede (2001b, p.14) researching one particular culture and comparing these results to Hofstede's results should not be done.

A selection of nations is made to which potential respondents are allowed to be part of, although this harms the external validity, this is a measure forced to take. Scores on Hofstede's cultural dimensions are not available for every single country and therefore limitations arise. All countries included in Hofstede's model (2010) are included in this research, despite occasional missing data is present in some countries. As the hypothesis focus on just two dimensions, this is justified, as all countries have scores on these particular dimensions. The integration of all possible countries enhances the validity of this research. The scores of Hofstede's model (2010) will be matched with the respondents scores on the questionnaire. A list of these nations is found in Appendix B.

The original results of Hofstede's model had a moderate reliability, of 0.68 and is therefore acceptable. Although a higher Cronbach's alpha is desirable, Hofstede's model is well fitted for this research design as was comprehensively discussed in chapter 2. Therefore the reliability score of this model is justifiable for this study.

## 3.3 Decision Styles Scale

Although multiple measurement instruments are available for researching intuitive processing, many of these differ from one another. This problem has its origin in the conceptualisation of intuition itself. As much disagreement is present in the conceptualisation, this will have a corresponding effect on the operationalisation of intuition. One of the foundations of these dissimilar measurement instruments is the unitary perspective versus the dual-process perspective. The debate among this topic, on which was elaborated in chapter 2, has resulted in multiple measurement instruments for either perspective. Instruments regarding the unitary perspective (such as the Cognitive Style Index developed by Allinson and Hayes (1996)) are ignored in this research as the validity of this approach has already been questioned in this article.

As the focus is on the dualistic perspective as discussed in chapter 2, measurement instruments regarding this perspective are evaluated. For this study the decision has been made to rely on the Decision Style Scale (DSS) created by Hamilton, Shi and Mohammed (2016). This is a relatively new measurement instrument assessing the use of intuition and rationality in decision-making processes and originates from the dualistic process perspective.

Another popular and possible measurement instrument for this study could have been Rational-Experiential Inventory (REI). This is based on a formerly popular model CEST

(Cognitive-Experiential Self-Theory) by Epstein and Pacini (1999) and Epstein et al. (1996) and treats intuition and analysis as two independent systems. Other less popular measures (Baldacchino et al., 2015, p. 218) such as the General Decision-Making Style used by Sadler-Smith (2004), and Linear and Non-Linear Thinking Style Profile (LNTSP) used in the study of Groves, Vance and Choi (2011) and developed by Vance, Groves, Paik & Kindler (2007) are also not selected for this research.

The GDMS is also less suited for this research due to its original focus on native American respondents. Although it has been tested on respondents from the UK, which also gave acceptable reliability (Sadler-Smith, 2004, p. 167), it is questioned how more contrasting cultures would react to this. Considering the focus of this study, regarding multiple countries with contrasting cultures, it is precarious to use this measurement instrument.

Although the LNTSP is somewhat related to studying intuition and rationality, and is based on a dual-process perspective (Vance et al., 2007, p. 171), this is not the best solution for the task. The arguments for not preferring the LNTSP are based on maintaining validity. Despite it separates intuitive and rational processing, it was originally designed and focused on making career decisions instead of making strategic decisions in organisations. Alteration could be made to make this model more applicable, however this will derive the model from its original design and may harm the validity.

In addition other appraised measurements such as the REI have some items which are not centring around decision-making itself, for example “I have a good sense of rhythm” and “I prefer to talk about international problems rather than to gossip or talk about celebrities” (Epstein et al., 1996, p. 394). These items more specifically refer to one’s personality than towards the use of intuitive and rational processing in decision-making itself. Besides this, the CSI are evaluated and the derived REI have been questioned regarding its factor structures (Hamilton, et al., 2016, p. 526).

The DSS is designed especially to assess rationality and intuition more narrowly than other measures when it comes to decision-making processes (Hamilton, et al., 2016, p. 524). Other measures are more designed for general information processing and problem solving, however are less orientated towards actual decision-making. An important aspect of DSS as the measurement instrument, is that it considers “decision styles as likelihoods of behaviour (Leykin & DeRubeis, 2010) that allow for some change or development in response to factors such as environmental load and pressure (Driver, Svensson, Amato & Pate, 1996)” (Hamilton

et al., 2016, p. 524). Therefore decision styles are viewed as having both trait-based and contextual antecedents (Hamilton et al., p. 524), this is a vital point as it again suggests a potential interrelationship between culture and decision-making processes, consisting out of intuition and rationality. Compared to other measurement instruments the actual decision-making orientation of the DSS is most appropriate in this research concept. Capturing intuition and rationality in decision-making itself is the core of this research and therefore this more suited than other measurements which are more focussing on information processing itself. The use of DSS is also more intensively linked to the academic area of management literature, whereas other measurements which are more closely linked to information processing and less to actual decision-making centre more around psychological topics.

The DSS consists out of a 10-item statements with a corresponding five-point Likert scale, five centring around rationality in decision-making processes and five centring around intuition in decision-making processes. The simplicity of this measurement instrument is beneficial for the data collection in this research. This will result in a lower dropout rate, due to its small amount of items. The reliability of this measure has been tested as sufficiently, for both the rational dimensions ($r = 0.79$) and the intuitive dimensions ($r = 0.79$) (Hamilton, et al., 2016, p. 528). The respondents are asked to score all items on a 5-point Likert scale, ranging from completely disagree to completely agree, to which the DSS is designed. A five-points scale also has its advantage that it manages cultural effects. Cultures differ in their behaviour towards Likert scale items, a five-point scale eliminates this effect mostly. As some cultures have the tendency to refrain from extremes, fewer bullets help to remedy this. The complete questionnaire can be found in the appendix (Appendix B - Questionnaire).

## 3.4 Respondents

As a questionnaire will be held in order to collect data for this research, in this research design a large sample size is demanded. This particular research design needs decent amount of data in order to reach viable levels of validity and reliability. Multiple countries should be researched and within these particular countries a sufficient sample size is demanded as very small group sizes will results in major problems regarding the reliability of this research. The aim is to collect data from respondents all over the world, however one remark must be made: only respondents from countries that have been researched by Hofstede et al. (2010a) will be approached. This is essential as the cultural dimensions are the foundation of this research.

The respondent will be not completely anonymous as the nationality will be asked, which is necessary for the study. This is a vital element of this research as Hofstede's scores will be linked to the respondent. Therefore complete anonymity can not be reached, however until a certain degree it is. Besides their nationality, demographic data will be asked, as is common in surveys. Logically, this will mentioned in the survey.

All respondents will be addressed in English as well as the survey is in English. Translating every survey to the native language of a particular culture would mean it would have to be translated in to many languages. As it will not be able to check the translation, translations could derive from the exact, original questionnaire. This would endanger the validity of this research, as this could lead to ambiguous interpretations of the statements and questions. As this research is focused upon managers, it is expected that these managers have a decent level of English for sufficently understanding the questionnaire, and therefore this thought is legitimate.

In order to exclude respondents who reside in the particular nation, but are not a correct resemblance of the present culture, a measurement for this should be taken. In correspondence with other studies centring the dimensional culture model of Hofstede et al. (2010a), as for example Leng and Botelho (2010), only the population who met the following requirement were allowed to participate: only respondents who were born and had lived more than half of their lifetime in their respective country of were considered in the sample. In this research birth nation does not exclude respondents, as respondents might have lived there only for a short period or perhaps have never lived there, but were born when their parents stayed in that particular nation. Although the requirement 'having lived more than half of their lifetime' excludes some of the population, this is a necessity to ensure the validity of this research. As scores of Hofstede et al. (2010a) model will be matched with the collected results, it is imperative to have the respondents properly resemble the research unit of Hofstede original research. is Therefore these measures are taken. Further measures regarding a more in-depth analysis in the respondent's origin are not necessary, nationalities are sufficient to measure the effect of culture on cognition; little difference was found among European Americans and Asian Americans, when comparing these with East Asians (Norenzayan, Smith, Kim & Nisbett, 2002).

## 3.5 Data measurement test

Based on the measurement levels which come forth out of the constructs the appropriate data analysis test can be determined. As the measurement level of the dimensions of national culture is ratio level and the measurement level of intuitive processing is ordinal (due to the 5-point Likert scale), the regression analysis will be used for analysing the collected data. This method will be used for the analysis in SPSS in order to answer the main research question and corresponding hypothesis.

Regression analysis is used in order to understand which among the independent variables (cultural dimensions) are related to the dependent variable (the use of intuitive processing in strategic decision-making). This analysis leads to results which will help in answering the hypotheses and the central question of this study.

# 4. Data analysis and results

The data collection was performed by addressing familiar managers. Those managers were kindly asked to spread the survey among their international colleagues with the desired profile. An extensive search of respondents was performed with the help of several organisations. Next to this, managers were personally addressed. These combined efforts led to the collected data of 722 respondents.

## 4.1 Sample size

The first step in the analysis of the collected responses was the analysis of missing data. Analysing the dataset resulted in a detection of multiple cases of missing data, in particular as a result of dropping out. The respondents dropping out and therefore not completing the survey were deleted. The initial response rate of 722 was therefore decreased by all missing data cases. In the questionnaire an important control variable was included, as stated in the previous chapter: Q3 – "Have you been living in this country for at least half of your life?" (Appendix B - Questionnaire). This control variable is vital in this research design as it is essential to have the respondents resembling the appropriate national culture. Therefore respondents answering negatively to Q3 were not included in this analysis. These respondents represented potential risk for the reliability and validity of this research. Respondents not having lived for at least half of their life in their respective nation have the potential to answering the questionnaire with a different cultural background as fellow nationals. This led to a reduction of the data to 517 respondents.

A quota was set on all nationalities, which made groups close at twenty respondents, this to ensure as much equal distribution among all nationalities. In some cases, a sample had to be drawn from the data, for example the group Dutch, which surpassed the quota. Group sizes of a specific nationality with a shortage of data, which dramatically influenced the representativity and reliability of these particular group. Therefore any nationality with fewer than 10 respondents was not included in the analysis. Eventually these deletions led to an acceptable sample size of 450 respondents, distributed over 26 nations. The distribution can be seen in Appendix C.1 – Descriptives.

## 4.2 Reliability

The second step performed in the data analysis is analysing the reliability of the data. The reliability of the data was measured in SPSS using the reliability test for all five variables of

both rationality and intuition. For the reliability of the variables for intuition a Cronbach's alpha of 0,826 was found (see table 4.2A), which comes close to the ideally desired score (α >0,85). Deletion of any of the five variables regarding intuition would not enhance this value of 0,826 (see table 4.2B). Therefore all five variables on intuition were included in the data analysis.

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| ,826 | 5 |

Table 4.2A - Reliability Statistics Intuition

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| Int1 | 10,65 | 9,235 | ,620 | ,792 |
| Int2 | 10,59 | 9,169 | ,636 | ,787 |
| Int3 | 10,82 | 8,939 | ,637 | ,787 |
| Int4 | 10,96 | 9,310 | ,608 | ,795 |
| Int5 | 11,19 | 9,123 | ,605 | ,796 |

Table 4.2B – Item-Total Statistics Intuition

Considering the reliability of the variables for rationality an Cronbach's alpha of 0,776 was found (see table 4.2C) which is acceptable and fairly satisfying (α >0,60). Deletion of a corresponding variable regarding rationality would not improve this score (see table 4.2D) and therefore all five variables were included in the data analysis. After testing the dataset's reliability the conclusion can be drawn that the reliability of the data is acceptable and suitable for the forthcoming data measurements. The complete output of the reliability analysis can be found in Appendix C.2 – Reliability analysis.

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| ,776 | 5 |

Table 4.2C - Reliability Statistics rationality

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| Rat1 | 16,45 | 4,894 | ,547 | ,736 |
| Rat2 | 16,51 | 4,870 | ,581 | ,725 |
| Rat3 | 16,55 | 4,783 | ,545 | ,736 |
| Rat4 | 16,53 | 4,806 | ,560 | ,731 |
| Rat5 | 16,66 | 4,663 | ,518 | ,747 |

Table 4.2D – Item-Total Statistics rationality

## 4.3 Factor analysis

Consequently a factor analysis was performed in order to observe the variability and correlation among the variables. The first measures which were taken are the Bartlett's Test of Sphericity, in order to determine if there is sufficient correlation among the variables, and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy which determines the predictability of one variable by other variables. The Bartlett's Test of Sphericity was found significant, with a value of 0,000 which is lower than α(0,05) and therefore the conclusion can be made that sufficient correlation is found among the variables. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is also found sufficient with a value of 0,830, which is higher than the general assumption of 0,50 and therefore this dataset is suited for factor analysis. The output of these analyses can be seen below in table 4.3A.

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | ,830 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1363,923 |
| | Df | 45 |
| | Sig. | ,000 |

Table 4.3A – KMO and Bartlett's Test

The amount of factors used in this analysis is two, this was determined a priori, based on the previous research of Hamilton et al. (2016) and their Decision Style Scale, therefore any measurements, such as the scree plot and the total variance explained (> 60%) are ignored. The measurement of the eigenvalue table does support the a priori measure.

Consequently the Oblique factor rotation was performed using Direct Oblimin in SPSS as correlation is found among the factors; in the correlation matrix factors were found > 0.30. In the Communalities table the correlations between the variables and the factor were all found > 0.30 and therefore all relevant, no deletion of variables had to be performed (see table 4.3B). The following assumption that was analysed was the presence of crossloaders, with the use of table 4.3C – Pattern matrix, as no variable was found with a difference of < 0,20 on the two scores, no variable had to be deleted. The variables were assigned to the right factor and computed into two variables. Five variables (Rat1, Rat2, Rat3, Rat4, Rat5) regarding rationality in strategic decision-making were computed into one variable of average rationality (Average_Rat). The other five variables (Int1, Int2, Int3, Int4, Int5), regarding intuition, were computed into one variable of average intuition (Average_Int). A complete overview of the results of the factor analysis can be found in Appendix C.3 – Factor analysis.

**Communalities**

| | Initial | Extraction |
|---|---|---|
| Rat1 | 1,000 | ,535 |
| Rat2 | 1,000 | ,562 |
| Rat3 | 1,000 | ,541 |
| Rat4 | 1,000 | ,533 |
| Rat5 | 1,000 | ,480 |
| Int1 | 1,000 | ,617 |
| Int2 | 1,000 | ,620 |
| Int3 | 1,000 | ,609 |
| Int4 | 1,000 | ,565 |
| Int5 | 1,000 | ,568 |

Extraction Method: Principal Component Analysis.

Table 4.3B – Communalities

**Pattern Matrix[a]**

| | Component 1 | Component 2 |
|---|---|---|
| Rat1 | -,008 | ,729 |
| Rat2 | -,035 | ,739 |
| Rat3 | ,083 | ,754 |
| Rat4 | -,012 | ,727 |
| Rat5 | -,051 | ,677 |
| Int1 | ,807 | ,104 |
| Int2 | ,800 | ,053 |
| Int3 | ,779 | -,005 |
| Int4 | ,727 | -,076 |
| Int5 | ,710 | -,124 |

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table 4.3C – Pattern Matrix

## 4.4 Multiple Linear Regression analysis

For the actual analysis considering the central research question in this article and its corresponding hypotheses, a multiple linear regression was performed in order to test these hypotheses. As discussed in the previous chapter, 3. Methodology, the linear regression is most suitable for this research.

Firstly all assumptions were checked and found sufficient in order to achieve the acceptable correctness and efficiency. With a value for skewness and kurtosis lower than absolute 3 (-3 and +3) the skewness and kurtosis are acceptable for analysis, as these do not disturb type 1 and type 2 errors. Therefore the normality is acceptable for either dependent variables. Consequently the linearity was acceptable based on the Normal P-Plots and there was not found any multicollinearity as all predictive variables have values less of ,700 among them. The standard residuals were found sufficient as they lie between -3,0 and +3,0. However one extreme outlier was detected for the variable rationality (Average_Rat), this particular case (178) was deleted, the outlier can be seen Appendix C.4 – Multiple regression. Finally the homoscedasticity is acceptable as no patterns were detected. Another assumption of multiple

regression is that ideally at least twenty cases (respondents in this research design) are needed per independent variable. With 450 respondents for six independent variables, this assumption is met. These data results can be found in Appendix C.4 – Multiple regression.

By performing the linear regression analysis it has been analysed if particular cultural dimensions significantly affect the use of intuition by managers in strategic decision-making. The note should be made that decision was made to use the 'stepwise' option in SPSS while performing the multiple linear regression. This was done in order keep the relevant regressors. The function 'Enter' decreases the precision of the estimated coefficients as all independent variables are forced into the analysis. As this research can be described as of explorative nature and mainly focuses on only two of the six dimensions, a complete model with corresponding explanatory power of all six dimensions combined is not necessary. The 'Enter' function provides these data, but at the same time influences the exact effect of a single dimension, as irrelevant regressors decrease the precision of the estimated coefficients and predicted values. Therefore the decision was made to analyse the collected data through this procedure.

Unfortunately the collected data with the matched dimension scores did not result in the hypothesized results. Firstly the relation between the dimension scores and the use of intuition in strategic decision-making processes by managers was not found as a significant model for predicting the outcome. An insignificant value of alpha was found as 'no variables were entered in the equation' (table 4.4A), this holds that none of the six dimensions significantly affect the use of intuition in strategic decision-making processes. Therefore the tendency to use of intuition by managers when making decisions can not be predicted by any of the national cultural dimensions.

**Warnings**

No variables were entered into the equation.

Table 4.4A – Output multiple regression intuition

This implies that the hypotheses were not significant found either. The first hypothesis, H1: *An individual from a society with a lower score on the cultural dimension uncertainty avoidance results in a higher use of intuition in strategic decision-making processes* was not found significant. Therefore the conclusion can be made that a manager from a society with a

lower score on the cultural dimension uncertainty avoidance does not result in a significantly higher use of intuition in strategic decision-making processes. Despite the suggested relationship between the cultural dimension uncertainty avoidance and intuition in this article and previous article of for example Dane and Pratt (2007), this has not been proven.

The second hypothesis, H2: *An individual from a society with a higher score on the cultural dimension femininity results in a higher use of intuition in strategic decision-making processes* was not found significant either. A manager from a society with a higher score on the cultural dimension femininity does not result in a significantly higher use of intuition in strategic decision-making processes. Although the relation between the cultural dimension femininity and intuition was extensively analysed on previous theory and elaborately discussed in this and previous articles (e.g. Dane & Pratt, 2007), the data does not support this relation. Nor has the suggestion of Hofstede (2001a, p. 318) been proven, who describes his expectation that intuitive behaviour is more likely to occur in feminine cultures. Although this is not in line with the expectations of various scholars, it is in line with the conclusions of Lamba and Ozdasli (2015, p. 350), who rejected their hypothesis "Femininity has positive and linear influence on intuitive decision-making manner."

Apart from the hypothesized relations between these two particular cultural dimensions and the use of intuition by managers in strategic decision-making processes, any other significant relations between the other cultural dimensions and intuition were not found either. Relations between intuition and the other dimensions were not expected, as these did not seem to relate to another, based on theoretical analysis. A complete overview of the data output of the multiple regression analysis can be found in Appendix C.4.

Although the central theme in this research is the use of intuition by managers. The measurement items of this research offers the opportunity to analyse the relationship between Hofstede's et al. (2010) cultural dimensions and the use of rationality by managers in strategic decision-making. Therefore a regression analysis was also performed for rationality. In this case a significant effect was found between one of the dimensions and the use of rationality. Analysing the results of the performed multiple linear regression a significance level of 0,045, which is smaller than $\alpha$ (0,05) (see table 4.4B and table 4.4D), revealed the significant relationship between power distance (PDI) and the use of rationality by managers in strategic decision-making (Average_Rat). All other cultural dimensions were found insignificant in relation with the use of rationality by managers. Although the level of power distance has a

significant effect on the use of rationality by managers in strategic decision-making, this effect is very minor. When taken a glance at table 4.4E the unstandardized B of 0,003 reveals it very minor effect on the use of rationality in strategic decision-making processes. The adjusted R-square value (0,019) suggests that despite the significance the actual impact of this relation is almost negligible (table 4.4C), as the predictive value of the model is very weak. The results provide evidence that the more power distant the national culture of the manager is characterised, the more rational the manager will behave in strategic decision-making processes, however this effect is very minuscule.

The significant effect of power distance and the use of rationality can be illustrated by the description of the concepts, as no relation between this matter has been identified in prior research. A higher degree of power distance in cultures leads to a more centralised authority (Hofstede et al., 2010a). This centralised authority may affect the relation between power distance and the use of rationality. A more centralised authority and a larger inequality of the distribution of power could influence towards a more analytical approach. A lower distribution in the inequality of power may result in a slightly lower use of rationality due to the responsibility of decisions being more extensively distributed. This means that the decisions are made by more persons in contrast to higher power distant cultures. A more extensive distribution of power with decentralised authority could result in a little lower use of rationality. There are more persons authorised to make decisions and this could imply that there to some degree less strict supervision, due to its decentralisation, which could in its turn influence the style of decision-making processes to a slightly less rational approach.

In higher power distant cultures the inequality of power may results in persons having to base their decisions in decision-making processes more on rationality, this in order to convince or come to an agreement with their superior, as more hierarchical systems imply. Additionally the degree of power distance influences the gap between subordinates and superiors. As the gap of the emotional distance between superior and subordinate is wide, subordinates are more anxious to participate in decision-making processes. If they do participate, they can not simply rely on unsubstantial arguments or gut feelings, they have to ground their decision or opinion on hard facts and analysis. Superiors in their turn will have the same issue with their superior, in which the use rationality might be slightly larger. Further, as more power lies with one individual, this person is more occupied with decision-making and therefore may tend to use a slightly more rational decision-making process, as they are probably more used to decision-making processes and rely on rationality. In more power distant cultures, where there

is more absence of support by subordinates, decisions are made more individually. Therefore they may feel a larger sense of responsibility due to their frequent decision-making and seek for arguments in order to justify their decisions. In addition the support on which they base decisions, they have to gather individually as well. Although the impact of the degree of power distance in cultures only affects decision-making very minor, a relationship between the concepts seem viable as the data proves.

**Variables Entered/Removed[a]**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | PDI | . | Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100). |

a. Dependent Variable: Average

Table 4.4B – Variables Entered/Removed (multiple regression rationality)

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | ,137[a] | ,019 | ,017 | ,51354 |

a. Predictors: (Constant), PDI

b. Dependent Variable: Average

Table 4.4C – Model Summary (multiple regression rationality)

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 2,259 | 1 | 2,259 | 8,565 | ,004[b] |
| | Residual | 117,885 | 447 | ,264 | | |
| | Total | 120,144 | 448 | | | |

a. Dependent Variable: Average

b. Predictors: (Constant), PDI

Table 4.4D – ANOVA (multiple regression rationality)

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | Correlations | | |
|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. | Zero-order | Partial | Part |
| 1 | (Constant) | 3,930 | ,076 | | 51,781 | ,000 | | | |
| | PDI | ,003 | ,001 | ,137 | 2,927 | ,004 | ,137 | ,137 | ,137 |

a. Dependent Variable: Average

Table 4.4E – Coefficients (multiple regression rationality)

## 4.5 One-way ANOVA

Regarding the demographic variables, a significant relationship was found between gender and the use of intuition in decision-making processes. As can be seen in the SPSS output below, table 4,5A, the significance level of 0,005 is smaller than α (0,05). Based on these results the conclusion can be drawn that the independent demographic variable 'gender' significantly affects the dependent variable 'Average intuition'. When taking a closer look at the results in the descriptive table 4,5B, the means of the groups 'male' and 'female' can be compared. The group 'female' has a mean score on 'Average intuition' of 2,8383, the group 'male' has a mean score of 2,6334 and therefore differs roughly 0,205 on a five item Likert scale.

The results show that females are found to rely more on intuitive processes while strategic decision-making compared to males, who are found to rely less on their intuition. Although the groups only marginally differ, the gender difference between the use of intuition in strategic decision-making processes is significant. This interesting finding will be further discussed in the next chapter. No other demographic variables were found to significantly affect intuitive processes.

## ANOVA

Average

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 4,344 | 1 | 4,344 | 8,084 | ,005 |
| Within Groups | 240,202 | 447 | ,537 | | |
| Total | 244,546 | 448 | | | |

**Table 4.5A – ANOVA table (ANOVA gender and intuition)**

## Descriptives

Average

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound | | |
| Male | 287 | 2,6334 | ,71624 | ,04228 | 2,5502 | 2,7167 | 1,00 | 5,00 |
| Female | 162 | 2,8383 | ,76200 | ,05987 | 2,7200 | 2,9565 | 1,00 | 4,80 |
| Total | 449 | 2,7073 | ,73882 | ,03487 | 2,6388 | 2,7759 | 1,00 | 5,00 |

**Table 4.5B – Descriptives table (ANOVA gender and intuition)**

# 5. Conclusion and Discussion

Based on the previously collected and analysed data from chapter 4 – Data analysis and results, a conclusion can be drawn. The conclusion based on the results found in this research will be discussed elaborately. Consequently important limitations of this particular research are described with corresponding suggestions for further research.

## 5.1 Conclusion

The conclusion can be drawn that the hypothesized relationships between the level of uncertainty avoidance and masculinity vs. femininity were not found to be significantly related to the use of intuition in strategic decision-making processes. Nor were there found any other cultural dimensions affecting the use of intuition in strategic decision-making processes. The use of rationality in strategic decision-making processes was found to be very marginally affected by the level of power distance of a person's national culture. More power distant cultures have the tendency to use slightly more rational processes when making strategic decisions compared to more less power distant cultures. Although this effect was found significant it is in line with Elbanna and Child's claim (2007): strategic decision-making processes being largely free of cultural effects. The minor cultural effect does not seem to have a substantial impact on strategic decision-making processes.

With the analysed results the research question this article centres around can be answered, which is the following: "How does national culture influence intuitive strategic decision-making?" National culture based on the six cultural dimensions of Hofstede et al. (2010a) does not significantly influence intuition in strategic decision-making processes, although it was expected. Therefore academics and business professionals should not focus on the national cultural dimensions proposed by Hofstede et al. (2010a) when predicting the use of intuition in strategic decision-making processes. A very marginal effect of the level of power distance of a culture is significantly related to the use of rationality by managers in strategic decision-making processes.

The managerial relevance is that professionals should not rely on Hofstede's cultural dimensions in order to predict cognitive processes of strategic decision-making. As a result professionals are not able to predict their own manager's strategic decision-making behaviour. Additionally this also implies that organisations can not indicate whether subsidiaries or any other related organisations in different cultures have a stronger tendency to use intuition in

strategic decision-making processes. Regarding the gender differences of intuitive processing in strategic decision-making the differences between males and females are relatively small for the managerial environment. This gender difference might not be that significantly large that managers this may influence business processes on daily basis. For managerial relevance this finding is more informative and may be used to analyse decision-making processes ocassionally. The identified significant effect of the level of power distance on the use of rationality in strategic decision-making processes is negligible for the professional world. As the effect of power distance on rationality is particularly small this should not influence managerial decisions regarding this aspect, and therefore this effect is primarily interesting for academics.

## 5.2 Discussion and limitations

A limitation of this research could be the sample size within groups, although it was acceptable for this research design of exploratory nature, the small amount of respondents within groups may not represent the overall national culture. As an illustration twenty managers from a specific nation may not reflect the entire national culture. Due to this limitation another suggestion for further research arises, a more extensive data collection from research institutions with more resources could analyse this research topic with a closer resemblance to the actual world population. In this research 26 countries were included due to limited resources, which is substantial and more than expected beforehand, however larger research institutions could perform this analysis with incorporating more nationalities and more respondents from these particular nations. The limited amount of resources and opportunities for this research made this above suggestion not possible. The limitation of resources was due to a limited network, nor were there any existing datasets. For the data collection was relied on familiar professionals with an international network, who distributed the survey to managers matching the research unit profile. Incorporating more respondents per country could provide more insight in the divergence in nationalities considering use of intuition in strategic decision-making.

Another limitation regarding the data set is that not all respondents are evenly distributed over the particular nations. Support for this decision was previously discussed and legitimate, however this limitation of unequal group sizes should be taken into account. However the unequal group sizes may be a potential influencer of the results. Measures for more unevenly distribution were taken as some cultures were not included which had insufficient data.

Nevertheless these lack of resources may not have been an issue if the relation between the cultural dimensions and intuition was very evident, as an relation between the concept would have been found with the actual collected data. As different nationalities were included with respectively very high and very low scores on the dimensions uncertainty avoidance and masculinity the realised sample size of 450 is acceptable. A large sample size may also provide the researcher(s) with the opportunity to compare countries one by one among each other.

Regarding the data collection another limitation should be noted. About seventy percent of the collected data was directly personally addressed through the global mail address book, with which professional functions were used in order to make sure the respondents have professional managing positions. Therefore no limitations are expected among this group, however about thirty percent of the data was collected via network, and was addressed by other managers. It was emphasized to data collectors that they should only address managers for participation in this research, however this is difficult to control. Although the expectation is that respondents were carefully selected, it is a note should be made.

Although the perceptions of national culture affecting the use of rationality and intuition have always been present in the area of management research, no consensus has been met regarding its effect, despite their suggestions. Hofstede's dimensions had not yet been examined in the perspective of culture affecting cognitive styles in strategic decision-making processes, although the gap for this research was proposed by Dane and Pratt (2007). Hofstede's et al. (2010a) model of dimensional cultures provided the opportunity to incorporate a great variety of national cultures in this research. Therefore significant relations between national cultural dimensions and the use of intuition and rationality in strategic decision-making could have been a breakthrough, for the academic and managerial environment, in predicting the use of intuition by other national cultures.

A comparison of just two distinctive national cultures could have led to significant differences in the use of intuition by managers, however these would not be of use for any other global comparisons, but only country-specific for these two nations. Besides, there has been performed various research in cultural comparison, however analysing a large amount of countries simultaneously, based on underlying dimension scores, was an undiscovered area. As this research did not find a significant difference among nations in the use of intuition in strategic decision-making processes, it could be interesting to perform experiments among

managers from different nationalities, in order to assess their differences in the process of strategic decision-making. There is still much to cover in this academic area due to contrasting research results, large bodies of research including the research of Norenzayan et al. (2002) found Asian cultures to be more intuitive over Anglo cultures, while other research found the opposite for example Allinson and Hayes (2000, p. 167) found Anglo, North European and European as the most intuitive groups: "the results do not support the idea of dichotomy between an intuitive East and analytic West". Among these contrasting results of cultural influencing intuition the performed research in this article can be placed in between of the extremes, as there was no relation found. The contrasting results may have some of its roots in the theoretical framework and corresponding research design. The CSI measurement was used by Allinson and Hayes (2000, p. 167), although this was performed from a unitary perspective, their findings should not be neglected. Experiments were used in Norenzayan et al. (2002), who did find a more analytic West and a more intuitive East, and the DSS-questionnaire was used in this research. Although all these research methods were evaluated as valid and reliable, it may have possible consequences. Therefore further underlying elements of these contrasting cultural differences in the effect of intuitive processes in strategic decision-making are yet to be discovered.

An interesting finding of this research was the gender difference in the use of intuition in strategic decision-making processes. Female were found to rely more on intuition than their male counterparts, as was stated in chapter 4. Data analysis and results. This outcome contributes to the existing literature on gender and strategic decision-making processes. Although demographic variables were not the essence of this study, this finding is an important result to note. Gender has been a thoroughly examined research area, but still has its contradictions and undiscovered areas, therefore this finding is of substantial impact. Gender has been found to affect intuition by multiple scholars before, therefore this is not a breakthrough, however among the results have been found contradictory conclusions. As an illustration, Taggart, Valenzi, Zalka and Lowe (1997) found no significant differences among gender groups, Allinson and Hayes (1996) found males having more tendency to use intuition than female counterparts, where most scholars, for example Norenzayan et al. (2002, p. 681-682), Sharma (1990), Rubinstein (1986), Agor (1986), Pacini and Epstein (1999), Parikh, Neubauer and Lank (1994) and Lamkin (1986) found females to engage intuition more than their male counterparts. Therefore the findings found in this research are in line with those of for example Norenzayan et al. (2002), who relied on experiments, females are found to rely

more on intuition while making decisions. According to Lieberman (2000) the more frequent use of intuition by females has its roots in the neuroscience of humans. Intuition is a result of better encoding and decoding skills which are partly a result of female's higher oestrogen levels. Allinson and Hayes (1996) relied on the CSI measurement model, which is has been questioned before, as discussed in chapter 3.3. The conclusions of Allinson and Hayes (1996) should therefore be interpreted with caution. The conclusions of the other group of scholars logically received more acceptance and legitimacy among scholars, are strengthened by the conclusions in this research. Therefore the overall conclusion is legitimate that females make more use of intuition during strategic decision-making processes than males.

Another potential suggestion for further research is linking intuition to other cultural frameworks. As the model of Hofstede et al. (2010a) did not show any significant relationships with the use of intuition in strategic decision-making processes, other frameworks may be researched. The GLOBE framework by House et al. (2004). Although the decision for the model of Hofstede et al. (2010a) was elaborately explained in chapter 2.1 and supported by various scholars (e.g. Taras et al. 2009), this study may be performed in search of a relation between cultural dimensions of GLOBE and managerial intuition in strategic decision-making processes. Further extensive research of corresponding GLOBE literature should be performed in order to hypothesize for potential relationships, any potential significant findings will automatically benefit the academic and managerial environment. The data set of personally collected data for this research is available for such studies.

Despite that this article does not further clarify the relationship between national culture and the use of intuition in strategic decision-making, it does have a significant contribution to the theory regarding intuition in strategic decision-making processes, as it does provide evidence for previously proposed theory. Other research strongly relate social orientation to culture and argue this being the influencer of analytic and holistic reasoning (Varnum et al., 2010). Social orientation, strongly related to independence and interdependence, with critical features as respectively individualism and collectivism, should not be confused with Hofstede et al. (2010a) dimension 'individualism and collectivism' as elaborately discussed in chapter 2.4.3 – Other dimensions and intuition. For this claim, which was originally introduced by Dane and Pratt (2007), evidence can be provided due to the research performed in this article. The theoretical framework of specifically independency, interdependency, analytical reasoning and holistic reasoning (Varnum et al., 2010) should not be compared with the theoretical framework proposed in this article. Interdependency was found to significantly affect holistic

reasoning and independency to significantly affect analytical reasoning (Varnum et al., p. 11). Collectivistic cultures have no significant relation with intuition, nor do individualistic cultures with rationality, which is concluded in this research. Therefore scholars should approach these two frameworks separately and with great caution. Although the frameworks may seem similar, research evidence shows that they are not. The results of these studies imply that the theoretical framework by Varnum et al. (2010), regarding holistic and analytical reasoning in environments with different levels of in(ter)dependency, is theoretically different from the proposed theoretical framework in this research, regarding intuitive reasoning and the level of collectivism vs individualism. Therefore further future research in this area should elaborately conceptualise these terms and frameworks, and exclude misleading interrelationships.

This article enriches the body of literature in the academic area of national culture and intuition in strategic decision-making processes, as well as it questions previously performed research from this area. Unfortunately no relation was found between any of Hofstede's dimensional cultures and intuition, though it contributed to the academic area on the relationship between culture and intuition. A significant relation could have been of great importance to both the managerial and the academic world, as the use of two cognitive abilities (rationality and intuition) when making strategic decisions by managers could have been predicted. Although this breakthrough has not been made yet, it remains a challenge for future research designs.

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## Appendix A - List of nationalities

A list of the nationalities of all countries with scores on the dimensions of Hofstede's model (2010a):

*Albanian, Angolan, Argentinean, Australian, Austrian, Bangladeshi (Bangladesh), Belgian, Bhutanese (Bhutan), Brazilian, Bulgarian, Burkinabé (Burkina Faso), Canadian, Cape Verdean, Chilean, Chinese, Colombian, Costa Rican, Croatian, Czech, Danish, Dominican (Dominican Republic), Ecuadorian, Egyptian, Salvadoran (El Salvador), Estonian, Ethiopian, Finnish, Fijian (Fiji), French, German, Ghanaian, Guatemalan, Greek, Honduran, Chinese (Hong Kong), Hungarian, Icelandic, Indian, Indonesian, Iranian, Iraqi, Irish, Israeli, Italian, Jamaican, Japanese, Jordanian, Kenyan, Kuwaiti, Latvian, Lebanese, Libyan Lithuanian, Luxembourgish, Malawian, Malaysian, Maltese, Mexican, Moroccan, Mozambican, Namibian, Nepali, Dutch (Netherlands), New Zealand, Nigerian, Norwegian, Pakistani, Panamanian, Peruvian, Phillipine, Polish, Portuguese, Puerto Rican, Romanian, Russian, Saudi Arabian, Senegalese, Serbian, Singaporean, Sierra Leonean, Slovakian, Slovenian, South African, South Korean, Spanish, Sri Lankan, Surinamese, Swedish, Swiss, Syrian, Taiwanese, Tanzanian, Thai, Trinidadian and Tobagian (Trinidad and Tobago), Turkish, Ukrainian, Emirati (United Arab Emirates), British, American, Uruguayan, Venezuelan, Vietnamese, Zambian.*

# Appendix B - Questionnaire

## Introduction:

For graduating my master Business Administration at Radboud University Nijmegen, the Netherlands, I'm researching the relation between national culture and the use of intuition when making strategic decisions. At the moment I am collecting data for my research and would appreciate it if you would take the time to participate.

The questionnaire takes a maximum of 5 minutes to complete.

My sincere gratitude in advance, Ruud van der Heijden

## Demographic:

Q1 What is your nationality?
*Selection of countries in appendix B.*

If your nationality is not among the selected countries, you are kindly thanked for your interest. I kindly ask you to NOT to participate in this research, by selecting a different nation. This will harm the results and therefore the validity and reliability of this research.

Q2 Were you born in this country?
*Yes/no*

Q3 Have you been living in this country for at least half of your life?
*Yes/no*

Q4 Gender:
*male/female*

Q5 Age:
*18-25*
*26-35*
*36-50*
*51-65*
*>65*

## Decision Styles Scale

*The following questionnaire are statements which you should answer to your own thought and situation. These statements are centring around circumstances at work, in particular when making decisions. Therefore these statements should be seen from a perspective regarding your personal work environment*.

*There are no "right" or "wrong" answers, so please state your opinion as honestly as possible. Using the scale below, please indicate the extent to which you agree or disagree with the statements. Describe how you are now, not as you wish to be in the future.*

### Rational items

**Completely disagree** ○ ○ ○ ○ ○ **Completely agree**

| | | |
|---|---|---|
| Q1 | I prefer to gather all the necessary information before committing to a decision. | ○ ○ ○ ○ ○ |
| Q2 | I thoroughly evaluate decision alternatives before making a final choice. | ○ ○ ○ ○ ○ |
| Q3 | In decision making, I take time to contemplate the pros/cons or risks/benefits of a situation. | ○ ○ ○ ○ ○ |
| Q4 | Investigating the facts is an important part of my decision-making process. | ○ ○ ○ ○ ○ |
| Q5 | I weigh a number of different factors when making decisions. | ○ ○ ○ ○ ○ |

### Intuitive items

**Completely disagree** ○ ○ ○ ○ ○ **Completely agree**

| | | |
|---|---|---|
| Q1 | When making decisions, I rely mainly on my gut feelings. | ○ ○ ○ ○ ○ |
| Q2 | My initial hunch about decisions is generally what I follow. | ○ ○ ○ ○ ○ |
| Q3 | I make decisions based on intuition. | ○ ○ ○ ○ ○ |
| Q4 | I rely on my first impressions when making decisions. | ○ ○ ○ ○ ○ |
| Q5 | I weigh feelings more than analysis in making decisions. | ○ ○ ○ ○ ○ |

# Appendix C – Data Analysis SPSS output

## C.1 Descriptives

**Nationalities:**

**Nationality**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | American | 17 | 3,8 | 3,8 | 3,8 |
| | Argentinean | 19 | 4,2 | 4,2 | 8,0 |
| | Australian | 19 | 4,2 | 4,2 | 12,2 |
| | Belgian | 19 | 4,2 | 4,2 | 16,4 |
| | Brazilian | 13 | 2,9 | 2,9 | 19,3 |
| | British | 18 | 4,0 | 4,0 | 23,3 |
| | Chinese | 18 | 4,0 | 4,0 | 27,3 |
| | Colombian | 20 | 4,4 | 4,4 | 31,8 |
| | Czech | 17 | 3,8 | 3,8 | 35,6 |
| | Dutch | 20 | 4,4 | 4,4 | 40,0 |
| | Finnish | 15 | 3,3 | 3,3 | 43,3 |
| | French | 16 | 3,6 | 3,6 | 46,9 |
| | German | 17 | 3,8 | 3,8 | 50,7 |
| | Hungarian | 18 | 4,0 | 4,0 | 54,7 |
| | Indian | 20 | 4,4 | 4,4 | 59,1 |
| | Indonesian | 18 | 4,0 | 4,0 | 63,1 |
| | Italian | 19 | 4,2 | 4,2 | 67,3 |
| | Japanese | 10 | 2,2 | 2,2 | 69,6 |
| | Malaysian | 20 | 4,4 | 4,4 | 74,0 |
| | Mexican | 14 | 3,1 | 3,1 | 77,1 |
| | Polish | 15 | 3,3 | 3,3 | 80,4 |
| | Portuguese | 13 | 2,9 | 2,9 | 83,3 |
| | Romanian | 20 | 4,4 | 4,4 | 87,8 |
| | Russian | 20 | 4,4 | 4,4 | 92,2 |
| | Swedish | 18 | 4,0 | 4,0 | 96,2 |
| | Thai | 17 | 3,8 | 3,8 | 100,0 |
| | Total | 450 | 100,0 | 100,0 | |

**Gender:**

**Gender:**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 288 | 64,0 | 64,0 | 64,0 |
| | Female | 162 | 36,0 | 36,0 | 100,0 |
| | Total | 450 | 100,0 | 100,0 | |

**Age:**

**Age:**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 18-25 | 82 | 18,2 | 18,2 | 18,2 |
| | 26-35 | 122 | 27,1 | 27,1 | 45,3 |
| | 36-50 | 171 | 38,0 | 38,0 | 83,3 |
| | 51-65 | 75 | 16,7 | 16,7 | 100,0 |
| | Total | 450 | 100,0 | 100,0 | |

## C.2 Reliability analysis

**Items intuition:**

**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 450 | 100,0 |
| | Excluded[a] | 0 | ,0 |
| | Total | 450 | 100,0 |

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| ,826 | ,826 | 5 |

**Item Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| Int1 | 2,90 | ,948 | 450 |
| Int2 | 2,96 | ,947 | 450 |
| Int3 | 2,73 | ,993 | 450 |
| Int4 | 2,59 | ,945 | 450 |
| Int5 | 2,36 | ,988 | 450 |

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| Int1 | 10,65 | 9,235 | ,620 | ,792 |
| Int2 | 10,59 | 9,169 | ,636 | ,787 |
| Int3 | 10,82 | 8,939 | ,637 | ,787 |
| Int4 | 10,96 | 9,310 | ,608 | ,795 |
| Int5 | 11,19 | 9,123 | ,605 | ,796 |

**Scale Statistics**

| Mean | Variance | Std. Deviation | N of Items |
|---|---|---|---|
| 13,55 | 13,709 | 3,703 | 5 |

**Items rationality:**

**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 450 | 100,0 |
| | Excluded[a] | 0 | ,0 |
| | Total | 450 | 100,0 |

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| ,776 | ,778 | 5 |

**Item Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| Rat1 | 4,23 | ,708 | 450 |
| Rat2 | 4,16 | ,688 | 450 |
| Rat3 | 4,13 | ,743 | 450 |
| Rat4 | 4,14 | ,723 | 450 |
| Rat5 | 4,02 | ,803 | 450 |

**Item-Total Statistics**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|---|
| Rat1 | 16,45 | 4,894 | ,547 | ,352 | ,736 |
| Rat2 | 16,51 | 4,870 | ,581 | ,374 | ,725 |
| Rat3 | 16,55 | 4,783 | ,545 | ,302 | ,736 |
| Rat4 | 16,53 | 4,806 | ,560 | ,327 | ,731 |
| Rat5 | 16,66 | 4,663 | ,518 | ,295 | ,747 |

**Scale Statistics**

| Mean | Variance | Std. Deviation | N of Items |
|---|---|---|---|
| 20,67 | 7,107 | 2,666 | 5 |

## C.3 Factor analysis

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | ,830 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1363,923 |
| | Df | 45 |
| | Sig. | ,000 |

**Communalities**

| | Initial | Extraction |
|---|---|---|
| Rat1 | 1,000 | ,535 |
| Rat2 | 1,000 | ,562 |
| Rat3 | 1,000 | ,541 |
| Rat4 | 1,000 | ,533 |
| Rat5 | 1,000 | ,480 |
| Int1 | 1,000 | ,617 |
| Int2 | 1,000 | ,620 |
| Int3 | 1,000 | ,609 |
| Int4 | 1,000 | ,565 |
| Int5 | 1,000 | ,568 |

Extraction Method: Principal Component Analysis.

**Total Variance Explained**

| | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings[a] |
|---|---|---|---|---|---|---|---|
| Component | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total |
| 1 | 3,622 | 36,223 | 36,223 | 3,622 | 36,223 | 36,223 | 3,159 |
| 2 | 2,008 | 20,080 | 56,303 | 2,008 | 20,080 | 56,303 | 2,905 |
| 3 | ,777 | 7,768 | 64,070 | | | | |
| 4 | ,652 | 6,516 | 70,587 | | | | |
| 5 | ,615 | 6,149 | 76,735 | | | | |
| 6 | ,582 | 5,815 | 82,550 | | | | |
| 7 | ,482 | 4,823 | 87,373 | | | | |
| 8 | ,455 | 4,546 | 91,919 | | | | |
| 9 | ,446 | 4,462 | 96,381 | | | | |
| 10 | ,362 | 3,619 | 100,000 | | | | |

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

**Component Matrix[a]**

| | Component | |
|---|---|---|
| | 1 | 2 |
| Rat1 | -,550 | ,482 |
| Rat2 | -,581 | ,474 |
| Rat3 | -,492 | ,547 |
| Rat4 | -,552 | ,478 |
| Rat5 | -,548 | ,425 |
| Int1 | ,604 | ,502 |
| Int2 | ,636 | ,464 |
| Int3 | ,661 | ,415 |
| Int4 | ,671 | ,339 |
| Int5 | ,692 | ,298 |

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

**Pattern Matrix[a]**

| | Component | |
|---|---|---|
| | 1 | 2 |
| Rat1 | -,008 | ,729 |
| Rat2 | -,035 | ,739 |
| Rat3 | ,083 | ,754 |
| Rat4 | -,012 | ,727 |
| Rat5 | -,051 | ,677 |
| Int1 | ,807 | ,104 |
| Int2 | ,800 | ,053 |
| Int3 | ,779 | -,005 |
| Int4 | ,727 | -,076 |
| Int5 | ,710 | -,124 |

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 5 iterations.

**Structure Matrix**

| | Component | |
|---|---|---|
| | 1 | 2 |
| Rat1 | -,206 | ,731 |
| Rat2 | -,236 | ,749 |
| Rat3 | -,122 | ,731 |
| Rat4 | -,209 | ,730 |
| Rat5 | -,235 | ,691 |
| Int1 | ,779 | -,116 |
| Int2 | ,786 | -,164 |
| Int3 | ,780 | -,216 |
| Int4 | ,748 | -,274 |
| Int5 | ,744 | -,317 |

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

**Component Correlation Matrix**

| Component | 1 | 2 |
|---|---|---|
| 1 | 1,000 | -,272 |
| 2 | -,272 | 1,000 |

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

## C.4 Multiple regression

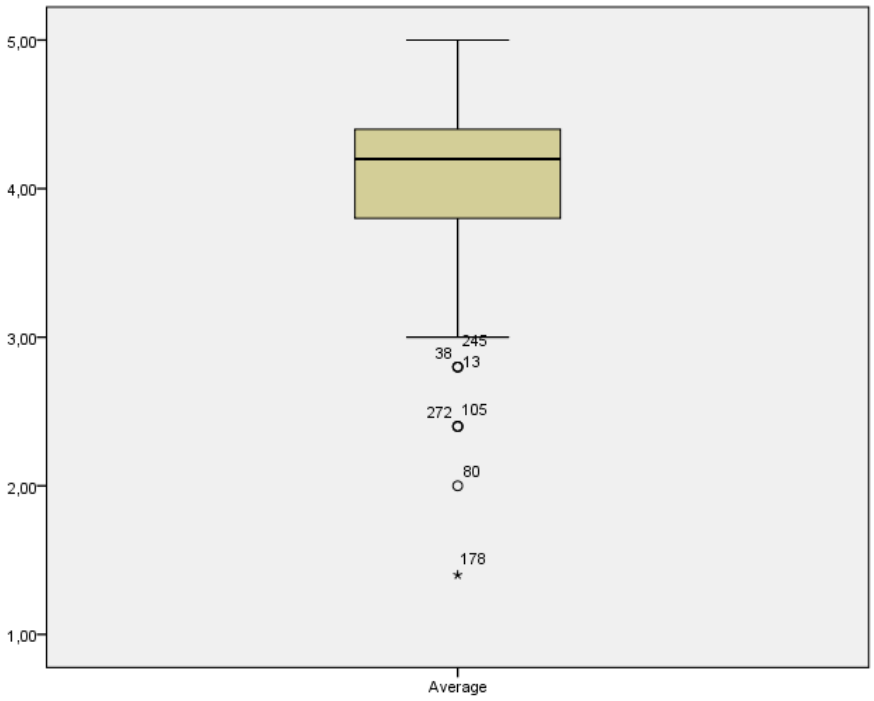
**Assumptions:**

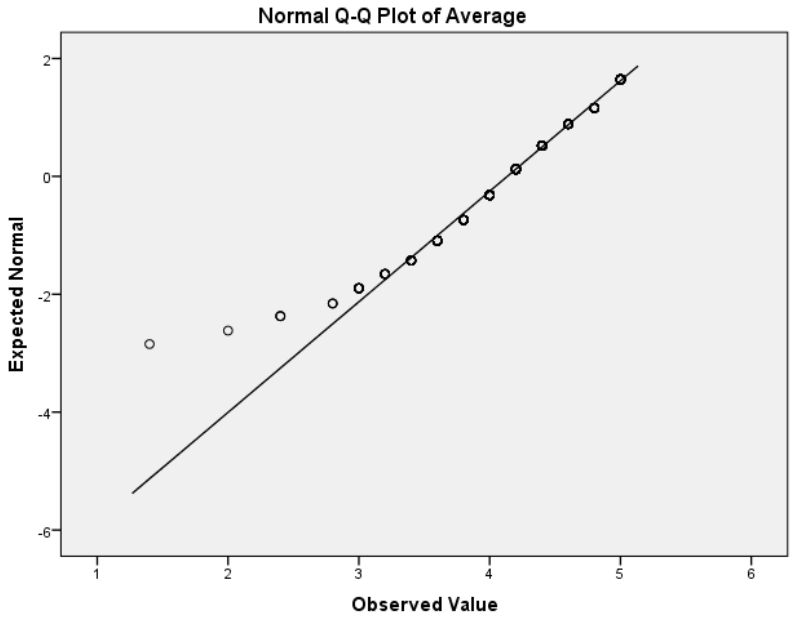
**Case Processing Summary**

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Valid | | Missing | | Total | |
| | N | Percent | N | Percent | N | Percent |
| Average | 450 | 100,0% | 0 | 0,0% | 450 | 100,0% |

**Descriptives**

| | | | Statistic | Std. Error |
|---|---|---|---|---|
| Average | Mean | | 4,1347 | ,02513 |
| | 95% Confidence Interval for Mean | Lower Bound | 4,0853 | |
| | | Upper Bound | 4,1841 | |
| | 5% Trimmed Mean | | 4,1593 | |
| | Median | | 4,2000 | |
| | Variance | | ,284 | |
| | Std. Deviation | | ,53317 | |
| | Minimum | | 1,40 | |
| | Maximum | | 5,00 | |
| | Range | | 3,60 | |
| | Interquartile Range | | ,60 | |
| | Skewness | | -,705 | ,115 |
| | Kurtosis | | 1,856 | ,230 |






## Multiple regression intuition:

**Warnings**

No variables were entered into the equation.

**Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| Average | 2,7073 | ,73882 | 449 |
| PDI | 60,9465 | 20,55832 | 449 |
| IDV | 52,8797 | 25,20990 | 449 |
| MAS | 52,1158 | 19,45955 | 449 |
| UAI | 66,7483 | 22,52065 | 449 |
| LTOWVS | 51,2561 | 21,89685 | 449 |
| IVR | 49,0824 | 20,94273 | 449 |

**Correlations**

| | | Average | PDI | IDV | MAS | UAI | LTOWVS | IVR |
|---|---|---|---|---|---|---|---|---|
| Pearson Correlation | Average | 1,000 | ,028 | -,012 | -,065 | -,012 | -,042 | ,047 |
| | PDI | ,028 | 1,000 | -,732 | ,035 | ,193 | ,096 | -,378 |
| | IDV | -,012 | -,732 | 1,000 | ,076 | -,124 | ,120 | ,190 |
| | MAS | -,065 | ,035 | ,076 | 1,000 | ,174 | ,029 | -,131 |
| | UAI | -,012 | ,193 | -,124 | ,174 | 1,000 | ,002 | -,241 |
| | LTOWVS | -,042 | ,096 | ,120 | ,029 | ,002 | 1,000 | -,541 |
| | IVR | ,047 | -,378 | ,190 | -,131 | -,241 | -,541 | 1,000 |
| Sig. (1-tailed) | Average | . | ,276 | ,400 | ,084 | ,397 | ,185 | ,162 |
| | PDI | ,276 | . | ,000 | ,232 | ,000 | ,022 | ,000 |
| | IDV | ,400 | ,000 | . | ,054 | ,004 | ,006 | ,000 |
| | MAS | ,084 | ,232 | ,054 | . | ,000 | ,268 | ,003 |
| | UAI | ,397 | ,000 | ,004 | ,000 | . | ,485 | ,000 |
| | LTOWVS | ,185 | ,022 | ,006 | ,268 | ,485 | . | ,000 |
| | IVR | ,162 | ,000 | ,000 | ,003 | ,000 | ,000 | . |
| N | Average | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | PDI | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | IDV | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | MAS | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | UAI | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | LTOWVS | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | IVR | 449 | 449 | 449 | 449 | 449 | 449 | 449 |

**Multiple regression rationality:**

**Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| Average | 4,1408 | ,51786 | 449 |
| PDI | 60,9465 | 20,55832 | 449 |
| IDV | 52,8797 | 25,20990 | 449 |
| MAS | 52,1158 | 19,45955 | 449 |
| UAI | 66,7483 | 22,52065 | 449 |
| LTOWVS | 51,2561 | 21,89685 | 449 |
| IVR | 49,0824 | 20,94273 | 449 |

**Correlations**

| | | Average | PDI | IDV | MAS | UAI | LTOWVS | IVR |
|---|---|---|---|---|---|---|---|---|
| Pearson Correlation | Average | 1,000 | ,137 | -,136 | ,060 | ,036 | -,045 | -,093 |
| | PDI | ,137 | 1,000 | -,732 | ,035 | ,193 | ,096 | -,378 |
| | IDV | -,136 | -,732 | 1,000 | ,076 | -,124 | ,120 | ,190 |
| | MAS | ,060 | ,035 | ,076 | 1,000 | ,174 | ,029 | -,131 |
| | UAI | ,036 | ,193 | -,124 | ,174 | 1,000 | ,002 | -,241 |
| | LTOWVS | -,045 | ,096 | ,120 | ,029 | ,002 | 1,000 | -,541 |
| | IVR | -,093 | -,378 | ,190 | -,131 | -,241 | -,541 | 1,000 |
| Sig. (1-tailed) | Average | . | ,002 | ,002 | ,103 | ,224 | ,173 | ,025 |
| | PDI | ,002 | . | ,000 | ,232 | ,000 | ,022 | ,000 |
| | IDV | ,002 | ,000 | . | ,054 | ,004 | ,006 | ,000 |
| | MAS | ,103 | ,232 | ,054 | . | ,000 | ,268 | ,003 |
| | UAI | ,224 | ,000 | ,004 | ,000 | . | ,485 | ,000 |
| | LTOWVS | ,173 | ,022 | ,006 | ,268 | ,485 | . | ,000 |
| | IVR | ,025 | ,000 | ,000 | ,003 | ,000 | ,000 | . |
| N | Average | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | PDI | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | IDV | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | MAS | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | UAI | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | LTOWVS | 449 | 449 | 449 | 449 | 449 | 449 | 449 |
| | IVR | 449 | 449 | 449 | 449 | 449 | 449 | 449 |

**Variables Entered/Removed[a]**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | PDI | . | Stepwise (Criteria: Probability-of-F-to-enter <= ,050, Probability-of-F-to-remove >= ,100). |

a. Dependent Variable: Average

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | ,137[a] | ,019 | ,017 | ,51354 |

a. Predictors: (Constant), PDI

b. Dependent Variable: Average

**ANOVA[a]**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 2,259 | 1 | 2,259 | 8,565 | ,004[b] |
| | Residual | 117,885 | 447 | ,264 | | |
| | Total | 120,144 | 448 | | | |

a. Dependent Variable: Average

b. Predictors: (Constant), PDI

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | 95,0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. | Lower Bound | Upper Bound | Zero-order | Partial | Part | Tolerance | VIF |
| 1 | (Constant) | 3,930 | ,076 | | 51,781 | ,000 | 3,781 | 4,079 | | | | | |
| | PDI | ,003 | ,001 | ,137 | 2,927 | ,004 | ,001 | ,006 | ,137 | ,137 | ,137 | 1,000 | 1,000 |

a. Dependent Variable: Average

**Excluded Variables[a]**

| Model | | Beta In | t | Sig. | Partial Correlation | Collinearity Statistics | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Tolerance | VIF | Minimum Tolerance |
| 1 | IDV | -,078[b] | -1,131 | ,259 | -,053 | ,464 | 2,153 | ,464 |
| | MAS | ,055[b] | 1,174 | ,241 | ,055 | ,999 | 1,001 | ,999 |
| | UAI | ,010[b] | ,205 | ,838 | ,010 | ,963 | 1,039 | ,963 |
| | LTOWVS | -,058[b] | -1,239 | ,216 | -,059 | ,991 | 1,009 | ,991 |
| | IVR | -,048[b] | -,941 | ,347 | -,045 | ,857 | 1,166 | ,857 |

a. Dependent Variable: Average

b. Predictors in the Model: (Constant), PDI

**Collinearity Diagnostics[a]**

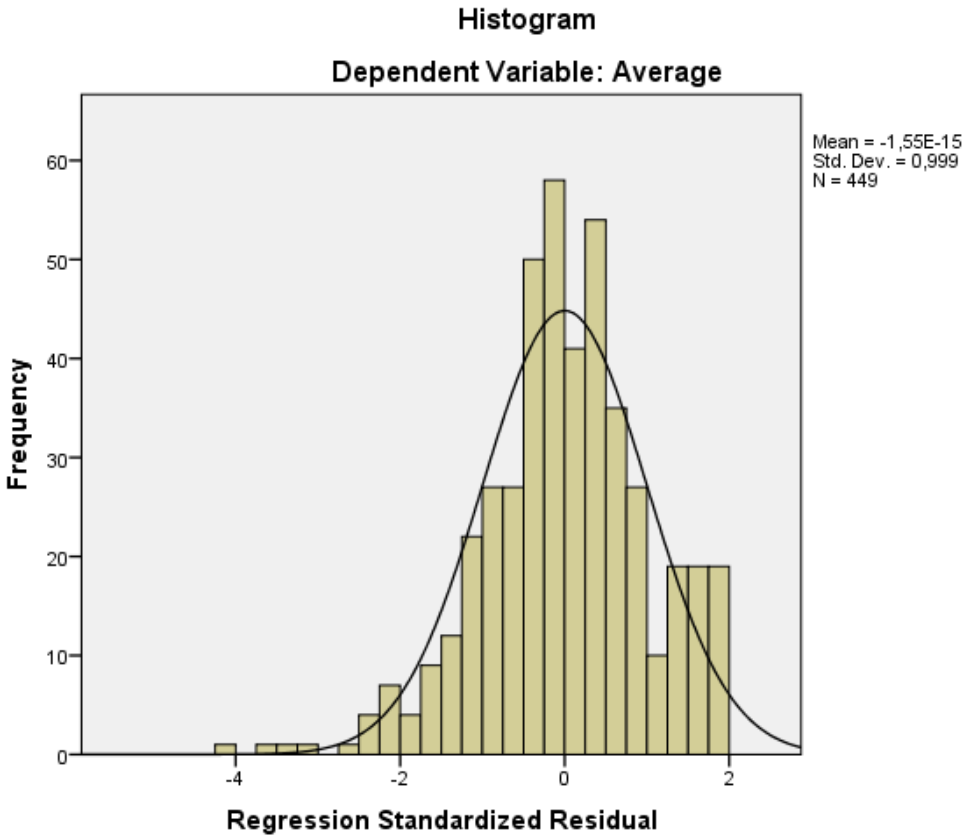
| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions (Constant) | Variance Proportions PDI |
|---|---|---|---|---|---|
| 1 | 1 | 1,948 | 1,000 | ,03 | ,03 |
| | 2 | ,052 | 6,100 | ,97 | ,97 |

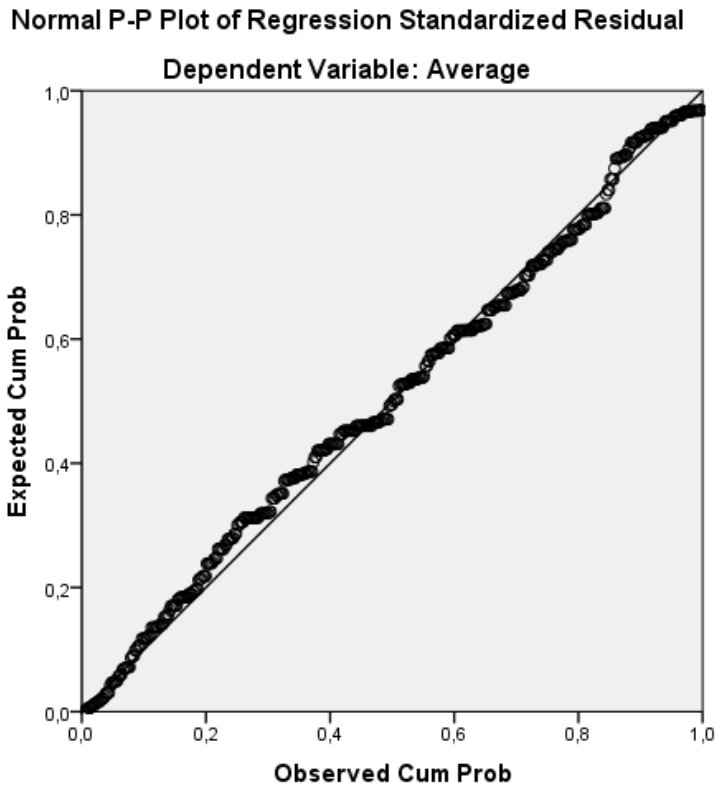
a. Dependent Variable: Average

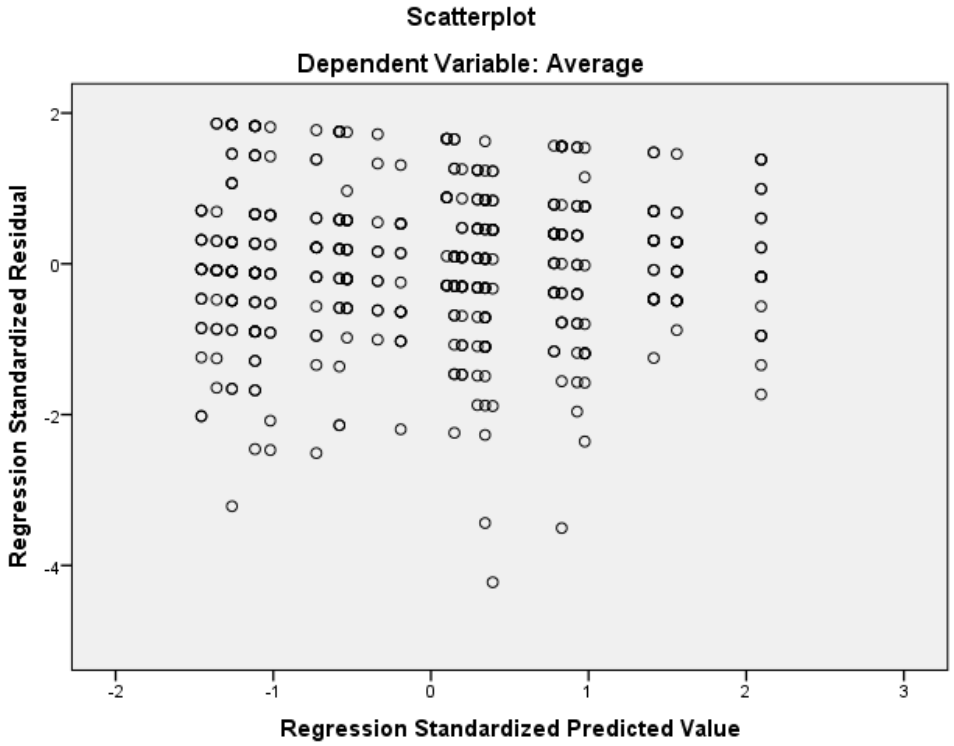
**Residuals Statistics[a]**

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | 4,0373 | 4,2895 | 4,1408 | ,07101 | 449 |
| Residual | -2,16857 | ,95577 | ,00000 | ,51297 | 449 |
| Std. Predicted Value | -1,457 | 2,094 | ,000 | 1,000 | 449 |
| Std. Residual | -4,223 | 1,861 | ,000 | ,999 | 449 |

a. Dependent Variable: Average




Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Average
Expected Cum Prob
Observed Cum Prob
0,0
0,2
0,4
0,6
0,8
1,0


Scatterplot
Dependent Variable: Average
Regression Standardized Residual
Regression Standardized Predicted Value
2
0
-2
-4
-2
-1
0
1
2
3

## C.5 – ANOVA (gender)

### Descriptives

Average

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound | | |
| Male | 287 | 2,6334 | ,71624 | ,04228 | 2,5502 | 2,7167 | 1,00 | 5,00 |
| Female | 162 | 2,8383 | ,76200 | ,05987 | 2,7200 | 2,9565 | 1,00 | 4,80 |
| Total | 449 | 2,7073 | ,73882 | ,03487 | 2,6388 | 2,7759 | 1,00 | 5,00 |

### Test of Homogeneity of Variances

Average

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| 1,614 | 1 | 447 | ,205 |

### ANOVA

Average

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 4,344 | 1 | 4,344 | 8,084 | ,005 |
| Within Groups | 240,202 | 447 | ,537 | | |
| Total | 244,546 | 448 | | | |