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Anna Maria Mohr & Aleksandra Stranden

Content

Abstract

While the relationship between sex and financial risk-taking behavior has been well explored in previous research, the existing literature lacks research that distinguishes between sex and gender as antecedents of financial risk-taking. Further, sensation-seeking and time pressure have shown to be associated with financial risk-taking. Our research goal is, therefore, to generate a better understanding of whether differences in financial risk-taking stem from sex or gender and how these factors interact with time pressure and sensation-seeking. Combining previous research findings, we construct a model of mediated moderation. We collect data to test this model through a self-reported online questionnaire (N = 127). From our analyses, we do not find our hypothesized model to be significant. However, further post-hoc analyses indicate that masculinity mediates the relationship between sex and financial risk-taking behavior. From a theoretical standpoint, these findings indicate that time pressure may not play as critical a role in explaining financial risk-taking as assumed. For practice, our findings indicate that masculinity may be a useful approximation measure for financial risk-taking behavior in organizational selection and promotion decisions.

Keywords: financial risk-taking behavior, risk-aversion, risk-seeking, sex, gender, male, female, masculinity, femininity, sensation-seeking, time-pressure

1. Introduction

Judgment and Decision Making, specifically financial risk-taking, is inherent to our everyday lives – in private and organizational contexts. Research has shown that individuals may differ in their risk perceptions and, consequently, their tendency to take risks (e.g., Demaree et al., 2008). That is, some individuals may tend to avoid risks while others may actively seek them. While there is extensive research on differences in financial risk-taking behavior between females and males, there is a lack of understanding of whether these differences can be attributed to sex or gender. Research has further shown that acute stress amplifies the differences in risk-taking between the sexes (Lighthall et al., 2009). The central aim of this Master Thesis is to fill the research gap on the influence of sex, gender, and time pressure on financial risk-taking behavior. Besides generating knowledge and contributing to the scientific discourse, this Master Thesis also seeks to create valuable insights for practitioners.

Why is it crucial to understand the antecedents of financial risk-taking behavior? For individuals, their financial risk-taking behavior may have an impact on their finances and, thus, their entire lifestyle. For example, a greater willingness to take financial risks has been associated with a higher net worth (Finke & Huston, 2003 as cited in Garrison & Gutter, 2010). In addition, financial risk-taking is also of relevance to organizations. As leaders' financial risk-taking behaviors have been shown to influence overall organizational performance (Gilley et al., 2002), it is crucial to consider this factor when selecting personnel for leadership positions. In recent years, an increasing number of women have entered leadership positions (Statista, 2022), making differences between men and women an important consideration. Understanding the antecedents of financial risk-taking behavior may explain variance in the representation of the sexes or personality traits in certain positions and serve as selection criteria. Therefore, our research question is whether sex mediated by masculinity and moderated by time pressure explains differences in financial risk-taking behavior when controlling for sensation-seeking. In order to answer this research question, we perform a thorough literature review on the current research status on financial risk-taking, sex, gender, and time pressure. Based on theories and research findings, we develop a research model and conduct quantitative research using a survey design to test this model.

2. Literature Review

2.1 Research status

To gain an overview of financial risk-taking behavior, sex, gender, and time pressure, these constructs are defined and the current research status is presented. The summary of the research status, in combination with relevant theoretical frameworks, serves as a basis for developing the research model and deducting hypotheses.

2.1.1 Financial risk-taking behavior

Decision-making is a choice between two or more, usually competing alternatives (Fitzgerald, 2002). Decision-making situations may occur under certainty, risk, or uncertainty. While certainty describes situations in which the consequences of decision alternatives are sure, uncertainty refers to situations without information on the probability of the alternatives' consequences. Risk, finally, describes a situation in which probabilities can be attached to the different alternatives' consequences (Edwards, 1954; Kahneman & Tversky, 1979; Mishra, 2014; Zhang et al., 2018). As certainty creates uniform and uncertainty arbitrary decisions, solely decisions under risk are of interest for analyzing individual differences in decision-making patterns. Therefore, this Master Thesis concerns itself with decisions under risk.

The existing research within the field of risk-taking is elaborate and includes several interlinked concepts: risk-taking attitude, risk-taking propensity, risk appraisal, and risk-taking behavior (Bran & Vaidis, 2020). This Master Thesis is solely focused on risk-taking behavior. Risk-taking behavior is defined as the behavior in risk situations, meaning either seeking or avoiding risks (Byrnes et al., 1999). Risk-taking behaviors may be reported, projected, or actual. While reported risk-taking behavior is found in self and other reports of behavior, projected risk-taking refers to hypothetical or predicted future risk-taking behavior. The major disadvantage of reported and projected risk-taking is the subjectivity in evaluating risk and possible socially desirable answering behavior (Yates & Stone, 1992). In contrast to the previous two concepts, actual risk-taking behavior is behavior that can be directly observed in risk situations (Bran &

Vaidis, 2020). In this way, subjectivity may be reduced. This Master Thesis will, therefore, focus on actual risk-taking behavior.

Another distinction that can be made regarding risk-taking is between general and context-specific risk-taking. While some research points towards there being a general factor of risk-taking (Dohmen et al., 2011; Frey et al., 2017; Highhouse et al., 2017; Nicholson et al., 2005), risk-taking can also be considered context-specific with the literature distinguishing five major domains: financial, health / safety-related, recreational, ethical, and social risk-taking (Horvath & Zuckerman, 1993; MacCrimmon & Wehrung, 1986). In this Master Thesis, we focus on financial risk-taking, which refers to the likelihood of an individual engaging in risky behaviors when making financial decisions (Blais & Weber, 2006). This domain is of particular interest as financial decisions are not only prevalent in private life but also a significant part of managerial decision-making, thus, impacting the overall success of organizations. Furthermore, financial risk-taking has been shown to differ for sex and gender, making it an interesting construct to study in the context of individual differences (Hallahan et al., 2004; Watson & Mark McNaughton, 2007 as cited in Garrison & Gutter, 2010).

2.1.2 Sex and gender

Research has shown that risk-taking behavior is predominantly influenced by characteristics of the person, situation, and the interaction of person and situation (Figner & Weber, 2011). In this sense, sex and gender may play a central role in explaining why some individuals behave more risk-seeking in financial decision situations than others.

Sex and gender are ambiguously defined within the scientific literature. The predominant view, however, is that sex is a biological and gender a psychological category (Abele, 2003). In this sense, sex refers to inherent biological and physiological traits that distinguish females and males, while gender encompasses the socially and psychologically constructed concepts of femininity and masculinity (Lott & Maluso, 2001; Pryzgoda & Chrisler, 2000). Historically, femininity and masculinity, as determinants of gender, have been understood as the traits typically prevalent in the sexes. The underlying assumption of this approach to gender is that the constructs are bipolar and one-dimensional (e.g., Gough, 1964; Guilford & Martin, 1943; Hathaway &

McKinley, 1943; Terman & Miles, 1936). Other conceptualizations promote the assumption of androgyny (e.g., Bem, 1974; Spence et al., 1975), meaning that "traditionally feminine and traditionally masculine characteristics [may be integrated] within a single individual" and, thus, these constructs may be distinct dimensions (Hoffman et al., 2000, p. 476). What is considered feminine or masculine is commonly based on what is socially desirable or perceived as typical for females or males (Hoffman et al., 2000). Finally, attempts to prevent stereotyping by creating personal definitions of femininity and masculinity have proven unsuccessful (e.g., Baldwin et al., 1986; Ravinder, 1987). Due to the disadvantages of bipolar, one-dimensional conceptualizations and personal definitions, femininity and masculinity are to date constructed as distinct dimensions that reflect society's perception of typically male or female behaviors (Bem, 1974; Hoffman et al., 2000; Hsu et al., 2021).

2.1.3 Research on sex and financial risk-taking

Research on sex and financial risk-taking has shown that sex may influence whether an individual behaves more risk-seeking or risk-averse when making financial decisions. Financial risk-taking has been found to differ for the sexes in that males are more likely to choose higher levels of financial risks than females (Garrison & Gutter, 2010). Several studies using gambling tasks, lottery experiments, and investment games have found women to invest significantly less and be consistently more risk-averse than men (Charness & Gneezy, 2012; Croson & Gneezy, 2009; Eckel & Grossman, 2002). Generally, men engage in more risky behaviors than women, as they perceive the likelihood of adverse outcomes lower and expect risky behavior to be more enjoyable (Harris & Jenkins, 2006). For example, a change from a male to a female CEO has been associated with a decrease in risk-taking within the organization (Elsaid & Ursel, 2011). Similarly, the impact of the CFO's sex on the firm's financial risk has been examined. Research has found that the impact of female CFOs on the firm's financial risk-taking behavior is mixed depending on the measure applied. At the same time, increasing the number of female board members, in general, was found to reduce financial risk, which indicates that the risk-taking behavior of females in top financial management positions may significantly differ from that of their male counterparts (Hurley & Choudhary, 2020).

Both biological and evolutionary principles may explain sex differences in risk-taking. According to theories that emphasize biological explanations, hormones and genes explain differences in the financial risk-taking behavior of men and women (Buss, 1989, 1994; Saad & Gill, 2000 as cited in Meier-Pesti & Penz, 2008). As men naturally require higher levels of stimulation to be aroused than women, they tend to take more risks (Meier-Pesti & Penz, 2008). Testosterone plays a crucial role in explaining sex differences in risk-taking behavior. This hormone is not only positively associated with aggression, sensation-seeking, hostility, mate-seeking, and dominance but also indicates a higher likelihood of showing risk-seeking behaviors. As males, by nature, have higher levels of testosterone than females, this may explain why men tend to show more risk-seeking behavior than women (Xie et al., 2017). In addition, evolutionary principles stress that human behavior is motivated by inclusive fitness, meaning that individuals strive to increase the number of next of kin. In this sense, women may seek partners who are able to care for them and their children, have a high social status, and have ample resources. As males who seek financial risks are more likely to represent these aspects, they are preferred as mating partners (Hamilton, 1964; Pawlowski et al., 2008a as cited in Meier-Pesti & Penz, 2008). Consequently, males may be more likely to take risks in everyday situations than females (Pawlowski et al., 2008).

2.1.4 Research on gender and financial risk-taking

The findings on sex and financial risk-taking behavior raise the question of whether the differences in risk-taking behavior stem from biological differences between the sexes or the gender ascribed to them. Traditionally, females have been found to behave more communal, meaning selfless and caring towards others, and less agentic, meaning self-assertive and eager to take charge (Eagly & Steffen, 1984). However, research has indicated that these attributions are shifting. As society is ever-changing, the psychological meaning ascribed to the sexes is fluid rather than static (Abele, 2003; Eagly et al., 2000; Wood & Eagly, 2002). Eagly et al. (2000) found that traits formerly attributed to males are becoming more socially accepted and desirable for females. Similarly, a meta-analysis conducted by Twenge (1997, as cited in Abele, 2003) indicated that while females continuously score higher on communion than males, agency has steadily

increased for both sexes, with the gap between females and males decreasing. Accordingly, females' propensity to act independently and take risks has increased (Meier-Pesti & Penz, 2008). A recent meta-analytic review revealed that differences between the sexes in both agency and communion are decreasing (Hsu et al., 2021). As, in recent years, females have started to increasingly identify with masculine attributes, the sex differences in financial risk-taking have also been seen to diminish (Auster & Ohm, 2000; Meier-Pesti & Penz, 2008; Twenge, 1997). These findings indicate that differences in risk-taking behavior between females and males may instead stem from gender differences than sex differences.

That risk-taking behavior may instead be related to the identification with typically masculine attributes than the biological sex is also underpinned in other research. For example, in their research, Garrison and Gutter (2010) saw that females have significantly higher exposure to financial social learning opportunities than males. They engage in more financial discussions with parents and peers and observe their financial behaviors more often (Garrison & Gutter, 2010). As males also tend to have a stronger agentic orientation focused on the self, their financial risk-taking is much more driven by their 'issue capability' than that of females (He et al., 2008). Finally, Montford and Goldsmith (2015) stipulate that financial self-efficacy may account for the sex differences in financial risk-taking. As females show lower levels of financial self-efficacy, they tend to choose the less risky investment options (Montford & Goldsmith, 2016).

An important finding in the context of gender as a predictor of risk-taking is that the differences between the sexes in their likelihood to take risks are related to the identification with masculine attributes but not feminine attributes. This means that while masculinity may explain the differences between men and women in financial risk-taking, femininity does not (Meier-Pesti & Penz, 2008).

2.1.5 Time pressure

Due to time constraints, many economic and financial choices are made automatically and without much deliberation (Kirchler et al., 2017). Time pressure may influence individuals' decision-making (Godinho et al., 2016), as it alters their risk preferences, changes their cognitive decision-making process, and causes them to make less consistent decisions (Olschewski & Rieskamp, 2021).

Research on the effect of time constraints indicates that when confronted with complex choices under time pressure, individuals fail to process all the information, base decisions on a limited set of attributes, and are more inclined to postpone decisions (Godinho et al., 2016). According to Kahneman (2011 as cited in Haji et al., 2019), there are two systems of thinking and making decisions: *System 1*, which "operates automatically and quickly, with little or no effort and no sense of voluntary control" (Kahneman, 2012, p. 22), and *System 2*, which "allocates attention to the effortful mental activities" (Kahneman, 2012, p. 22). In this sense, System 1 is instinctive, emotional, and unconscious, while System 2 is more precise, deliberate, and conscious. Both systems work hand-in-hand: System 1 provides impressions, intuitions, intentions, and feelings, which, when endorsed by System 2, turn into beliefs and voluntary action. As System 1 works significantly faster than System 2, it is commonly applied to protect the individual from imminent threats; only when System 1 conflicts with our experiences, System 2 is applied (Haji et al., 2019; Kahneman, 2012). When under time pressure, individuals cannot access System 2 and are, thus, forced to apply System 1. In this way, time pressure reduces cognitive deliberation and, in turn, makes the evaluation of risks and decision-making much more intuitive (Haji et al., 2019; Kahneman, 2012).

Research also indicates that time pressure can affect individuals' risk-taking behavior, making them more or less risk averse (Madan et al., 2015; Olschewski & Rieskamp, 2021; Zur & Breznitz, 1981). Specifically, financial decisions are heavily influenced by time pressure (Busse & Green, 2002 as cited in Xie et al., 2017). In vignette studies, being set under time pressure prompted participants to seek the safer choice more often (Haji et al., 2019; Huber & Kunz, 2007). Participants may be discouraged from taking risks under time pressure as insufficient information on the decision scenario leads them to choose the safer option (Haji et al., 2019). Contrary to these findings, Olschewski and Rieskamp

(2021) observe that risky choices may increase under time pressure instead. This observation is attributed to a decrease in choice consistency and an increase in the use of simpler decision strategies. However, they do not find that the actual risk preferences change (Olschewski & Rieskamp, 2021). Finally, some research also points to the individual's sex influencing the effect of time pressure on risk-taking behavior. Acute stress has been shown to amplify sex differences in risk-taking, with women becoming more risk-averse and men becoming more risk-seeking when time pressure increases (Lighthall et al., 2009).

2.1.6 Sensation-seeking

In theory and research, risk-taking does not stand alone but is related to other concepts. A strong correlate and a key factor in explaining individuals' financial risk-taking behavior is sensation-seeking (Breivik et al., 2017; Horvath & Zuckerman, 1993; Sjöberg & Engelberg, 2009). Sensation-seeking is a broad personality trait that is characterized by seeking out varied, novel, complex, and intense experiences and being willing to take physical, social, and financial risks in pursuit of such experiences (Horvath & Zuckerman, 1993). As individuals scoring high on sensation-seeking are driven by increasing their arousal and stimulation, they are more likely to engage in risk-taking behavior (Roberti, 2004). When taking risks, individuals scoring high on sensation-seeking experience less negative and more positive sensations than individuals scoring low on sensation-seeking (Breivik et al., 2017). In other words, individuals scoring high on sensation-seeking have both a different perspective on and experience of risks than individuals scoring low on sensation-seeking and, in consequence, are more likely to seek out risks. Similarly, individuals with a high level of sensation-seeking also tend to be attracted to the heightened level of arousal and stimulation created by financial investment risks. It has been found that individuals scoring high on sensation-seeking are more willing to take financial risks and wager their investments than those scoring low on sensation-seeking (Kirkcaldy & Furnham, 1993; Wong & Carducci, 1991). As for financial risk-taking, individuals' levels of sensation-seeking have been found to differ between the sexes, with females scoring significantly lower on sensation-seeking than males (Sjöberg & Engelberg, 2009).

2.2 Theoretical Framework

2.2.1 Theoretical Framework of Managerial Risk-taking

As previously discussed, financial risk-taking is a crucial part of managerial decision-making. There is a wide variety of different theoretical frameworks aiming to explain risk-taking behavior in managerial decision-making. The *Theoretical Framework of Managerial Risk-taking* combines the most prominent theoretical perspectives to provide a comprehensive overview of how managerial risk-taking functions. In this framework, the *Agency theory*, the *Behavioral Theory of the Firm*, the *Prospect Theory*, the *Behavioral Agency Model and Socioemotional Wealth*, as well as the *Upper Echelons Theory* are considered for identifying and explaining the different causes, moderators, and outcomes of managerial risk-taking (Hoskisson et al., 2017). However, the *Theoretical Framework of Managerial Risk-taking* is much too broad to be used for specific research purposes. Instead, we use it as a point of reference and conceptual framework to integrate the different research findings (Hoskisson et al., 2017).

2.2.2 Upper Echelons Theory

The Upper Echelons Theory (UET) is one theory within the broader Theoretical Framework of Managerial Risk-taking, which assumes that the executives' characteristics, i.e., their experiences, values, and personalities, influence their judgment and decision-making, and, in turn, influence the overall organizational performance (Abatecola & Cristofaro, 2018; Hambrick, 2007). As executives make decisions based on their personal interpretations of reality, which derive from cognitive processes, beliefs, personality traits, and ethical norms (Abatecola & Cristofaro, 2018), "organizations become reflections of their top managers" (Hambrick & Mason, 1984, p. 193). However, the causality of these processes has not been conclusively determined, making it possible that executives are also attracted to settings that match their personal characteristics or make decisions that align with the expectations of others towards them based on their personal characteristics (Hambrick, 2007).

The idea of the influence of executives' characteristics on their decision-making builds on Simon's (1957) fundamental premises of bounded rationality. In this perspective, risk-taking behavior is a product of the reality individuals

construct based on their orientations (Hambrick, 2007; Simon, 1957). Uncertain situations are not considered knowable but simply interpretable, meaning that to understand organizational decisions, it is necessary to understand the executives' dispositions (Hambrick, 2007). When economic agents make decisions, they frequently use mental shortcuts susceptible to biases (Kahneman, 2012). Especially when there is much managerial discretion and executives are under heavy job demands, they greatly rely on their dispositions and experiences to make decisions (Hambrick, 2007). Executives' dispositions affect information processing in three ways: First, the executive's dispositions direct their field of vision, meaning which stimuli are potentially perceivable. Second, the executive's dispositions steer the perception of stimuli and make it selective. Finally, the executive's dispositions also influence the interpretation of the perceived stimuli (Hambrick & Mason, 1984).

The UET distinguishes two main dimensions of personal characteristics: psychological properties and observable experiences (Hoskisson et al., 2017). Psychological properties refer to values, cognitive models, and personality characteristics. As a large body of research shows that individual differences in personality may explain differences in decision-making (Hoskisson et al., 2017), femininity and masculinity, for example, may be relevant to consider in decision-making. Observable experiences consist of, e.g., executive tenure, functional background, and educational experience (Hoskisson et al., 2017). These are, however, not the focus of the current research study. Next to these two dimensions of personal characteristics, UET suggests that there may also be other characteristics influencing decision-making, including age and gender (Hoskisson et al., 2017).

2.2.3 Social Role Theory of Sex Differences and Similarities

A theory that more specifically focuses on individual differences in sex and gender and how they influence the individual's decision-making is the *Social Role Theory of Sex Differences and Similarities*. This theory constitutes that affective, cognitive, and behavioral differences between females and males stem from differences in their gender role beliefs. These gender roles are the foundation for socialization and are based on the division of labor between the sexes (Eagly, 1987; Eagly et al., 2000). The development of gender roles can be traced back to

biological differences between the sexes, notably men's height and strength and women's reproductive abilities (Eagly, 1987, 2009; Eagly & Wood, 2012; Wood & Eagly, 2002). Additionally, the local economy, social structure, and ecology may influence the division of labor (Eagly & Wood, 2012; Koenig & Eagly, 2014). For example, as females in industrialized societies are more likely to take on care obligations, they are perceived to be more communal than males. It is, however, essential to note that gender role beliefs are changing, with female's self-reported agency having grown more similar to men's over time, although the sex differences in communion have stayed stable (Eagly et al., 2020; Haines et al., 2016; Twenge, 1997, 2001).

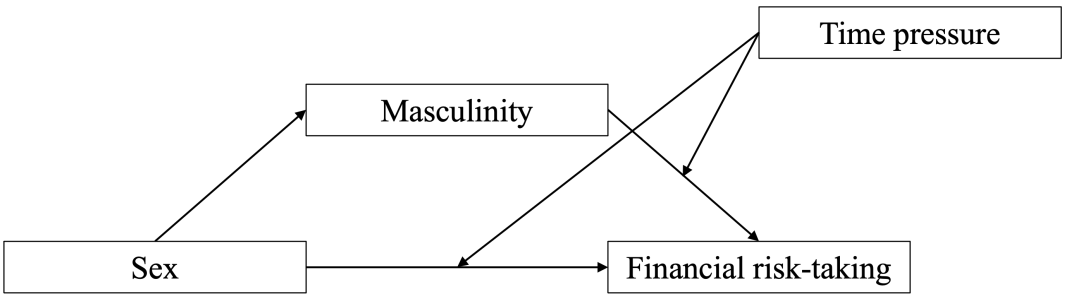
According to Eagly et al. (2000) and Eagly & Wood (2012), gender roles influence the individual's affect, cognition, and behavior through three biosocial mechanisms: hormonal regulation, social regulation, and self-regulation. Hormonal regulation may lead to gender differences in affect, cognition, and behavior, as labor activities typically performed by males activate different hormones than those typically performed by females. That is, typically masculine activities, such as competitiveness, antagonism, and risk-taking are linked to higher testosterone levels (Booth et al., 2006, as cited in Eagly & Wood, 2012), while typically feminine activities, such as parental bonding, nurturing, proximity, and risk aversion are linked to higher levels of oxytocin (Campbell, 2008, as cited in Eagly & Wood, 2012). Social regulation refers to how females and males are penalized and rewarded by society for deviating or conforming to gender role beliefs. For example, females showing an assertive and directive leadership style are evaluated more negatively than males who adopt the same style. As individuals are aware of associated costs, they tend to behave in accordance with the gender roles ascribed to them in order to maximize their benefits (Eagly & Wood, 2012). Finally, self-regulation in the context of Social Role Theory refers to how individuals internalize and integrate gender role beliefs in their sense of self and use this to regulate their behavior. Those with self-concepts that differ widely from the gender role beliefs will tend to feel, think, and behave less gender-stereotypically (Eagly & Wood, 2012).

2.3 Introduction to the research models

From the research findings and theoretical models described above, we deduct a research model that illustrates the hypothesized relationships between sex, gender, financial risk-taking behavior, and time pressure (see Figure 1). In the following, we detail the research model and the related hypotheses.

Figure 1

Research model and hypotheses



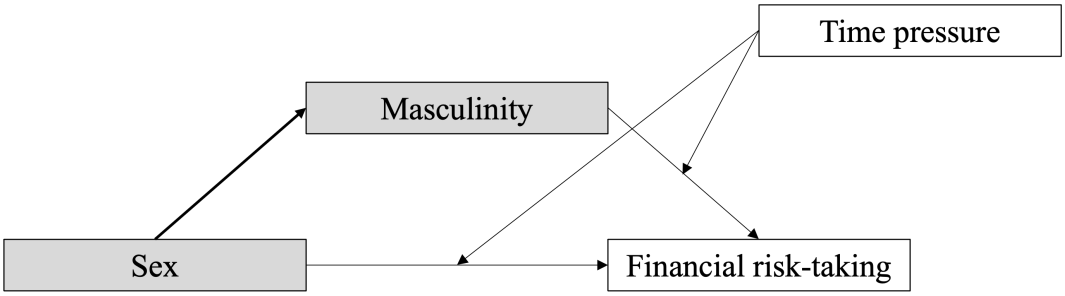
Note. Own illustration.

Social Role Theory constitutes that females and males have distinct gender roles that stem from their dispositions, environmental factors, and socialization and influence their affect, cognition, and behavior (Eagly, 1987; Eagly & Wood, 2012). While females have historically been found to be more communal/feminine, men have been shown to be more agentic/masculine (Eagly & Steffen, 1984). As gender roles have been changing in recent years, the differences in agency and communion have been decreasing with females. However, the differences in masculinity between the sexes remain (Hsu et al., 2021; Twenge, 1997). Based on these findings, we propose the following hypothesis (see Figure 2):

Hypothesis 1: Sex predicts masculinity in that females tend to be less masculine and males more masculine.

Figure 2

Hypothesis 1



Note. Own illustration.

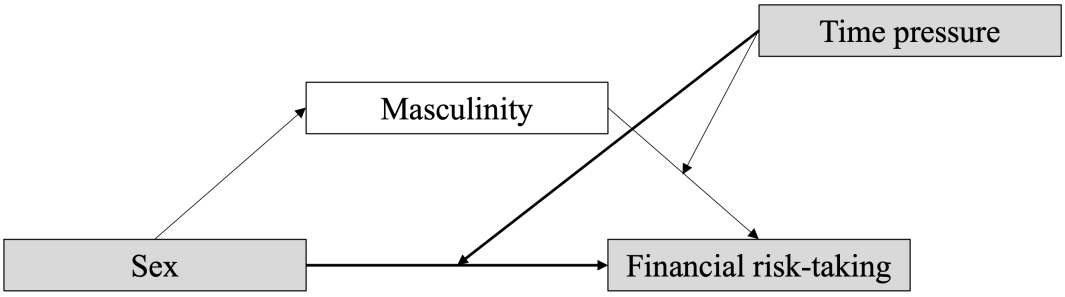
The Upper Echelons Theory establishes that individuals' dispositions greatly influence their judgments and decision-making (Abatecola & Cristofaro, 2018; Hambrick, 2007). A critical disposition may be the decision-maker's sex (Hoskisson et al., 2017). Traditionally, differences in risk-taking behavior have been associated with sex. Several studies have shown that there are differences in risk-taking behavior between females and males, with females tending to be more risk-averse and males more risk-seeking (Charness & Gneezy, 2012; Croson & Gneezy, 2009; Eckel & Grossman, 2002; Harris & Jenkins, 2006).

At the same time, several studies have shown time pressure to be related to risk-taking behavior. As time pressure inhibits the individuals' ability for cognitive deliberation, it is believed to affect the evaluation of risks and decision-making (Haji et al., 2019; Kahneman, 2012; Xie et al., 2017). However, research findings are ambiguous regarding how time pressure concretely affects risk-taking. While some research indicates that individuals make risk-averse choices under time pressure (Haji et al., 2019; Huber & Kunz, 2007), other research shows the contrary (Olschewski & Rieskamp, 2021). A possible explanation for the ambiguity of these findings is that time pressure is simply a moderator of the relationship between sex and risk-taking behavior. Lighthall et al. (2009) found that females become more risk-averse and males more risk-seeking when under acute stress. In accordance with these findings, we hypothesize the following (see Figure 3):

Hypothesis 2: The relationship between sex and financial risk-taking is moderated by time pressure in that females tend to behave more risk-averse and males more risk-seeking under time pressure.

Figure 3

Hypothesis 2



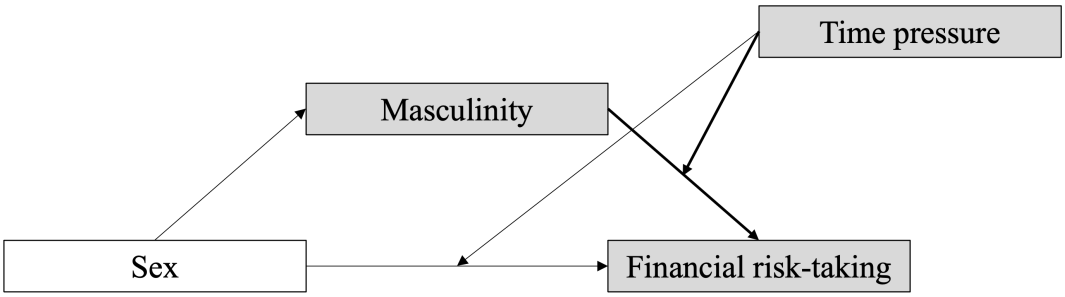
Note. Own illustration.

As research shows that males tend to be more masculine than females (Eagly & Steffen, 1984; Hsu et al., 2021) and males become more risk-seeking under time pressure (Lighthall et al., 2009), we argue that the relationship between masculinity and risk-taking may be moderated by time pressure. Our hypothesis is, thus, as follows (see Figure 4):

Hypothesis 3: The relationship between masculinity and financial risk-taking is moderated by time pressure in that less masculine individuals tend to behave more risk-averse and more masculine individuals more risk-seeking under time pressure.

Figure 4

Hypothesis 3



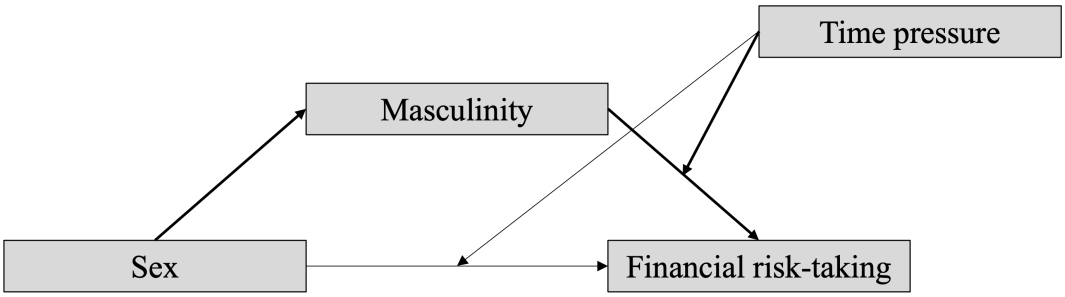
Note. Own illustration.

Finally, research has found that individuals scoring higher on masculinity are more likely to be risk-seeking than those scoring low on masculinity (Meier-Pesti & Penz, 2008). As research also indicates that females are less masculine than males (Hsu et al., 2021; Twenge, 1997), we hypothesize that the effect of sex on financial risk-taking behavior may be mediated by masculinity. Again, we consider the possible moderating effect of time pressure as Lighthall et al. (2009) found that females become more risk-averse and males more risk-seeking when under acute stress. Therefore, we propose the following hypothesis (see Figure 5):

Hypothesis 4: While masculinity mediates the relationship between sex and financial risk-taking in that males tend to be more masculine and, in turn, more risk-seeking, time pressure moderates the relationship between masculinity and financial risk-taking in that more masculine individuals increase, and less masculine individuals decrease their risk-seeking behavior under time pressure.

Figure 5

Hypothesis 4



Note. Own illustration.

3. Method

3.1 Research design

As the hypothesized relationships between sex, gender, financial risk-taking, and time pressure build on existing theories and research findings, our approach is predominantly deductive (Bryman et al., 2019). In order to test the formulated hypotheses, we follow a quantitative research strategy and apply a survey-based cross-sectional research design. We chose this research design as it is most effective for explanatory research (Marshall, 2005; Sander et al., 2019). Concretely, this means that we collect data on sex, gender, financial risk-taking behavior, time pressure, sensation-seeking, and demographic variables in a survey at one singular point in time.

In line with our research question and strategy, we applied a self-reported online questionnaire containing behavioral tasks to collect the required data (see Appendix: Qualtrics Survey). The questionnaire consists of 60 items and can be completed in about 5 to 10 minutes. We conducted the survey through Qualtrics, a web-based tool for delivering self-reported surveys to which BI Norwegian Business School provides free access. Using an online survey allows for easy distribution on our part, low effort on the participants' part, and ensures anonymity.

3.2 Sample and Data Collection Procedure

For our sample, we did not have any specific selection requirements. This decision is based on the fact that all individuals take financial risks regularly and that our research question is aimed at increasing the knowledge about general patterns in financial risk-taking behavior. We recruited our participants through snowball and convenience sampling (Bell et al., 2019). The survey was shared through different digital channels, e.g., LinkedIn, Facebook, and e-mail, as well as in-person, e.g., sharing the project with friends and family and making fellow students aware of our research project. Some of our contacts also re-shared the survey on their social media accounts. Snowball and convenience sampling are easy to apply; however, it should be noted that it potentially impairs the generalizability of the findings as the sample is likely biased (Bell et al., 2019).

In order to be able to generalize our findings and eliminate sampling errors and biases, the sample size needs to be large enough (Taherdoost, 2017). Balancing quality and economic considerations, we aimed to have a final sample size of 100 – 150 participants. The survey was open for participation from 09.03.2023 to 12.04.2023, with reminders to participate being sent out continuously. We obtained 225 responses, of which 127 were fully completed. This corresponds to a 56.45% completion rate.

3.3 Measures

In the following, we exaggerate the different constructs used in our research project and which instruments we apply to measure them. Next to financial risk-taking behavior, sex, gender, time pressure, and sensation-seeking, we also collect relevant demographic data to describe our sample.

3.3.1 Financial risk-taking behavior

The dependent variable within our study is financial risk-taking behavior. As previously described, risk-taking behavior can be reported, projected, or actual (Bran & Vaidis, 2020). In this research project, we focus on actual financial risk-taking behavior, which requires us to use behavioral rather than self-report measures in the assessment.

There are a variety of methods for measuring risk-taking behavior. A prevalent task for measuring actual risk-taking behavior is the Asian Disease task by Tversky & Kahneman (1981). This task offers participants the scenario of a disease outbreak, which is expected to kill a certain amount of people. The participants are then presented with two alternative programs to combat the outbreak. Expressed in either a gain or a loss frame, the participants receive one risk-averse and one risk-seeking alternative (Tversky & Kahneman, 1981). The Asian disease task is realistic yet comprehensive enough to keep the participants engaged. A drawback of this measure is that the task concerns health risks, while our research focuses on financial risk-taking. In the past, the task has been adapted to fit other risk scenarios, e.g., military decision-making (Hærem et al., 2011). In the same way, the task could be adapted to fit the financial risks context, e.g., a scenario in which an investment leads to financial gains. The disadvantage of this approach is that it is time intensive to adapt the measure and the adapted version is not validated.

A widely used measure of financial risk-taking behavior, specifically business risks, is the Carter Racing case (Brittain & Sitkin, 1990; Sitkin & Weingart, 1995). In this case, the participants take the role of the owner of a racing firm, which is experiencing engine problems, and must decide whether to withdraw from the season's last race. If they decide to withdraw, they risk losing advertising support. The case exposes the participants to uncertainty and puts them under time pressure. The advantage of using the Carter Racing case to measure actual risk-taking behavior is that it is highly realistic and quickly engages the participants. However, the Carter Racing case was initially conceptualized for a classroom setting, is quite lengthy, and complex to administer (Brittain & Sitkin, 1990; Sitkin & Weingart, 1995). Due to economic considerations, we find this measurement instrument inadequate for our purposes.

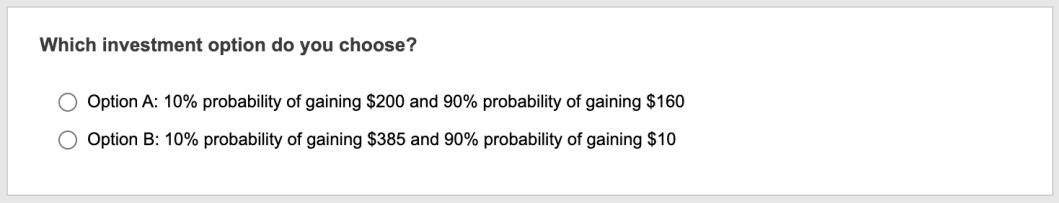
Another commonly used measure of actual risk-taking behavior is the Balloon Analogue Task (BART) (Lejuez et al., 2002). The BART aims to provide a realistic context in which risk-taking behavior can be examined and is thus administered as a simulation on a computer screen. In this simulation, a small balloon is shown on a balloon pump alongside a button labeled “Collect $$$” and a display showing the amount earned on the last balloon and the total amount earned. Each click on the pump inflates the balloon adding money to a temporary reserve. If the participants click on the “Collect $$$” button, the amount in the temporary reserve is moved into the permanent reserve. However, if the balloon explodes, the amount in the temporary reserve is lost. Participants can maximize their earnings when pumping each balloon 64 times (Lejuez et al., 2002). A major disadvantage of this measure is that the underlying logic of how many pumps generate maximum earnings is difficult to identify for most participants. Since we assume that the participants in our study are only willing to invest limited cognitive effort into understanding the items within the questionnaire, we find the logic behind this measurement instrument too complex to lead to reliable and valid results.

Finally, the Multiple Price List Method is also commonly applied to measure financial risk-taking (Holt & Laury, 2002). In the Multiple Price List Method, the participants are presented with a sequence of investment choices where they must choose between two options with different probabilities for fixed financial gains. This means that there is an expected pay-off difference between

the two options (Holt & Laury, 2002). While some researchers suggest that changing the financial gains instead of the probabilities may lead to more stable results, this debate is not settled (Csermely & Rabas, 2016; Drichoutis & Lusk, 2016). We, therefore, chose to retain the original format as suggested by Holt & Laury (2002), only increasing the amount of the fixed financial gains by 100. We do so to increase the relevance of the decision scenarios for the participants. We presented the participants with one example and ten different investment choices. While the financial gains remained stable, the probabilities were changed in the following way: from a 10% probability of gaining $200 and a 90% probability of gaining $160 to a 20% probability of gaining $200 and an 80% probability of gaining $160 and so on (see Appendix: Qualtrics Survey). An example item can be seen in Figure 6.

Figure 6

Example item: Financial risk-taking behavior



Note. Own illustration.

In order to determine how risk-averse / risk-seeking the participants are, the number of safe choices, meaning choice option A, is calculated. As research has found a clear division point between participants at which participants switch from choosing option A to choosing option B, this simple manner of calculation is considered sufficient (Holt & Laury, 2002). The values retrieved from this calculation can then be interpreted using the following scale shown in Table 1.

Table 1

Classification scale: risk-taking behavior

Number of safe choices	Classification of risk-taking behavior
0-1	highly risk-seeking
2	very risk-seeking
3	risk-seeking
4	risk-neutral
5	slightly risk-averse
6	risk-averse
7	very risk-averse
8	highly risk-averse
9-10	completely risk-averse

Note. Own illustration based on Holt & Laury (2002).

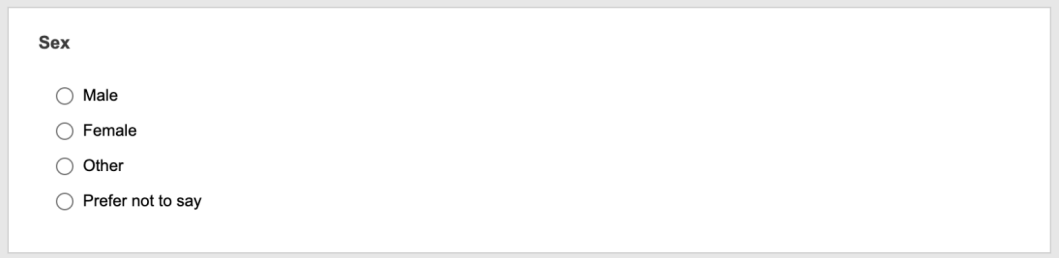
We find that the Multiple Price List Method is an appropriate instrument to measure financial risk-taking behavior in our study as it reflects financial risk-taking behavior, is easily understood by participants, and is simple to apply (Drichoutis & Lusk, 2016; Holt & Laury, 2002).

3.3.2 Sex

The independent variable in our research model is sex. As previously discussed, we define sex as the inherent biological and physiological traits that distinguish females and males (Lott & Maluso, 2001; Pryzgoda & Chrisler, 2000). In this sense, we measure sex by simply asking for the participants' sex. We include four answer options: *male*, *female*, *other,* and *prefer not to say* (see Figure 7). For theoretical reasons, those defining their sex as *other* or *prefer not to say* are excluded from further analysis. However, these options were not chosen.

Figure 7

Item: Sex



Note. Own illustration.

3.3.3 Gender

In our research model, we also include masculinity, a dimension of gender, as a mediating variable. As previously mentioned, gender is defined as the socially and psychologically constructed concepts of femininity and masculinity (Lott & Maluso, 2001; Pryzgoda & Chrisler, 2000). This means that masculinity refers to the degree to which an individual identifies with the societal perception of what it means to be a male (Hoffman et al., 2000). In contrast to sex, gender is a latent construct; thus, masculinity is best assessed using psychometric tests.

The Attitude Interest Analysis Test (AIAT) by Terman and Miles (1936) is the first psychometric test measuring masculinity and femininity as inherent traits. This psychometric test builds on the assumption that masculinity and femininity are not readily observable behavior linked to mental health and opposite poles on a continuum. The AIAT consists of 455 items, which are a mix of word associations, inkblot associations, interest items, and introversion-extroversion items (Terman & Miles, 1936). However, over time research criticized the AIAT for exaggerating the differences between males and females, placing negative connotations on the female scale, and conceptualizing masculinity and femininity as poles of a bipolar scale. In response to the criticism, the concept of androgyny was developed, which conceptualizes masculinity and femininity as separate scales (Morawski, 1987).

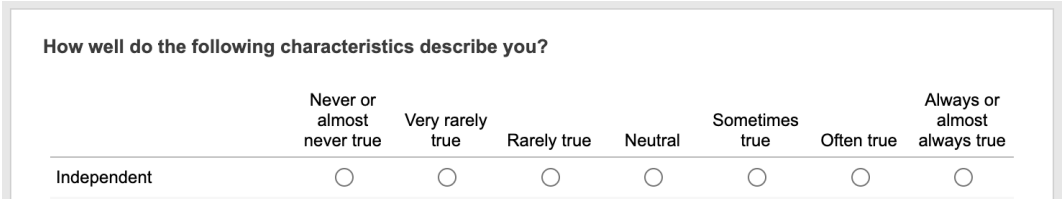
Based on the concept of androgyny, alternative measures of masculinity/femininity were developed. In Spence und Helmreich's (1978) Personal Attributes Questionnaire (PAQ), individuals rate themselves on a series of bipolar items on three distinct scales: a masculine scale, a feminine scale, and a masculine-feminine scale. In this sense, the PAQ integrates the criticism towards

the AIAT. At the same time, the PAQ only measures gender identity, meaning an individual's sense of masculinity/femininity. This means that what classifies as masculine/feminine becomes variable and idiosyncratic (Spence et al., 1979).

While also defining femininity and masculinity as two independent dimensions, the Bem (1974) Sex Role Inventory (BSRI), in contrast, defines masculinity/femininity as what are socially desirable traits for males/females. In this way, masculinity and femininity have a much more unified meaning and are only weakly related to individual gender attitudes, attributes, and behaviors (Bem, 1974). In the original BSRI, individuals indicate to which degree a series of statements is true about them. The questionnaire consists of 60 items, of which 20 measure femininity, 20 measure masculinity, and 20 measure neutral traits on a 7-point scale (Bem, 1974; Mori et al., 2002). The BSRI has been shown to be a reliable and valid measure of masculinity/femininity (Mori et al., 2002). An even more improved measure of masculinity/femininity is the shortened version of the BSRI (Bem, 1979; Colley et al., 2009). This questionnaire consists of 30 items measured on a 7-point scale: 10 masculine, 10 feminine, and 10 neutral items (Bem, 1979). In the following, we present example items for measuring masculinity, femininity, and neutral traits according to the shortened BSRI (see Figures 8, 9, and 10). From the pre-test of our survey, we learned that the participants, who are primarily non-native English speakers, struggled with understanding the meaning of the trait words used in the shortened BSRI (Bem, 1979). Therefore, we included a short list of each trait's meaning based on the definitions given in the Oxford Learner's Dictionary at the bottom of the survey (Oxford University Press, 2023).

Figure 8

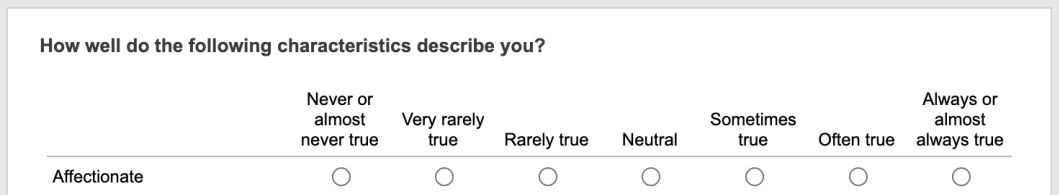
Example item: Masculinity



Note. Own illustration.

Figure 9

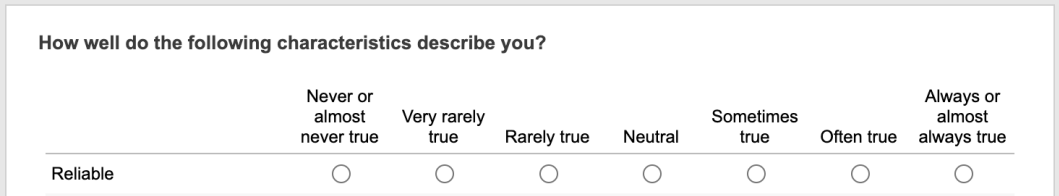
Example item: Femininity



Note. Own illustration.

Figure 10

Example item: Neutral



Note. Own illustration.

Due to the illustrated advantages of the BSRI, we measure masculinity using the widely employed 30-item Bem (1979) Sex Role Inventory (BSRI) (Bem, 1979; Geldenhuys & Bosch, 2020). The scores for masculinity, femininity, and neutral traits are created by calculating the averages from the respective items.

3.3.4 Time pressure

As indicated in the research model and hypotheses, we further measure time pressure as a moderator variable. When selecting a measure of time pressure, we consider approaches used in other research studies.

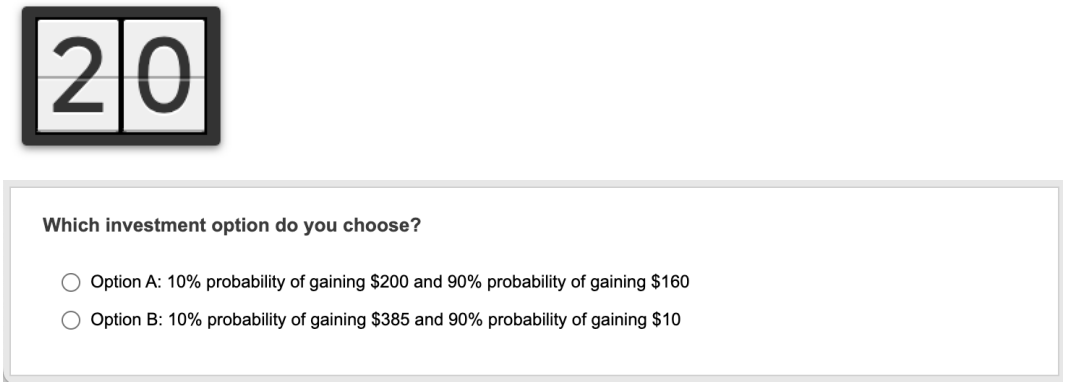
Both Kocher et al. (2013) and Xie et al. (2017) placed individuals under one of three different time constraints when making a decision on lottery pairs. They imposed either no constraint, reflecting the control group with no time pressure, a time constraint of 8 seconds to generate moderate time pressure in the first experimental group, or a time constraint of 4 seconds to model extreme time pressure in the second experimental group (Xie et al., 2017). Haji et al. (2019) similarly manipulated the time available to make a bid by placing participants either in a high-time-pressure treatment, giving them 25 seconds to make a decision, or a low-time-pressure treatment, giving them 6 minutes to decide. The remaining time was shown in a countdown timer below the scenario and above the

bid entry field (Haji et al., 2019). Olschewski and Rieskamp (2021) also manipulated time pressure using an experimental and a control group to create high or low time pressure. They found the median reaction time to be 1.8 seconds. Therefore, participants had 2 seconds to make a decision in the experimental condition, while participants in the control condition had 30 seconds to do so (Olschewski & Rieskamp, 2021).

As previous research studies have shown to differ greatly concerning which time constraint is considered to induce high or low time pressure (Haji et al., 2019; Olschewski & Rieskamp, 2021; Xie et al., 2017), we choose to adjust the time constraint applied in our study to the time participants used to make decisions in our pre-test. The pre-test showed that the participants' decision-making became faster throughout the choice options. In order to maintain an effective manipulation, we, thus, opted to adjust the time constraint steadily. Based on the time used in the pre-test, we opted for the following time constraints in the experimental group: 20 seconds for the first decision, 10 seconds for decisions 2, 3, and 4, and finally, 5 seconds for the remaining decisions. The remaining time is shown in the countdown below the decision scenario and above the options (see Figure 11). The control group had no time constraints.

Figure 11

Example item: experimental group



Note. Own illustration.

Godhinho (2016) also manipulated time pressure by placing the experimental group under a time constraint with a countdown on the survey page. To check whether the manipulation of the time constraint leads to the desired effect, Godhinho (2016) assesses whether participants perceive time pressure.

This is done through three control questions, which are then scored on a 9-point Likert scale from 1 (not at all) to 9 (very much) (Godinho et al., 2016). We apply these same questions to ensure an effective manipulation by time pressure; however, we simplify the scale to a 5-point Likert scale (see Figure 12).

Figure 12

Example item: manipulation check

Note. Own illustration.

3.3.5 Sensation-seeking

As research has linked sensation-seeking to both sex (Sjöberg & Engelberg, 2009) and risk-taking (Breivik et al., 2017; Zuckerman, 1979), we assess sensation-seeking as a control variable in addition to our main variables.

One of the most commonly used scales to measure sensation-seeking is the Form V of the Sensation Seeking Scale (SSS-V) (Conner, 2022; Zuckerman, 1996). This scale consists of 40 items grouped into four subscales that correspond to the key features of the construct: experience seeking, disinhibition, thrill/adventure seeking, and boredom susceptibility. An individual's level of sensation-seeking is calculated by computing an average score based on responses to the complete set of 40 items (Zuckerman, 1996, 2015). While the SSS-V has been widely applied, it is also subject to substantial criticism. Firstly, it is not very economical due to its length (Stephenson et al., 2003). Second, the SSS-V has issues with reliability and validity. The scale exhibits criterion contamination with, e.g., risk-taking behavior, has an unstable factor structure, uses anachronistic, colloquial language, and limits the response range by applying a forced choice response format (Conner, 2022).

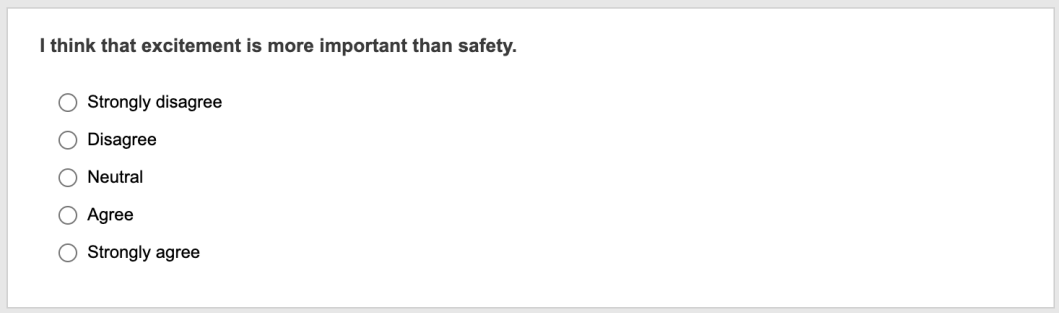
In response to the criticism, alternative measures of sensation-seeking have been developed, which are all significantly shorter and show good external validity (Stephenson et al., 2003). For example, Stephenson et al. (2003) developed the BSSS-4, a 4-item scale, and the SS2, a 2-item scale, as psychometrically sound measures of sensation-seeking. However, the criticism

towards these scales is that sensation-seeking manifests in a broad range of behaviors and preferences, which requires a large, heterogenous pool of items to ensure content validity. Further, the utility of these scales within adult populations is unknown (Stephenson et al., 2003).

Considering the economic and psychometric requirements, we apply the Sensation Seeking Personality Trait (SSPT) scale to measure sensation-seeking in our study (Conner, 2022). This recently developed scale is a reliable and valid measure for sensation-seeking and corrects the psychometric issues of previous scales. The SSPT consists of ten items, phrased as statements regarding an individual's preference for novel and/or exciting activities. Participants rate their level of agreement or disagreement with the statements on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The overall sensation-seeking score is calculated using the average score across all ten items (Conner, 2022). An example item is shown in Figure 13.

Figure 13

Example item: sensation-seeking



Note. Own illustration.

3.3.6 Demographics

To describe our sample, we included additional demographic variables: age, civil status, highest educational degree, occupation, area of study or work, and yearly income. Documenting the sample's demographics allows us to determine in which way the research findings are generalizable, identify possible limitations of the study, and make inferences for future research and replication studies (Bryman et al., 2019). First, it is crucial to determine the participants' ages, as research has shown that individuals are less likely to take risks with increasing age (Kannadhasan, 2015; Rolison et al., 2014). We, therefore, measure age by simply asking the participants to indicate their age in years (see Figure 14).

Figure 14

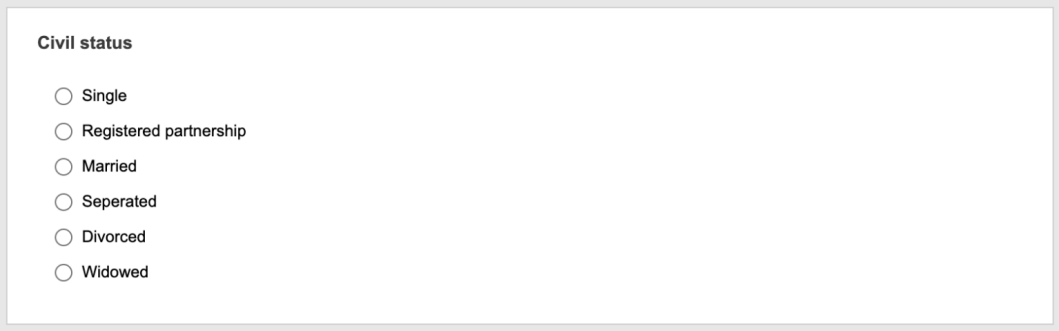
Item: age

Note. Own illustration.

Second, research has also found that marital status affects risk-taking behavior in that married individuals tend to be more financially risk-averse than single individuals (Kannadhasan, 2015; Rui & Sherman, 2005). Therefore, we collect data on the participants' civil status by asking whether they are *single*, in a *registered partnership*, *married*, *separated*, *divorced*, or *widowed* (see Figure 15).

Figure 15

Item: civil status

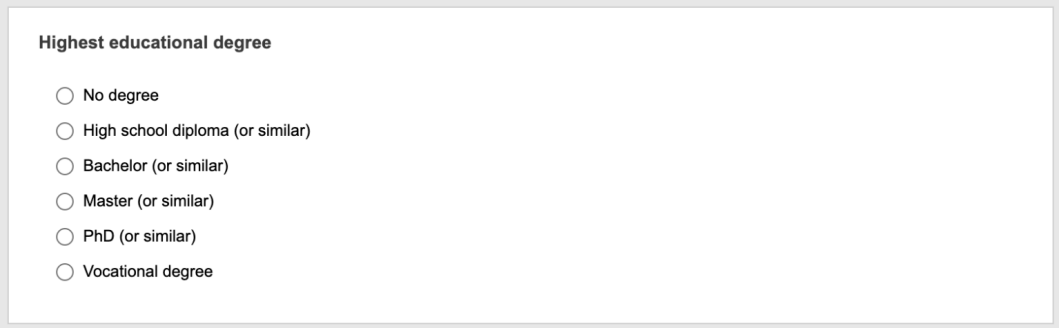


Note. Own illustration.

Next, we collect data on the participants' highest educational degree. As research has shown that individuals with a higher educational degree typically have a greater capacity to evaluate investment risks, this is a relevant variable to consider (Kannadhasan, 2015). Figure 16 shows the item applied in this study.

Figure 16

Item: highest educational degree

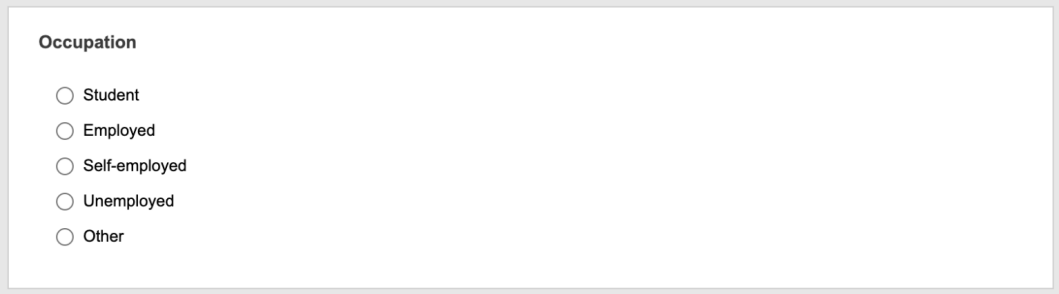


Note. Own illustration.

We further assess the participants' occupations by offering the answer options: *student*, *employed*, *self-employed*, *unemployed*, and *other* (see Figure 17). We decided to include occupation as a demographic variable as research suggests that occupation impacts an individual's risk-taking behavior in that self-employed individuals are more risk-seeking than individuals employed by another individual or organization (Kannadhasan, 2015).

Figure 17

Item: occupation



Note. Own illustration.

In order to control for possible background knowledge, we also assess the participants' area of study or work (see Figures 18 and 19). We offered 32 answer options (see Appendix B: Areas of Study and Work).

Figure 18

Item: Area of Study

Note. Own illustration.

Figure 19

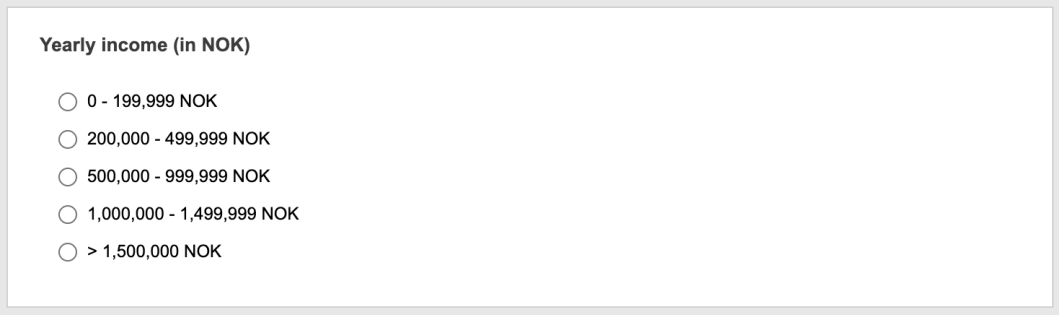
Item: Area of Work

Note. Own illustration.

Finally, we also ask the participants to indicate their yearly income in Norwegian Kroner (NOK), as research indicates that individuals with higher incomes are more risk-seeking than those with lower incomes (Kannadhasan, 2015). We offer five income categories to increase the willingness to answer this personal question and ensure anonymity (see Figure 20).

Figure 20

Item: yearly income



Note. Own illustration.

3.4 Data quality

To ensure that our research findings are high quality, we consider the quality criteria: objectivity, reliability, validity, and replicability (Bell et al., 2019). First, objectivity refers to the research findings being independent of the researcher's values, opinions, and beliefs (Reiss & Sprenger, 2014). We aim to maximize objectivity in our research project by employing a quantitative research design, using established measures, and conducting a standardized online survey. This way, we minimize our impact on data collection, analysis, and interpretation.

Second, reliability refers to the quality of the employed measures in that they are consistent and yield repeatable results (Bell et al., 2019; Brahma, 2009; Cooper, 2020; Johnson & Christensen, 2014). In our research project, we assess all constructs through well-established measures that have shown high reliability in past research. We further calculate Cronbach's Alpha for all constructs as a measure of reliability (Bell et al., 2019; Cooper, 2020).

Third, validity is concerned with the integrity of the conclusions drawn from the research findings. Different types of validity can be distinguished: construct validity refers to whether the measure captures the construct it is intended to; internal validity means that the conclusions about causality hold; external validity relates to the generalization of the results beyond the specific research context; ecological validity means that the findings are applicable to natural settings (Bell et al., 2019; Brahma, 2009; Cooper, 2020; Johnson & Christensen, 2014). As discussed above, the measures applied in our study have been used and tested in previous research and shown to be valid.

Finally, replicability refers to being able to replicate the research in its entirety by documenting the precise procedures and making them available to the public (Bell et al., 2019). In our Master Thesis, we document our exact procedures allowing for replication. We describe our sample along demographic variables, exaggerate the statistical procedures applied to analyze the data, and attach the survey we utilized to collect the data (Appendix A: Qualtrics Survey).

3.5 Research ethics

Throughout the whole research process, it is crucial to consider ethical issues that may arise between the researcher and the research participants. In recent years, researchers' ethical scrutiny level has increased, making research ethics an integral part of the research process. The four core ethical principles in business research relate to avoiding harm, ensuring informed consent, guaranteeing privacy, and preventing deception (Bell et al., 2019).

At the beginning of our online survey, we include an introductory paragraph outlining our research question, methods, and potential research implications. We further stress that participation in the research study is voluntary (Appendix A: Qualtrics Survey). In this way, the participants can make an informed decision about whether they want to participate in the study or not. Further, the participants can terminate their participation at any time during the survey if they wish to do so.

Another ethical concern is the handling of personal information. Personal information is defined as “any information that could be linked to a particular individual” (e.g., a social security number, a name, or an e-mail address/IP address) (Sikt, n.d.). In our research project, we maintain confidentiality and protect the individual’s anonymity, as we do not collect any personal information that could identify individuals (e.g., name or contact information) and conduct our survey online, thus not having any in-person contact with the participants. Therefore, we do not require approval of our research study through the Norwegian Center for Data Research (NSD).

4. Results

4.1 Data Preparation

Prior to analyzing the data collected, we needed to prepare the data. We downloaded the data as a SPSS Statistics Data Document directly from Qualtrics. First, we conducted a mandatory check for data entry errors and missing data (Bryman et al., 2019). We deleted all incomplete data sets using listwise deletion and, thus, decreasing the sample size from 225 to 127. Second, we needed to combine the data collected for the same items in the different experimental groups. Finally, we created the constructs. To do so, we needed to re-code some items (Q9, Q15, Manipulation_check_1.0, and Manipulation_check_3.0) and then calculate the overall scores as described in the methods section. After preparing the data, we retained the final dataset for our analyses and hypotheses testing.

4.2 Reliability & Correlational Analyses

In order to ensure that the measures applied in this study are reliable and valid, we conducted reliability and correlational analyses (Bell et al., 2019). Reliability is assessed using the method of Cronbach's Alpha, which identifies the internal consistency of a set of survey items. It can range from 0 to 1. In research, .70 is frequently used as a threshold value, meaning that at this level or higher items are considered to reliably measure the concerning construct (Tavakol & Dennick, 2011). It is important to note that Cronbach's Alpha can also be too high, indicating that the items are redundant. The threshold value for item redundancy is frequently considered to be .95 (Tavakol & Dennick, 2011).

In this study, we utilize scales for measuring the following constructs: risk aversion, masculinity, femininity, neutrality, sensation-seeking, and perceived time pressure. The scale for risk aversion consisted of 10 items and yielded a Cronbach's Alpha of $\alpha = .778$, indicating that the measure applied is reliable. Gender was measured using three subscales consisting of 10 items each: masculinity ($\alpha = .867$), femininity ($\alpha = .871$), and neutrality ($\alpha = .551$). While masculinity and femininity appear to be reliable measures, neutrality cannot be considered reliable. This finding, however, is to be expected as neutrality is not a theoretical construct but a control variable for socially desirable answering behavior (Bem, 1974). The sensation-seeking scale consisted of 10 items and

Cronbach's Alpha was α =.849, indicating reliability. Finally, perceived time pressure was measured on a three-item scale, generating a Cronbach's Alpha of α = .759, suggesting that the applied measure is reliable.

We conducted a correlational analysis using Pearson's R to assess the convergent and discriminant validity of the measures applied (Bryman et al., 2019). The results are depicted in Table 2.

Table 2

Construct correlations

		RA	Sex	M	F	N	TPP	TPC	S
RA	**Pearson's r**	1	.151	-.265**	.111	-.165	.183*	.069	-.268**
	Sig. (2-tailed)		.089	.003	.213	.064	.039	.439	.002
Sex	**Pearson's r**	.151	1	-2.07*	.262**	.064	.138	-.071	-.333**
	Sig. (2-tailed)	.089		.020	.003	.473	.122	.427	<.001
M	**Pearson's r**	-.265**	-.207*	1	-.091	.509**	-.106	.007	.547**
	Sig. (2-tailed)	.003	.020		.310	<.001	.235	.934	<.001
F	**Pearson's r**	.111	.262**	-.091	1	.251**	.171	.031	-.192*
	Sig. (2-tailed)	.213	.003	.310		.004	.054	.731	.030
N	**Pearson's r**	-.165	.064	.509**	.251**	1	-.119	-.050	.207*
	Sig. (2-tailed)	.064	.473	<.001	.004		.184	.574	.020
TPP	**Pearson's r**	.183*	.138	-.106	.171	-.119	1	.433**	-.051
	Sig. (2-tailed)	.039	.122	.235	.054	.184		<.001	.566
TPC	**Pearson's r**	.069	-.071	.007	.031	-.050	.433**	1	.133
	Sig. (2-tailed)	.439	.427	.934	.731	.574	<.001		.137
S	**Pearson's r**	-.268**	-.333**	.547**	-.192*	.207*	-.051	.133	1
	Sig. (2-tailed)	.002	<.001	<.001	.030	.020	.566	.137	

Note. **. Correlation is significant at the .01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

In these analyses, we find that masculinity is significantly negatively related to sex ($r = -.207$, $p = .020$), while femininity is shown to be significantly positively related to sex ($r = .262$, $p = .003$). This reflects prior research showing that females tend to be more feminine and males more masculine (Bem, 1974; Hoffman et al., 2000; Hsu et al., 2021). Masculinity is also found to be significantly negatively related to risk aversion ($r = -.265$, $p = .003$), which aligns with earlier research findings suggesting that the more masculine individuals are, the more likely they are to seek risks (Abele, 2003; Meier-Pesti & Penz, 2008). Further, we find that sensation-seeking (S) is significantly negatively related to risk aversion (RA) ($r = -.268$, $p = .002$), sex (Sex) ($r = -.333$, $p < .001$), and femininity (F) ($r = -.192$, $p = .030$) as well as significantly positively related to masculinity (M) ($r = .547$, $p < .001$) and neutrality (N) ($r = .207$, $p = .020$). These findings also align with previous research showing that female, more feminine, less masculine, and more risk-averse individuals are less sensation-seeking (Breivik et al., 2017; Sjöberg & Engelberg, 2009). Finally, perceived time pressure (TPP) is not only significantly positively correlated with the time pressure condition (TPC) ($r = .433$, $p < .001$) but also with risk aversion ($r = .183$, $p = .039$). The correlation with the time pressure condition indicates that the manipulation was effective, while the correlation of the perceived time pressure with risk aversion validates previous research that with increasing time pressure, individuals tend to avoid risks (Haji et al., 2019). As the findings of the correlational analyses align with previous research findings, we can assume convergent and discriminant validity of the measures.

4.3 Descriptive Statistics

To better understand our dataset, we conducted descriptive statistics at the variable level (Bryman et al., 2019). Our sample consisted of 127 individuals aged 17 to 66 years ($M = 29.99$, $SD = 10.301$), of which 37.8% were male and 62.2% were female. Most participants (56.7%) were single (see Table 3). Nearly all participants (93.7%) held a bachelor's degree or higher (see Table 4). Approximately half and half of the participants were either students or employed (see Table 5). The main areas of study were business (31.7%), psychology (15%), and economics (10%) (see Table 6). Similarly, the main area of occupation was business (31.3%), followed by engineering and technology (13.4%) and education

(10.4%) (see Table 7). The largest part of the sample, further, had a yearly income of 0 - 199,999 NOK (42.5%), and only a small percentage (4.7%) had more than 1,500,000 NOK yearly income at their disposal (see Table 8).

Table 3

Civil status

Single	Registered Partnership	Married	Divorced
56.7%	24.4%	16.5%	2.4%

Table 4

Highest Educational Degree

No degree	High school diploma (or similar)	Bachelor (or similar)	Master (or similar)	PhD (or similar)	Vocational degree
0.8%	5.5%	40.9%	47.2%	3.9%	1.6%

Table 5

Occupation

Student	Employed	Self-employed	Unemployed	Other
47.2%	47.2%	.8%	2.4%	2.4%

Table 6

Areas of study

Business	Psychology	Economics	Other
31.7%	15%	10%	43.3%

Table 7

Areas of occupation

Business	Engineering & technology	Education	Other
31.3%	13.4%	10.4%	44.9%

Table 8

Yearly Income

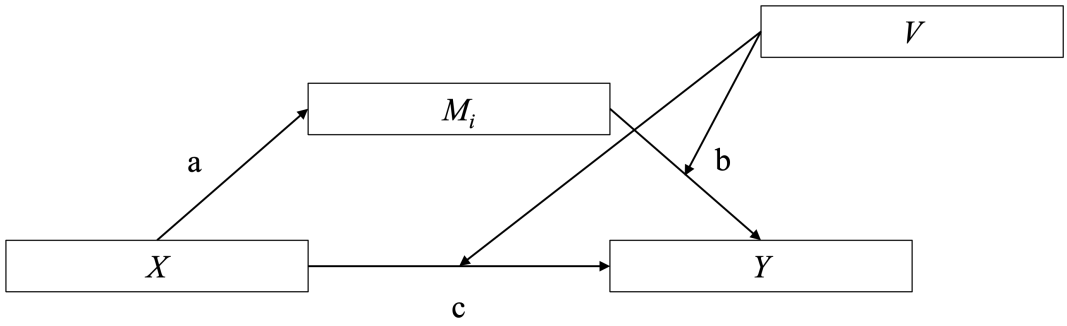
0 - 199,999 NOK	200,000 - 499,999 NOK	500,000 - 999,999 NOK	1,000,000 - 1,499,999 NOK	> 1,500,000 NOK
42.5%	20.5%	27.6%	4.7%	4.7%

4.4 Hypotheses Testing

We tested our research model and the associated hypotheses using the PROCESS macro for SPSS. The PROCESS macro is an observed variable OLS and logistic path analysis modeling tool, which can be utilized to estimate direct and indirect effects in single/multiple mediation models, two- or three-way interactions in moderation models, and conditional indirect effects in moderated mediation models with single/multiple mediators/moderators. In total, the PROCESS macro contains 92 different models (Hayes, 2013). As our research model represents a conditional process model with a single mediator and a single moderator, we apply Hayes model 15 to test it (see Figure 21).

Figure 21

Hayes Model 15



Note. Based on Hayes (2013).

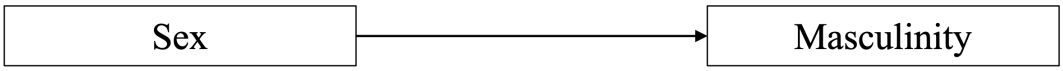
In our research model, the independent variable *X* is sex, the mediator M_i is masculinity, the moderator *V* is time pressure, and the dependent variable *Y* is financial risk-taking behavior. Due to the significant correlations between sensation-seeking and financial risk-taking, sex, and masculinity, we additionally control for sensation-seeking when testing this model.

4.4.1 Hypothesis 1

To test hypothesis 1, we check the regression model for the a-path, where the independent variable sex is assumed to predict the mediator variable masculinity (see Figure 22).

Figure 22

Graphic representation of the a-path



Note. Based on Hayes (2013).

The results indicate that the a-path is not significant. That is, the independent variable sex does not have a significant effect on the mediator variable masculinity (p = .7274) (see Table 9). We, thus, reject hypothesis 1.

Table 9

Regression model for the a-path with the Outcome Variable: M

Model Summary

R	R-sq	MSE	F	df1	df2	p
.5472	.2994	.5711	26.4975	2.0000	124.0000	.0000

Model

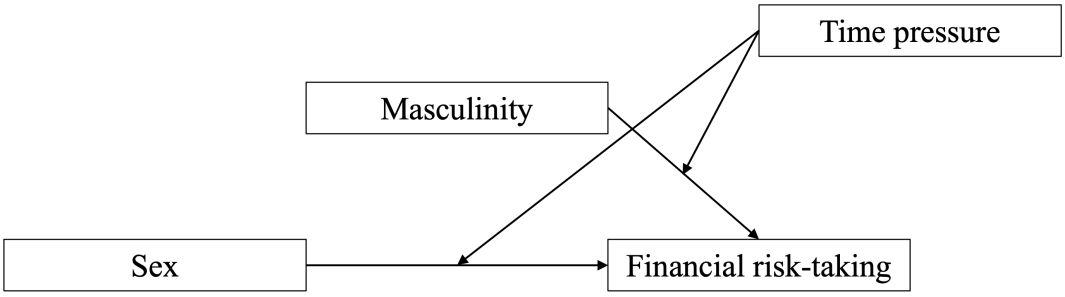
	coeff	se	t	p	LLCI	ULCI
constant	2.4494	.5035	4.8650	.0000	1.4529	3.4459
Sex	-.0512	.1467	-.3494	.7274	-.3415	.2391
S	.7795	.1157	6.7398	.0000	.5506	1.0085

4.4.2 Hypothesis 2 and 3

Next, to test hypothesis 2 and hypothesis 3, we check the regression model for b- and c'-path. The c'-path depicts the possible prediction of financial risk-taking through sex moderated by time pressure, which reflects hypothesis 2. The b-path describes how masculinity moderated by time pressure may predict financial risk-taking, representing hypothesis 3 (see Figure 23).

Figure 23

Graphic representation of the b- and c'-path



Note. Based on Hayes (2013).

The results from running the regression model show that both interactions are non-significant (see Table 10). Int_1 is the interaction for the c-path, meaning sex and time pressure on financial risk-taking, and has an effect size of R2-chng = .0042 (p = .4528). Int_2 is the interaction for the b-path, namely masculinity and time pressure on financial risk-taking, and has an effect size of R2-chng = .0001 (p = .9108). This means that both hypothesis 3 and hypothesis 4 are rejected.

Table 10

Regression model for the b- and c-path

Model Summary

R	R-sq	MSE	F	df1	df2	p
.3315	.1099	4.9137	2.4696	6.0000	120.0000	.0275

Model

	coeff	se	t	p	LLCI	ULCI
constant	7.9759	1.9400	4.1112	.0001	4.1348	11.8170
Sex	.6387	.5952	1.0731	.2854	-.5398	1.8173
M	-.4033	.3232	-1.2477	.2146	-1.0433	.2367
TPC	1.2355	2.9326	.4213	.6743	-4.5709	7.0419
Int_1	-.6370	.8457	-.7532	.4528	-2.3115	1.0375
Int_2	.0526	.4683	.1122	.9108	-.8747	.9798
S	-.6908	.4072	-1.6967	.0924	-1.4970	.1153

Product terms key: Int_1 = Sex x TPC; Int_2 = M x TPC

Test(s) of highest or unconditional interaction(s)

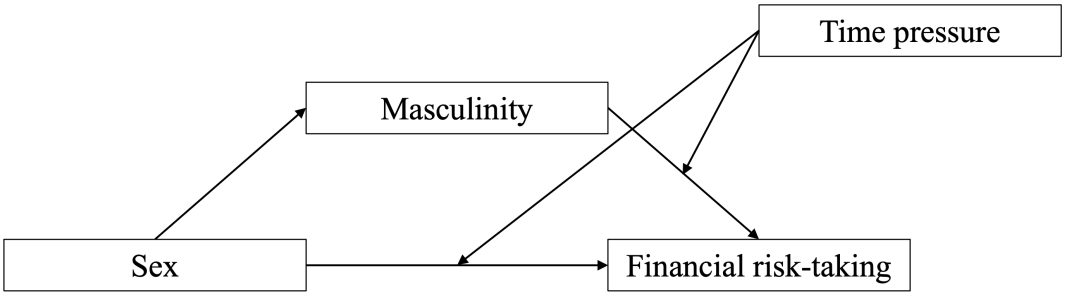
	R2-chng	F	df1	df2	p
X*W	.0042	.5674	1.0000	120.000	.4528
M*W	.0001	.0126	1.0000	120.000	.9108

4.4.3 Hypothesis 4

The index of moderated mediation indicates whether the overall model is significant, meaning there is a moderated mediation. For our model, this means that the test shows two things simultaneously: whether masculinity mediates the relationship between sex and financial risk-taking behavior and whether the relationship between masculinity and financial risk-taking is moderated by time pressure at the same time (see Figure 24).

Figure 24

Graphic representation of the paths tested in the index of moderated mediation



Note. Based on Hayes (2013).

The output from the analysis indicates that the overall model is not significant (95% CI [-.1328, .1240]), meaning that there is no moderated mediation in this model (see Table 11).

Table 11

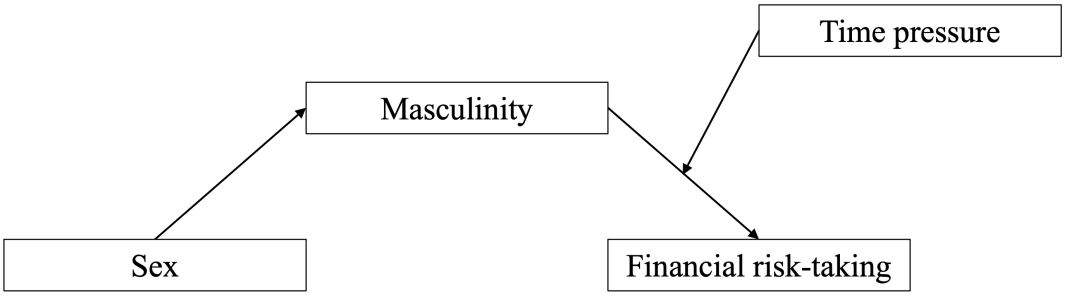
Index of moderated mediation (difference between conditional indirect effects)

	Index	BootSE	BootLLCI	BootULCI
TPC	-.0027	.0584	-.1328	.1240

Despite the moderated mediation being insignificant, we report the conditional direct and indirect effect for reasons of completeness. The conditional indirect effect describes the effect of sex on financial risk-taking behavior mediated by masculinity and moderated by time pressure (see Figure 25).

Figure 25

Graphic representation of the conditional indirect effect



Note. Based on Hayes (2013).

In the analysis, the significance of the indirect effect is examined using two different values for the moderator: the mean and the mean plus one standard deviation. The indirect effect is not significant for either the mean as a value for the moderator (95% CI [-.1165, .1876]) or the mean plus one standard deviation (95% CI [-.1167, .1876]). This suggests that there is no moderated mediation for sex, masculinity, time pressure, and financial risk-taking (see Table 12).

Table 12

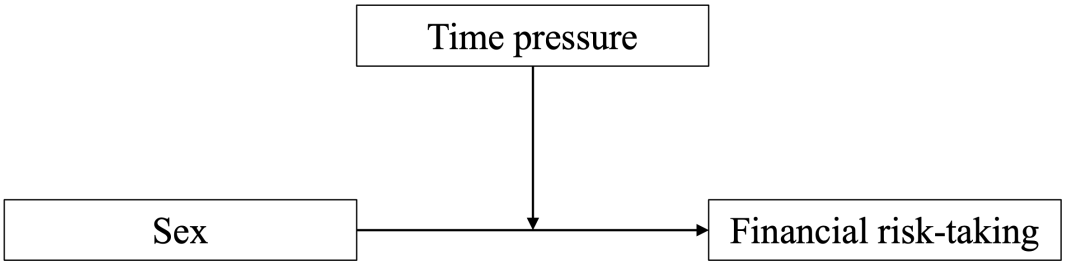
Conditional indirect effect of sex on financial risk-taking mediated by masculinity

TPC	Index	BootSE	BootLLCI	BootULCI
.0000	.0207	.0721	-.1165	.1876
1.0000	.0180	.0702	-.1167	.1876

The conditional direct effect describes the effect of sex on financial risk-taking behavior moderated by time pressure (see Figure 26).

Figure 26

Graphic representation of the conditional direct effect



Note. Based on Hayes (2013).

The significance of the direct effect is examined using the mean and the mean plus one standard deviation as values for the moderator. Neither using the mean as a value for the moderator (95% CI [-.5398, 1.8173]) nor the mean plus one standard deviation (95% CI [-1.2126, 1.2160]) makes the indirect effect significant. This finding suggests that there is no significant moderation of time pressure on the relationship between sex and financial risk-taking (see Table 13).

Table 13

Conditional direct effect of sex on financial risk-taking

TPC	Effect	se	t	p	LLCI	ULCI
.0000	.6387	.5952	1.0731	.2854	-.5398	1.8173
1.0000	.0126	.6133	.0028	.9978	-1.2126	1.2160

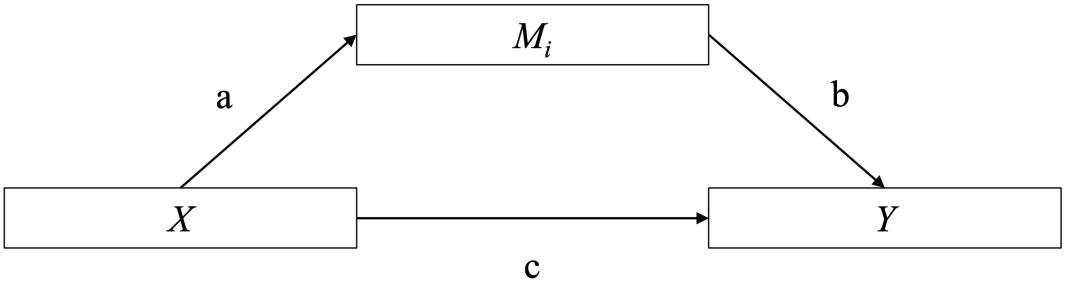
4.5 Post-hoc Analysis

As our data analyses did not support our a-priori hypotheses, we conducted additional post-hoc exploratory analyses. This scientific technique is also called *harking*, hypothesizing after results are known. When conducted transparently based on well-reasoned considerations and to broaden the scientific inquiry and generate knowledge more effectively and efficiently, harking is considered an ethical research method and referred to as *tharking*. In contrast, harking is ethically problematic when it is undisclosed, also referred to as *sharking* (Hollenbeck & Wright, 2017). In order to ensure that our research is beneficial to the scientific progress in the field and ethical, we transparently discuss why we consider alternative explanations and report the harking results as what they are: post-hoc analyses.

Based on the correlations found between the different study variables, we assume that there may be mechanisms alternative to our suggested research model that may explain individual differences in financial risk-taking behavior better (see Table 2). Firstly, time pressure and perceived time pressure were only found to correlate ($r = .433$, $p < .001$). Therefore, we decided to drop time pressure as a moderating variable in the model. Secondly, we found that masculinity correlates with sex ($r = -.207$, $p = .020$) and financial risk-taking behavior ($r = -2.65$, $p = .003$), suggesting that these variables may explain each other. In order to test possible explanations, we conducted several post-hoc analyses. However, we only found one model to be significant. This alternative research model represents a mediation model with a single mediator. To test our research model, we thus apply Hayes model 4 (see Figure 27).

Figure 27

Hayes Model 4



Note. Based on Hayes (2013).

In this model, the independent variable X is sex, the mediator M_i is masculinity, and the dependent variable Y is financial risk-taking behavior. Accordingly, the significance of the direct effect of sex on financial risk-taking as well as the indirect effect of sex on financial risk-taking mediated by masculinity is examined in the post-hoc analysis. While the indirect effect is significant (95% CI [.0404, .4976]), the direct effect is not (95% CI [-.3453, 1.2964]). This suggests that masculinity mediates the relationship between sex and financial risk-taking without sex directly affecting financial risk-taking behavior (see Tables 14 and 15).

Table 14

Direct effect of sex on financial risk-taking

Effect	se	t	p	LLCI	ULCI
.4755	.4147	1.1466	.2538	-.3453	1.2964

Table 15

Indirect effect of sex on financial risk-taking mediated by masculinity

Effect	BootSE	BootLLCI	BootULCI
.2376	.1193	.0404	.4976

By further examining the different paths within the model, we find that both the a-path (R-sq = .0428, p = .0197), which reflects the effect of sex on masculinity, and the b-path (R-sq = .0798, p = .0065), which describes the effect of masculinity on financial risk-taking, are significant (see Table 16 and 17).

Table 16

Regression model for the a-path

Outcome variable: M

Model Summary

R	R-sq	MSE	F	df1	df2	p
.2068	.0428	.7740	5.5855	1.0000	125.0000	.0197

Model

	coeff	se	t	p	LLCI	ULCI
constant	5.4534	.2726	20.0070	.0000	4.9140	5.9929
Sex	-.3805	.1610	-2.3634	.0197	-.6992	-.0619

Table 17

Regression model for the b-path

Outcome variable: RA

Model Summary

R	R-sq	MSE	F	df1	df2	p
.2826	.0798	4.9158	5.3802	2.0000	124.0000	.0057

Model

	coeff	se	t	p	LLCI	ULCI
constant	7.3584	1.4082	5.2255	.0000	4.5712	10.1456
Sex	.4755	.4147	1.1466	.2538	-.3453	1.2964
M	-.6243	.2254	-2.7698	.0065	-1.0705	-.1782

5. Discussion

5.1 Theoretical Implications

The main purpose of our study was to investigate whether individual differences in financial risk-taking behavior stem from sex or gender differences. In order to examine this, we tested a model of moderated mediation. In this model, we assumed that sex would have both a direct effect on financial risk-taking behavior and an indirect effect, a mediation through masculinity and that these effects would each be moderated by time pressure. We further controlled for sensation-seeking. However, we did not find this original research model to be significant. This finding is rather surprising as it stands in contrast to previous research findings.

Previous research suggests that the decision-maker's sex may predict their level of masculinity, with females tending to be less masculine than males (Eagly & Steffen, 1984; Hsu et al., 2021). Therefore, we hypothesized that sex predicts masculinity in that females tend to be less masculine than males. However, our findings did not support the hypothesis that sex predicts masculinity. Several notions may explain this null finding. A possible explanation is that the measurement of masculinity may be flawed. The scale we applied in our study relies on the concept of androgyny. In this concept, masculinity and femininity are defined as distinct dimensions that respectively reflect stereotypically male and female traits (Bem, 1974). This approach, however, bears the risk of being inconsistent with prevailing notions of gender. More recent research has shown that gender attributions are shifting (Abele, 2003; Eagly et al., 2000; Wood & Eagly, 2002). Therefore, what is considered typically male or female and, thus, conceptualized as masculinity and femininity may no longer match the conceptualizations of the BSRI (Bem, 1979) used in our study. As our sample is relatively young (M = 29.99, SD = 10.301), mainly single (56.7%), and academically educated (88.1% hold a bachelor's or master's degree), they may not perceive gender differences as pronounced. There have also been attempts to conceptualize masculinity using individual definitions (Baldwin et al., 1986; Ravinder, 1987). Following this idea, the null findings in our study may have been caused by the participants' individual understandings of masculinity deviating from that in the BSRI (Bem, 1979). However, as the correlational analyses

suggest that masculinity and femininity are both significantly correlated with sex, it appears as though the BSRI scales are valid. Therefore, we suggest that while there may be a correlational relationship between sex and masculinity, sex may not cause masculinity.

Further, previous research has indicated that sex and financial risk-taking are related in that males tend to be more risk-seeking than females (Charness & Gneezy, 2012; Croson & Gneezy, 2009; Eckel & Grossman, 2002; Garrison & Gutter, 2010). At the same time, research has also indicated that time constraints are related to financial risk-taking behavior. While the findings on the effects of time pressure on financial risk-taking behavior are ambiguous, time pressure has been found to amplify the differences between the sexes (Haji et al., 2019; Lighthall et al., 2009; Olschewski & Rieskamp, 2021). Consequently, we hypothesized that time pressure moderates the relationship between sex and financial risk-taking behavior in that females become more risk-averse and males more risk-seeking. The results of the regression model, however, are not statistically significant and thus, the hypothesis is rejected. Again, we consider possible explanations for discrepancies between the research status, hypothesis, and findings. One possible reason could be the measurement of financial risk-taking behavior. From our pre-test, we know that the participants struggled with understanding the risk-taking task when set under time pressure, which could potentially impact the validity of the measurement instrument. However, we accounted for this in the final version of our survey by giving an example risk-taking task beforehand and adjusting the time constraint throughout the tasks. Another aspect that may have contributed to the null findings is that the gains in the financial risk-taking task are solely hypothetical. This may inhibit the participant's motivation and research has also shown that individuals cannot imagine how they would behave under hypothetical situations (Holt & Laury, 2002). Another factor that may have led to the null finding is that the scores for financial risk-taking are calculated assuming that participants stay consistent in their answer choices and do not switch back and forth between answer options A and B (Holt & Laury, 2002). However, the answering behavior may fluctuate more than expected, deeming the calculation method for the financial risk-taking scores applied here inappropriate. The measurement of time pressure is another possible reason why the findings are not significant. As the manipulation check

shows that the time pressure constraint and the perceived time pressure correlate significantly, it seems as though the time pressure manipulation was effective. Seeing as the research findings on the effect of time pressure are so ambiguous (Haji et al., 2019; Lighthall et al., 2009; Olschewski & Rieskamp, 2021), we, therefore, rather consider that time pressure may simply not affect the relationship between sex and financial risk-taking behavior. It is also possible that other variables that we did not control for may have influenced the relationship between sex, time pressure, and financial risk-taking. Age, for example, has been shown to explain differences in financial risk-taking (Zabel et al., 2009). Differences in the distribution of ages within the male and female sample may, thus, cancel out the expected effect.

Research has also found masculinity to be related to financial risk-taking (Meier-Pesti & Penz, 2008). As males are more masculine than females (Eagly & Steffen, 1984; Hsu et al., 2021), and under time pressure, males become more risk-seeking (Lighthall et al., 2009), we further hypothesized that masculinity moderated by time pressure would be able to predict financial risk-taking. However, this hypothesis was not supported by our data. As previously discussed, this discrepancy can potentially be explained by the measurement of masculinity potentially being inconsistent with prevailing or individual notions of gender. Similarly, the measurement of financial risk-taking may have implications on the findings; that is, the complexity and abstractness of the tasks as well as the calculation of the financial risk-taking scores, may have led to the null findings. Furthermore, we control for sensation-seeking. As sensation-seeking and masculinity are significantly correlated ($r = -.265$, $p = .003$), we can assume that their effects on financial risk-taking behavior are highly confounded. When controlling for sensation-seeking, the effect of masculinity may, therefore, be minimized to insignificance. Another possible explanation for the null findings for this hypothesis is that time pressure may simply not have an effect. This explanation is supported by the ambiguous research findings on time pressure in the context of financial risk-taking (Haji et al., 2019; Lighthall et al., 2009; Olschewski & Rieskamp, 2021) and that we did not find any significant correlation between time pressure and financial risk-taking ($r = .069$, $p = .439$).

As mentioned, previous research has shown that sex and masculinity (Eagly & Steffen, 1984; Hsu et al., 2021)) as well as masculinity and risk-taking

behavior are related (Meier-Pesti & Penz, 2008) and that time pressure influences the relationship between sex/masculinity with financial risk-taking (Lighthall et al., 2009). Furthermore, sensation-seeking has been shown to be related to financial risk-taking behavior (Breivik et al., 2017; Zuckerman, 1979). Combining these previous research findings, our fourth and final hypothesis assumes that masculinity mediates the relationship between sex and financial risk-taking, while time pressure moderates the relationship between masculinity and financial risk-taking. We did not find this model to be significant. Considering that the previous hypotheses were not significant either and that hypothesis 4 combines these into an overall research model, the possible explanations mentioned previously may contribute to explaining why the findings for hypothesis 4 stand in contrast to existing research. The possible explanations entail the measurement of masculinity, the measurement of financial risk-taking behavior, the effect of time pressure, sensation-seeking as a control variable, as well as the nature of the relationships between the variables.

As the mediated moderation model was not found to be significant, we conducted post-hoc analyses based on the correlations among our study variables. These provided interesting insights into the relationships between sex, masculinity, and financial risk-taking behavior. Our post-hoc analysis showed that masculinity significantly mediates the relationship between sex and financial risk-taking. This finding is in line with previous research findings indicating that sex is associated with masculinity (Eagly & Steffen, 1984; Hsu et al., 2021) and masculinity is associated with financial risk-taking behavior (Meier-Pesti & Penz, 2008). It is further in accordance with our correlational analysis showing that both sex and masculinity ($r = -.207$, $p = .020$) and masculinity and financial risk-taking behavior ($r = -.265$, $p = .003$) are correlated. Finding that this simpler model, in which masculinity mediates the relationship between sex and financial risk-taking behavior, is significant may suggest the following: First, it underpins the assumption that time pressure may not explain differences in financial risk-taking behavior. Second, it suggests that sensation-seeking and masculinity may be so highly confounded that controlling for either will diminish the effects of the other on financial risk-taking. Third, as the findings of the post-hoc analysis are in line with the current research status, it also indicates that the measurements applied are appropriate.

Overall, our study contributes to theory by extending existing research on financial risk-taking behavior, its antecedents, and underlying mechanisms. While the relationship between sex and financial risk-taking behavior has been well-explored, the distinction between sex and gender has rarely been drawn. Therefore, our research findings add depth to the current research status. Our study also contributes to the broader theoretical frameworks as it examines sex and masculinity as variables of individual differences and their effect on financial risk-taking behavior. In this way, our findings underpin the assumptions of the Upper Echelons Theory. As the post-hoc analysis shows that individuals' sex and masculinity influence their financial risk-taking behavior, our study supports the theory's tenant that executives' individual traits influence their judgment and decision-making (Abatecola & Cristofaro, 2018; Hambrick, 2007). At the same time, our findings also support the assumptions of the Social Role Theory of Sex Differences and Similarities. The post-hoc analysis indicates that the relationship between sex and financial risk-taking is mediated by masculinity, which is in line with the theory's tenant that the behavioral differences between females and males stem from differences in their gender roles (Eagly, 1987; Eagly et al., 2000). By contrasting the influence of sex vs. masculinity on financial risk-taking behavior, our study, finally, also contributes to the wider nature vs. nurture debate.

5.2 Practical Implications

Financial risk-taking is fundamental to individuals' everyday lives in private and professional settings (Gilley et al., 2002). Therefore, our research findings also have significant practical implications. When considering these implications, it is important to note that our findings are not generalizable but should be viewed as a point of reference as we applied convenience sampling (Bryman et al., 2019).

First, our findings allow individuals and organizations to understand the antecedents and processes underlying financial risk-taking, creating greater awareness of one's own and others' financial decisions. As our research findings indicate that sex influences masculinity and masculinity, in turn, influences financial risk-taking behavior, sex and masculinity can be used to understand financial decisions better. For example, an organization's tendency to seek financial risks may be explained by its high percentage of organizational decision-

makers, who are more masculine in their traits. Finding significant effects for sex and masculinity but not for time pressure may indicate that individual differences may be more influential than contextual variables regarding financial risk-taking behavior. This, however, contrasts the majority of existing research that constitutes a greater influence of contextual factors (Figner & Weber, 2011; Miller & Byrnes, 1997).

Second, our research findings may also have practical implications for selection and promotion decisions within organizations. Depending on the organizational needs, certain decision-making positions will need to be filled with individuals who are more or less financially risk-seeking to achieve the desired organizational results. A conventional bank, for example, may want to employ individuals who tend to avoid financial risks, while an investor in innovation may want to employ individuals who seek a certain level of financial risk. Using a personality test that assesses individuals' levels of masculinity may be a useful tool to approximate financial risk-taking behavior and can, in that way, serve as a basis for selection and promotion decisions. It is important to note that selecting based on sex may, for one, be considered discriminatory (Equality and Anti-Discrimination Act, 2018) and, for another, is an inappropriate selection criterion as our research findings only indicate an indirect effect on financial risk-taking behavior. Organizations should instead consider masculinity as a criterion whilst still being aware that the measure of masculinity is solely an approximation of financial risk-taking behavior. Masculinity should, further, not be the single criterion for selection and promotion decisions, as financial risk-taking is an important but not the only aspect influencing organizational success (Pandey et al., 2021; Yang & Maxwell, 2011).

Finally, our research can also serve as a reference point for making more balanced organizational decisions. Awareness of which individuals are more masculine and which are less masculine and the attached tendencies to behave risk-seeking or risk-averse may allow organizations to adapt their support to fit these individuals. For example, an organization that knows that a particular employee scores high on masculinity may, in the employee's onboarding and training, stress the importance of not taking unnecessary risks, while an employee scoring low on masculinity may be encouraged to do the opposite.

5.3 Limitations & Future Research

Our Master Thesis exhibits some limitations that need to be accounted for when interpreting and using the study findings for theoretical and practical purposes. Firstly, the measure of financial risk-taking behavior has some limitations. Financial risk-taking behavior was assessed using a hypothetical decision scenario. Research has shown that individuals' behavior in decision scenarios with hypothetical gains may differ significantly from their behavior in decision scenarios with actual gains (Holt & Laury, 2002). Therefore, future research should apply financial risk-taking measures that offer the participants actual gains. Moreover, to increase the relevance of the decision scenarios, we adapted the potential gains by multiplying them by 100. We, thus, suggest that further research examines how changes in the amount of the gains may systematically affect the decisions made. In addition, as done in the original measurement (Holt & Laury, 2002), we adapted the percentages rather than the amounts of the gains. Research has indicated that results may be more stable when adapting the percentages (Csermely & Rabas, 2016; Drichoutis & Lusk, 2016). Future research may, thus, adapt the percentages instead. Furthermore, the scores for financial risk-taking are calculated based on the assumption that the participants are consequent in their answering behavior and do not switch back and forth between risk-seeking and risk-averse options (Holt & Laury, 2002). It may be interesting for future research to check this assumption and, if not verified, try to adapt the calculation of the scores. Finally, the financial risk-taking task is a relatively unfamiliar situation, as the feedback from our pre-test revealed. We adapted the final survey by including an example task. However, future research could also try to find more realistic and easier-to-understand tasks.

Secondly, the measure of masculinity also shows limitations. For one, as a self-report measure of personality traits, the BSRI scale may potentially be object to socially desirable answering behavior (Bem, 1979; Bryman et al., 2019). We aimed to inhibit this effect by informing the participants about the anonymity of the survey beforehand and conducting the survey online. Further, the traits used in the items to measure masculinity may carry different meanings for individuals depending on, for example, their language abilities, cultural background, or generation. As the BSRI was validated on an American sample (Bem, 1979), this may limit the validity of our findings.

Our sample also created some limitations for our research findings. With a sample size of 127 participants, our sample is relatively small. Further, the sample is not representative of the general population, making the findings of our study not generalizable (Bryman et al., 2019). As we conducted convenience sampling, our sample reflects biases from our network, e.g., our sample is young, highly educated, and mainly works within HR, psychology, social sciences, and business. To be able to generalize the findings, researchers may consider analyzing 'big data' (Pielke, 2013).

As we collected our data at a single point in time, we had an increased risk for common method variance (Podsakoff et al., 2003). We conducted reliability and correlational analysis to check for this. However, future research should aim to collect data over time. Moreover, we mainly applied self-report measures, which may not accurately represent the "true" values (Bryman et al., 2019). Future research should, therefore, collect data from several sources to achieve a more complete picture of the individual's traits. Finally, using a web-based platform, whilst an advantage of our study for many reasons, may also create limitations. Completing the survey online inhibits the ability to control the environment. This means that the participants' attention may easily be drawn away. While we aimed to prevent this by including the progress rate, we still had a relatively low completion rate, and some participants took very long to complete the survey.

Besides considering the discussed limitations, future research may also examine the impact of other individual differences on financial risk-taking behavior. The Upper Echelons Theory assumes that the individual's psychological properties and observable experiences are personal characteristics that may impact judgment and decision-making (Hoskisson et al., 2017). In that sense, it may be relevant to explore the relationships between personality traits, e.g., the 'Big Five' (Costa & McCrae, 1995) or motivational needs like power, achievement, and affiliation (McClelland, 1989), and financial risk-taking as well as the relationships between experiences, e.g., executive tenure and educational background, and financial risk-taking (Hoskisson et al., 2017). In this context, it is also crucial to assess the relative impact of these factors and whether their explanatory power of financial risk-taking behavior is greater than that of sex and masculinity.

6. Conclusion

In this Master Thesis, we have examined the influence and interactions of sex, gender, and time pressure on financial risk-taking with the aim of contributing new knowledge to research and practice. We collected data using a self-reported online survey and tested a model of mediated moderation.

In our original research model, we hypothesized that the relationship between sex and financial risk-taking is mediated by masculinity, whilst the relationship between masculinity and financial risk-taking is moderated by time pressure when controlling for sensation-seeking. While this model could not be confirmed, the post-hoc analysis showed that masculinity does mediate the relationship between sex and financial risk-taking. In this sense, our study appears to align with existing theory and research. Not only do the study results align with the Upper Echelons Theory and the Social Role Theory of Sex Differences and Similarities, but they also contribute to the wider nature vs. nurture debate. That is, nature, here sex, seems to influence nurture, here masculinity. At the same time, contextual factors, such as time pressure, appear irrelevant to the individual's financial risk-taking behavior.

From these findings, we also deduct practical implications. Our research study helps create an understanding of which factors influence financial decision-making. This is relevant for selection and promotion decisions in organizations. Individuals' masculinity can be assessed and used as a criterion for selecting employees according to the organization's or position's financial risk requirements. Identifying which individuals are more masculine and may, thus, tend to be more risk-seeking may also allow organizations to adapt onboarding and training initiatives to retain the organization's overall financial risk-taking at a balanced level. However, replication studies on larger and more representative samples and further research into other factors may provide a better understanding of the (relative) quality of sex and masculinity as predictors of financial risk-taking behavior. Nonetheless, our analyses give a solid indication of the impact of sex and masculinity and where future research should be directed.

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Appendices

Appendix A: Qualtrics Survey

Start of Block: Introduction

T1 Dear participant,

Judgment and Decision Making, specifically risk-taking, is inherent to our everyday lives – in private and in organizational contexts. Research has found that individuals may differ in their risk-taking behavior with sex and gender playing a central role (e.g., Demaree et al., 2008; Charness & Gneezy, 2012; Croson & Gneezy, 2009; Eckel & Grossman, 2002).

As part of our Master Thesis, we conduct a survey to examine the differences in financial risk-taking behavior between men and women. Your participation is very important to better understand this topic.

Our survey takes approximately 5-10 minutes to complete. Please, ensure that you are well-rested, focused, and in a calm and well-lighted environment when completing the questionnaire. Please be reminded that there is no right or wrong answer and it is important that you record your first intuitive answer.

No individual identification information will be collected in this survey. The participation in the survey is anonymous and your data will be handled confidentially. Your participation is voluntary. There will be no negative consequences for you if you choose not to participate or later decide to withdraw.

Thank you for your interest in our research project!

Anna Maria Mohr and Aleksandra Stranden
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Page Break

End of Block: Introduction

Start of Block: Gender

T2 In this first part of the survey, you will be presented with a list of characteristics.
Please, indicate for each characteristic how well it describes you.

Page Break

Q1 How well do the following characteristics describe you?

	Never or almost never true	Very rarely true	Rarely true	Neutral	Sometimes true	Often true	Always or almost always true
Assertive	○	○	○	○	○	○	○
Leadership ability	○	○	○	○	○	○	○
Dominant	○	○	○	○	○	○	○
Strong personality	○	○	○	○	○	○	○
Forceful	○	○	○	○	○	○	○
Aggressive	○	○	○	○	○	○	○
Willingness to take a stand	○	○	○	○	○	○	○
Independent	○	○	○	○	○	○	○
Defends own beliefs	○	○	○	○	○	○	○
Willingness to take risks	○	○	○	○	○	○	○
Understanding	○	○	○	○	○	○	○
Sympathetic	○	○	○	○	○	○	○

Eager to soothe hurt feelings	○	○	○	○	○	○	○
Sensitive to others' needs	○	○	○	○	○	○	○
Compassionate	○	○	○	○	○	○	○
Loves children	○	○	○	○	○	○	○
Affectionate	○	○	○	○	○	○	○
Gentle	○	○	○	○	○	○	○
Warm	○	○	○	○	○	○	○
Tender	○	○	○	○	○	○	○
Conscientiousness	○	○	○	○	○	○	○
Moody	○	○	○	○	○	○	○
Reliable	○	○	○	○	○	○	○
Jealous	○	○	○	○	○	○	○
Conventional	○	○	○	○	○	○	○
Tactful	○	○	○	○	○	○	○

Conceited	○	○	○	○	○	○	○
Secretive	○	○	○	○	○	○	○
Truthful	○	○	○	○	○	○	○
Adaptable	○	○	○	○	○	○	○

Adaptable = able or willing to change in order to suit different conditions
Affectionate = showing feelings of liking or love
Aggressive = showing anger and a willingness to attack other people
Assertive = behaving confidently and not being frightened to say what you want or believe
Compassionate = feeling or showing sympathy and sadness for the suffering or bad luck of others, and wanting to help them
Conceited = too proud of yourself and your actions and abilities
Conscientiousness = the quality of working hard and being careful
Conventional = traditional and ordinary
Dominant = being more important, strong, or noticeable than others
Eager to soothe hurt feelings = to make someone feel calm or less worried when their feelings have been hurt
Forceful = expressing opinions strongly and demanding attention or action
Gentle = calm, kind, or soft
Jealous = upset and angry because someone that you love seems interested in another person
Leadership ability = having a set of characteristics that make a good leader
Loves children = to like children very much
Moody = when your moods change suddenly and you become angry or unhappy easily
Reliable = behaving in an expected way, being trustworthy, and believable
Secretive = hiding your feelings, thoughts, intentions, and actions from other people
Sensitive to others' needs = dealing with others' needs carefully in order to avoid upsetting them
Strong personality = being sure of yourself and powerful
Sympathetic = understanding and caring about someone else's suffering
Tactful = being careful not to say or do anything that could upset someone
Tender = gentle, loving, or kind
Truthful = being honest and not containing or telling any lies
Understanding = being knowledgable about a subject, situation, etc. or about how something works
Warm = friendly and loving
Willingness to take a stand = being willing to defend ideas and other people

source: Cambridge Dictionary

End of Block: Gender

Start of Block: Risk-taking behavior - Experimental group

Instructions In the following, you will be presented with different investment scenarios.

In each scenario, you will have the choice between two investment options (Option A and Option B). While the investment sum is the same for both options, they have different probabilities and profits attached.

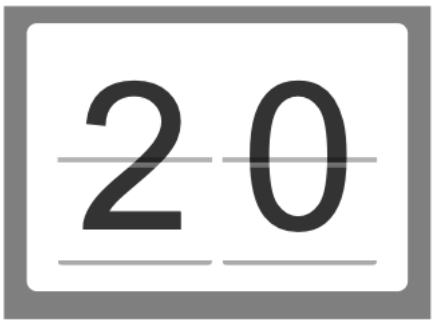
Please, choose the option that you think will maximize your profits.

You have limited time to choose an option. The time will be counted down on a timer at the top of the page.

Example: Which investment option do you choose?

- ○ Option A: 0% probability of gaining $200 and 100% probability of gaining $160
- ○ Option B: 0% probability of gaining $385 and 100% probability of gaining $10

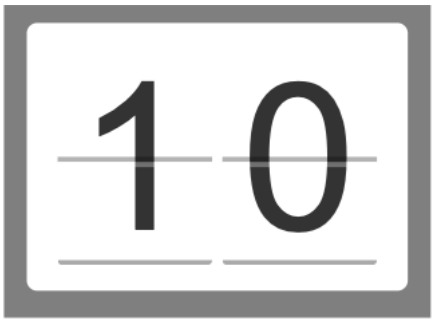
Page Break



Decision 1: Which investment option do you choose?

- Option A: 10% probability of gaining $200 and 90% probability of gaining $160
- Option B: 10% probability of gaining $385 and 90% probability of gaining $10

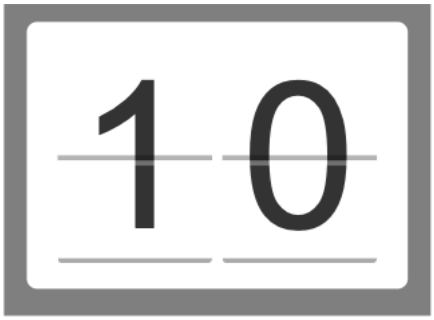
Page Break



Decision 2: Which investment option do you choose?

- Option A: 20% probability of gaining $200 and 80% probability of gaining $160
- Option B: 20% probability of gaining $385 and 80% probability of gaining $10

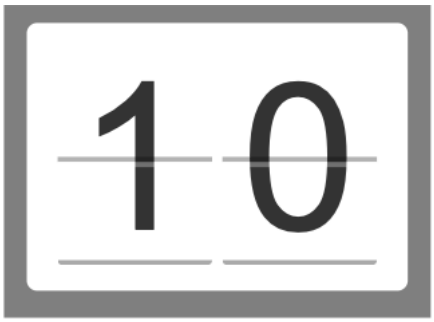
Page Break



Decision 3: Which investment option do you choose?

- Option A: 30% probability of gaining $200 and 70% probability of gaining $160
- Option B: 30% probability of gaining $385 and 70% probability of gaining $10

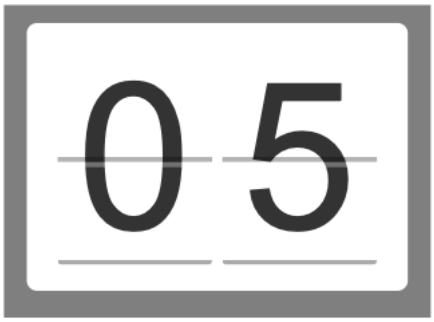
Page Break



Decision 4: Which investment option do you choose?

- Option A: 40% probability of gaining $200 and 60% probability of gaining $160
- Option B: 40% probability of gaining $385 and 60% probability of gaining $10

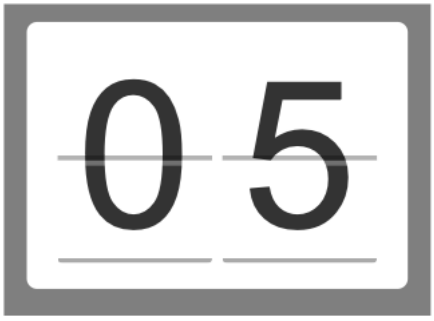
Page Break



Decision 5: Which investment option do you choose?

- Option A: 50% probability of gaining $200 and 50% probability of gaining $160
- Option B: 50% probability of gaining $385 and 50% probability of gaining $10

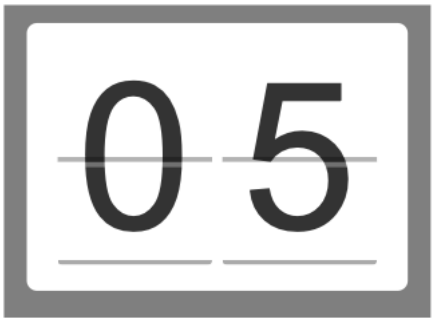
Page Break



Decision 6: Which investment option do you choose?

- Option A: 60% probability of gaining $200 and 40% probability of gaining $160
- Option B: 60% probability of gaining $385 and 40% probability of gaining $10

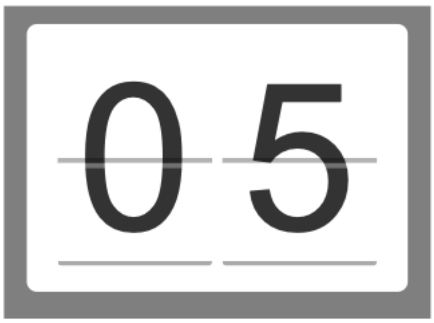
Page Break



Decision 7: Which investment option do you choose?

- Option A: 70% probability of gaining $200 and 30% probability of gaining $160
- Option B: 70% probability of gaining $385 and 30% probability of gaining $10

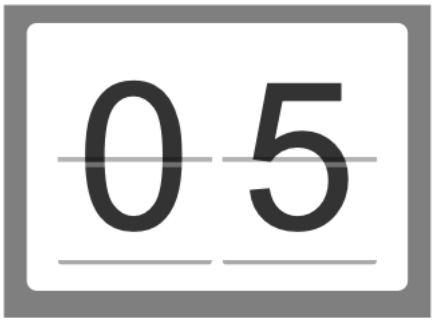
Page Break



Decision 8: Which investment option do you choose?

- Option A: 80% probability of gaining $200 and 20% probability of gaining $160
- Option B: 80% probability of gaining $385 and 20% probability of gaining $10

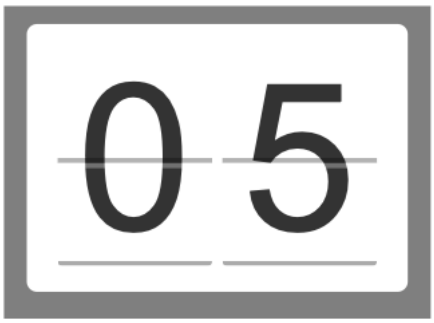
Page Break



Decision 9: Which investment option do you choose?

- Option A: 90% probability of gaining $200 and 10% probability of gaining $160
- Option B: 90% probability of gaining $385 and 10% probability of gaining $10

Page Break



Decision 10: Which investment option do you choose?

- Option A: 100% probability of gaining $200 and 0% probability of gaining $160
- Option B: 100% probability of gaining $385 and 0% probability of gaining $10

Page Break

Manipulation check 1: Do you believe you had enough time to make a good choice?

- ○ Not at all
- ○ Somewhat not
- ○ Neutral
- ○ Somewhat
- ○ Very much

Manipulation check 2: Do you believe you had enough time to carefully evaluate each option available?

- ○ Not at all
- ○ Somewhat not
- ○ Neutral
- ○ Somewhat
- ○ Very much

Manipulation check 3: How pressured did you feel while making your decision?

- ○ Not at all
- ○ Somewhat not
- ○ Neutral
- ○ Somewhat
- ○ Very much

End of Block: Risk-taking behavior - Experimental group

Start of Block: Risk-taking behavior - Control group

Instructions In the following, you will be presented with different investment scenarios.

In each scenario, you will have the choice between two investment options (Option A and Option B). While the investment sum is the same for both options, they have different probabilities and profits attached.

Please, choose the option that you think will maximize your profits.

Example: Which investment option do you choose?

- ○ Option A: 0% probability of gaining $200 and 100% probability of gaining $160
- ○ Option B: 0% probability of gaining $385 and 100% probability of gaining $10

Page Break

Decision 1: Which investment option do you choose?

- ○ Option A: 10% probability of gaining $200 and 90% probability of gaining $160
- ○ Option B: 10% probability of gaining $385 and 90% probability of gaining $10

Page Break

Decision 2 Which investment option do you choose?

- ○ Option A: 20% probability of gaining $200 and 80% probability of gaining $160
- ○ Option B: 20% probability of gaining $385 and 80% probability of gaining $10

Page Break

Decision 3 Which investment option do you choose?

- ○ Option A: 30% probability of gaining $200 and 70% probability of gaining $160
- ○ Option B: 30% probability of gaining $385 and 70% probability of gaining $10

Page Break

Decision 4 Which investment option do you choose?

- ○ Option A: 40% probability of gaining $200 and 60% probability of gaining $160
- ○ Option B: 40% probability of gaining $385 and 60% probability of gaining $10

Page Break

Decision 5 Which investment option do you choose?

- ○ Option A: 50% probability of gaining $200 and 50% probability of gaining $160
- ○ Option B: 50% probability of gaining $385 and 50% probability of gaining $10

Page Break

Decision 6 Which investment option do you choose?

- ○ Option A: 60% probability of gaining $200 and 40% probability of gaining $160
- ○ Option B: 60% probability of gaining $385 and 40% probability of gaining $10

Page Break

Decision 7 Which investment option do you choose?

- ○ Option A: 70% probability of gaining $200 and 30% probability of gaining $160
- ○ Option B: 70% probability of gaining $385 and 30% probability of gaining $10

Page Break

Decision 8 Which investment option do you choose?

- ○ Option A: 80% probability of gaining $200 and 20% probability of gaining $160
- ○ Option B: 80% probability of gaining $385 and 20% probability of gaining $10

Page Break

Decision 9 Which investment option do you choose?

- ○ Option A: 90% probability of gaining $200 and 10% probability of gaining $160
- ○ Option B: 90% probability of gaining $385 and 10% probability of gaining $10

Page Break

Decision 10 Which investment option do you choose?

○ Option A: 100% probability of gaining $200 and 0% probability of gaining $160

○ Option B: 100% probability of gaining $385 and 0% probability of gaining $10

Page Break

Manipulation check 1: Do you believe you had enough time to make a good choice?

- ○ Not at all
- ○ Somewhat not
- ○ Neutral
- ○ Somewhat
- ○ Very much

Manipulation check 2: Do you believe you had enough time to carefully evaluate each option available?

- ○ Not at all
- ○ Somewhat not
- ○ Neutral
- ○ Somewhat
- ○ Very much

Manipulation check 3: How pressured did you feel while making your decision?

- ○ Not at all
- ○ Somewhat not
- ○ Neutral
- ○ Somewhat
- ○ Very much

End of Block: Risk-taking behavior - Control group

Start of Block: Control variable - Instructions

T3 Next, you will be presented with a series of statements concerning your preference for new / exciting activities.
Please, indicate how much you agree or disagree with the statements.

End of Block: Control variable - Instructions

Start of Block: Control variable - Sensation-seeking

Q8 I enjoy participating in unsafe activities.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Page Break

Q9 I don't enjoy trying new things.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Page Break

Q10 I think it is important to try as many new things as I can.

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly agree

Page Break

Q11 I do things even if I know that doing them will get me in trouble.

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly agree

Page Break

Q12 I love challenging myself with new and interesting tasks.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Page Break

Q13 I think that excitement is more important than safety.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Page Break

Q14 I have most fun when I am doing risky or dangerous things.

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly agree

Page Break

Q15 I rarely do things that seem risky.

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly agree

Page Break

Q16 I like to experience anything and everything I can.

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly agree

Page Break

Q17 I like to explore new areas.

- ○ Strongly disagree
- ○ Disagree
- ○ Neutral
- ○ Agree
- ○ Strongly agree

End of Block: Control variable - Sensation-seeking

Start of Block: Demographics

T4 In this last part of the survey, you will be asked to answer some questions regarding your demographics.

Page Break

Q18 Sex

- Male
- Female
- Other
- Prefer not to say

Q19 Age (in years)

_____

Q20 Civil status

- Single
- Registered partnership
- Married
- Seperated
- Divorced
- Widowed

Q21 Highest educational degree

- ○ No degree
- ○ High school diploma (or similar)
- ○ Bachelor (or similar)
- ○ Master (or similar)
- ○ PhD (or similar)
- ○ Vocational degree

Q22 Occupation

- ○ Student
- ○ Employed
- ○ Self-employed
- ○ Unemployed
- ○ Other

Q23 Area of study

▼ Agriculture, forestry, & environment ... Other

Q24 Area of occupation

▼ Agriculture, forestry, & environment ... Other

Q25 Yearly income (in NOK)

- 0 - 199,999 NOK
- 200,000 - 499,999 NOK
- 500,000 - 999,999 NOK
- 1,000,000 - 1,499,999 NOK
- > 1,500,000 NOK

End of Block: Demographics

Appendix B: Areas of Study and Work

Agriculture, forestry, & environment
Anthropology
Architecture & Design
Biology
Business
Chemistry
Computer science
Culinary arts
Economics
Education
Engineering & technology
Geography
History
Human physical performance & recreation
Journalism, media studies, & communication
Linguistics & languages
Literature
Law
Mathematics & logic
Medicine
Military science
Performing arts
Philosophy
Physics
Political science
Psychology
Public administration
Religion
Social work
Sociology
Visual arts
Other