



**Universiteit Utrecht**

**Master Thesis U.S.E.**

# **Should You Dare To Be Different?**

## **The Effect of Perceived Personal Distance in Early-Stage Investment Decision Making**

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## **Management Summary**

Research focused on the effect of intercultural differences between investors and entrepreneurs in start-up investment decision making has so far only considered cultural differences to be caused by differences in race, ethnicity or country of origin. This study argues that such a definition of culture is incomplete, and expands this concept by including the dimension of personal distance – described as differences related to thinking, value and communication – into the investment decision framework. Next to investigating the way in which the level of personal distance an investor perceives towards an entrepreneur affects their decision to invest, this study researches whether awareness of personal distance further influences this relationship. By means of an online experiment, a sample of Dutch business students were asked to evaluate the level of perceived personal distance towards a fictional entrepreneur and evaluate their decision to invest in his start-up. In this two-by-two between subjects design, participants were actively assigned to one of four conditions based on different levels of personal distance and awareness. Ultimately, this study accepts the hypothesis that perceived personal distance negatively affects the amount investors are willing to invest in a start-up, and that making investors explicitly aware of a low level of personal distance positively impacts this relationship. Further, this study shows indication of a similar, negative effect of perceived personal distance on the an investor's likelihood of investment, but is not yet able to provide significant proof of such a relationship in light of a low sample size. The acceptance of two hypotheses results into strategical implications for entrepreneurs looking for start-up investment: they are encouraged to look for personally similar investors and highlight interpersonal similarities to increase their chances of receiving investment. On a theoretical note, this study calls for the including of personal distance as a dimension of cultural distance in the investment decision making framework, as well as revisiting the rejected hypothesis in a direct follow up study with an increased sample size.

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## Chapter 1 – Introduction

For a start-up venture, getting access to the right starting capital is the most critical success factor. Not only does a lack of investment financing often result in the inability to turn a business opportunity into a start-up venture, research has also found a positive relationship between external equity and the emergence speed of a new venture, as well as eventual venture success (Reid and Smith, 2000). Contrary to what is often believed, however, the likelihood of receiving investment only is only limited dependent on the strength of a business plan (Kirsch et al., 2009). Instead, when pitching a business opportunity to potential investors, other factors are found to have a much more substantial effect on the investor's decision to invest in a start-up, such as investor gut feel and intuition, and an investor's overall impression about the entrepreneur (Huang and Pearce, 2015). Research on which factors influence investment decisions are mostly focused on observable characteristics related to the entrepreneur rather than their business, as these characteristics, such as trustworthiness (Maxwell and Levesque, 2011), have been found to have a large impact on the investment decision (Sudek, 2006). A common outlook on the way these entrepreneur characteristics influence investment decisions is through the way they influence attitudes or activate bias towards the entrepreneur.

Looking at our current knowledge about the influence of these observable entrepreneur characteristics on investment decisions, two main problems can be identified. Firstly, current research on factors influencing investor decision making is often only focused on characteristics concerning the entrepreneur, thus implicitly assuming that these characteristics influence all investors in the same way. Findings on the positive effect of the use of hand gestures by entrepreneurs in an investment pitch, proposed by Clarke et al. (2019) for example, do not take into account that different investors might evaluate these gestures in different ways, instead assuming no differences in effect between investors. Second, although some conclusions regarding the effect of culture in the investment decision setting can be found, the current definition of culture as used in explaining the investment decision making process is, at best, incomplete. The few studies that currently include culture in their research on start-up investment decisions address culture solely as the country of origin or "race" (e.g. Boulton et al., 2019) of the entrepreneur, providing limited conclusions about the effect of culture in start-up investment settings such as "minority entrepreneurs are less likely to receive angel funding" (Boulton et al., 2019). Only studying culture in this way does not treat culture as a cause of bias in investment decision making in the way that perceived cultural distance does. More importantly, solely referring to culture through country or origin or race does not address the entire scope of (perceived) cultural distance. Research on perceived cultural differences in other settings has found cultural distance to consist of two distinct dimensions: ethnic distance, related to differences in race or country of origin, and personal distance, related to differences in thinking, values and communication. The main reasoning behind the distinction between ethnic and personal distance proposed in literature is the notion of personal connections or distance between people that transcend race or ethnicity (Sanders et al., 2015).

As such, personal distance captures important elements of perceived cultural differences that are not addressed by ethnic distance.

This main goals for this study can thus be described twofold. First, this study aims to contribute to the currently limited understanding of the influence of bias and perception in investor decision making by focusing on perception of differences rather than assuming differences to be seen as equal by all investors. Next to this, it aims to expand the current understanding of the impact of culture in investment decisions by including personal distance as a dimension of culture besides ethnic distance.

Furthermore, next to filling a gap in investment literature, researching the effect of perceived personal distance could also provide value on a social level. Findings about a potential influence of personal distance in an investor's decision making process could have strategic implications for entrepreneurs by advising them on which types of investors to seek out based on not only levels of ethnic, but also personal distance. Furthermore, expanding knowledge on the effect of cultural distance in investment decision making could impact government policies aimed at increasing chances in the labour market by adapting these policies to also influence biases on a personal level, instead of only focusing on increasing equality on an ethnic level. Increasing chances in receiving start-up investment for individuals or groups being perceived as different in a society could increase equality of opportunity as well as decrease the loss of potentially valuable start-ups and ideas.

Next to extending current knowledge on investment decisions making, this study aims to propose a strategy that could possibly reduce an expected negative effect of perceived personal distance through creating awareness of this distance. Multiple studies have found that creating awareness about certain aspects could prime people into overly focusing on this aspect (Schunn and Dunbar, 1996). In this way, it is highly possible that making investors explicitly aware of personal distance between them and an entrepreneur could influence the effect of perceived personal distance on their investment decision. Proof of such a relationship to exist could influence strategies of entrepreneurs in engaging investors with a potentially high perceived cultural distance.

Based on the above named topics of interest in this study - the relationship between perceived personal distance and the potentially moderating effect of awareness on this relationship- the following research question is formulated:

*To what extent does perceived personal distance affect an investor's decision to invest in a start-up venture, and to what extent does awareness of personal distance influence this relationship?*

A theoretical understanding about investment decision making in this study is based on research in this field focused on the influence of observable entrepreneur characteristics on an investor's decision (Clarke et al., 2019; Johnson et al., 2015; Chevy et al., 2019). These studies discuss the effect of entrepreneur characteristics on attitudes and biases of an investor, and are used to substantiate the claim that, though not yet researched in this setting, perceived cultural (personal) distance between an investor and entrepreneur affects the likelihood of investment in a start-up. This effect is hypothesized to be negative. This claim is backed by discussing several theories explaining negative effects of culture (differences) in society, such as the way cultural differences influence attitudes and biases and the way perceived cultural distance influences attitudes and bias in particular. Specifically, research on interpersonal relations and the way perceived cultural distance affects attitudes and biases, through for example the similarity-attraction paradigm (Tsui et al., 1992; Wells and Aicher, 2013), is discussed. This is done by drawing on findings about the influence of perceived cultural distance on the relationship and attitudes between patients and doctors, as the effect of PCD in healthcare has been widely discussed (Street et al. 2008). Finally, the potential impact of awareness on the level of perceived personal distance is considered. This is done by drawing on theories suggesting that awareness of personal differences may increase focus on these differences (Schunn and Dunbar, 1996), affecting the extent to which they are used as a decision making criterion. With this in mind, both a positive and negative hypothesis about the moderating effect of awareness on the PPD-investment relationship is proposed based on the differences between high and low distance conditions.

Hypotheses about the relationships between perceived personal distance, investment decisions and awareness are answered using data gathered by an online experiment. Participating investors were asked to evaluate an investment opportunity under varying levels of perceived personal distance and awareness of this distance. The resulting quantitative data is analysed by testing the hypothesis using simple linear and regression and mediation testing in Stata.

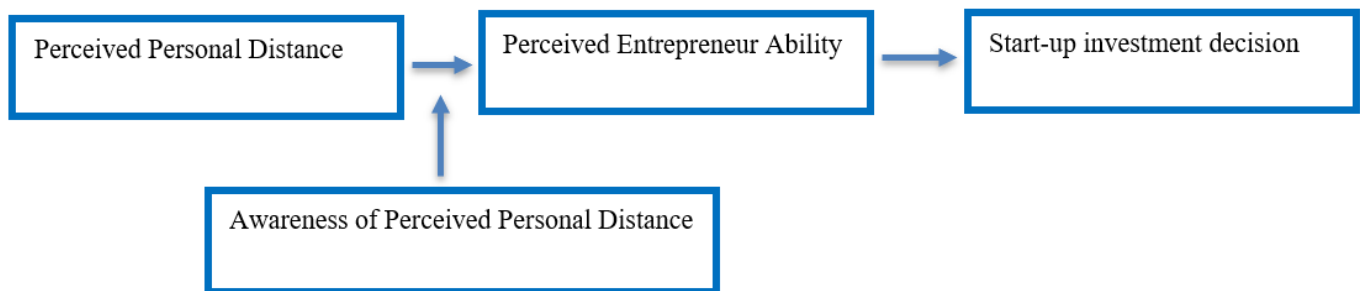
This study provides three main contributions to literature on start-up investment decisions. First of all, this paper aims to show the added benefits of focusing on relative differences between investors and entrepreneurs to explain what effects the likelihood of investment, rather than only focus on entrepreneur attributes as a one-way mechanism. By showing that these perceptive differences are a main component of shaping investor attitudes and biases about entrepreneur, a call for research is made to extend research on current factors influencing investment decision making by including the perceived effects of these factors on investors. In this way, this study challenges existing research on observable entrepreneur characteristics (e.g. Clarke et al. 2019; Johnson, 2015) to reflect on the way investor perceptions of these characteristics influence an investment decision, rather than only their quantifiable values. Second, this paper expands the scope of perceived cultural distance by introducing perceived personal distance as an important factor in the start-up investment decision framework; expanding

current knowledge on the effect of culture in investment decisions, which has so far solely focused on the ethnic dimension. To create a more complete understanding of the impact of culture in investment decision making, existing research on this effect, such as the one provided by Boulton et al. (2019), is advised to expand on their claims by including personal distance in their research instead of only measuring culture based on the dimension of ethnic distance. Finally, this study aims to discuss ways of decreasing negative effects of perceived cultural distance by proposing awareness as a solution. Reasons why awareness of perceived personal distance may or may not influence PPD will be discussed, and a call for more research focused on ways to decrease the negative effect of perceived personal distance in investment decisions will be made. Moreover, the potential finding that awareness about personal distance decreases the extent to which this distance is perceived will be used to help formulate strategies for entrepreneurs to help them receive investment.

## Chapter 2 - Theoretical Framework

### 2.1 Conceptual Model

Consider below the conceptual model of this study as a visualisation of the main relationships researched: the effect of perceived personal distance on an investor's decision and the mediating and moderating effects of perceived entrepreneur ability and awareness on this relationship. The idea of entrepreneur ability as a mediating force between perceived personal distance and an investor's start up investment decision will be introduced in section 3.2.2.



### 2.2 Literature review

#### 2.2.1 Start-up investment decision making

As mentioned in the introduction, research on investment decision making has found that business plans often have a limited impact on an investor's decision (Kirsch et al., 2009), and that investors instead base their decision on their perception of the entrepreneur in light of an overall lack of credible information and information asymmetries. In line with most research on factors influencing investor decision making, this study will focus on factors related to the entrepreneur which are observable by investors, such as the use of hand gestures (Clarke et al, 2019), whether an entrepreneur articulated a disruptive vision (van Balen, 2019) or even the entrepreneur's gender (Johnson, 2015). This study draws on previous findings discussing how these observable factors can unconsciously affect an investor's assessment of an opportunity, through for example implicit attitudes or biases.

As mentioned in the introduction, research in this area has already provided proof that culture is such a factor, with higher (perceived) cultural distance negatively affecting an investor's investment decision. As a result, entrepreneurs who are culturally different from investors face more difficulties acquiring investment compared to entrepreneurs who are culturally similar. A good example of such a consequence is the fact that minority entrepreneurs are significantly less likely to receive investment (Boulton et al. 2019). The main mechanism behind the influence of culture on an investor's decision this study relies upon is similarity-attraction theory (Tsui et al., 1992), which suggests that similarities between people increases interpersonal attraction and positively influences attitudes towards each other



(Wells and Aicher, 2013). In this way, cultural similarities between an investor and entrepreneur would lead to favourable investor attitudes towards the entrepreneur, while cultural differences would lead to unfavourable attitudes, both affecting the investor's decision.

Although the effect of culture on investment decision making seems clear in this regard, it is important to note that investment decision research only looks at culture as consisting of differences in race, ethnicity or country of origin. This definition of culture is lacking, as an investor's perception of cultural differences between themselves and an entrepreneur are influenced by more than just these factors. This study aims to expand on this incomplete understanding of the effect of culture in investment decision making by focusing on a dimension of culture which has so far been overlooked.

### *2.2.2 Perceived Personal Distance*

Multiple studies have proven that objective and subjective measures of culture do not always correlate with each other, in a way that two cultures can be similar on objective measures but still perceived to be dissimilar and vice versa (Bierwiazonek & Waldzus, 2016; Suanet & van de Vijver, 2009). As such, in measuring cultural differences between individuals, such as between investors and entrepreneurs in the setting of this study, perceived cultural distance as a relative measure is preferred way to measure cultural differences over for example the Hofstede dimensions (Hofstede, 1980). Although no clear interdisciplinary definition of perceived cultural distance can be found in literature, a commonly accepted principle in this literature is that perceived cultural difference consists of different dimensions. Here, the distinction between culture as defined by demographics such as race or country of origin as opposed to culture as a measure of personal character is often made.

This paper bases the conceptualization of perceived cultural distance on previous research by Street et al. (2008), who propose the following two dimensions of cultural distance (note that in their paper they refer to it as cultural similarity) to account for this distinction:

*Personal distance:* Includes items reflecting differences in thinking, values, and communication.

*Ethnic distance:* Includes items related to race and community.

The main reason for such a distinction of cultural distance is to account for the often made mistake of solely referring to cultural distance through differences related to race or ethnicity. Research has shown proof of personal connections or differences between people that transcend race or ethnicity (Sanders et al., 2015). As a simple example, consider that a Dutch investor is expected to perceive more cultural distance towards an entrepreneur when this entrepreneur is a baker, than when they share the investor's background in finance/business, even when the entrepreneur shares the Dutch nationality of the investor in both cases. As such, using perceived personal distance as a dimension of perceived cultural distance allows us to account for perceived distance that cannot be attributed to differences in race or ethnicity.

As can be seen above, important items constituting this type of distance are differences in thinking, values and communication that are not caused through a difference in race or ethnicity between two people, but rather through differences in demographics such as age, gender, education and profession (Pascal, 2019). Even though these items capture only a few dimensions of culture, they have been found to be the most relevant dimensions to the effect of cultural differences in individual interactions (Saha et al., 2011), and are thus applicable for this study.

Concerning exact factors of personal distance, this study draws inspiration from research on the effect of personal similarity on moral judgements, following the paper from Pascal (2019). In this paper, the main factors impacting personal similarity (or in the case of our study, distance) proposed are age, profession, education and hobbies. Pascal (2019) reasons that the more of these aspects between people are different (similar), the higher (lower) the personal distance someone perceives to exist towards the other person. These factors are adopted both to actively manipulate perceived personal distance in this study, while simultaneously proving that these factors are main drivers of perceived personal distance between an investor and entrepreneur.

Studies using personal distance or similarity as a dimension of cultural distance have shown that, similar to the effect of ethnic distance, a greater personal distance often negatively impacts attitudes between people. In an experiment conducted by Herzog (2008) for example, participants tasked to assess the severity of punishment someone should receive for committing a crime were found to give significantly more severe punishments when the personal distance between them and the offender is large. Next to the similarity-attraction paradigm introduced in section 2.1.1, multiple explanations for the fact that a greater personal distance leads to more negative evaluations of attitudes of people have been given; a higher personal distance for example decreases the extent to which people are able to sympathize with another (Herzog, 2008), and activates a tendency to evaluate out-group members more negatively (Cashdan, 2012; De Zavala et al., 2013).

As these negative effects of perceived personal distance can be expected to have implications in the setting of investment decisions as well, and no research on perceived personal distance as a dimension of perceived cultural distance has been done, this study will focus on the effect of perceived personal distance on an investor's likelihood to invest in a start-up.

## 2.3 Hypotheses Development

*The following section formulates hypotheses about the relationships of interest in this study.*

### 2.3.1 Perceived Personal Distance

As mentioned before, the idea of (perceived) cultural distance and its effect on an investor's investment decision has so far only been researched in terms of ethnic distance by studies addressing the influence of race and country of origin in the investment decision making process. Since this study aims to introduce perceived personal distance as the other side of cultural distance in the investment decision making setting, a first point of interest is to establish factors that constitute perceived personal distance.

In this study, personal distance is assumed to consist of four main factors: age, profession, education, background and hobbies. The extent to which investors perceive themselves to be personally different or similar to an entrepreneur is expected to be affected by these factors: when investors observe these entrepreneur characteristics to be similar to themselves they will ultimately perceive less personal distance towards the entrepreneur compared to when they observe the characteristics to be different to themselves. With this in mind, hypothesis 1 is formulated.

*H1: Greater differences in age, profession, education and hobbies between an investor and entrepreneur increase the extent to which investors perceive an entrepreneur to be personally distant.*

### 2.3.2 Perceived Personal Distance and Investment Decision

Looking at research on the effect of cultural differences and perceived personal distance, the consensus that greater cultural distance, for both the dimensions of personal and ethnic distance, leads to negative outcomes in interactions can clearly be found. Cultural distance is often found to lead to unconscious, negative attitudes such as bias and prejudices against people who are perceived to be distant (Mahfud et al., 2018). An examples of a common explanation for the negative effect of perceived cultural distance are a tendency to have unfavourable attitudes towards members of an out-group compared to attitudes towards one's in-group (Cashdan, 2012; De Zavala et al., 2013).

Specifically, perceived cultural (personal) distance has been found to be a cause for negative attitudes towards people in individual interaction, for example between patients and doctors (Alizadeh and Chavan, 2020; Street et al. 2008; Saha et al., 2011) or members of a host-society and migrants (Mahfud et al., 2018). Combining these findings with the previously mentioned findings that investors are susceptible to unconscious attitudes such as bias in investment decision making (e.g. Johnson et al., 2015), it is expected that perceived personal distance will have a similar effect on the attitude of investors towards entrepreneurs.

Specifically, this study argues that the expected negative effect between perceived personal distance on both the likelihood and amount of investment is caused by the similarity-attractiveness paradigm, with investors holding favourable attitudes towards entrepreneurs they perceive to be personally similar and unfavourable attitudes towards entrepreneurs they perceive to be personally different.

These attitudes are expected to influence the extent to which investors perceive an entrepreneur to be competent or able to run a business, further referred to as “perceived entrepreneur ability”. Investors who perceive a high level of personal distance towards an entrepreneur -and thus hold less favourable attitudes towards them based on the similarity-attractiveness paradigm- are expected to perceive the entrepreneur to be less competent than investors who perceive a low level of personal distance and hold more favourable attitudes. Since an investor’s perception of an entrepreneur’s ability is found to strongly impact their investment decision (Maxwell and Levesque, 2011), this study suggests perceived entrepreneur ability as the main mechanism behind a negative effect of perceived personal distance on an investor’s decision.

Hypothesis H2A and H2B test the effect of perceived personal distance on an investor’s investment decision. In this study, the decision an investor makes about investing in a start-up is evaluated in two ways: the likelihood that an investor will invest, and the amount an investor is willing to invest once they decided to invest. Based on the reasoning that higher perceived personal distance results in a lower perceived entrepreneur ability through a less favourable attitudes towards the entrepreneur, and the positive effect of perceived entrepreneur ability on an investment decision found in literature, the hypotheses are formulated as follows:

*H2A: Greater perceived personal distance reduces the likelihood for an investor to invest in a start-up.*

*H2B: Greater perceived personal distance reduces the amount an investor is willing to invest in a start-up.*

### *2.3.3 Awareness of Perceived Cultural Distance*

Next to researching the effect of perceived personal distance on an investor’s investment decision, this study aims to research whether creating awareness about this distance could mitigate the expected negative effects of perceived personal distance in investor - entrepreneur interactions. In order to introduce awareness as a way of increasing the likelihood of receiving investment based on its interaction with personal distance, it is necessary to find out whether awareness of personal distance actually affects the relationship between perceived personal distance and an investor’s investment decision. In other words, to what extent are investors who are explicitly aware of the level of personal distance between them and an entrepreneur more (or less) likely to invest as opposed to investors who are not (explicitly) aware of this distance?

A look at research in the domain of behavioural studies gives an impression of the impact awareness about perceptions could have about the effect of these perceptions or the way they are being used. The main reasoning here is that when people are aware of certain stimuli, these stimuli can provide a strong signal, causing people to overly focus on this stimuli and focus less on other aspects (Pentland, 2007). In this way, creating awareness about a certain aspect or attribute of something/someone acts as a way of priming someone's attention towards this, increasing their influence on subsequent actions or decision (Schunn and Dunbar, 1996). Explained more simply, when people are made explicitly aware about a product attribute, such as its packaging, they are likely to overly rely on this attribute when deciding to buy the product or not. In our setting of start-up investment decision making, awareness about personal distance towards an entrepreneur could prime an investor to overly rely on their perception of this distance when deciding whether to invest. This would turn personal distance into an important investment criterion for investors who are made aware of this distance, while investors not explicitly aware of personal distance towards the entrepreneur might not consider this distance to be a factor of importance at all in deciding whether to invest.

When moderating the PPD – investment decision relationship in this way, awareness of perceived personal distance is not expected to always impact this relationship in a positive or negative way, but to depend on the level of perceived personal distance by increasing the effect size of perceived personal distance. Investors who are explicitly aware of a high level of perceived personal distance towards an entrepreneur are expected to be less likely to invest, as they actively use the negative attitudes towards the entrepreneur created by using this distance as a criterion for their investment decision. On the contrary, investors who are explicitly aware of a low level of personal distance towards an entrepreneur are more likely to invest, as they actively use the positive attitudes towards the entrepreneur created by this distance as a criterion for their investment decision. Hence, although investors who are made explicitly aware of personal distance will actively use this as an investment criterion regarding of their perception of this distance, their perception will determine whether they evaluate this criterion positively or negatively.

In short, awareness of perceived personal awareness is expected to enhance the relationship between PPD and the investment decision: negatively affecting the investment decision when PPD is high through a focus on differences, and positively affecting the investment decision when PPD is low through a focus on similarities. Based on this, the following hypotheses H3' based on the moderating role of awareness are formulated:

*H3A: When personal distance is high, awareness of personal distance negatively impacts an investors decision to invest in a start-up.*

*H3B: When personal distance is low, awareness of personal distance positively impacts an investors decision to invest in a start-up.*

## **Chapter 3 – Methodology**

*This section introduces the online experiment that will be used to gather data for this study.*

### **3.1 Experimental Design**

To study whether perceived personal distance influences an investor's likelihood to invest in a start-up opportunity and the extent to which awareness affects this relationship, this study will follow a between-subjects experimental design. As literature has shown that perceived personal distance can be a hard variable to measure, the nature of this experimental design is beneficial, as it allows for an active manipulation of this distance. Furthermore, conducting this experiment through means of an online survey will render the abstract concept of perceived personal distance measurable by using predetermined scales as measurement items. Lastly, experimental research is suitable for this research purpose as it enables the random assignment of participants into distinct conditions, which are important in comparing the effect sizes of different levels of perceived cultural distance, while simultaneously detecting a potential effect of awareness on the relationship between PPD and the investment decision.

### **3.2 Procedures**

Participants were sent a survey showing a fictional investment opportunity, where they were asked whether they would invest in the presented start-up. The investment opportunity presented in this experiment was based on the "Willyspheres", a children's toy that can be used to easily create perfect spheres from sand or snow. This product was voted 2<sup>nd</sup> place by the public in "Het beste idee van Nederland" (the best idea of the Netherlands), a contest where amateur inventors present their products, and subsequently went into large scale production. The investment opportunity presented in the online experiment featured a short introduction about the entrepreneur behind the start-up, as well as a description of the product and a call for investment. The product description was deliberately kept short and simple as to not shift the participant's focus from the entrepreneur behind the start-up. Both the description of the entrepreneur and product were anonymized in the experiment and altered to fit the goal of the research. The product and entrepreneur description can be found in Appendix 1.

Participants in the experiment were randomly assigned to one of the four conditions presented below. The distinction between high and low perceived personal distance conditions allows to test whether the manipulation of this distance, addressed in section 3.4, is successful for H1, while simultaneously increasing variance in the level of perceived personal distance between respondents in favour of H2a and H2b. As this study is interested in the overall impact of PPD on an investor's investment decision, and not on the direct effect of the manipulation of personal distance, the distinction between high and

low PPD conditions will only be used to answer H1 and H3. When analysing experiment results to answer hypotheses H2', the natural variation in perceived personal distance will be used.

**Condition 1 – Low perceived personal distance / no awareness:** An investment opportunity is presented where the perceived personal distance between the investor and entrepreneur is low. This is done by presenting the entrepreneur with emphasis on characteristics that are perceived as similar.

**Condition 2 - Low perceived personal distance / awareness:** An investment opportunity is presented where the perceived personal distance between the investor and entrepreneur is low. Next to this, the participants in this condition received treatment in such a way that they were explicitly aware of personal distance when evaluating the investment opportunity.

**Condition 3 - High perceived personal distance / no awareness:** An investment opportunity is presented where the perceived personal distance between the investor and entrepreneur is high. This is done by emphasizing characteristics that are perceived as different when presenting the entrepreneur.

**Condition 4 – High perceived personal distance / awareness:** An investment opportunity is presented where the perceived personal distance between the investor and entrepreneur is high. Next to this, the participants in this condition received treatment in such a way that they were explicitly aware of this perceived personal distance when evaluating the investment opportunity.

To control for any confounding effects, emphasis on the characteristics of entrepreneur that are perceived as either similar or different were the only differences between the two high and low perceived personal distance conditions.

### **3.3 Sampling**

As the experimental design of this study, with participants randomly allocated to four different conditions, calls for a large sample, participants in the experiment are sampled using a convenience sample. Using personal connections and networking, a sample of Dutch students with an educational background in business is approached. Besides seeing this sampling method as the best way to generate enough respondents, it also ensures that participants in the experiment share the same demographic in terms of the aspects of personal distance used in this study: age, profession and educational background. Moreover, as all participants in the sample have the same national background, ethnic distance is expected to not play a cofounding role in explaining the respondent's investment decisions in the experiment. The type of student included in the sample was not only limited to business students to ensure all respondents share the same educational background, but also to best represent the ideal sample of (angel) investors. No further limitations to participant demographics were included in the

sample to allow for a large enough sample. Possible confounding effects of demographics not controlled for in the sample, such as gender, were measured in the experiment and included as a control variable.

The above described sampling method led to an overall sample size of 55 participants. As this is a smaller sample size than expected, the consequences with regards to interpreting the analysis results will be addressed in chapter 5.

### **3.4 Operationalization**

*The following section discusses the variables of interest in this study and the way they are conceptualized in the online experiment.*

#### *3.4.1 Start-up investment decision making*

The dependent variable in this study, the decision an investor makes about an investment opportunity, is measured on a ratio scale. Participants in the experiment were first asked whether they would like to invest in the start-up by answering how likely they would be to invest in the presented investment opportunity ranging from “very unlikely” to “very likely”. Next, participants were asked to indicate the monetary amount they would be willing to invest in the presented investment opportunity by answering the question “Imagine you have €100,000 in savings you want to invest. Regardless of your answer on the previous question, how much of these savings would you be willing to invest in SandSphere?”. A second framing of this question was added in the pre-test of the experiment, asking participants “Similar to the previous question, imagine that you are an investor working for an investment company. You are asked to decide how to invest the €100.000 you are managing. If SandSphere is amongst one of the options to invest in, how much would you be willing to invest in SandSphere?”.

#### *3.4.2 Perceived Personal Distance*

Participants of the experiment were expected to perceive either a low or high personal distance towards the entrepreneur presented in the fictional investment opportunity, depending on which condition they are randomly assigned to. Because of this, the entrepreneur description as part of the presented investment opportunity included the items of personal distance used in this study: age, profession, educational background and hobbies. Between the high and low perceived personal conditions, these characteristics are manipulated to represent either a difference or a similarity with regards to our sample size (see Appendix 1). In this way, the entrepreneur presented in the low PPD condition is said to be 24 years old, works as a junior business consultant and has studied business on a university level. Contrary to this, the entrepreneur presented in the high PPD condition (with the same name), is 54 years old, works as a sculpture artist and has studied arts on a Dutch MBO level. Compared to age, profession and educational background, no criteria in selecting the sample controlled for differences in hobbies between the respondents. Because of this, the entrepreneur included in the investment description is



said to have a very common hobby (football) in the low PPD condition, compared to a relatively uncommon hobby (ultimate frisbee) in the high PPD condition.

To ensure that participants were subjected to the manipulation of perceived personal distance in the experiment, respondents were asked to answer the following attention question after reading the investment opportunity description: “ “What is the profession of the Entrepreneur”, with the correct answer being “junior business consultant” for the low PPD condition, and “sculpture artist” for the high PPD condition. This attention question served a dual purpose, at it also highlighted an important similarity (low PPD) or difference (high PPD) right before allowing participants to continue to the next part of the survey.

To test whether the participants assigned to the low and high PPD conditions did indeed experience either a low or high perceived personal distance towards the entrepreneur in the experiment, and thus to ultimately answer H1, a manipulation check was included in the experiment. This manipulation check consisted of items of personal distance adapted from the perceived similarity items used by Street et al. (2008). To measure personal distance instead of similarity, these items were reverse coded similar to the way Alizadeh and Chavan (2020) did. As this study focuses on perceived personal distance in a different setting than the studies that have previously used this measure of PCD - the investor-entrepreneur relationship rather than the patient-doctor relationship - the statements were adapted to reflect the entrepreneur the participants are evaluating, as well as made more relevant to the entrepreneur description provided in the experiment. The statement “The way my doctor and I reason about problems is ...” used to measure perceived personal distance, will for example be adapted to “The way the entrepreneur and I reason about business ideas is ..... A full description of the items used can be found in Appendix 2.

### *3.4.3 Perceived Entrepreneur Ability*

As can be found in the hypothesis development, the expected main driver of the effect of perceived personal distance on the investment decision is the influence of PPD on the way an investor evaluates the ability of an entrepreneur. When perceived personal distance is high, the investor is expected to evaluate the entrepreneur as less competent and vice versa. To test whether entrepreneur ability is indeed the main mechanism behind the effect of PPD on the investment decisions, the way participants evaluate the entrepreneur presented in the investment opportunity was measured in the experiment, and subsequently included in the model analysis.

In the experiment, entrepreneur ability was measured by asking the participants to evaluate the entrepreneur on 5 statements. These statements were adapted from Mayer and Davies (1999), who measured employee trust in top management, and Moro et al. (2014), who studied investor evaluations of entrepreneurial competence in the small business context. Statements used to measure

ability/competence in these papers were adapted in such a way to be relevant to the investment opportunity presented in the experiment, and can be found in Appendix 4.

#### *3.4.4 Awareness*

Random assignment determined whether participants in the experiment are assigned to the treatment condition, which consists of creating awareness of personal distance before a participant is asked to evaluate the investment opportunity.

Awareness of personal distance is simulated in the experiment through the order in which participants are asked to evaluate the personal and ethnic similarity between them and the entrepreneur and the investment opportunity. Participants in the no-treatment conditions were asked to evaluate the investment opportunity before answering the statements about perceived personal and ethnic distance. This procedure is very common in research, as it ensures that the idea of perceived personal distance does not create any bias regarding the participant's evaluation of the investment decision. In the treatment conditions however, the influence of perceived personal distance on the evaluation of the investment condition is the measure of interest. As such, participants in the treatment conditions were asked to evaluate perceived personal distance before evaluating the investment opportunity. In this way, participants in the treatment condition are expected to be explicitly aware of PPD when evaluating the investment opportunity, while for participants in the no-treatment conditions PPD acted as an implicit attitude in evaluating the investment opportunity.

#### *3.4.5 Social Desirability*

Within the setup of our experiment, social desirability is expected to be the main threat to the validity and reliability of the results. Social desirability in self-report surveys is described as subjects giving socially desirable responses by over- or underreporting their behaviour (Kwak et al., 2021). In this way, participants in our experiment could either underreport the perceived personal difference towards an entrepreneur, or overreport their intention to invest in the opportunity. To reduce a potential confounding effect of social desirability bias (SDB), social desirability bias is measured in the experiment and included as a control variable in the data analysis.

Social desirability bias is measured using items of the Marlowe-Crowne scale (Crone & Marlowe, 1960), the most commonly used scale for measuring SDB. As the full 33 item Marlowe-Crowne scale is considered to be too large to include in our survey – in fear of creating fatigue amongst participants, a shortened version of this scale as proposed by Strahan and Gerbasi (1972) will be used. Their scale consists of positive and negative coded items such as “I always try to practice what I preach”. This scale has been found to be best shortened version of the Marlowe-Crowne scale, as it has a high internal consistency and is highly correlated with the original scale (Fischer and Fick, 1993).

#### *3.4.6 Other control variables*

Based on a review of investment literature, common factors influencing investment decisions, gender, age and risk preference, were measured in the experiment to be included as control variables. Participants were asked to state their preferred gender and their age, as well as answer the question “how much do you describe yourself as willing to take risks” on a range of “none at all” to “a great deal”.

### **3.5 Data analysis**

The data gathered in the experiment is analysed using quantitative methods in Stata. Responses on the items used to measure perceived personal distance, perceived entrepreneur ability and social desirability bias are used to create single item measures of these variables by computing the average score of a participant on these items. For these variables, a the Cronbach’s Alpha score is used to test construct validity.

After answering H1 using the manipulation check described in section 3.4.2, hypothesis H2’ and H3’ are addressed based on a linear regression. As described in H2’, the effect of perceived personal distance on both the likelihood of investment and amount investors are willingness to invest in the investment opportunity will be analysed. This is done by running two regression models where the investment amount and investment likelihood serve as the models dependent variables. Based on subsequent evaluation of the models robustness, both a regression model including and excluding control variables is run and presented in the findings section. Argumentation regarding which model is used to answer hypotheses H2’ and H3’ can be found in sections 4.2.5 and 4.2.7. Both hypotheses are either accepted or rejected based on the effect sized denoted by the respective variables’ coefficient in the regression results and it’s corresponding significance value based on a T-test.

As mentioned both in this study’s conceptual model and section 2.2.2, this study relies on a mediating role of an investor’s perceived ability of the entrepreneur to explain the effect of perceived personal distance on the investor’s investment decision. To test whether this is indeed the case, a mediation test using structural equation modelling (SEM) is used, the results and interpretation of which can be found in section 5.2.6. Indirect effects of perceived personal distance on the investment decision through perceived entrepreneur ability are analysed, with the interpretation of the corresponding coefficient and Z-test score used to draw a conclusion about the mediating role of entrepreneur ability.

## Chapter 4 - Findings

### 4.1 Pre-test Results

Before setting out the experiment to our final sample, a small pre-test with the help of 10 students from the International Management Master at Tilburg University was conducted. The main goal of this pre-test was to test both whether the low and high PPD conditions did indeed result in a difference in perceived personal distance, and whether asking participants whether they would invest €100.000 of their own or an investment company's money proved more effective. Due to the sample size of this pre-test being only 10, no statistical analysis was performed on the results. Instead, conclusions regarding the effectiveness of the PPD and investment were drawn based on the descriptive statistics presented in Table 1.

Table 1 describes the descriptive statistics regarding the level of PPD for each of the four conditions a participant in the experiment could be assigned to. Please note that even though participants answered the PPD items on a scale from "very different" to "very similar", the responses have been reverse coded to reflect perceived personal distance rather than perceived personal similarity. Hence, a higher score on PPD reflects a greater perceived personal distance between a participant and the entrepreneur in the experiment. A similar reverse coding will also be applied for the PPD items in the main experiment. Although no real inferences on these statistics can be made due to the low sample size, the fact that the average PPD for both "high PPD" conditions is higher than the average PPD for both "low PPD" conditions indicate that participants assigned to a high PPD condition do indeed experience a higher level of perceived personal distance. Based on this, the manipulation of perceived personal distance in the pre-test is also used in the main experiment.

As can be seen in Table 2, the investment measure that asked participants to imagine they work in an invest firm and invest €100.000 of the company's money lead to a higher average investment indicated by participants than the investment measure asking participants to invest a portion of their own money. As we are ultimately interested in the effect of perceived personal distance on the investment decisions, it is beneficial to capture more variation in our measurement of the investment decision. The higher standard deviation of the company investment framing indicates that when asking participants to invest a portion of a company they imaginably work for, the variation between stated amounts is higher than when participants are asked to invest a portion of their own money. Because of this, the company investment version of the investment decision question is the one that has been chosen to measure the amount participants are willing to invest in the company in the online experiment.

Table 1: Descriptive statistics for PPD per condition

Condition	Obs.	Mean PPD	Std. Dev.	Min	Max
High PPD / Awareness	4	4.125	0.75	3.5	5
High PPD / No Awareness	2	5	0.94	4.33	5.67
Low PPD / Awareness	3	3.72	0.79	2.83	4.33
Low PPD / No Awareness	1	3	3	3	3

Table 2: Descriptive statistics for Investment Decision measures

Variable	Obs.	Mean	Std. Dev.	Min	Max
Personal investment	10	6.4	7.121173	0	20
Company investment	10	13.5	9.300538	0	30

## 4.2 Main experiment results

### 4.2.1 Descriptive statistics

Table 3 shows the descriptive statistics of all the variables included in the various models used in this study used to analyse the effect of perceived personal distance on the investment decision and the influence of awareness on this relationship. A quick overview of these variables can be found below:

*Investment Likelihood:* The extent to which participants said they were likely to invest, ranging from 1 (very unlikely) to 5 (very likely)

*Investment Amount:* The amount participants were willing to invest in the investment opportunity, ranging from 0 to 100 (and can thus be translated to percentages).

*PPD:* The average perceived personal distance of participants.

*Awareness:* a dummy variable which denotes whether a participant was assigned to an awareness (1) or no awareness (0) condition.

*High PPD / Awareness:* Interaction between the High PPD condition and Awareness dummy variable.

*Entrepreneur Ability:* The participant's evaluation of the ability/competence of the entrepreneur behind the investment opportunity, ranging from 1 to 5.

*Risk Preference:* The extent to which participants evaluate themselves as risk taking, ranging from 1 (highly risk averse) to 5 (highly risk seeking).

*Social Desirability:* The participant's overall social desirability score.

*Gender:* A dummy variable denoting whether a participant is male (1) or female (0). The two respondents who choose a third option when asked for their preferred gender are discarded in this variable.

As can be seen in Table 3, the experiment resulted in an overall sample of 55 respondents after the deletion of respondents who opened the survey but did not answer any questions (10) and respondents who did not pass the attention check in the experiment (2). Considering the experimental setup of this study, the final amount of 55 respondents can be considered to be relatively low, as the amount of respondents is lower than the suggested sample size of 71 that is found when running a power test using the actual  $R^2$  of model 3 of 0.1852 (see Appendix 5). This creates sampling issues when interpreting results, which will be addressed further in this paper.

*Table 3: Descriptive statistics*

<b>Variable</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Investment Likelihood	55	2.636364	1.060462	1	5
Investment Amount	55	23.05455	20.64283	0	100
PPD	55	3.824242	1.023599	1.833333	5.66667
Awareness	55	0.545454	0.5025189	0	1
High PPD / Awareness	55	0.545454	0.4396203	0	1
Entrepreneur Ability	54	3.351852	0.6203288	1.6	5
Risk Preference	54	3.611111	1.250157	1	6
Social Desirability	54	3.722222	0.5530079	1.75	4.75
Gender	53	0.537037	0.5033084	0	1

#### *4.2.2 Pairwise Correlation*

Table 4 shows the correlation coefficients of the variables used in this study, based on the Pairwise correlation test. With the low sample size in mind, it is no surprise that the majority of correlation coefficients between the variables in this study are rather low (ranging from as small as +/- 0.0005 to roughly 0.3). Because of this, correlation coefficients starting at +/- 0.4 are considered to be the “stronger” correlations in this study.

When looking at the pairwise correlation matrix, the low correlation coefficients of control variables risk preference and social desirability with the dependent variables investment amount and investment likelihood suggest that the control variables included in this study are less strong in predicting the investment decision of participants than expected. Besides considering these control variables to have little or no relationship with an investor’s investment decision, a possible explanation for this could be that due to the low amount of respondents in the sample, the regression model does not support the inclusion of 7 variables, but would rather perform better with a smaller number of variables included. With this in mind, the results of regressing one or both of the dependent variables on a model including control variables will lead to the decision of whether to include the control variables in this study at all.

Next to this, it is interesting to note that the correlation coefficients of perceived personal distance (for example with the investment amount) are the strongest value in Table 4. This suggests that basing conclusions, such as on the effect of PPD on the investment decision, on the natural variation of perceived personal distance between respondents is indeed the most logical option in this study.

Table 4: Pairwise correlations

	Investment Amount	Investment Likelihood	PPD	Awareness	High PPD / Awareness
Investment Amount	1.0000				
Investment Likelihood	0.4518	1.0000			
PPD	-0.3317	-0.1168	1.0000		
Awareness	0.0185	0.0663	0.0982	1.0000	
High PPD / Awareness	-0.1505	0.0433	0.3825	0.5334	1.0000
Entrepreneur Ability	0.2936	0.2704	0.2796	0.1846	0.2114
Risk Preference	-0.0005	0.0369	0.0219	-0.2207	-0.0872
Social Desirability	-0.0972	-0.2008	0.0277	0.0057	0.0300
Gender	-0.2127	-0.1685	0.0712	0.0664	-0.1287

	Entrepreneur Ability	Risk Preference	Social Desirability	Gender
Entrepreneur Ability	1.0000			
Risk Preference	-0.2387	1.0000		
Social Desirability	0.0978	-0.2138	1.0000	
Gender	-0.3991	0.2482	-0.0979	1.0000

#### 4.2.3 Internal consistency of scales: Cronbach's Alpha

Multiple variables in the experiment are measured using a scale made up of multiple items; perceived personal distance, entrepreneur ability and social desirability. As a first step in the main experiment data analysis, the Cronbach Alpha scores for these scales were used to measure the internal consistency of the scales. The results of the corresponding Cronbach Alpha tests can be found in Table 5 below.

As can be seen in Table 5, perceived personal distance - the main independent variable of interest in this study - and entrepreneur ability – used to test whether a change in perceived personal distance affects an investor's investment decision through a change in the perception of an entrepreneurs ability – have sufficient Cronbach Alpha scores of ( $\alpha = 0.7875$ ,  $\alpha = 0.7200$ ). Since excluding one or multiple items in these scales does not increase the alpha scores of the scales, all scale items are used in determining a respondent's average perceived personal distance and perceived entrepreneur ability. Based on the commonly used rule of thumb, where a scale with an alpha score of  $> 0.70$  is deemed reliable (e.g. Shemwell et al. 2015), both scales are considered suitable to use in statistical models.

The social desirability scale has a relatively low alpha score ( $\alpha = 0.5516$ ) when all scale items are included. When limiting this scale to only items 4, 6, 7 and 8 (see Appendix 3), this score increases to 0.6423. Although this does not meet the necessary threshold of 0.7, the fact that this score is fairly close to this threshold leads to the decision to stick to the use of social desirability as a control variable and reconsider its necessity when its impact on the statistical models has become clear.

Table 5: Cronbach's Alpha for scale variables

Scale	Number of items	Cronbach's Alpha
Perceived Personal Distance	4	0.7936
Entrepreneur Ability	5	0.7200
Social Desirability	8	0.5516
Social Desirability	4	0.6423

#### 4.2.4 Perceived Personal Distance

Hypothesis 1: “Greater differences in age, profession, education and hobbies between an investor and entrepreneur increase the extent to which investors perceive an entrepreneur to be personally distant.” aims to test whether perceptions of the cultural distance between them and the entrepreneur differ between participants. To do so, we test whether assignment to either the high or low perceived personal distance conditions in the experiment did indeed result in a distinction between the level of PPD amongst participants using a manipulation test. In other words, this manipulation test studies whether the different conditions work in the way the manipulation between these conditions was intended. As the difference between “awareness” and “no awareness” between the conditions solely consisted of priming participants about their perceived distance towards the entrepreneur, the manipulation check only focuses on the difference between high and low PPD conditions, and checks whether this difference is significant. This manipulation check is used to either accept or reject H1, which argues that the manipulation of perceived personal distance through the entrepreneur’s age, profession, education and hobbies leads to a significant difference between the level of perceived personal distance for respondents in the high and low PPD conditions.

Table 6 shows the average perceived personal distance, a score which is obtained by taking the average of a participant’s score on the six personal distance items in the experiment. Please note that, as mentioned before, the participant’s answers on the personal distance items measure have been reverse coded so that a higher score reflects a higher perceived personal distance rather than a higher perceived similarity on a 6-point scale. As can be seen in Table 6, the average perceived personal distance for both high distance conditions is more than a full scale point higher than the average perceived personal distance for the low distance conditions. This difference in mean perceived distance indicates that



assignment to either the high or low PPD categories affects the extent to which participants perceive themselves to be different from the entrepreneur in the experiment in the way the manipulation intended. To test whether the difference in mean PPD scores between the two high and the two low PPD conditions found in Table 6, a one-way ANOVA based on the average PPD score of two groups is conducted. This ANOVA test is conducted using a dummy variable scoring 1 when a participant is assigned to either of the “high PPD conditions”, and 0 when a participant is assigned to a low PPD condition. In this way, the ANOVA test allows us to test the difference in the average PPD score between the high and low PPD conditions. As can be seen in Table 7, the significance level of this ANOVA test ( $P = 0.0000$ ) calls for a rejection of the hypothesis that the difference in mean PPD score between the two groups is created by chance on a highly significant level ( $P < 0.01$ ). As such, it is concluded that the difference in mean PPD score between participants assigned to the high and low PPD conditions is significant. Based on these results, it can be concluded that the manipulation of perceived personal distance based on age, profession, education and hobbies leads to a significantly lower perceived personal distance when these factors are different between an investor and entrepreneur. As such, H1 “*Greater differences in age, profession, education and hobbies between an investor and entrepreneur increase the extent to which investors perceive an entrepreneur to be personally distant.*” is accepted.

Table 6: Average PPD per Condition

Condition	Average PPD
High PPD / Awareness	4.88095
High PPD / No Awareness	4.513889
Low PPD / Awareness	3.072917
Low PPD / No Awareness	3.397436

Table 7: One way ANOVA test for mean PPD scores between high and low PPD conditions

Source	Sum of Squares	Df	Mean Square	F	Prob > F
Between groups	22.5174839	1	22.5174839	35.04	0.0000
Within groups	34.061304	53	0.642666114		

#### 4.2.5 Effect of Perceived Personal Distance on Investment Decision

After having accepted H1, a conclusion regarding either the acceptance or rejection of H2A: “*Greater perceived personal distance reduces the likelihood for an investor to invest in a start-up*” and H2B: “*Greater perceived personal distance reduces the amount an investor is willing to invest in a start-up*” will be drawn based on regressing the respondents’ investment decision (measured in both likelihood and amount) on the set of dependent and control variables used in this study.

The results of such a regression can be found in Table 8, where the investment likelihood is chosen as the dependent variable and all independent and control variables are included in the model. A first look at the results of the regression in Table 8 shows a negative coefficient for the effect of the level of perceived personal distance on the investment amount, suggesting that an increase in perceived personal distance leads to a decrease in the amount an investor is willing to invest. Table 8 suggests however that there could be no relationship at all and that this coefficient is merely generated by chance ( $P = 0.879$ ). A further look at Table 8 shows that the effects of the control variables in the model (risk preference, social desirability and gender) are also all statistically insignificant. As mentioned in section 4.2.2, this could be attributed to the fact that due to the low sample size, the model would perform better with a smaller numbers of variables. Because of this, the choice has been made to rerun the regression and exclude both the control variables and the mediating variable entrepreneur ability, leaving a small regression model where the investment likelihood and amount are only regressed on perceived personal distance, awareness and the interaction between PPD and awareness. It is important to note that as a result of this decision, potentially less variance in the investment decision of our sample is accounted for.

Table 9 shows the results of the regression when the control variables are excluded. Here, the perceived personal distance coefficient ( $b = 0.31$ ) suggests that an increase of perceived personal distance by one scale point leads to a decrease in the investment likelihood of 0.31 on a 5-point scale. This effect is however found to only be statistically significant on a 10% level ( $P = 0.093$ ). With the low sample size of the experiment in mind, it is best to only draw conclusions based on a 5% significance level. Hence, although the negative coefficient of perceived personal distance suggests a negative relationship between PPD and the investment likelihood to exist, hypothesis H2A: “*Greater perceived personal distance reduces the likelihood for an investor to invest in a start-up*”, cannot be accepted based on its statistical insignificance. It would, however, be highly interesting to see whether conducting a similar experiment with a higher sample size would increase the statistical significance and allow us to ultimately accept H2A.

Table 10 shows the results of a similar regression, with the same variables now being regressed on the investment amount. The same negative coefficient for PPD is found, and the statistical significance has changed ( $P = 0.044$ ). Hence, the effect of the overall variation in perceived personal distance between respondents, is significant at a 5% level ( $P$ -value of PPD is 0.028). A look at the effect of PPD on the investment amount in Table 10 then tells us that a one scale point increase in perceived personal distance leads to a statistically significant decrease in the investment amount of 6.45% ( $b = -6.45$ ). Since this shows that an increase in perceived personal distance leads to a statistically significant decrease in the amount respondents were willing to invest, H2B: “*Greater perceived personal distance reduces the*

amount an investor is willing to invest in a start-up” is accepted. Hence, we can conclude that for investors willing to invest in a state-up perceived personal distance negatively impacts the amount they are willing to invest.

Table 8: Regression of Investment Likelihood on independent variables (including control variables)

Investment Amount	Coef.	Std. Err.	t	P>(t)	95% Conf.	Interval
PPD	-0.0374578	0.2446667	-0.15	0.879	-0.5299472	0.4550298
Awareness	0.0560267	1.179685	0.05	0.962	-2.318556	2.43061
PPD / Awareness	0.0042792	0.3022398	0.01	0.989	-0.6040981	0.6126565
Entrepreneur Ability	0.4300471	0.2844577	1.51	0.137	-0.1425365	1.002631
Risk Preference	0.0733905	0.1288792	0.57	0.572	-0.1860299	0.3328108
Social Desirability	-0.4195555	0.2711222	-1.55	0.129	-0.9652963	0.1261852
Gender	-0.2455467	0.3332715	-0.74	0.465	-0.9163875	0.425294
_cons	2.737654	1.949986	1.40	0.167	-1.187465	6.662772

Table 9: Regression of Investment likelihood on independent variables (excluding control variables)

Investment Likelihood	Coef.	Std. Err.	t	P>(t)	95% Conf.	Interval
PPD	-0.312647	0.182529	-1.71	0.093	-0.6792676	0.053973
Awareness	0.278348	0.397743	0.7	0.487	-0.5205429	1.077238
PPD / Awareness	-0.405460	0.573911	-0.71	0.483	-1.558193	0.747274
_cons	3.369891	0.685499	4.92	0	1.993025	4.746757

Table 10: Regression of Investment amount on independent variables (excluding control variables)

Investment Amount	Coef.	Std. Err.	t	P>(t)	95% Conf.	Interval
PPD	-6.454953	3.125331	-2.07	0.044	-14.85307	-0.892385
Awareness	0.118551	6.95411	0.02	0.986	-12.29914	18.12213
PPD / Awareness	-1.391874	8.56162	-0.16	0.871	-29.69321	14.20218
_cons	48.029480	12.92932	3.71	0.001	23.37814	75.80834

#### 4.2.6 Mediation of Entrepreneur Ability

As mentioned in section 2.2, the main expected mechanism to drive the negative effect of perceived personal distance on an investor’s investment decision is an investor perceived entrepreneur ability: when perceived personal distance is high, investor are expected to evaluate an entrepreneur as less competent to run their business, negatively affecting their decision to invest in the start-up. Based on the acceptance of H2B and the rejection of H2A, this section analyses whether entrepreneur ability does indeed mediate the effect of perceived personal distance on the investment amount. Table 11 expands the regression model used in Table 9 by including the respondents perception of the competence of the entrepreneur in the experiment, denoted with Entrepreneur Ability. When looking at these results, an

immediate thing that stands out is that by including the perceived entrepreneur ability, the direct effect of perceived personal distance on the investment amount decreases in both amount (from a decrease of 7.87% per scale point to a decrease of 5.02%) as well as in significance, rendering this effect insignificant ( $P = 0.205$ ). Furthermore, even though the coefficient of entrepreneur ability shows its expected positive effect on the investment amount (an increase of 8.20% per scale point), it is concluded that this effect is not statistically significant ( $P = 0.115$ ). As with the effect of high/low PPD condition assignment mentioned before, a larger sample size would result in more variation within the variable, and could possibly decrease this P-value to indicate a significant effect. For now, however, the results from Table 11 do not yet suggest significant mediation of Entrepreneur Ability.

This conclusion is supported further when looking at Table 13, which displays the results of a mediation test using structural equation modelling (SEM) to determine the indirect effect of perceived personal distance through its influence on the perceived entrepreneur ability. As concluded before, the negative, direct effect of perceived personal distance is significant at a 5% level ( $P = 0.037$ ). Next to this, a significant direct relationship between PPD and entrepreneur ability can be found in the mediation results of Table 13 ( $P = 0.032$ ), as well as when regressing Entrepreneur Ability on the main variables in this experiment ( $P = 0.029$ ), the results of which are presented in Table 12. The negative effects of PPD on Entrepreneur Ability in both the regression ( $b = -0.29$ ) and mediation ( $b = -0.17$ ) results show that an increase in perceived personal distance decreases the extent to which investors evaluate an entrepreneur as competent.

Looking at the indirect effect of perceived personal distance on the investment amount, through perceived entrepreneur ability, in Table 13, the regression coefficient suggests that a one scale point increase in perceived personal distance indirectly leads to a decrease in the amount an investor is willing to invest of 1.24% ( $b = -1.24$ ) through its influence on the perceived entrepreneur ability. This effect, however, cannot be concluded statistically significant ( $P = 0.188$ ). With a similar, statistically insignificant P-value regarding the positive direct effect of perceived entrepreneur ability on the investment amount (a one scale point increase in perceived ability is associated with an increase in the investment amount of 7.31%,  $P = 0.095$ ), the statistical results in Tables 11, 12 and 13 do not prove good enough to accept the notion that the extent to which investors perceive an entrepreneur to be competent is the main mechanism behind the significant effect of perceived personal distance on an investor's investment decision. Nonetheless, it is important to note that the effect sizes of the direct effects of perceived personal distance on entrepreneur ability and entrepreneur ability on the investment amount suggest such a relationship to exist, and that replicating the experiment with a larger sample size could be a step towards proving this.

Table 11: Regression of Investment amount on independent variables + mediation (excluding control variables)

Investment Amount	Coef.	Std. Err.	t	P>(t)	95% Conf.	Interval
PPD	-5.017821	3.904057	-1.29	0.205	-12.86745	2.831812
Awareness	2.607879	7.531927	0.35	0.731	-12.53607	17.75183
High PPD / Awareness	-9.964837	11.11455	-0.9	0.374	-32.31214	12.38246
Entrepreneur Ability	8.200587	5.106282	1.61	0.115	-2.066281	18.46745
_cons	13.652000	25.93157	0.53	0.601	-38.48691	65.79091

Table 12: Regression of Entrepreneur Ability on independent variables

Entrepreneur Ability	Coef.	Std. Err.	t	P>(t)	95% Conf.	Interval
PPD	-0.2908292	0.1291481	-2.25	0.029	-0.5502313	-0.0314281
Awareness	-0.5986289	0.6521368	-0.92	0.363	-1.908484	0.7112265
PPD / Awareness	0.2093898	0.1648968	1.27	0.21	-0.1218152	0.5405948
_cons	4.356004	0.5167045	8.43	0	3.318173	5.393836

Table 13: Test for mediation between PPD and "Investment Amount"

Investment Amount	Coef.	Std. Err.	Z	P>(z)	95% Conf.	Interval
<b>Direct effects</b>						
Entrepreneur Ability	7.306508	4.377226	1.67	0.095	-1.272697	15.88571
PPD	-5.551453	2.661364	-2.09	0.037	-10.76763	-0.335275
<b>Indirect effects</b>						
Entrepreneur Ability						
PPD	-1.242267	0.943795	-1.32	0.188	-3.092072	0.607538

#### 4.2.7 Moderation of Awareness

To test whether awareness acts as a moderating effect on the relationship between perceived personal distance and an investor's investment decision as hypothesized in hypotheses H3A and H3B, the main regression model regressing the investment amount on perceived personal distance and awareness is run again, this time including the interaction between perceived personal distance and the investment amount as a conceptualization of the expected moderation effect. Note that due to the rejection of H2B, this regression is only run using the investment amount as a measure of an investor's investment decision. The results of this regression can be found in Table 14. Although the effect size coefficient of the interaction variables ( $b = -0.91$ ) could be interpreted as a negative influence of awareness on the relationship between PPD and the investment amount, the small effect size of this coefficient combined with the high insignificance level ( $P = 0.868$ ) initially suggest that the moderating effect of awareness is random and does thus not exist.

The main problem with interpreting the results of Table 14 is that these only allow to interpret a one-way effect of awareness on the PPD – investment relationship. By basing conclusions of a potential moderation of awareness on the interaction between awareness and the overall variation of PPD between respondents, the effect size of this interaction has to be interpreted as the extent to which awareness increases or decreases the effect of PPD on an investor’s decision. Following the formulation of H3 with the hypothesis however, this study expects awareness to positively affect the investment decision when PPD is low, and negatively when PPD is high. To check whether awareness does indeed moderate the PPD-investment relationship in this way, the moderation effect has to be split in two: the effect of awareness when PPD is high will help answer H3A, while the effect of awareness when PPD is low will answer H3B. To accommodate for this, the interaction effect between PPD and awareness has been split into two interaction effect based on assignment to one of the two PPD conditions in the experiment: high PPD / Awareness and Low PPD / Awareness.

Tables 15 and 16 provide results of the regressions run by replacing the interaction effect between perceived personal distance and awareness with the interaction effects between the high/low PPD conditions and awareness. Results are reported in two separate tables to avoid multicollinearity between the high PPD / Awareness and Low PPD / Awareness interaction effects. In Table 15, we see that a negative effect size of the interaction effect High PPD / Awareness is ( $b = -1.39$ ), indicating a decrease in the investment amount of 1.39% when investors are made aware of a high level of personal distance towards an entrepreneur. The very high P-value ( $P = 0.871$ ) of this relationship, however, suggests a high likelihood that this effect is created by chance, indicating that this effect is not statistically significant. Based on this insignificance, it is safe to conclude that awareness of personal distance does not affect the PPD – investment amount relationship when perceived personal distance is high. This conclusion leads to the rejection of H3A: “*When personal distance is high, awareness of personal distance negatively impacts an investors decision to invest in a start-up*”. It is thus not assumed investors who are made aware of a high level of personal distance allow their perceived personal distance to negatively affect their investment decision by using this distance as an investment criterion.

Table 16 shows a high effect size for the interaction effect Low PPD / Awareness, suggesting that investors that are aware of their low level of personal distance towards an entrepreneur are on average willing to invest just over 20% more than investors who are not aware of this low level of personal distance. It can be concluded that this effect is statistically significant ( $P = 0.035$ ). This positive moderation effect of awareness when perceived personal distance is low leads to the acceptance of H3B “*When personal distance is low, awareness of personal distance positively impacts an investors decision to invest in a start-up*”. This shows us that investors who are made aware of a low level of personal distance (or a high level of personal similarity), tend to use similarities between them and the

entrepreneur as a reason to invest in a start-up. Furthermore, contrasting the acceptance of H3B with the rejection of H3A indicates that making investors aware of personal distance impacts their investment decision only when this awareness is used to prime investors on similarities between them and the entrepreneur, and that there is no effect when it signals differences.

*Table 14: Regression of Investment Amount on Independent Variables, including PPD / Awareness*

<b>Investment Amount</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt;(t)</b>	<b>95% Conf.</b>	<b>Interval</b>
PPD	-6.168239	4.23337	-1.46	0.151	-14.66708	2.330606
Awareness	2.941064	21.74648	0.14	0.893	-40.71681	46.59894
PPD / Awareness	-0.914555	5.463271	-0.17	0.868	-11.88263	10.05332
_cons	46.901740	17.12641	2.74	0.008	12.51904	81.28444

*Table 15: Regression of Investment Amount on Independent Variables, including High PPD / Awareness*

<b>Investment Amount</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt;(t)</b>	<b>95% Conf.</b>	<b>Interval</b>
PPD	-6.454953	3.125331	-2.07	0.044	-14.85307	-0.892385
Awareness	0.118551	6.95411	0.02	0.986	-12.29914	18.12213
High PPD / Awareness	-1.391874	8.56162	-0.16	0.871	-29.69321	14.20218
_cons	48.029480	12.92932	3.71	0.001	23.37814	75.80834

*Table 16: Regression of Investment Amount on Independent Variables, including Low PPD / Awareness*

<b>Investment Amount</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt;(t)</b>	<b>95% Conf.</b>	<b>Interval</b>
PPD	-7.134350	3.354081	-2.13	0.038	-13.87122	-0.397481
Awareness	11.203710	7.112775	-1.58	0.122	-25.49013	3.082722
Low PPD / Awareness	20.073230	7.716713	2.17	0.035	1.488454	38.65801
_cons	44.621850	12.47675	3.58	0.001	19.56157	69.68213

## **Chapter 5 – Conclusions and Recommendations**

This chapter addresses the findings from the regression analysis along with its implications. A general conclusion from the findings will be presented first. Both scientific and practical implications of this research will be discussed. Following a discussion concerning the limitations of this study, recommendations for future research on the same topic will be addressed.

### **5.1 Conclusions**

Following the regression findings and the resulting acceptance of hypotheses H1, H2B and H3B, as well as the rejection of hypotheses H2A and H3A, a few clear conclusions regarding the effect of perceived personal distance on an investor's investment decision and the moderating role of awareness on this relationship can be made. Firstly, the acceptance of H1 shows that cultural distance does not only consist of ethnic or racial components. The significant differences in respondents' perceived personal distance caused by a manipulation of personal distance prove that a multidimensional approach towards (perceived) cultural distance is necessary, and supports Street et al.'s (2008) idea that cultural distance can be seen as the sum of an ethnic and a personal component. The manipulation of perceived personal distance through age, profession, educational background and hobbies gives more insight into what constitutes personal distance, and proves that people see others as culturally different even when race or nationality is similar because of these differences related to personal distance.

The acceptance of H2B shows the need to include perceived personal distance as a factor explaining an investor's investment decision, by concluding that an increase in perceived personal distance between an investor and entrepreneur will significantly decrease the amount said investor is willing to invest in a start-up. Furthermore, even though no statistical significance for the relationship has yet been found, this study suggests that perceived personal distance also negatively influences an investor's investment likelihood in such a way that when an investor perceives themselves to be personally different from an entrepreneur, they are overall less likely to invest in a start-up compared to when they perceive themselves to be personally similar. The impact of perceived personal distance on the amount an investor is willing to invest and the likelihood that an investor is willing to invest at all has important strategic implications for entrepreneurs seeking investment, which will be addressed in section 5.2.1. This study suggests that an investor's perception of the entrepreneurs ability is the main reason for this negative effect of PPD on the investment decision: investors are more likely to perceive personally similar entrepreneurs as competent/able and personally different entrepreneurs as less competent/unable, partly basing their investment decision on this perception of ability. For now, a lack of statistical significance prevents this study from concluding that such a mediation effect exists, yet shows indication of such an effect to be present and potential to be proven true in further research.



Next to studying the main effect of perceived personal distance on an investor's investment decision, this study also argues for a moderation effect of awareness on this relationship. This moderation effect is said to enhance the effect of PPD, in a way that investors who are made explicitly aware that they are personally different from an entrepreneur are less likely to invest, while investors who are made aware that they are personally similar are more likely to invest. This relationship has ultimately been proven to only be true when personal distance between investors and an entrepreneur is low, and investors thus perceive the entrepreneur to be personally similar. In this case, the amount investors are willing to invest in a start-up increases when they are explicitly aware that they are personally similar to an entrepreneur. The adopted explanation for such an effect is that when investors are made aware of personal similarity, they use this similarity as a (positive) relevant criterion in their decision.

## **5.2 Discussion: Practical and Theoretical implications**

### *5.2.1 Practical Implications*

The results of this study have important strategic implications for entrepreneurs looking for investment in their start-up. Based on the negative effect of perceived personal distance on an investor's investment decision, it is beneficial for entrepreneurs to seek out investors who are personally similar to them. Although this study can only suggest that this will increase their likelihood of receiving investment, it has proven to result in an increase in the investment amount an investor is willing to invest in a start-up. The latter also inspires funding strategies for entrepreneurs by motivating entrepreneurs to ask for higher investment amounts from investors who see them as personally similar.

In case an entrepreneur does not have access to personally similar investors, or when the extent to which investors will perceive them as personally distant or similar is not clear, the proven moderating effect of awareness in low personal distance situations could be of help to entrepreneurs. When presenting themselves, entrepreneurs are encouraged to focus on personal similarities they share with investors and make investors explicitly aware of these similarities. As the moderation analysis in this study has proven, this will significantly enhance the positive effect of a low level of perceived personal distance on an investor's decision, increasing the amount an investor will be willing to invest. Finally, when competing for funding with other start-ups, highlighting personal similarities towards investors can create a competitive advantage for an entrepreneur, increasing the potential to receive investment over competitors.

### *5.2.2 Theoretical Implications*

The previously mentioned results in this study lead to some interesting implications about the role of perceived personal distance in investment decisions. First of all, this study shows that the impact of entrepreneur characteristics on an investor's investment decision does not only depend on the characteristics themselves, but rather on the investor's perception of these characteristics. Based on this,

we add a critical note to studies that only look at the effect of entrepreneur characteristics in investment decision making from an entrepreneur viewpoint, by arguing that the assumption that these factors influence the decision of all investors in the same way is flawed. Hence, this study recommends research focused on explaining factors affecting an investor's investment decision to evaluate the perception of these factors.

More importantly, this study has proven that cultural distance between an investor and entrepreneur impacts an investor's decision even when there is no observable distance in race or country of origin: the main identifiers currently used to describe cultural distance. This calls for a broader view of cultural distance, with a focus on not only ethnic distance, but also the idea of personal distance proposed by Street et al. (2008) and proven in this study to be one of the explaining factors behind an investor's decision making process. As such, this paper successfully introduces the distinction of cultural distance as consisting of an ethnic and a personal component, and stresses the need for more research to focus on this personal component when studying the effects of investor-entrepreneur relations in investment decision making. This calls for a re-evaluation of studies focused on the role of culture in investment decision making settings, such as the one previously introduced by Boulton et al. (2019), and the inclusion of personal distance in further studies – both when focusing on the effect of culture in this setting or aiming to create a model explaining all the factors that impact an investor's decision making process. Hence, this paper directly affects research aimed at explaining the effect of culture in investment decision making (e.g. Boulton et al., 2019), research focused on explaining investor perceptions of an entrepreneur (e.g. Clarke et al., 2019) and a large body of research on drivers behind factors influencing an investor's decision making process in general (e.g. Maxwell and Levesque, 2011).

Next to this, the conclusion that awareness of personal distance enhances the positive effect of a low level of perceived cultural distance on an investor's investment decision suggests that the extent to which personal and/or cultural distance impacts an investor's decision is influenced by a multitude of external factors, of which some are already researched individually in an investment decision setting. This opens up the potential for studies focused on further defining the PPD – investment decision relationship by extending this model with other relevant moderating factors. Together with the need for more research on the effect of personal distance in investment decision settings, this implication is further addressed in the next section.

## **5.3 Limitations and Recommendations for Future Research**

### *5.3.1. Limitations*

A major limitation touched upon multiple times already in this study is the low sample size of the experiment, with only 55 observations per variable ultimately included in the various regression models. As mention in chapter 4, a direct result of this is the statistical insignificance of various effect sizes obtained in the regression models, and the resulting inability to accept multiple hypotheses with promising results. Specifically, even though our results indicate a relationship between perceived personal distance and an investor's likelihood to invest in a start-up, this claim cannot yet be made with certainty. The same goes for an investor's perceived ability of an entrepreneur, predicted to be the main driver behind the relationship between PPD and the investment amount and likelihood. In light of this, this study calls for a follow up study conducting a similar experiment with an increased sample size. The precedents set by this study, proof of significance for including the concept of perceived personal distance in investment decision making research and a successful manipulation of perceived personal distance, show that such a follow up study could potentially lead to significant results regarding the relationship between PPD, investment decisions and entrepreneur ability. This could be used to expand on the strategic implications for entrepreneurs mentioned in section 5.2.2., and lead the way to more research on perceived personal distance in investment settings.

A second consequence of the low sample size in this experiment are the limitations to the amount of variables included in the regression models, and the resulting exclusion of control variables age, gender, risk preference and social desirability. A larger sample size would allow for inclusion of these variables, which will most likely result in a larger portion of variance in the PPD – investment decision model accounted for and more significant results regarding the main relationships studied. Hence, when conducting the follow up research mentioned before, this study calls for a careful evaluation and inclusion of control variables that play a role in the PPD – investment decision relationship.

A third and final limitation addressed in this section is the nature of our sample. Due to logistic restrictions, such as a small time frame for concluding the research and the need to strictly control certain demographic aspects of sample members, our sample draws upon a selection of business students. Although considered to be somewhat representative of the population of this study, (angel) investors, external validity of the results could be increased by selecting a sample representing our population to a larger extent. Because of this, future research on the effect of perceived personal distance on investment decisions should aim to draw upon a sample of actual investors, rather than relying on a proxy sample such as business students.

### *5.3.2 Summary of recommendations*

As the main recommendations for future research stem from the limitations of this study, the reasoning behind these recommendations can be found in section 5.3.2. In short, this study calls for the inclusion of personal distance in research focused on cultural distance in investment decision settings, as the personal component of cultural distance is so far greatly overlooked. Further, direct follow up research based on this study is needed, with an increases sample size, focus on relevant control variables and a more representative sample are the most vital components.

## Appendix

### Appendix 1: Entrepreneur and Start-up description featured in the online experiment

*Entrepreneur description: Low Perceived Personal Distance condition*

**Name: Joop Duppen**

**Age: 24**

**Profession: Junior Business Consultant**

**Education: Business School (University Level)**

**Hobby: Football**

My name is Joop Duppen, I am 24 years old and work as a junior business consultant. In my free time, I enjoy playing football.

In my job, creative thinking is very important, as it is needed to come up with the best solution in different situations. I think creativity is not only important in a professional environment, but also in daily live. As such, I like to stimulate others to be creative and inspire them to use their imagination. In light of this, I created the “sand spheres” as a side project: a tool that makes sand art accessible to anyone and motivates people to use their imagination in a fun way.

*Entrepreneur description: High Perceived Personal Distance condition*

**Name: Joop Duppen**

**Age: 54**

**Profession: Sculpture artist**

**Education: Academy of Arts (Dutch MBO education)**

**Hobby: Ultimate frisbee**

My name is Joop Duppen, I am 54 years old and work as a sculpture artist. In my free time, I enjoy playing ultimate frisbee.

In my job, I like to create unexpected sculptures out of a very common material: sand. Even though sand is everywhere, I like to surprise people with its versatility by using various different sizes and shapes in my work. I hope to stimulate others to be creative and inspire them to use their imagination. Because of this, I created the “sand spheres”: a tool that makes sand art accessible to anyone and motivates people to use their imagination in a fun way.

### *Start-Up Description*



Discover your inner artist! Are you building a turtle, caterpillar or a racecar during your day on the beach? Anyone can make perfect spheres out of sand with the sand spheres. Our sand spheres allow children to embrace creativity and make the most beautiful sand sculptures during a lovely holiday on the beach, or simply while playing in the sandpit. Next to this, the sand sphere works just as perfect on snow, and can help you build the perfect snowman on a winter day. Sand spheres are usable by anyone over 2 years old, and provide fun for the whole family.

For only €5,-, a set of sand spheres includes 4 spheres in different sizes from 20 to 50 centimeters, which allows you to build unique sand sculptures and let your imagination run wild. The sand spheres are incredibly easy to use and provide the perfect extension to the classic “bucket - and - shovel” beach toy sets.

I am looking for an investment of €100,000, which will mostly be used to upscale production to meet the rapidly growing demand. The current valuation of SandSphere is estimated to be around €500,000.

**Appendix 2: Items for Perceived Personal Distance (adapted from Street et al. 2008)**

1. The way the entrepreneur and I reason about business ideas .....
2. The entrepreneur and I have ....presentation styles.
3. The entrepreneur and I have ... general values in life.
4. The entrepreneur and I have ... interests/hobbies in life.
5. The entrepreneur and I have ... educational backgrounds.
6. The entrepreneur and I have ... careers.

Response options: very different, moderately different, slightly different, slightly similar, moderately similar, very similar

**Appendix 3: Shortened Marlowe-Crowne scale for Social Desirability Bias (adapted from Strahan and Gerbasi, 1972)**

1. (T) I am willing to admit it when I make a mistake.
2. (T) I try to practice what I preach.
3. (T) I never resent being asked to return a favour.
4. (F) I sometimes deliberately say something that hurts someone's feelings.
5. (F) I like to gossip at times.
6. (F) I sometimes take advantage of someone.
7. (F) I try to get even rather than forgive and forget.
8. (F) I really insist on having things my own way.

Response options: never, rarely, sometimes, mostly, always. Responses are coded 1=always, 0=never in the true conditions (denoted by T), and 1=never, 0=always in the false conditions (denoted by F).

**Appendix 4: Items for Entrepreneurial Ability (adapted from Mayor and Davies, 1999; and Moro et al. 2014).**

1. The entrepreneur knows the market he operates in well. (Moro et al. 2014)
2. The entrepreneur has a good vision about the company's future. (Moro et al. 2014)
3. The entrepreneur is capable of performing its tasks as owner of SandSphere. (Mayer and Davies, 1999)
4. The entrepreneur is well qualified to be owner of SandSphere. (Mayer and Davies, 1999)
5. I feel confident about the entrepreneur's skills. (Mayer and Davies)

Response options: Strongly disagree, disagree, neither agree nor disagree, agree, strongly agree.

## **Appendix 5: Power test to determine suggested sample size**

Estimated sample size for linear regression for  $R^2$ .

$H_0: R^2_T = 0$ , versus  $H_a: R^2_T \neq 0$

*Study parameters*

Alpha = 0.0500

Power = 0.8000

Delta = 0.2273

$R^2_T = 0.1852$

Number of covariates tested = 7

*Estimated sample size*

N = 71



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