University of Southampton

Faculty of Environmental and Life Sciences

School of Psychology

The Young Male Hypothesis of Risk -Taking Behavior

By

Effrosyni Mitsopoulou

ORCID ID [https://orcid.org/0000-0003-1448-4950]

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Abstract

The young male syndrome postulates that young men demonstrate excessive risk-taking behavior. Initially, archival studies analyzing homicide data confirmed this phenomenon, yet few experimental or cross-sectional studies have offered additional support. The current research systematically tested the young male hypothesis in five studies. The hypothesis proposes that the general tendency for men to be more prone to risk than women is stronger among younger than older adults. Looked at from a different angle, the hypothesis proposes that the general tendency for risk propensity to decline with age is stronger among men than women. Study 1 assessed general risk propensity among members of the Dutch general public. Results did not support the young male hypothesis. Study 2 assessed both general and domain-specific risk propensity, again among Dutch respondents. Results pertaining to risk propensity in the occupational and leisure/sports domains contradicted the young male hypothesis. Study 3 refined the measurement of domain-specific risk propensity. Results neither replicated the contradictory findings of Study 2 nor offered support for the young male hypothesis. Yet, a suggestive pattern emerged in the financial domain, which was consistent with the hypothesis: the tendency for men (compared to women) to be more inclined toward financial risk was stronger among younger than older adults. Study 4 implemented further methodological improvements to hone in on the young male hypothesis. Results revealed strong support for the hypothesis in the financial and recreational risk domains. Considering the inherent limitations of the self-report measures used in Studies 1-4, Study 5 assessed financial risk propensity via choice scenarios, with outcomes phrased either as gains or losses. Results again supported the hypothesis, but only when financial outcomes were framed as gains. Whereas individuals are generally risk averse in the gain domain, young men bucked this trend in an attempt to maximize financial outcomes. Evolutionary perspectives consider this behavior as a high risk-high reward strategy.

Keywords: age, gender, young male hypothesis, risk taking

Table of Contents

Table of Tables

Table of Figures

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CHAPTER I: A Literature Review on Decision Making under Risk: Definitions, Theoretical Approaches, and Objectives

1.1 Introduction

In this chapter, I review the rich literature on decision making under risk. I focus, in particular, on the interaction between decision makers' age and gender in determining whether an individual will engage in risky choices. This review forms the foundation for the research questions, aims, and hypotheses tested in Chapters II to VI.

1.2 The Long History of Risk

Throughout human history, risk played a key role in survival. The life expectancy of early humans was short as they searched for food and shelter while exposed to physical dangers from predators and poor weather conditions (Caspari & Lee, 2004; Rosenberg, 2004). A physical risk and material reward went hand in hand, meaning that risk-taking ancestors ended up with food whereas a risk-averse one faced starvation. Therefore, the concept of risk is deeply rooted in human history (Grier, 1980; 1981; Trimpop, 1994).

As early as 3200 B.C. established communities in Mesopotamia dealt with risks such as goods transportation, war, and diseases and formed appropriate risk plans (Covello & Mumpower, 1985; Grier, 1981). Historically, the "Code of Hammurabi", dated back to 1754 B.C., is the oldest written document on record that presents an adequate risk management plan (Trimpop, 1994). According to this Babylonian law code, a merchant would advance goods to a trader with interest, but would also include an additional amount owed by the trader as consideration for the merchant's declaration that, if the goods were lost or stolen during transport due to no fault of the trader, the trader would be free of all debt to the merchant (Trenerry, 2010; Ungarelli, 1984).

It was much later that specific arrangements were formed between merchants and traders as the shipping trade continued to grow. These arrangements were known as “bottomry contracts” and developed further in ancient Greece around the 3rd century B.C. They entailed a loan secured by a ship with an interest rate, as well as an extra premium charge in exchange for potential loss of the ship and cancellation of the debt. By 750 B.C., these contracts were widespread across Greece and almost every voyage was covered with risk premiums of 10-15% (Covello & Mumpower, 1985). Bottomry contracts were the first line of defense against uncertain and risky deals in the market.

During the Roman Empire, records indicated that the Romans made arrangements for the safe delivery of products and had contracts for indemnification that were not confined to maritime risks (e.g., life insurance) (Trenerry, 2010). After the fall of the Roman Empire around 700 A.D., insurance contracts towards risks almost disappeared and only resurfaced in the 12th to 14th century. The oldest recorded contract of insurance is believed to be a document from 1343 found in the state archives of Genoa, Italy (Hinkelman, 2008; Nelli, 1972).

During the 17th century, the Renaissance was a time of significant growth and development concerning risks that businesses had to assess. Two French mathematicians, Blaise Pascal (1623-1662) and Pierre de Fermat (1601-1665), formulated the fundamental principles of probability for the first time (Eves, 1990). Their definition of probability was precise enough for use in mathematics, yet comprehensive enough to be applicable to a wide range of real-world phenomena (e.g., risk assessment in business). In 1666, the concept of risk assessment and property insurance arose from the Great Fire of London (Ungarelli, 1984).

Around this time, Lloyd’s of London was formed, issuing policies on risks and payoffs worldwide (Ungarelli, 1984).

In sum, across the historical records, civilizations left evidence of preventive measures dealing with major risks, such as natural disasters, epidemics, pollution, food contaminations, transportation accidents, and occupational injuries (Hughes, 2014). They addressed problems that nowadays are still of major importance. All these risk management attempts, however, lacked a scientific risk-analysis basis, even though they estimated costs and benefits involved based on probabilities. It was not until the end of the 19th century that a more sophisticated statistical analysis was presented. Von Bortkiewicz (1868-1931) collected data of soldiers’ annual deaths by horse kicks in the Prussian Army over a period of 20 years (Quine & Seneta, 1987). He demonstrated that the number of soldiers who were killed by horse kicks closely followed a Poisson distribution (Pandit, 2015). In the 20th century, new theoretical frameworks emerged that described the features of risk and how they could be estimated. I will review these perspectives later in this chapter.

1.3 Decision Making: The Role of Risk

Individuals’ lives are guided by decisions (e.g., what to have for breakfast, what to wear, whether to accept a job offer, or how to save more money). Therefore, it is essential to understand how individuals make decisions. They should be aware of how various factors influence past decisions in order to improve their quality and achieve reliably better results in future.

“Decision making” is generally defined as the selection of an action among other alternatives, aimed at producing optimal outcomes. It entails multi-level processing and is shaped by parameters that often go unnoticed. In other words, decision making can be influenced by several factors, including past experience (Juliusson, Karlsson,& Gärling, 2005), cognitive biases (Stanovich & West, 2008), age and individual differences (Bruine de Bruin, Parker, & Fischoff, 2007), and belief in personal relevance (Acevedo & Krueger, 2004). In general, a decision can be either an instinctive split-moment choice (e.g., running away from a barking dog) (Oh et al., 2016) or a cognitively demanding calculation (e.g., deciding about a life insurance plan) (Kool et al., 2010).

However, an important feature that many – if not most – decisions carry is the degree of risk (i.e., early definitions described risk as an outcome that may occur with a certain probability) (Mirsha, 2014; Taghavifard, Damghani, & Moghaddam, 2009). For instance, driving a car could lead to a crash, taking a prescription antibiotic might cause unpleasant side effects, and living near a nuclear power plant increases the chances of radiation exposure. These types of decisions are called risky decisions or decisions under risk. The study of decision making under risk is of notable importance to all of the behavioral sciences (Mirsha, 2014) because it has both theoretical and practical meaning. However, it is difficult to identify a single definition of decision making under risk, as the concept differs depending on the field of research (i.e., economics, management sciences, psychology, anthropology, and sociology) (Shapira, 1995). For example, from the economic perspective, risk is defined in terms of the variability of possible monetary outcomes, whereas in the clinical literature, risk is generally defined as exposure to possible loss or harm (Schonberg, Fox,& Poldrack, 2011).

1.3.1 Definitions of Risk

Vlek and Stallen (1980) listed six components commonly reported in risk definitions:

- The probability of loss;
- The size of a substantial loss;
- The expected loss;

- The variance of the probability distribution over the probability of all possible consequences;
- The semi-variance of the utility distribution; and
- The linear function of the expected value and the variance of the distribution of consequences.

These, however, mainly describe economic features. It was not until the end of the 1980s that researchers such as Haight (1986) and Oppe (1988) directly linked all risky actions with decision-making processes. As such, Yates (1990; 1992) proposed three major components of the risk concept, entailing: (a) a loss, (b) the significance of a loss, and (c) the uncertainty associated with a loss. In addition, Yates (1992) distinguished these losses in relation to the decision maker's reference point and his/her subjective value system. The reference point considers how an individual evaluates the possible consequences of a certain decision in comparison with his/her current status. For instance, an income of $45,000 may be a gain for some people but a loss for others, depending on their status quo. Although Yates (1992) specified various references, he did not account for either the attractiveness of certain risky decisions, or the physiological or emotional benefits of a risky action.

Furthermore, Trimpop (1994; Vlek & Stallen, 1980) argued that risk was truly a situation with different shortcomings. For example, if the risk was defined just as the probability of a loss (in economic terms), then possible gains (e.g., meeting a prospective marriage partner) and their loss in case of no action were excluded. On the one hand, positive events could be considered risky in the sense of losing something else (e.g., becoming a parent for the first time also means losing independence). On the other hand, negative events could be considered non-risky if it means having some unavoidable consequences while striving towards a greater goal (e.g., dealing with various health issues in pregnancy). Until this point, definitions seemed to neglect any expectations and/or non-monetary gains or losses (Lopes, 1987).

Another factor that the initial definitions (mainly based on normative theories) ignored was the time factor. They actually treated every moment as an independent unit, which was unrealistic considering that individuals' expectations about the future can influence present decisions and vice versa (Trimpop, 1994). Lastly, Fuller (1988) suggested that risk taking was not only under the control of conscious decision making. Specifically, Fuller (1984, 1988) argued that risky actions were accompanied by the illusion of conscious involvement, in particular when they were attached to a reward. It is important, therefore, not to reduce risk taking to mere conscious decision making.

Other terms, such as hazard, dangers, and threat, were often used interchangeably with risk (Brenner, 1983; Knight, 1921; Winterhalder et al., 1999). Nevertheless, research showed that risk is a much broader concept that includes the notion of variability or uncertainty caused by either positive or negative outcomes, while hazardous and dangerous choices are more likely to lead to negative outcomes (McNeil et al., 2005). Although I focused on risky decisions throughout this thesis, I proceeded with the understanding that risk and uncertainty are generally integrated when individuals make decisions (Volz & Gigerenzer, 2012).

Taking into consideration researchers' criticism and arguments, a definition of risk should capture four key components that are essential to its understanding: (1) the outcome uncertainty, (2) the outcome expectations, (3) the currency of variance, and (4) the outcome potential. The first component refers to the variability of outcomes (March, 1978; Vlek & Stallen, 1980). For instance, a gamble that offers a 25% chance of winning $2,000 is considered riskier than receiving $750 guaranteed, even if both options have the same expected value ($500). The second component, the outcome expectations, suggests that risk has a range of outcomes – either positive or negative – which, in turn, elicit different decision-making attitudes. According to Sitkin and Pablo (1992), it is not the expected value per se that constitutes a risk, but the degree of which this outcome would be either disappointing or satisfying to the decision maker. From this perspective, even a positive outcome can be unsatisfactory if it does not reach one's goals (March & Shapira, 1992). The third component, the currency of variance, specifies a currency which depends on a specific domain. For instance, if an individual decides to purchase a high-risk stock versus a low-risk savings bond, the currency of risk, in this case, is money. Sometimes, however, the currency of risk becomes more complicated and impacts multiple domains of life (e.g., pathological gambling, which impacts the financial, social, and also health domains) (Ferland et al., 2008; Mishra, Lalumière, & Williams, 2010; Shaffer & Korn, 2002). The most parsimonious currency proposed so far is biological fitness (Daly & Wilson, 2001; Houston et al., 2014; Mallpress et al., 2015; Wang, 2002), which is not based on explicit calculations of likely outcomes (i.e., probabilities) but on proxies of fitness (e.g., resources, social status, and access to mates) (Mirshra, 2014; Neuberg et al., 2004; Rode et al., 1999). I will describe its features in a later section. The final component, the outcome potential, incorporates questions such as "how bad could it get?" or "how much could I win?". It may be the case that individuals often overweight extreme outcomes, even if their likelihood is a remote possibility (Kahneman & Tversky, 1979). A characteristic example is individuals' willingness to purchase lottery tickets, where they perceived probability of winning inflated because the potential outcome is so great (Allman, 1985).

In an attempt to combine these components, Trimpop (1994, p. 9) proposed a more complete definition, describing risk as: "… any consciously or non-consciously controlled behavior with a perceived uncertainty about its outcome, and/or about its possible benefits, or costs for the physical, economic or psycho-social well-being of oneself or others". Throughout this dissertation, I adopt this definition when referring to the term "risk".

1.4 Theoretical Perspectives on Willingness to Take Risks

The concept of risk propensity has significant implications for the theoretical modeling of risk-taking behavior, and for achieving insights into the mechanisms underlying individual-level choices on engaging in risky decisions. Risk propensity is conceptualized as an individual's risk-taking tendency, defined as an individual's current tendency to take or avoid risks (Sitkin & Pablo, 1992; Sitkin & Weingart, 1995). Risk propensity is considered an individual trait (Kogan & Wallach, 1961), which can change over time as a result of experience (Wang et al., 2015). For example, Brockhaus (1980) argued that individuals' general predisposition towards risk would incline some (e.g., entrepreneurs) to undertake more risks than other individuals (e.g., bureaucrats), whereas MacCrimmon and Wehrung (1990) found that more mature decision makers (in terms of age and seniority) were consistently more risk averse than those who were less mature. Next, I present influential theoretical perspectives on risk propensity.

1.4.1 Frameworks Explaining Risk Propensity

Broadly speaking, there are two clusters of theories – normative and descriptive – which adopt different approaches to describing decision making under risk. Rational or normative theories have dominated in economics, explaining how people should make decisions; Expected Utility Theory (Friedman & Savage, 1948; 1952) is an example. In general, normative theories involve a top-down approach in order to identify the most "rational" choice in a given situation (a rational choice is typically defined by decisions that maximize the currency of interest). In this case, the currency is explained in terms of utility, which is a measure of happiness, gratification, and/or satisfaction derived from behavior (i.e., the consumption of a good or a service) (Friedman & Savage, 1952). The Expected Utility

Theory finds applications in many economic contexts, such as insurance sales, and casinos (Briggs, 2017), and even addresses practical questions in epistemology (i.e., when to accept a hypothesis; Maher, 1993). In contrast, descriptive theories, such as Prospect Theory, include a bottom-up approach in an attempt to identify related mechanisms involved in decision-making processes. These theories describe how individuals make decisions rather than why.

1.4.1.1 Expected Utility Theory

From the normative perspective, the most dominant theory of risky behavior is the Expected Utility Theory. Expected Utility Theory is derived from the context of risk (von Neumann & Morgenstern, 1944), as well as the context of uncertainty (Anscombe & Aumann, 1963; Savage, 1954). Historically, it stems from Bernoulli's (1738) proposed solution to the St. Petersburg paradox. Imagine a game in which an individual must decide the maximum amount of money he/she is willing to pay as an entry fee. The game is played by flipping a coin until it comes up tails, and the total number of flips (n) to that point determines the prize. If the coin shows heads on the first flip, the coin can be flipped again, until tails shows up. The player then earns $2n where n is the number of heads that show up in a row. The expected value of the gamble is infinite, thus, it is expected that any "rational" player should gamble any fixed amount for the opportunity to play (Bernoulli, 1738):

$$(1/2) \times \$2 + (1/4) \times \$4 + (1/8) \times \$8 + (1/16) \times \$16 + (1/n) \times \$2n = \infty$$

However, when individuals participated, they were mostly unwilling to wager even $25 to play the game, and the probability of winning more than $4 was less than 25 percent (Hacking, 1980).

This solution led Bernoulli (1738) to the first conception of the Expected Utility Theory. He proposed that money has marginal utility, meaning that one dollar is not worth much to a wealthy person, but it is extremely valuable to a poor person. Thus, in addition to the absolute value of a decision's outcome (e.g., money earned), individuals may identify some subjective values known as utilities – a measure of happiness, gratification, or satisfaction derived from behavior (Friedman & Savage, 1952). Therefore, Expected Utility Theory predicts that decision makers seek to maximize these utilities in all decisions (Mishra, 2014).

At first, the Expected Utility Theory described three types of utility functions in order to describe the relationship between the expected value and the perceived utility of a decision. These were: risk indifference, risk aversion, and risk preference (von Neumann & Morgenstern, 1944). Each one differs in its estimation of marginal utility, defined as the change in utility that occurs for every unit change in reward. The first describes a linear relationship between the marginal utility and the currency of interest (i.e., outcome), the second a concave-down function, and the third a concave-up curve. Overall, the Expected Utility Theory represents a simple and parsimonious model that gives strong testable predictions (Lewandowski, 2017). However, a major issue appeared. The concept of utility was problematic. Utility as a currency of maximization is difficult to operationalize because it can take many forms. For some individuals, the utility may entail wealth, happiness, opportunity, or any other positive reward in different domains. Consequently, any decision can be easily justified post hoc as being utility maximizing. Robinson (1962, p. 47) stated: "utility is the quality in commodities that makes individuals want to buy them, and the fact that individuals want to buy commodities shows that they have utility". Therefore, it was argued that the concept of utility offers little predictive value (Mirsha, Barclay & Sparks, 2017; Weber, Blais, & Betz, 2002).

1.4.1.2 Prospect Theory

Prospect Theory, in contrast, states that people make decisions based on the potential value of losses and gains, rather than the final outcome, and that people evaluate these losses and gains using certain heuristics (e.g., the Take the Best Algorithm; Albar & Jetter, 2009). This model is descriptive because it models real-life choices, rather than optimal decisions, as normative models do. Prospect Theory was formulated in 1979 by Daniel Kahneman and Amos Tversky, as a more psychologically accurate description of decision-making mechanisms. In the original formulation, the term prospect referred to a lottery (i.e., a term affiliated with Expected Utility Theory).

Although Prospect Theory does not violate any of the Expected Utility Theory axioms, it questioned the use of rational decision making thinking and criticized Expected Utility Theory's inability to predict decisions under different conditions (Aktipis & Kurzban, 2004; Ellsburg, 1961; Kahneman & Tversky, 1979). Particularly, Kahneman and Tversky (1979) based their review on empirical evidence, revealing that people are not always rational or consistent when it comes to their risky choices, but overweight outcomes that are obtained with certainty to outcomes that are merely probable. They called this the certainty effect and proposed that this effect contributes to risk-seeking behavior in choices involving certain losses, and risk aversion in choices involving certain gains. In addition, evidence indicated that individuals tend to simplify choices between alternatives by focusing on components that differentiate them. Thus, individuals often disregard components that are shared among the alternatives. This isolation effect produces inconsistency in people's preferences when the same choice is presented in different ways (Kahneman & Tversky, 1979).

Another phenomenon that Prospect Theory successfully described is known as the risky choice framing (Tversky & Kahneman, 1981). This explained that individuals can shift their preference between options with equal expected outcomes in identical problems that were differentially framed in terms of losses or gains. The Asian disease problem introduced by Tversky and Kahneman (1981) was the first illustrating this effect. In this scenario, one group of participants chose between two programs designed to combat a disease that was expected to kill 600 people. If program A is adopted, 200 people will be saved, and if program B is adopted, there is 1/3 probability that 600 people will be saved and a 2/3 probability that no people will be saved. Another group chose between two programs that were described in terms of lives lost. If program A is adopted, 400 people will die, and if program B is adopted, there is 1/3 probability that nobody will die and 2/3 probability that 600 people will die. In general, the researchers found that decision makers responded differently to dissimilar but objectively equivalent descriptions of the same problem (Diederich, Wyszynski, & Ritov, 2018). Specifically, they tended to choose the sure option (program A) when the problem was phrased positively in terms of lives saved, whereas they chose the risky option (program B) when it was phrased negatively in terms of lives lost. This behavior demonstrated a common pattern that choices involving gains are often risk averse while choices involving losses are often risk seeking.

In spite of addressing some commonly observed violations of Expected Utility Theory, Prospect Theory also suffers from the shortcomings of a poorly defined currency (Mishra, 2014) because utility as a currency of variance remained mostly unchanged (Kahneman & Tversky, 1979). It has been argued that an evolutionary-orientated approach provides a more clearly defined currency and avoids some problems presented within the classic theories (Li et al., 2012; Mishra, 2014; Mishra, Barclay, & Sparks, 2017). I discuss this perspective next.

1.4.1.3 Risk-Sensitivity Theory

Risk-Sensitivity (R-S) Theory is first and foremost a normative theory developed by behavioral ecologists in order to explain food acquisition decisions (Mishra, 2014). Caraco, Martindale and Whittam (1980) conceived the R-S Theory after monitoring the foraging preferences of yellow-eyed junco birds under two different energy budgets; one positive and one negative. Specifically, they presented two different food patches which offered the same mean payoff (e.g.,120 calories), but had different payoff variance (patch 1 ranged from 110 to 130 calories – low variance – while patch 2 ranged from 40 to 200 calories – high variance). A foraging bird would choose a patch related to its budgetary needs. If it had acquired sufficient calories throughout the day, it would choose the low variance patch (a positive energy budget) to meet its survival needs. On the other hand, if it had not acquired an adequate amount of calories, then it would choose the high variance patch (a negative energy budget) because it allowed a chance of survival. Caraco and colleagues (1980) concluded that juncos shifted from risk aversion to risk preference when a need had to be fulfilled that could not be satisfied with a low-variance reward. This adaptability pattern is known as the energy-budget rule (Mirsha, 2014; Stephens & Krebs, 1986). A subsequent study showed the same pattern in white-crowned sparrows (Caraco, 1983).

In a decision-making context, the R-S Theory can provide explanations describing decision makers' changes between risk aversion to risk-seeking attitudes (known as "risk shifts") in situations of need (i.e., need is described as an inconsistency between an individual's present and desired state) (Ermer, Cosmides, & Tooby, 2008; Mishra & Fiddick, 2010; Rode, Cosmides, Hell, & Tooby, 1999). For example, someone with a $5,000 debt should prefer a gamble offering a 10% chance of winning $5,000 over earning $500 with certainty. Although both options have the same mean payoff, the riskier option at least offers a chance to meet one's need. This observation maps on the risk choice framing effect described by Prospect Theory, but here evolutionary psychologists stress the importance of motivational factors. At the same time, the R-S Theory remains a biological-based theoretical framework which is strongly tied to survival, reproductive success, and fitness. In other words, every risk-sensitive decision which meets one's need guarantees survival and enhances reproductive success and fitness (Mishra 2014; Mishra et al., 2017). Indeed, the R-S Theory accounts for multiple needs in different domains (Bednekoff, 1996; Hurly, 2003) and suggests that individuals tend to prioritize their needs by allocating time and energy accordingly (Kaplan & Gangestad, 2005; Stearns et al., 2008).

As mentioned earlier, an important component of risk is the currency of variance. It is rather difficult to define it because each framework of decision making derives a distinct operational currency. For example, Expected Utility and Prospect Theory tend to focus on the maximization of utility, whereas biological models like R-S Theory are concerned with survival needs and fitness motivations. At first glance, the currency of fitness suffers from a similar problem with utility, meaning that it is difficult to quantify and operationalize in terms of everyday decisions (Mishra, 2014). Strictly speaking, fitness refers to the average contribution of a specific individual's genotype to the gene pool of the following generation (Williams, 1966). Nevertheless, R-S Theory assumes that decisions are foremost the functional products of evolution by natural selection, and acknowledges that any underlying fitness/motivation drives all behaviors, including risk taking (Buss, 2009; Confer et al., 2010). Consequently, resources, in this context, are of the utmost importance. Education, income, occupational status, social status (or prestige), respect, and quality mates are regarded as meaningful resources (Daly & Wilson, 2001). Historically, individuals acquiring plentiful resources (e.g., high social status and quality mates) were more likely to reproduce and generate high-quality offspring compared with those possessing low resources (e.g., low social status and no mates) (Easton, Goetz, & Buss, 2015). All in all, R-S Theory postulates that natural selection shapes individuals' underlying motivations (proposing a fitness currency which is equivalent of acquiring resources in a human context) which over time become de facto goals that individuals seek to attain, even if they are not explicitly aware of them (Mishra et al., 2017). Without a question, R-S Theory is recognized as a powerful framework for understanding decision making under risk in various contexts (Ermer, Cosmides, & Tooby, 2008; Mishra, 2014; Gonzales, Mishra, & Camp, 2016; Mishra, Daly, Lalumière, & Williams, 2012).

1.5 The Current Research: The Young Male Hypothesis

The focus of the current research is on the young male hypothesis. It proposes that younger men are particularly prone to risk taking, compared to women and older men. Therefore, the hypothesis suggests that, whereas men are generally more risk taking than are women (Byrnes, Miller, & Schafe, 1999; Croson & Gneezy, 2009; cf. Brinig, 1995; Schubert et al., 1999), this gender difference is more pronounced among younger than older adults. Looked at from a different angle, the hypothesis proposes that, whereas younger adults are generally more risk taking than older adults (Deakin, et al., 2004; Rolison, Hanoch, & Wood, 2012 cf. Dror, Katona, & Mungur,1998), this negative association between risk taking and age is more pronounced among men than women.

1.5.1 Theoretical background (Risk Sensitivity Theory and evolutionary theory)

Research has shown that men are generally more likely to engage in risk taking and favor risky choices than women (Byrnes, Miller, & Schafe, 1999; Charness & Gneezy, 2011; Eckel & Grossman, 2008). In particular, male risk taking is at its height during the earliest reproductive years (Daly & Wilson, 2001) demonstrating increased risk-seeking behavior in various domains in life (i.e., finance, health, career, leisure activities) (World Health Organization [WHO], 2011). Young adulthood remains a distinct developmental period (approximately lasts between 18 to 25 years of age) in which significant changes occur (e.g., establishing an occupation, finding a love partner, accepting of adult roles – marriage, parenthood) (Arnett, 2007).

Much of the evolutionary research on risk taking has focused on explaining this behavior. One major explanation for the rise in risk taking is the Young Male Syndrome (YMS) (Daly & Wilson, 1985, 2001). The young male syndrome stems from parental investment theory (Trivers, 1972), which suggests that frequently aggressive and violent behaviors are found among the sex with the most intense reproductive competition (Fischer & Hills, 2012). Within an evolutionary framework, competing for mates (i.e., mate choice) is the engine of evolution by natural selection and, subsequently, to parental investment (Li et al., 2012). For example, a well-known example of sexual selection in the animal kingdom is the peacock's ostentatious tail (Darwin, 1871). The male peacock has a lot of showy feathers, which are metabolically expensive to produce, even more expensive to maintain, and may cause him to be sighted and caught by predators (Yorzinski et al., 2017). Indeed, this behavior does not comply with the perspective of natural selection, given that this attention-grabbing display may threaten survival. However, the colorful tail works as a cue to attract peahens (i.e., female peacocks) and yields significant fitness benefits (such as material resources, which will give better chances of survival and reproduction for their offspring; Price, Schluter, & Heckman, 1993). Equivalently, in a human context, males may overextend themselves to attract females. In particular, men start being more aggressive during adolescence when their status is low and there is uncertainty about their prospects to attract potential mates (Piquero, Farrington, & Blumstein, 2003). This behavior peaks around young adulthood, when men have an increased tendency to compete with other men (i.e., intrasexual competition; Baumeister et al., 2017; Fischer & Hills, 2012; Li et al., 2012;Wilson & Daly, 1985), allowing this behavior even to escalate to dangerous and aggressive levels (Byrnes, Miller & Schafer, 1999). A characteristic example is the involvement of young men in gangs and gang crime, including delinquency (McLean & Holligan, 2018). In general, gang violence can occur between gangs and non-gang individuals, as well as between or within gangs. This kind of violence serves to defend or expand the gang (by recruiting new members), keep members from leaving, exercise revenge, enhance perceptions of power and invincibility, and gain respect or dominance over others (Pacheco, 2010). Although there are significant negative consequences (Cruz, 2007; Davies & MacPherson, 2011), gangs offer a sense of belonging and purpose for many young people who lack other opportunities (Howell, 2012).

From the R-S Theory perspective, the willingness of young males to engage in such risky situations might be adaptive in terms of fitness maximization (Tamas et al., 2019). This behavior can be instrumental in acquiring prestige and dominance over other males (Jonason & Fisher 2009; Segal 2001), gaining more resources (Baumeister et al., 2017; Daly & Wilson, 2001), and appearing more attractive to females (e.g., they are regarded as more brave and altruistic) (Farthing, 2007; Kelly & Dunbar, 2001). In the sexual context, in particular, the frequent risk taking among young men can be explained as a sexually selected trait for attracting mates (Wilke et al., 2006). Therefore, the overall fitness maximization behavioral strategy is suggested to be the ultimate cause of the YMS (Daly & Wilson, 2001; Tamas et al., 2019).

This excessive risk-seeking behavior does not come without any cost. Clinical studies show that young males' risky choices place them in considerable danger. Such actions include: driving a motor vehicle in an alcohol/drug-intoxicated state, pursuing extreme sports or other dangerous sports (e.g., climbing), driving a motor vehicle at high speed, and/or without using a seat belt or helmet, and being involved in violent activities (e.g., fights, assaults) (Tamás et al., 2019; Tieves, Yang, & Layde, 2005). Additionally, experimental findings indicate that, in mating contexts, men are less focused (Li et al., 2012). For example, Iredale, Van Vugt, and Dunbar (2008) found that men were more likely to donate money to a charity when their donation was observed by a female audience and Griskevicius et al. (2007) found that mating motives led men to invest more money in flashier consumer goods. All in all, these risky attitudes are suggestive of men's desire to stand out and impress potential mates.

Yet, since the YMS was first formulated, little research has systematically tested it hypothesis, and few studies have considered the idea of young male risk taking as a mating strategy (Li et al., 2012; Wilke et al., 2006).

1.5.2 Archival evidence

Preliminary studies using archival data confirmed the YMS. Among the first, Wilson and Daly (1985) analyzed 690 homicidal conflicts in Detroit in 1972 and concluded that many, perhaps most, homicides concern status competition. Also, they found that homicide victims and perpetrators tended to share specific characteristics; they were unemployed, single, young men. Notably, this taste for risk can significantly reduce among married men, but rise again among the divorced and widowed (Daly & Wilson, 2001; Waite, 1995). In a similar vein, the Australian Bureau of Statistics (ABS) (2008) reported that transport accidents, self-harm, and drug use were the top three underlying causes of death in young people (aged 18 to 25 years) for the period 2004-2006. Likewise, in Europe, young adults' (aged 15 to 24 years) risky lifestyles contributed to increased injuries with substances (Kumpula & Paavola, 2008) and higher rates of criminality (Farsang & Kocsor, 2016).

1.5.3 Experimental and cross-sectional evidence

Contrary to archival data, few primary cross-sectional and experimental studies have tested the young male hypothesis. I focus here on two studies that are directly relevant to my present purposes. Nicholson and colleagues (2005) conducted a correlational study to assess the psychometric properties of the newly developed measure, the Risk-Taking Index (RTI).

Their objective was to test the validity of a short but easy to administer measure, which encompasses several dimensions of risk-taking behavior, with the goal of improving existing single-item measures. They recruited a large sample of university students and company executives (*N* = 2151). Participants completed the RTI, which assessed risk propensity in six domains: recreational, health, financial, career, safety, and social. They also completed the NEO PI-R (Costa & MaCrae, 1992) to assess the Big Five personality factors. Their results revealed that, consistent with prior findings, age was negatively associated with risk propensity in each of the six domains. Furthermore, Nicholson et al. noted that, within the health, career, safety, and social domains, the negative association between age and risk propensity was significant for men but not for women. On this basis, Nicholson et al. (2005) concluded that risk taking is a young male phenomenon. However, a closer examination of their results casts doubt on their claim (Table 1). I re-examined the correlations between age and risk propensity, separately for men and women. Specifically, I tested whether the correlations for men were significantly more negative than those for women, using a test for comparing independent correlation coefficients (http://vassarstats.net/rdiff.html). I report the results of these tests in Table 1. Although the correlation between age and risk propensity was numerically more negative for men than women in some domains, none of these differences were statistically significant. This offers a perfect illustration of the principle that “the difference between ‘significant’ and ‘not significant’ is not itself statistically significant” (Gelman, 2006, p. 328). Nicholson et al. also neglected the fact that their sample included nearly four times more men than women, rendering tests of the correlations for men more powerful. This problem is clearly visible in the health domain, where the correlation for men (r = -.07) was significant yet numerically smaller than the non-significant correlation for women (r = -.08).

Table 1

Correlations between risk taking domains and age for men and women

	Male (*n* = 1567)	**Female (*n* = 418)**	***z*-values**	***p*-values**
Recreational	-.17***	-.23***	1.13	.258
Health	-.07**	-.08	.18	.857
Career	-.12***	-.05	-1.28	.200
Finance	-.21***	-.19***	-.38	.704
Safety	-.10***	-.03	-1.27	.204
Social	-.17***	-.13	-.74	.459

* $p < .05$; ** $p < .01$; *** $p < .001$.

In an experimental setting, Baker and Maner (2009) examined the mating-related factors expected to shape the risky choices in males by employing a modified version of a financial game. They recruited university-aged individuals (*N* =181), who participated in a modified version of the behavioral risk measure BART (Lejuez et al., 2002). Participants were told that they would interact with an opposite-sex partner. The researchers then manipulated (1) whether participants were under the impression that their performance was either private or observed by the opposite-sex partner, and (2) whether this opposite-sex partner was engaged to be married or single and interested in meeting someone. The researchers also assessed participants' sexual and romantic arousal. While participating in the BART, participants accumulated gains by pumping virtual balloons. If a balloon was pumped too many times, it exploded and participants lost points from that balloon. If a balloon was pumped fewer times, it was unlikely to explode but fewer points were earned. The explosion threshold varied across balloons, so that participants could not determine the ideal number of pumps.

Results revealed a positive association between sexual and romantic arousal and risky decision-making when men believed that they were observed by a romantically available woman. On the contrary, the association between sexual/romantic arousal and risk taking was not significant when young men thought that their performance was private or that the opposite-sex observer was romantically unavailable. Female participants did not show this pattern of results. Baker and Maner's (2009) findings were in line with the evolutionary framework, suggesting that young male risk taking may be rooted in men's higher degree of intrasexual competition (Wilson & Daly, 1985). They concluded that these experimental findings provided evidence supporting the hypothesis that young male risk taking serves self-presentational functions in a mating context. However, because the researchers only recruited university-aged participants, their findings cannot be generalized to older participants. Accordingly, one cannot rule out the possibility that Baker and Maner's findings reflect a general gender difference (i.e., a gender main effect), and are not specific to younger men (i.e., a Gender × Age interaction). A strong and conclusive test of the young male hypothesis requires a test of gender differences across the widest possible age range.

1.6 Overview

I tested the young male hypothesis in five studies, employing different measurement approaches. In Chapter 2 (Study 1), I tested the young male hypothesis using secondary data retrieved from an online panel of Dutch households. Risk propensity was assessed with the Dohmen measure (Dohmen et al., 2011), which evaluates participants' general willingness to engage in risky actions. Although the measure is easy to administer (i.e., it is a single-item measure) and there is compelling evidence for its validity (Caliendo et al., 2009; Dohmen et al., 2011; Lönnqvist et al., 2015), it only accounts for general risk propensity and does not assess domain-specific risk propensity.

To address this limitation, Chapter 3 (Study 2) tested the young male hypothesis in the context of both general and domain-specific risk propensity. Specifically, I examined three domains: financial, occupational, and leisure/sport. As in Chapter 2 (Study 1), I tested the hypothesis in a large sample of the Dutch general public. Although this study took a preliminary step toward examining domain-specific risk preferences, it did not include a number of key domains (i.e., social). I addressed this by increasing the diversity of domains in Chapter 4 (Study 3).

Chapter 4 implemented a valid risk-propensity measure, the Risk-Taking Index (RTI; Nicholson et al., 2005), which assesses the self-reported frequency of risky behaviors across six domains: recreational, health, financial, career, safety, and social. I recruited English-speaking participants from an online platform and from the University of Southampton participant pool. Whereas the RTI taps into a wide range of domains, it uses only a single item to assess risk propensity in each domain. To further refine the assessment of domain-specific risk propensity, and hone in with greater precision on the young male hypothesis, Chapter 5 (Study 4) implemented a more comprehensive, multi-item scale.

In Chapter 5 (Study 4), I introduced a reliable and validated risk propensity measure, the 30-item Domain-Specific Risk-Taking Scale (DOSPERT; Blais & Weber, 2006), to test the young male hypothesis. This measure assesses self-reported risk propensity across five domains: ethical, financial, health/safety, recreational, and social. Each domain is assessed with multiple items. In addition, the DOSPERT measures perceived risks and perceived benefits associated with these domains, enabling me to control for these variables and, by so doing, achieve more precise tests of the young male hypothesis. I recruited English-speaking participants via different crowdsourcing platforms. Whereas the DOSPERT has good construct validity and is arguably superior to the much briefer measures used in the preceding studies, it still suffers from the inherent limitations of self-report measures. To address this limitation, my final study implemented a different measurement approach by examining risky choices within decision scenarios (Chapter 6, Study 5).

In Chapter 6 (Study 5), I tested the young male hypothesis in the context of widely used and extensively validated risky-choice scenarios (Tversky & Kahneman, 1981). Informed by the preceding studies, I specifically focused on risk-taking in the financial domain. I recruited English-speaking participants via multiple online platforms.

To conclude, Chapter 7 summarizes the findings across all studies and provides an overall assessment of the young male hypothesis. I discuss the limitations of the current research and propose future research directions that potentially enrich understanding of individual differences in risk-taking context, in particular as they relate to age, gender, and their interplay.

CHAPTER II: General Risk Propensity

2.1 Introduction

This study tested the young male hypothesis among members of the Dutch general public. I measured risk propensity with the measure developed by Dohmen and colleagues (2011). This single-item measure (Dohmen measure, for short) asks directly about one's general willingness to engage in risky actions. The Dohmen measure is easy to administer and previous research indicates that it is robust predictor of risk-taking behavior (Bonin et al., 2007; Caliendo et al., 2009; Dohmen et al., 2011; Grund & Sliwka, 2006; Jaeger et al., 2010; Josef et al., 2016; Lönnqvist et al., 2015). For example, Dohmen-measure scores predict actual choices in traditional lotteries with real-life economic risky choices (Budría et al., 2013; Caliendo et al., 2009; Dohmen et al., 2011). The measure has been widely used in large-scale studies, such as the German Socio-Economic Panel (Josef et al., 2016), the US Health and Retirement Survey (Fisher, Gideon, Hsu, & McFall, 2011), the British Household Panel (Galizzi, Machado, & Miniaci, 2016), and the Swiss Household Panel (Mamerow, Frey, & Mata, 2016).

I tested the following hypotheses. First, I hypothesized that age will be inversely related to individuals' general willingness to take risks (H1). Second, men should evidence greater willingness to take risks than women (H2). Third, and most important, the young male hypothesis entails that age and gender will interact, such that men's (compared to women's) greater risk propensity is more pronounced among younger (than older) adults. Looked at from a different angle, the young male hypothesis stipulates that the inverse association between age and risk propensity is stronger among men than women (H3).

2.2 Method

2.2.1. Participants and Procedure

To test my hypotheses, I used data collected within the context of the Longitudinal Internet Studies for the Social Sciences (LISS) project (https://www.lissdata.nl/lissdata). The LISS panel consists of 4500 households, comprising 7000 individuals. The panel is based on a true probability sample of households drawn from the population register by Statistics Netherlands. Panel members complete online questionnaires every month and are paid for each completed questionnaire. One member in the household provides household data and regularly updates this information. The LISS Core Study is a longitudinal study that is repeated annually and follows changes in the life course of the panel members. In addition to the LISS Core Study, there is an opportunity for social scientists to administer bespoke studies to sub-samples of the LISS panel. Many researchers, from linguistics to medical sciences, have taken up the opportunity and their data are publically available as Assembled Studies (to distinguish them from Core Study). The LISS panel has been in operation since October 2007, and all data are made available through the LISS data archive.

Among the Assembled Studies, I identified a cross-sectional study titled “Testing Mechanisms for Identifying True Risk Preferences”. This study was conducted in February 2012 and contained data measuring general risk propensity. Two hundred and fifty-nine participants (men = 117, women = 142; M_{age} = 53.37, *SD* = 13.99, range: 23 to 91years) responded to the Dohmen measure, which assesses general willingness to take risks. I did not identify any extreme outliers (see Field, 2009; Tabachnick & Fidell, 2001). The sample size afforded statistical power equal to .95 to detect a medium effect (*f* =.25) (G*Power 3; Faul, Erdfelder, Lang & Buchner, 2007).

2.2.2. Measures

2.2.2.1 Demographics

I retrieved information on participants' age, gender, education level, profession, occupation, income level, and marital status from the LISS Background Variables dataset.

2.2.2.2 General Risk Propensity

Risk preference was assessed with the Dohmen question (Dohmen et al., 2011). It provides a global assessment of individuals' willingness to take risks. The exact wording of the question is: "How do you see yourself? Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" Respondents rated their willingness on a 10-point scale (0 = *not at all willing to take risks* to 10 = *very willing to take risks).* The item is part of the risk aversion scale that was first piloted in a subset of the German Social-Economic Panel population (Dohmen et al., 2011). The item has shown good construct validity and high test-retest reliability over a one-year period (Dohmen et al., 2011; Josef et al., 2016; Lönnqvist et al., 2015).

2.3 Results

I carried out a moderation analysis (Hayes, 2013, PROCESS macro, model 1) to examine whether age (mean-centered; Singer, 1998), gender (contrast coded: women = -1, men = 1), and the Age × Gender interaction predicted participants' general risk propensity. A moderation analysis portrays a multiple regression equation with an interaction term. Specifically, equation 1 shows the linear regression model for predicting Y (risk propensity) from X (age), Z (gender), and the interaction between X and Z (i.e., moderating effect of Y), represented by the X • Z product term (Aiken & West, 1991; Cohen & Cohen, 1983):

$$Y = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 X \bullet Z + \varepsilon \qquad \text{[Equation 1]}$$

Here β_0 is the intercept, β_1 is the regression coefficient for X, β_2 is the regression coefficient for Z, β_3 is the regression coefficient for the product term that carries information about the interaction between X and Z, and ε is a normally distributed random error term. Rejecting the null hypothesis H_0, that the interaction term's regression coefficient is zero indicates the presence of a moderating or interaction effect.

I present the results in Figure 2.1. The overall model for the Dohmen measure of general risk propensity was significant: $F(3, 255) = 11.48$, $p < .001$, $R^2 = .12$. As predicted, both main effects were significant. Age was inversely related to risk propensity (H1), $B = -.04$, $\beta = -.32$: $t(255) = -5.38$, $p < .001$, 95% CI [-.052, -.024], and men evinced higher risk propensity than women (H2), $B = .34$, $\beta = .16$: $t(255) = 2.42$, $p = .016$, 95% CI [.063, .616]. These results are consistent with the literature on aging and gender differences in risk taking. However, the interaction term was not significant, $B = -.001$, $\beta = -.01$: $t(255) = -0.20$, $p = .845$, 95% CI [-.015, .013]. Thus, the young male hypothesis was not supported (H3). Figure 1 displays the best-fitting slopes for the regression of risk propensity on age, separately for men and women. Risk propensity declines linearly with age for men and women. Looked at from a different angle, men evince greater risk propensity than women, and this gender difference remains consistent across the age range.

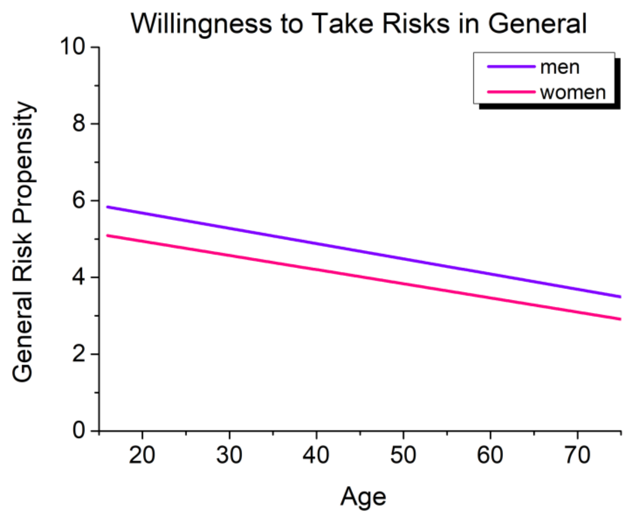


Figure 2. 1 General risk propensity as a function of age and gender. The best-fitting age slopes are based on multiple regression analyses conducted separately for men and women.

2.4 Discussion

I tested the young male hypothesis among members of the Dutch general public, using secondary data retrieved from the LISS panel. I assessed risk propensity in terms of participants' general willingness to engage in risky actions. Although the study was adequately powered, results did not support the young male hypothesis. However, consistent with the extant literature (Deakin et al., 2004; Denburg, et al., 2001; Dohmen et al., 2011; Josef et al., 2016; Rolison, Hanoch, & Wood, 2013), results revealed a negative association between age and the general risk propensity. Furthermore, men were more willing to take general risks than women, a finding that is also in agreement with past research (Byrnes, Miller, & Schafer, 1999; Charness & Gneezy, 2011; Croson & Gneezy, 2009). Replication of the reduced general risk propensity among older (compared to younger adults) and higher general risk propensity among men (than women) suggests that the lack of support for the young male hypothesis cannot be simply attributed to measurement error or noise. An important limitation of the present study is that I assessed general risk propensity only. It is possible that the presumed greater risk propensity of younger men (compared to women and older men) is domain-specific rather than general. If this is the case, then a sensitive test of the young male hypothesis requires that one distinguishes between risk preferences within distinct domains. I do so in my next study.

CHAPTER III: Study 2

3.1 Introduction

Consistent with the existing literature, Study 1 revealed that general risk propensity declined with age and was higher among men than women. The study did not, however, support the young male hypothesis. An important limitation of Study 1 was that it only examined general risk propensity and did not assess risk propensity in specific domains. To address this, and examine if support for the young male hypothesis is domain-specific, Study 2 assessed risk propensity in three domains: financial, occupational, and leisure/sports. In addition, Study 2 again included the Dohmen measure of general risk propensity (Dohmen et al., 2011), allowing for an exact replication of Study 1. I tested the same hypotheses as in Study 1, pertaining to age (H1), gender (H2), and the Age × Gender interaction (i.e., young male hypothesis; H3).

3.2 Method

3.2.1 Participants and Procedure

As in Study 1, I used the LISS panel data. Among the LISS Assembled Studies, I identified a study entitled "Commercial Opportunities", which was conducted in March 2010. This study included the Dohmen measure, measuring the general risk propensity (Dohmen et al., 2011). In addition, this study included three questions assessing risk propensity within specific domains: financial, occupational, and leisure/sports. The sample size was larger than in Study 1, affording greater precision and higher statistical power. Two thousand six-hundred and eight participants (men = 1,187, women = 1,461; M_{age} = 50.20, SD = 16.50, range from 18 to 90 years) responded to the general and domain-specific risk propensity questions. Prior to the main analyses, data screening did not reveal any extreme outliers (Field, 2009; Tabachnick & Fidell, 2001). The sample size afforded statistical power equal to .99 to detect a medium effect size (f =.25, α = .05; G*Power 3; Faul, Erdfelder, Lang, & Buchner, 2007).

3.2.2 Measures

3.2.2.1 Demographics

I retrieved information on participants' age, gender, education level, profession, occupation, income level, and marital status from the LISS Background Variables dataset.

3.2.2.2 General and Domain-Specific Risk Propensity

Participants' general risk preference was assessed with the Dohmen question (Dohmen et al., 2011): "How do you see yourself? Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" In addition, the study included three questions evaluating participants' willingness to take risks in specific domains: financial, occupational, and leisure/sports: "People can behave differently in different situations. How would you rate your willingness to take risks in the following areas? (A) in financial matters, (B) in occupation, (C) during leisure/sports?" For the general and domain-specific questions, respondents rated their willingness on a 10-point scale (0 = *highly risk averse*, 10 = *fully prepared to take risks*). The items have good construct validity and high test-retest reliability (Dohmen et al., 2011; Josef et al., 2016).

3.3 Results

I carried out a moderation analysis (Hayes, 2013; PROCESS macro, model 1) to examine whether age (mean-centered; Singer, 1998), gender (contrast coded: women = -1, men = 1), and the Age × Gender interaction predicted participants' general and domain-specific risk propensity. Figure 3.1 presents the results.

3.3.1. General Risk Propensity

The overall model for the Dohmen question was significant: $F(3, 2604) = 44.55$, $p < .001$, $R^2 = .05$. As in Study 1, I found that both main effects were significant. Age was inversely related to general risk propensity (H1): $B = -.02$, $\beta = -.16$, $t(2607) = -8.52$, $p < .001$, 95% CI [-.028, -.018], and men reported higher levels of general risk propensity than women (H2): $B = .36$, $\beta = .15$, $t(2607) = 8.06$, $p < .001$, 95% CI [.270, .443]. However, the interaction was not significant: $B = .004$, $\beta = .03$, $t(2607) = 1.59$, $p = .113$, 95% CI [-.001, .010]. Figure 3.1 reveals that general risk propensity declines linearly with age for men and women. Looked at from a different angle, men evince greater general risk propensity than women, and this gender difference remains consistent across the age range. Thus, the young male hypothesis was not supported (H3). These results replicate the findings of Study 1.

3.3.2. Financial Domain

The overall model for risk propensity in the financial domain was significant: $F(3, 2604) = 43.19$, $p < .001$, $R^2 = .05$. As for general risk propensity, both main effects were significant. Age was negatively associated with financial risk propensity (H1): $B = -.02$, $\beta = -.16$, $t(2607) = -8.20$, $p < .001$, 95% CI [-.029, -.018], and men evinced higher levels of financial risk propensity than women (H2): $B = .39$, $\beta = .16$, $t(2607) = 8.40$, $p < .001$, 95% CI [.299, .481]. The Age × Gender interaction was not significant: $B = .00$, $\beta = -.001$, $t(2607) = -0.04$, $p = .965$, 95% CI [-.006, .005]. The young male hypothesis was not supported in the financial domain (H3). This pattern of results is practically identical to the pattern for general risk propensity (Figure 3.1).

3.3.3. Occupational Domain

Turning to the occupational domain, the overall model was significant: $F(3, 2604) = 64.92$, $p < .001$, $R^2 = .07$. As for general and financial risk propensity, both main effects were significant. Age was inversely related to occupational risk propensity: $B = -.03$, $\beta = -.20$, $t(2607) = -10.58$, $p < .001$, 95% CI [-.035, -.024], and men reported higher occupational risk propensity than women: $B = .41$, $\beta = .17$, $t(2607) = 8.91$, $p < .001$, 95% CI [.322, .504]. The Age × Gender interaction was also significant: $B = .001$, $\beta = .06$, $t(2607) = 3.17$, $p < .01$, 95% CI [.003, .014]. However, inspection of Figure 3.1 indicates that the interaction pattern was not consistent with the young male hypothesis. To be precise, whereas the young male hypothesis predicts that the greater risk propensity of men (compared to women) should be more pronounced among younger (than older) adults, results revealed the opposite pattern. Regions-of-significance tests indicated that men evinced greater risk propensity than women across the entire age range ($p < .05$), but the gender effect increased (rather than decreased) with age. From a different angle, the young male hypothesis entails that the negative association between age and risk propensity should be stronger among men than women, yet I found the opposite. Tests of simple age slopes revealed that age was negatively associated with occupational risk propensity among both men ($B = -.20$, $t(2607) = -5.08$, $p < .001$, 95% CI [-.029, -.013]), and women ($B = -.39$, $t(2607) = -10.06$, $p < .001$, 95% CI [-.046, -.031]) but the association was stronger for women (Figure 3.1).

3.3.4. Leisure/Sports Domain

The pattern of results for risk propensity in the leisure/sports domain closely resembled the pattern for occupational risk propensity. The overall model was significant: $F(3, 2604) = 105.81$, $p < .001$, $R^2 = .11$. Again, both main effects were significant; risk propensity declined with age ($B = -.04$, $\beta = -.27$, $t(2607) = -14.70$, $p < .001$, 95% CI [-.047, -.036]), and men (compared to women) reported higher levels of risk propensity in the leisure/sport domain ($B = .48$, $\beta = .19$, $t(2607) = 10.38$, $p < .001$, 95% CI [.387, .569]). The Age × Gender interaction was also significant ($B = .001$, $\beta = .05$, $t(2607) = 2.60$, $p < .01$, 95% CI [.002, .013]).

However, as was the case in the occupational domain, the interaction pattern was not consistent with the young male hypothesis (Figure 3). Contrary to the young male hypothesis, regions-of-significance tests indicated that men evinced greater risk propensity than women across the entire age range ($p < .05$), but the gender effect increased (rather than decreased) with age. In addition, tests of simple age slopes revealed that age was inversely related to leisure/sports risk propensity among both men ($B = -.03$, $t(2607) = -.8.29$, $p < .001$, 95% CI [-.042, -.026]), and women ($B = -.05$, $t(2607) = -12.65$, $p < .001$, 95% CI [-.056, -.041]), but the association was stronger for women (rather than men) (Figure 3.1).

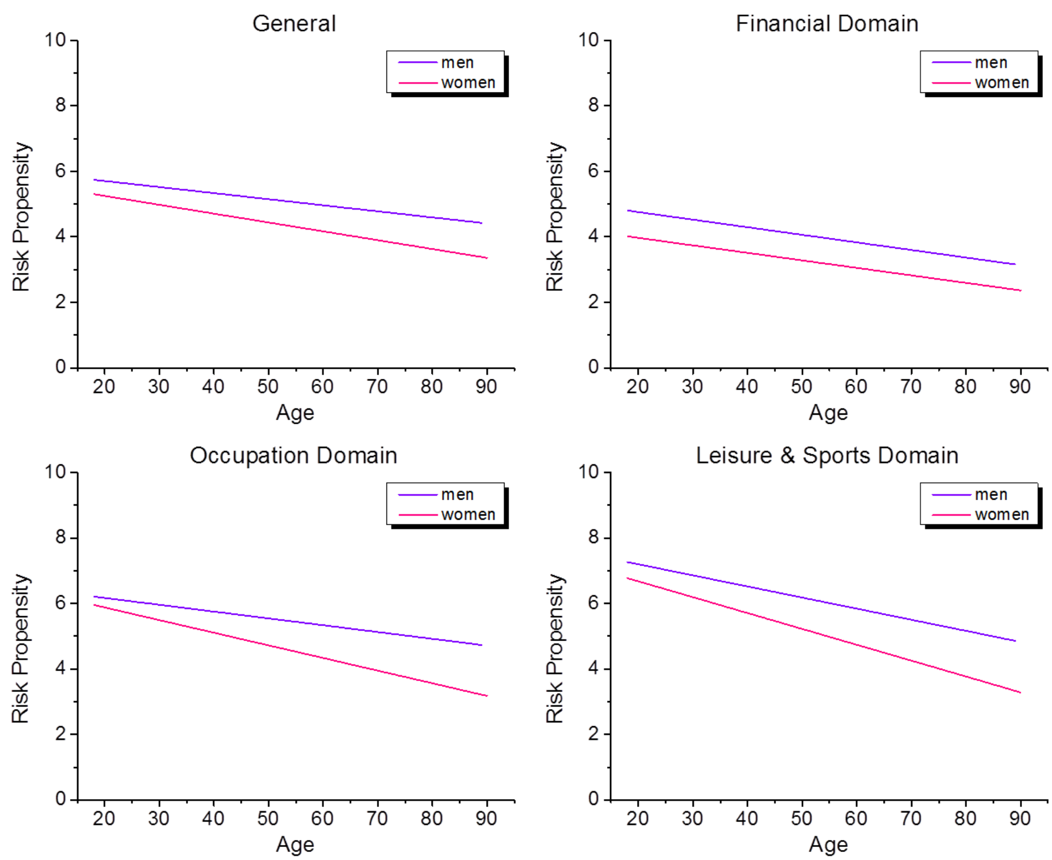


Figure 3. 1 General and domain-specific risk propensity as a function of age and gender. The best-fitting age slopes are based on multiple regression analyses conducted separately for men and women.

3.4 Discussion

I tested the young male hypothesis in a representative sample of the Dutch general public, using a large secondary dataset retrieved from the LISS data archive. I assessed risk propensity in terms of individuals' general and domain-specific willingness to take risks (financial, occupation, and leisure/sports). For general risk propensity, results exactly replicated Study 1 findings. General risk propensity declined with age, and was higher among men than women, but the young male hypothesis was not supported. Within each of the three specific domains, age was also inversely associated with risk propensity. Furthermore, men reported higher risk propensity than women within each specific domain. Thus, in line with prior research, and replicating Study 1 findings, H1 and H2 received unequivocal support.
A key objective of Study 2 was to examine if support for the young male hypothesis is domain specific. I found no evidence that it is. Within the financial domain, men (compared to women) reported being more prepared to take financial risks, regardless of age. Furthermore, men and women showed an almost identical decline in risk propensity across their life span. Within the occupational and leisure/sports domains, results even contradicted the young male hypothesis. In both domains, (a) the gap in risk propensity between men and women became larger (rather than smaller) across the life span, and (b) the decline in risk propensity across the life span was stronger (rather than weaker) among women than men.

Study 2 had two limitations. First, although the inclusion of three domain-specific risk-propensity questions was a step in the right direction, other important domains were not explored. These include, for example, the social and health domains (Weber et al., 2002). Second, the domain-specific questions were abstract and did not provide participants with concrete examples of financial, occupational, or leisure/sports risks. This vagueness and lack of clarity may have introduced considerable random measurement error (e.g., due to individual differences in the conceptualization of these different types of risk). I addressed these limitations in Study 3 by considering three additional domains of risk (health, safety, and social) and by providing participants with concrete examples of each type of risk (e.g., for health risk: smoking, poor diet, high alcohol consumption).

CHAPTER IV: Study 3

4.1 Introduction

Study 2 revealed that general and domain-specific risk propensity declines with age, and is higher for men than for women. However, it did not provide evidence for the young male hypothesis. On the contrary, findings for the occupational and leisure/sports domains indicated that the greater risk propensity of men (compared to women) became more (rather than less) pronounced across the lifespan. One major limitation of Study 2 was that some important domains were not included.

Therefore, Study 3 implemented a valid risk-propensity measure, which assessed the self-reported frequency of risky behaviors in six domains. These included the three specific domains examined in Study 2: financial, occupational (labeled "career"), and leisure/sport (labeled "recreational"). This created the opportunity to replicate Study 2 findings and, in particular, the unexpected results for the occupational and leisure/sports domains. The risk-propensity measure also included three new domains: health, safety, and social. For each domain, participants were presented with specific examples of risk taking, thereby addressing a limitation of the risk-propensity measure used in Study 2. I tested the same hypotheses as in Studies 1-2, pertaining to age (H1), gender (H2), and the Age × Gender interaction (i.e., young male hypothesis; H3).

4.2 Method

4.2.1 Participants and Procedure

A priori power analysis indicated a total sample of 128 participants would be sufficient to detect a medium effect size (f = .25, α = .05) (G*Power 3; Faul, Erdfelder, Lang & Buchner, 2007).

I achieved recruiting one hundred and sixty-five participants online through the CrowdFlower crowdsourcing platform (n = 120) and University of Southampton campus advertisements (n = 45). The inclusion criteria were: (a) resident in an English-speaking country, and (b) 18 years of age and above. However, I excluded two cases due to missing values. The final sample consisted of: CrowdFlower participants who were mostly US residents (64 females, 52 males, 2 unreported, M_{age} = 32.95, SD = 9.29, range = 18 to 58 years), who received $2 upon completion and University participants who were undergraduate students (34 females, 11 males, M_{age} = 20.36, SD = 2.40, range = 18 to 32 years) who took part for course credit; in total, one hundred and sixty-three participants. Following the criteria proposed by Field (2009) and Tabachick and Fidell (2001), I did not detect any extreme outliers.

The study was approved by the University of Southampton psychology ethics committee.

4.2.2 Measures

4.2.2.1 Demographics

Participants provided information on their age, gender, education level, and occupation.

4.2.2.2 Risk Propensity

I assessed risk propensity with the Risk Taking Index (RTI; Nicholson et al., 2005). This scale consists of six domain-specific risk-taking items. The exact wording is: “We are interested in everyday risk-taking. Please could you tell us if any of the following have ever applied to you, now or in your adult past? (a) recreational risks (e.g., rock-climbing, scuba diving); (b) health risks (e.g., smoking, poor diet, high alcohol consumption); (c) career risks (e.g., quitting a job without another to go to); (d) financial risks (e.g., gambling, risky investments); (e) safety risks (e.g., fast driving, city cycling without a helmet); and (f) social risks (e.g., standing for election, publicly challenging a rule or decision)”. Participants rated each item on a 5-point scale (1 = *never*, 5 = *very often*). Overall, the scale has good construct validity and high internal consistency (Nicholson et al., 2005).

4.3 Results

I carried out a moderation analysis (Hayes, 2013; PROCESS macro, model 1) to examine whether age (mean-centered; Singer, 1998), gender (contrast coded: women = -1, men = 1), and the Age × Gender interaction predicted participants’ domain-specific risk propensity. Figure 4.1 presents the results per domain.

4.3.1. Recreational Domain

The overall model for risk propensity in the recreational domain was significant: $F(3, 157) = 3.82$, $p < .01$, $R^2 = .07$. The association between age and recreational risk propensity was not significant (H1): $B = -.01$, $\beta = -.10$, $t(162) = -1.18$, $p = .242$, 95% CI [-.030, .008]. Men reported significantly higher levels of recreational risk propensity than women (H2): $B = .25$, $\beta = .22$, $t(162) = 2.88$, $p < .01$, 95% CI [.079, .421]. The Age × Gender interaction was not significant (H3): $B = .01$, $\beta = .07$, $t(162) = 0.81$, $p = .417$, 95% CI [-.011, .026].

4.3.2. Health Domain

Turning to the health domain, the overall model was significant: $F(3, 157) = 3.35$, $p < .05$, $R^2 = .06$. Results revealed a marginal negative association between age and risk propensity within the health domain (H1): $B = -.02$, $\beta = -.15$, $t(162) = -1.76$, $p = .081$, 95% CI [-.038, -.002]. In addition, men reported higher health risk propensity than women (H2): $B = .26$, $\beta = .21$, $t(162) = 2.68$, $p < .01$, 95% CI [.067, .443]. The Age × Gender interaction was not significant (H3): $B = -.00$, $\beta = -.04$, $t(162) = -0.48$, $p = .635$, 95% CI [-.025, .016].

4.3.3. Career Domain

The overall model for the career domain was significant: $F(3, 156) = 3.65$, $p < .05$, $R^2 = .07$. Risk propensity was not significantly associated with age (H1): $B = -.00$, $\beta = -.01$, $t(162) = -0.10$, $p = .919$, 95% CI [-.010, .010]. But men (compared to women) reported higher levels of risk propensity in the career domain (H2): $B = .28$, $\beta = .26$, $t(162) = 3.30$, $p < .001$, 95% CI [.114, .455]. The Age × Gender interaction was not significant (H3): $B = .00$, $\beta = .02$, $t(162) = 0.18$, $p = .858$, 95% CI [-.017, .021].

4.3.4. Financial Domain

The overall model for risk propensity in the financial domain was significant: $F(3, 155) = 5.83$, $p < .01$, $R^2 = .10$. I did not find a significant association between age and financial risk propensity (H1): $B = -.00$, $\beta = -.01$, $t(162) = -0.08$, $p = .940$, 95% CI [-.021, .019]. Men reported higher risk propensity than women (H2): $B = .38$, $\beta = .31$, $t(162) = 4.03$, $p < .001$, 95% CI [.192, .562]. The Age × Gender interaction was not significant (H3): $B = -.01$, $\beta = -.09$, $t(162) = -1.08$, $p = .280$, 95% CI [-.031, .009].

However, the inspection of Figure 4.1 indicates an interaction pattern that could be consistent with the young male hypothesis. Specifically, the young male hypothesis predicts that the greater risk propensity of men (compared to women) should be more pronounced among younger (than older) adults. Indeed, the magnitude of the gender effect declined with age. Regions-of-significance tests indicated that men evinced significantly ($p < .05$) greater financial risk propensity than women up to middle age (~39 years). For participants older than 39 years, the gender effect was not significant. From a different angle, the young male hypothesis entails that the negative association between age and risk propensity should be stronger among men than women. Tests of simple age slopes revealed that age was negatively associated with financial risk propensity among men, although this association was not significant, B = -.01, $t(158) = -0.69$, $p = .488$, 95% CI [-.045,.022]. Among women, age was positively associated with risk propensity but, again, not significantly so, B = .01, $t(158) =$ 0.91, $p = .363$, 95% CI [-.012, .032]. In all, I consider this pattern suggestive, descriptive support for the young male hypothesis in the financial domain.

4.3.5. Safety Domain

In the safety domain, the overall model was significant: $F(3, 157) = 2.65$, $p < .05$, R^2 = .05. Again, the association between age and safety risk propensity was not significant (H1): B = -.01, β = -.07, $t(162) = -0.82$, $p = .412$, 95% CI [-.026, .011]. But again men reported higher risk propensity than women (H2): B = .18, β = .16, $t(162) = 2.03$, $p < .05$, 95% CI [.005, .352]. The Age × Gender interaction was not significant (H3): B = .01, β = .11, $t(162) =$ 1.32, $p = .189$, 95% CI [-.001, .031].

4.3.6. Social Domain

The final domain tested was the social and, again, the overall model was significant: $F(3, 157) = 5.69$, $p < .01$, $R^2 = .10$. The association between age and social risk propensity was not significant (H1): B = -.01, β = -.10, $t(162) = -1.22$, $p = .226$, 95% CI [-.025, .001]. However, men reported higher levels of social risk propensity than women (H2): B = .36, β

= .30 $t(162) = 3.98$, $p < .001$, 95% CI [.18, .53]. The Age × Gender interaction was not significant (H3): $B = -.01$, $\beta = -.05$, $t(162) = -0.63$, $p = .533$, 95% CI [-.025, .013].

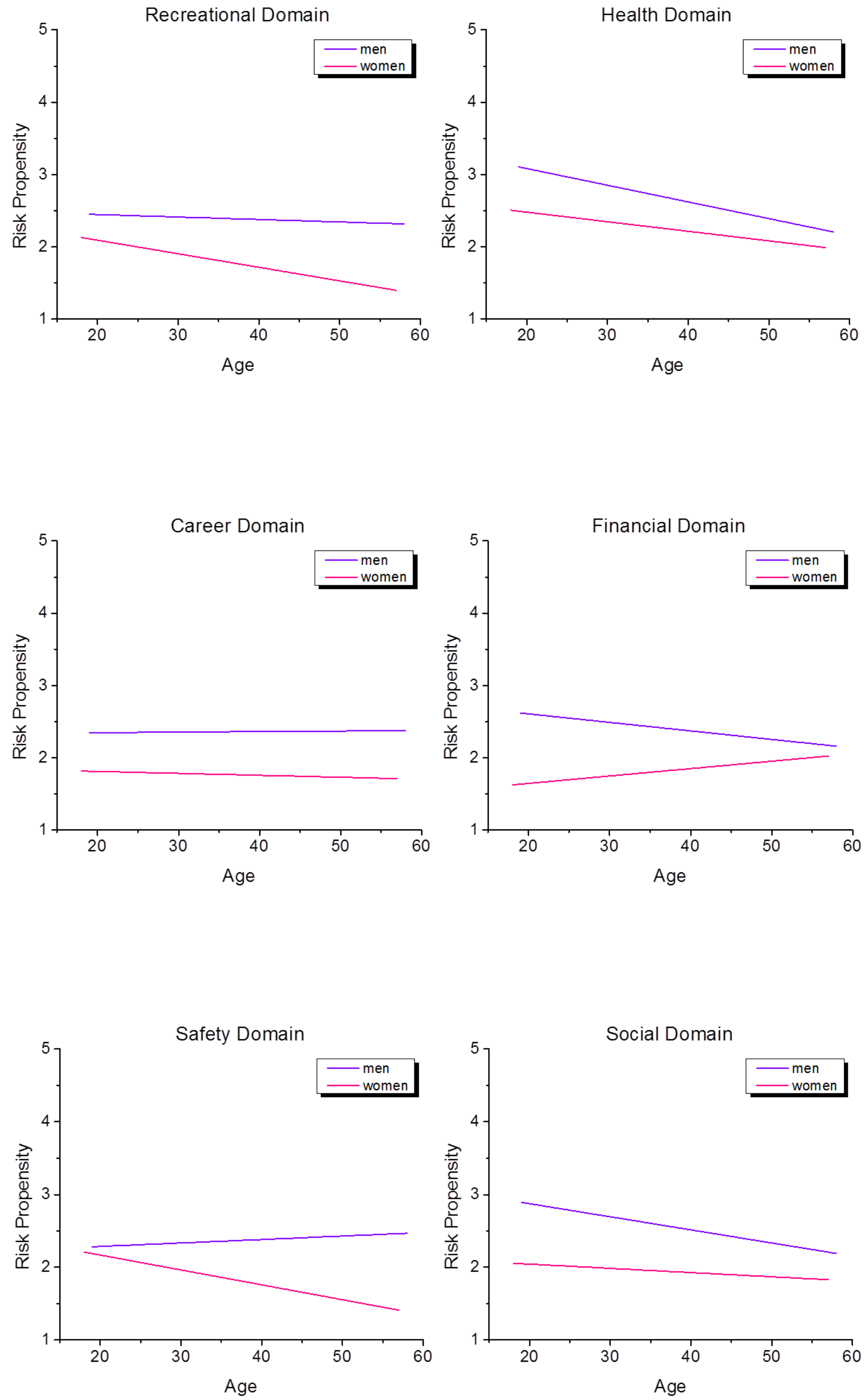


Figure 4. 1 Domain-specific risk propensity as a function of age and gender. The best-fitting age slopes are based on multiple regression analyses conducted separately for men and women.

4.4 Discussion

In Study 3, I tested the young male hypothesis in an English-speaking sample. I assessed risk propensity with the RTI (Nicholson et al. 2005). This measure captures individual differences in risk taking across six domains (recreational, health, career, financial, safety, and social). Consistent with prior research and Studies 1-2, men reported significantly greater risk propensity than women within each domain. However, contrary to Studies 1-2, age was not significantly associated with risk propensity in any domain. One possible explanation for this unexpected null finding is the restricted age range in the Study 3 sample (18-58 years), compared to the Study 1 (18-91 years) and Study 2 (18-90 years) samples.[1]

As in Study 2, I did not replicate the Age × Gender interactions in the occupational and leisure/sports domains, which contradicted the young male hypothesis. Although, I did not found support for the young male hypothesis, additional analyses in the financial domain revealed that the tendency for men to evince greater risk propensity than women decreased with age. Looked at from a different angle, age was negatively associated with risk propensity among men, but not among women and both results were not statistically significant. Thus, this pattern provided only indicative support for the young male hypothesis in the financial domain. All in all, Study 3 findings are compatible with research by Nicholson et al. (2005). The researchers also assessed risk propensity with the RTI and (despite their claims to the contrary) did not support the young male hypothesis either.

In addition to the limited age range, Study 4 has two further limitations. First, the sample size was relatively small. Second, the RTI assesses risk propensity within each domain with a single item only, potentially yielding unreliable indices. I addressed these limitations in Study 5 by recruiting a large English-speaking sample and assessing risk propensity with the reliable and validated Domain-Specific Risk Attitude Scale (DOSPERT; Blais & Weber, 2006; Weber, Blais, & Betz, 2002). The DOSPERT is a 30-item scale that assesses risk taking in five content domains (six items per domain): financial decisions (separately for investing versus gambling), health/safety, recreational, ethical, and social decisions.

CHAPTER V: Study 4

5.1 Introduction

In Study 3, I assessed risk propensity within six domains (recreational, health, career, financial, safety, social), using the RTI (Nickolson et al., 2005). Although I replicated previous findings (Studies 1-2) that men reported significantly greater risk propensity than women within each domain, age was not significantly associated with risk propensity in any domain. Furthermore, Study 3 did not replicate the Study 2 Age × Gender interactions in the occupational and leisure/sports domains, which contradicted the young male hypothesis but the results revealed non-significant Age × Gender interactions in all five domains. Yet, a suggestive pattern emerged in the financial domain which was consistent with the young male hypothesis. Study 3 had two major limitations. First, the sample size was small and the age range was restricted (18-58 years). Restriction of the age range can potentially explain the unexpected null finding related to age and risk propensity. Second, the RTI evaluated risk propensity within domains using single items only, which could produce unreliable measures.

Addressing these limitations, Study 4 employed a reliable and validated risk propensity measure: the 30-item Domain-Specific Risk-Taking Scale (DOSPERT; Blais & Weber, 2006). The DOSPERT captures self-reported risk propensity across five domains: ethical, financial, health/safety, recreational, and social. Additionally, the DOSPERT assesses perceived risks and perceived benefits associated with risk taking within these domains. Particularly, Blais & Weber (2006; 2009) argued that any observed risk propensity behavior reflects a trade-off between perceived risks and perceived benefits. Perceived risks and benefits can differ between individuals and also vary as a function of content and context. Indeed, these two additional dissociable and evaluative components have been shown to explain a significant proportion of the domain-specific variability in risk taking (Weber et al., 2002; Weller, Ceschi, & Randolph, 2015). In particular, participants are more likely to take risks to the extent that perceived risks associated with the risky behavior are lower and perceived benefits of the behavior are higher (Blais & Weber, 2006). Accordingly, I measured conventional risk attitudes (i.e., self-reported level of risk taking) and, as control variables, also assessed perceptions of riskiness and perceptions of benefits. Similar to Studies 1-3, I tested the same hypotheses pertaining to age (H1), gender (H2), and the Age × Gender interaction (i.e., young male hypothesis; H3).

5.2 Method

5.2.1 Participants and Procedure

A priori power analysis indicated a total sample of 128 participants would be sufficient to detect a medium effect size ($f = .25$, $\alpha = .05$) (G*Power 3; Faul, Erdfelder, Lang & Buchner, 2007).

I recruited four hundred and seven participants through CrowdFlower ($n = 195$) and Prolific Academic ($n = 212$) crowdsourcing platforms. The inclusion criteria were: (a) resident in an English-speaking country, and (b) 18 years of age and above. CrowdFlower participants were English-speaking US residents (65 females, 129 males, 1 unreported), who received $1.5 upon completion. Their ages ranged from 18 to 70 years ($M = 31.61$, $SD = 9.11$). Prolific Academic participants were English-speaking UK residents (92 females, 118 males, 2 unreported), who were compensated with £2 upon completion. Their ages ranged from 18 to 63 years ($M = 30.90$, $SD = 10.04$). Preliminary data screening analyses did not detect any extreme outliers (Field, 2009; Tabachnick & Fidell, 2001).

The study was approved by the University of Southampton psychology ethics committee.

5.2.2 Measures

5.2.2.1 Demographics

I collected information on participants' age, gender, education level, marital status, and occupation.

5.2.2.2 Risk Propensity

I assessed risk propensity with the revised 30–item Domain-Specific Risk-Taking Scale (DOSPERT; Blais & Weber, 2006). The DOSPERT evaluates conventional risk attitudes (defined as the likelihood with which respondents might engage in risky activities; "For each of the following statements, please indicate the likelihood that you would engage in the described activity or behavior if you were to find yourself in that situation"), perceived risks (defined as the respondents' assessment of how risky each activity/behavior is; "For each of the following statements, please indicate how risky you perceive each situation"), and expected benefits (defined as the benefits from engaging in such an activity; "For each of the following statements, please indicate the benefits you would obtain from each situation") across five broad domains. Each domain is assessed with six items. For each item, participants used a 7-point scale to make three ratings: their likelihood of engaging in described behavior (1 = *Extremely unlikely,* 7 = *Extremely likely*), the perceived riskiness of the described behavior (1 = *Not at all Risky,* 7 = *Extremely Risky),* and the expected benefits of the described behavior (1 = *No benefits at all,* 7 = *Great benefits*). I averaged responses across items within each domain, creating domain-level indices of risk propensity, perceived risk, and expected benefits. The domains were: ethical (e.g., "Not returning a wallet you found that contains $200", $\alpha_{\text{risk attitudes}} = .83$, $\alpha_{\text{perceived risk}} = .75$, $\alpha_{\text{expected benefits}} = .83$), financial (e.g., "Investing 10% of your annual income in a new business venture”, $\alpha_{\text{risk attitudes}}$ = .85, $\alpha_{\text{perceived risk}}$ = .83, $\alpha_{\text{expected benefits}}$ = .88), health/safety (e.g., “Driving a car without wearing a seat belt”, $\alpha_{\text{risk attitudes}}$ = .76, $\alpha_{\text{perceived risk}}$ = .77, $\alpha_{\text{expected benefits}}$ = .89), recreational (e.g., “Taking a skydiving class”, $\alpha_{\text{risk attitudes}}$ = .86, $\alpha_{\text{perceived risk}}$ = .78, $\alpha_{\text{expected benefits}}$ = .84), and social (e.g., “Moving to a city far away from your extended family”, $\alpha_{\text{risk attitudes}}$ = .71, $\alpha_{\text{perceived risk}}$ = .81, $\alpha_{\text{expected benefits}}$ = .70). The DOSPERT has been validated in a wide range of settings, populations, and cultures (Blais & Weber, 2009). It has adequate internal-consistency (Weber et al., 2002) and good construct validity (Weller, Ceschi, & Randolph, 2015).

5.3 Results

I carried out a moderation analysis (Hayes, 2013; PROCESS macro, model 1) to examine whether age (mean-centered; Singer, 1998), gender (contrast coded: women = -1, men = 1), and the Age × Gender interaction predicted participants’ domain-specific risk propensity after controlling for perceived risks and expected benefits.[2] Figure 5.1 presents the results per domain.

5.3.1 Ethical Domain

The overall model for risk propensity in the ethical domain was significant: $F(5,380) = 106.71$, $p < .001$, $R^2 = .58$. However, neither the age and gender main effects nor the Age × Gender interaction was significant: age main effect (H1), $B = -.01$, $\beta = -.05$, $t(406) = -1.57$, $p = .118$, 95% CI [-.017, .002]; gender main effect (H2), $B = .02$, $\beta = .01$, $t(406) = 0.34$, $p = .735$, 95% CI [-.078, .110]; and Age × Gender interaction (H3), $B = -.00$, $\beta = -.01$, $t(406) = -0.31$, $p = .758$, 95% CI [-.011, .008]. From the covariates, the expected benefits was significantly associated with risk propensity, $B = .79$, $\beta = .74$, $t(406) = 21.62$, $p = <.001$, 95%

CI [.718, .862] whereas the perceived risk was not, *B* = -.06, β = -.05, *t*(406) = -1.51, *p* = .131, 95% CI [-.141, .018].

5.3.2 Financial Domain

The overall model for risk propensity in the financial domain was significant: *F*(5, 380) = 48.12, $p < .001$, $R^2 = .39$. Age was marginally associated with financial risk propensity (H1): *B* = -.01, β = -.08, *t*(406) = -1.85, *p* =.065, 95% CI [-.023, .001], and men evinced higher levels of financial risk propensity than women (H2): *B* = .20, β = .14, *t*(406) = 3.34, $p < .001$, 95% CI [.080, .312]. The Age × Gender interaction was also significant: *B* = - .01, β = -.09, *t*(406) = -2.19, *p* <.05, 95% CI [-.025, -.001]. The inspection of Figure 5.1 indicates that the interaction pattern was consistent with the young male hypothesis. In specific, the young male hypothesis predicts that the greater risk propensity of men (compared to women) should be more pronounced among younger (than older) adults. Indeed, the magnitude of the gender effect declined with age. Regions-of-significance tests indicated that men evinced significantly ($p < .05$) greater financial risk propensity than women up to middle age (~37 years). For participants older than 37 years, the gender effect was not significant. From a different angle, the young male hypothesis entails that the negative association between age and risk propensity should be stronger among men than women. Consistent with this hypothesis, tests of simple age slopes revealed that age was negatively associated with financial risk propensity among men, *B* = -.02, *t*(406) = -2.87, $p < .01$, 95% CI [-.041, -.008], but not among women, *B* = .01, *t*(406) = 0.23, *p* = .821, 95% CI [-.015, .019] (Figure 5.1). Both covariates were significantly associated with risk propensity: perceived risk, *B* = -.29, β = -.25, *t*(406) = -6.04, *p* = <.001, 95% CI [-.383, -.195], and expected benefits, *B* = .47, β = .46, *t*(406) = 11.22, *p* = <.001, 95% CI [.386, .550].

5.3.3 Health/Safety Domain

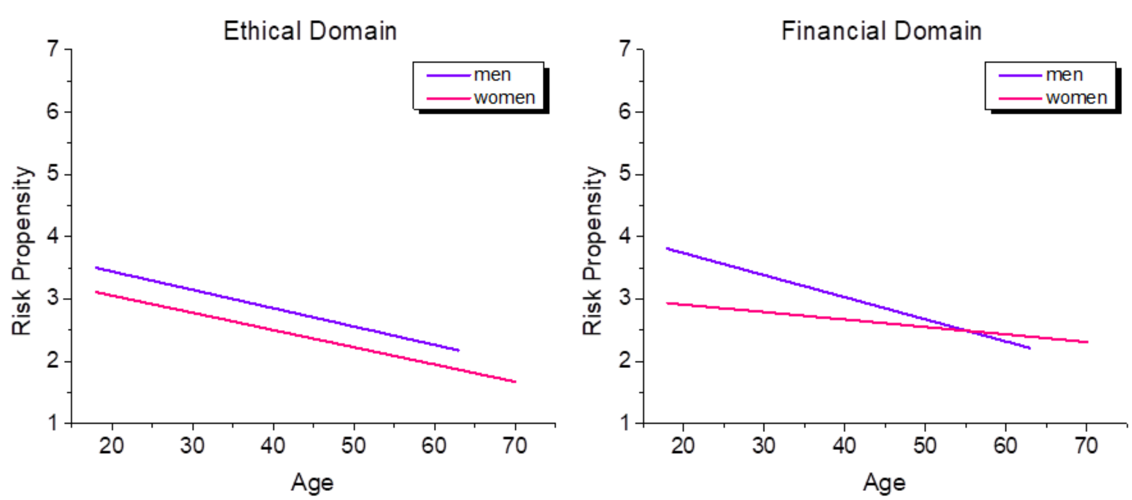
The overall model in health/safety domain was significant: $F(5,380) = 58.26$, $p <.001$, $R^2 =.43$. The association between age and risk propensity was not significant (H1), $B = -.00$, $\beta = -.00$, $t(406) = -0.11$, $p = .915$, 95% CI [-.011, .010]. Men, however, reported significantly higher levels of health risk propensity than women (H2), $B = .10$, $\beta = .08$, $t(406) = 1.97$, $p =.050$, 95% CI [.000, .208]. The Age × Gender interaction was not significant (H3), $B = -.00$, $\beta = -.04$, $t(406) = -1.03$, $p = .304$, 95% CI [-.016, .005]. Both covariates were significantly associated with risk propensity: perceived risk, $B = -.21$, $\beta = -.19$, $t(406) = -4.63$, $p = <.001$, 95% CI [-.299, -.120], and expected benefits, $B = .54$, $\beta = .58$, $t(406) = 14.12$, $p = <.001$, 95% CI [.465, .615].

5.3.4 Recreational Domain

Turning to the recreational domain, the overall model was significant: $F(5, 380) = 59.25$, $p < .001$, $R^2 = .44$. Age was inversely related to recreational risk propensity (H1), $B = -.02$, $\beta = -.14$, $t(406) = -3.43$, $p < .001$, 95% CI [-.034, -.009], and men reported higher recreational risk propensity than women (H2), $B = .14$, $\beta = .09$, $t(406) = 2.29$, $p < .05$, 95% CI [.020 .253]. The Age × Gender interaction was also significant (H3), $B = -.02$, $\beta = -.10$, $t(406) = -2.55$, $p =.011$, 95% CI [-.028, -.004]. Figure 5.1 points out that the interaction pattern was consistent with the young male hypothesis, such that the magnitude of the gender effect declined with age. Regions-of-significance tests indicated that men evinced significantly ($p < .05$) greater recreational risk propensity than women up to middle age (~32 years). For participants older than 32 years, the gender effect was not significant. In addition, tests of simple age slopes revealed that age was significantly inversely related to recreational risk propensity among men, $B = -.04$, $t(406) = -4.26$, $p < .001$, 95% CI [-.055, -.020], but not among women, $B = -.01$, $t(406) = -0.68$, $p = .497$, 95% CI [-.024, .011] (Figure 5.1). From the covariates, the expected benefits was significantly associated with risk propensity, *B* = .66, β = .57, *t*(406) = 13.77, *p* = <.001, 95% CI[.562, .750] whereas the perceived risk was not, *B* = -.06, β = -.05, *t*(406) = -1.17, *p* = .242, 95% CI[-.165 .042].

5.3.5 Social Domain

The overall model for risk propensity in the social domain was significant: $F(5,380) = 30.22$, $p < .001$, $R^2 = .28$. Yet, neither the age and gender main effects nor the Age × Gender interaction were significant: age main effect (H1), *B* = .00, β = .02, *t*(406) = 0.53, *p* = .560, 95% CI [-.007, .012]; gender main effect (H2), *B* = -.03, β = -.02, *t*(406) = -0.53, *p* = .599, 95% CI [-.120, .069]; and Age × Gender interaction (H3), *B* = -.00, β = -.04, *t*(406) = - 0.97 , *p* = .335, 95% CI [-.014, .005] respectively. To point out that the inspection of Figure 5.1 indicates that the association between age and risk propensity was slightly positive rather than negative for women and a bit stronger for both sexes. Related to covariates, both were significantly associated with risk propensity: perceived risk, *B* = -.23, β = -.26, *t*(406) = -5.85, *p* = <.001, 95% CI [-.312, -.155], and expected benefits, *B* = .51, β = .49, *t*(406) = 11.12, *p* = <.001, 95% CI [.421, .601].



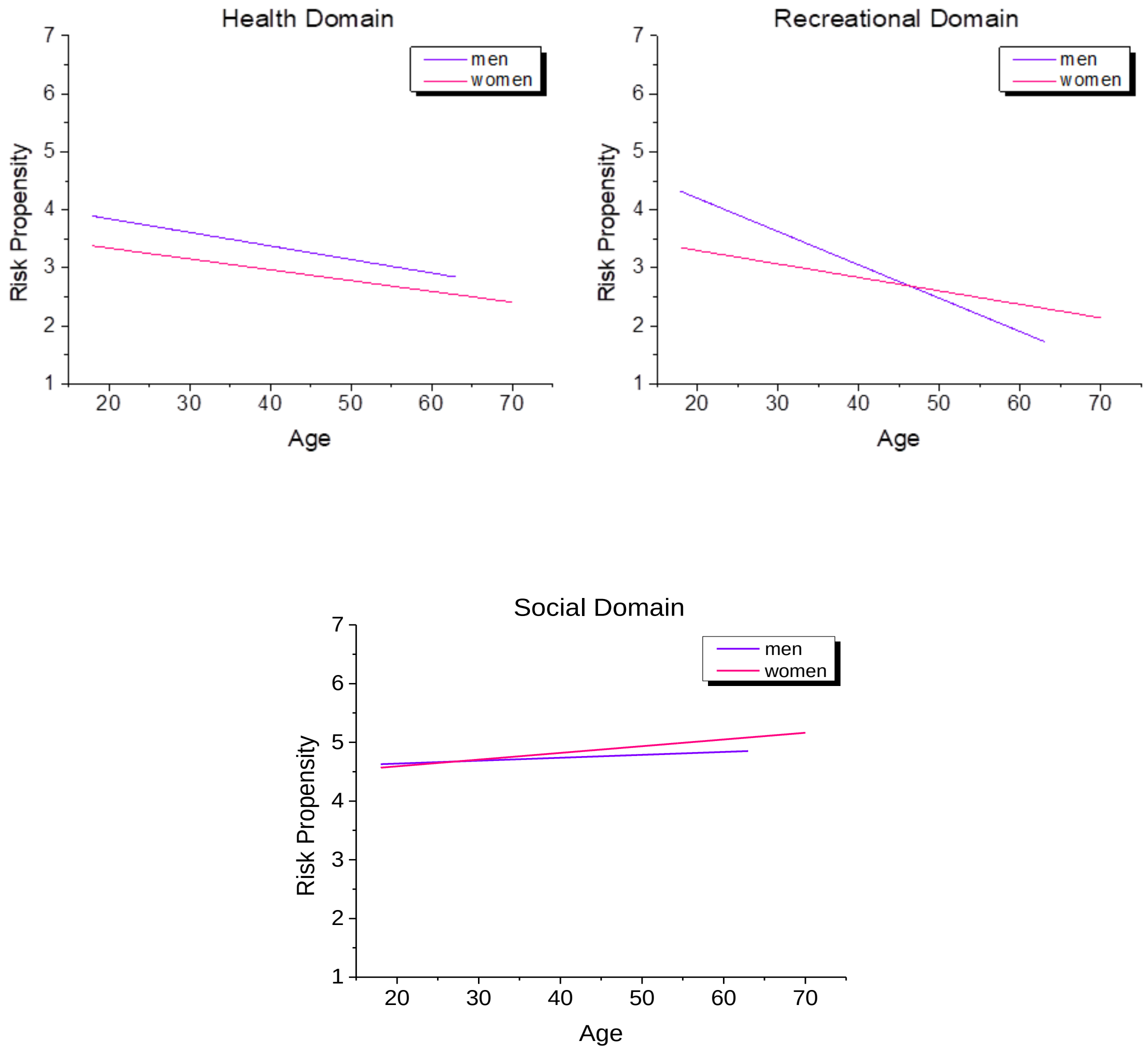


Figure 5. 1 Domain-specific risk propensity as a function of age and gender. The best-fitting age slopes are based on multiple regression analyses conducted separately for men and women.

5.4 Discussion

In Study 4, I tested the young male hypothesis in a large English-speaking sample. I assessed risk propensity with the DOSPERT scale (Blais & Weber, 2006). This measure evaluates conventional risk propensity and perceived-risk attitudes (i.e., perceived risks and expected benefits) across five domains (ethical, financial, health, recreational, and social). Within three out of the five domains, the age and gender main effects were consistent with past research and Studies 1-3. Specifically, I found that, within the financial and recreational domains, age was inversely associated with risk propensity (H1). Within the financial, recreational, and health/safety domains, men reported greater risk propensity than women (H2) (Byrnes et al., 1999; Charness & Gneezy, 2012; Kennison, & Ponce-Garcia, 2012; Nicholson et al., 2005). For the first time, I also found support for the young male hypothesis. Particularly, within the financial and recreational domains, the tendency for men to evince greater risk propensity than women declined with age. Looked at from a different angle, age was negatively associated with risk propensity among men, but not among women.

Given that Study 4 supplied evidence for the young male hypothesis, the key objective of Study 5 was to replicate the findings obtained within the financial domain, using a different measurement approach. Thus far, I relied on single (Dohmen et al., 2011) or multiple-item (Blais & Weber, 2006) self-report measures. To address the inherent limitations of self-report questionnaires, Study 5 will assess risk propensity using choice scenarios, a widely used and validated measure for risk taking (Kogan & Wallach, 1961; Mandrik & Bao, 2005). I will focus on the financial domain in particular, because it has yielded the strongest support for the young male hypothesis so far. In spite of Study 4 also supporting the young male hypothesis in the recreational domain, Study 2 revealed contrary evidence in the same domain (labeled leisure/sports in that study). All things considered, then, the recreational domain has yielded less evidence than the financial domain for the young male hypothesis.

CHAPTER VI: Study 5

6.1 Introduction

Study 4 assessed propensity toward risky behaviors, as well as perceived risks and expected benefits associated with these behaviors, within five domains (ethical, financial, health, recreational, and social) using the DOSPERT scale (Blais & Weber, 2006). I replicated previous findings (Study 1-3) that age was inversely associated with risk propensity in financial and recreational domains. Furthermore, men reported significantly greater risk propensity than women in financial, recreational, and health/safety domains. The age and gender main effects were not significant in the social and ethical domains. In addition, I found supporting evidence for the young male hypothesis within financial and recreational domains, indicating that men's (compared to women's) greater risk propensity was more pronounced among younger (than older) adults. Looked at from a different angle, the negative association between age and risk propensity in these domains was stronger among men than women.

Taking into account these findings, Study 5 seeks further support for the young male hypothesis in the financial domain by employing a different measurement approach. Accordingly, in Study 5, I used decision scenarios. Such scenarios were among the first measures to evaluate risky choices in the context of gains or losses (Tversky & Kahneman, 1981). It is a well-established finding that individuals tend to choose the safe option when their choices are phrased in terms of gains, while they tend to choose more risky options outcomes are framed in terms of losses (Kahneman & Tversky, 1979, 1984; Tversky & Kahneman, 1981). Study 5 tested the same hypotheses pertaining to age (H1), and gender (H2), and the Age × Gender interaction (H3). Specifically, the key objective was to replicate the significant Age × Gender interaction, focusing attention on the financial domain.

6.2 Method

6.2.1. Participants and Procedure

A priori power analysis indicated a total sample of 279 participants would be sufficient to detect a medium effect size (*f* = .25, α = .05) (G*Power 3; Faul, Erdfelder, Lang, & Buchner, 2007).

I recruited one thousand and nineteen participants online though the CrowdFlower crowdsourcing platform. The inclusion criteria were: a) residents in an English-speaking country (i.e., US, UK, Australia, Canada, and Ireland), b) 18 years of age and above. They received $2 upon completion.

Four participants were excluded due to missing data, resulting in a sample size of one thousand and fifteen participants (513 females, 494 males, 8 unreported).Their ages ranged from 18 to 75 years (*M* = 34.34, *SD* = 11.89). I also tested for extreme values in the remaining sample. Following the criteria proposed by Tabachick and Fidell (2001) and Field (2009), I did not detect any outliers.

The study was approved by the University of Southampton psychology ethics committee.

6.2.2 Measures

6.2.2.1 Demographics

Participants provided information on their age, gender, age, education level, and occupation.

6.2.2.2. Risk Propensity

I assessed risk propensity using a sub-scale from the Adult Decision-Making Competence measure (A-DMC; Bruine de Bruin, Parker, & Fischhoff, 2007). The scale presents 14 risky scenarios and it specifically measures consistency in choice across equivalent, positively and negatively worded questions. I focused on paired scenarios from the financial domain; one scenario focused on risk taking in the context of income tax (Highhouse & Paese, 1996) and one on risk taking in the context of investments (Roszkowski & Snelbecker, 1990). For each scenario, I included a version in which outcomes were framed as gains, and a version in which outcomes were framed as losses. The gain versions of the tax and investment scenarios read, respectively:

> "Because of changes in tax laws, you may get back as much as $1200 in income tax. Your accountant has been exploring alternative ways to take advantage of this situation. He has developed two plans: If Plan A is adopted, you will get back $400 of the possible $1200. If Plan B is adopted, you have a 33% chance of getting back all $1200, and a 67% chance of getting back no money. Which plan would you use?"
>
> "Imagine that your client has $6,000 invested in the stock market. A downturn in the economy is occurring. You have two investment strategies that you can recommend under the existing circumstances to preserve your client's capital. If strategy A is followed, $2,000 of your client's investment will be saved. If strategy B is followed, there is a 33% chance that the entire $6,000 will be saved and a 67% chance that none of the principal will be saved. Which of these two strategies would you favor?"

The loss version of these scenarios read:

> "Because of changes in tax laws, you may get back as much as $1200 in income tax. Your accountant has been exploring alternative ways to take advantage of this situation. He has developed two plans: If Plan A is adopted, you will lose $800 of the possible $1200. If Plan B is adopted, you have a 33% chance of losing none of the money and a 67% chance of losing all $1200. Which plan would you use?"

> "Imagine that your client has $6,000 invested in the stock market. A downturn in the economy is occurring. You have two investment strategies that you can recommend under the existing circumstances to preserve your client's capital. If strategy A is followed, $4,000 of your client's investment will be lost. If strategy B is followed, there is a 33% chance that nothing will be lost and a 67% chance that $6,000 will be lost. Which of these two strategies would you favor?"

Instead of requiring participants to make a discrete choice between options A and B with each scenario, participants used a 6-point rating scale to discriminate better among their preferences (Bruine de Bruin, Parker, & Fischhoff, 2007). The response scale was anchored at 1 (*Definitely would choose A*) to 6 (*Definitely would choose B*). Higher scores indicated a riskier attitude. Overall, the scale has adequate construct validity across populations (Bruine de Bruin, Parker, & Fischhoff, 2007; Weller, Ceschi, & Randolph, 2015). Responses to the gain version of the tax and investment scenarios were significantly correlated ($r[1014] = .35$, $p < .001$), and I averaged across scenarios to create an index of risk taking in the gain domain. Likewise, responses to the loss versions of these scenarios were significantly correlated ($r[1014] = .36$, $p < .001$), and I averaged them to index risk taking in the loss domain.

6.3 Results

Next, I carried out a moderation analysis (Hayes, 2013; PROCESS macro, model 1) to examine whether age (mean-centered; Singer, 1998), gender (contrast coded: women = -1, men = 1), and the Age × Gender interaction predicted participants' financial risk propensity. Figure 6.1 presents the results within the domain.

6.3.1 Financial - Gain Domain

The overall model for financial risk taking in the gain domain was significant: *F*(3, 989) = 19.26, $p < .001$, $R^2 = .06$. Age was inversely associated with risk taking (H1), *B* = -.02, β = -.22, *t*(1014) = -6.85, $p < .001$, 95% CI [-.031, .-017] and men reported higher levels of risk taking than women (H2), *B* = .09, β = .07, *t*(1014) = 2.24, $p < .05$, 95% CI [.011, .172]. The Age × Gender interaction was also significant, *B* = -.01, β = .07, *t*(1014) = -2.21, $p < .05$, 95% CI [-.015, -.001]. Inspection of Figure 6.1 indicates that the interaction pattern was consistent with the young male hypothesis. In particular, regions-of-significance tests indicated that men evinced significantly ($p < .05$) greater financial risk taking than women up to middle age (~36 years), after that point, women became more risky than men but the flipped effect did not reach a significant level. In addition, tests of simple age slopes revealed that age was negatively associated with financial risk taking among men (*B* = -.03, *t*(1014) = -5.73, $p < .001$, 95% CI [-.040, -.021]), and women (*B* = -.02, *t*(1014) = -3.78, $p < .001$, 95% CI [-.033, -.010]), but the association was stronger for men (Figure 6.1).

6.3.2 Financial - Loss Domain

Turning to the loss domain, the overall model was significant, *F*(3, 990) = 5.72, $p < .001$, $R^2 = .02$. I found a significant negative association between age and risk propensity (H1): *B* = -.01, β = -.11, *t*(1014) = -3.33, $p <.001$, 95% CI [-.019, -.005], but the gender effect was not significant (H2): *B* = .02, β = .01, *t*(1014) = 0.41, $p = .679$, 95% CI [-.066, .101]. The Age × Gender interaction was also not significant (H3): *B* = .01, β = .05, *t*(1014) = 1.40, $p = .161$, 95% CI [-.002, .012]. The young male hypothesis was not supported in the loss domain.[3]

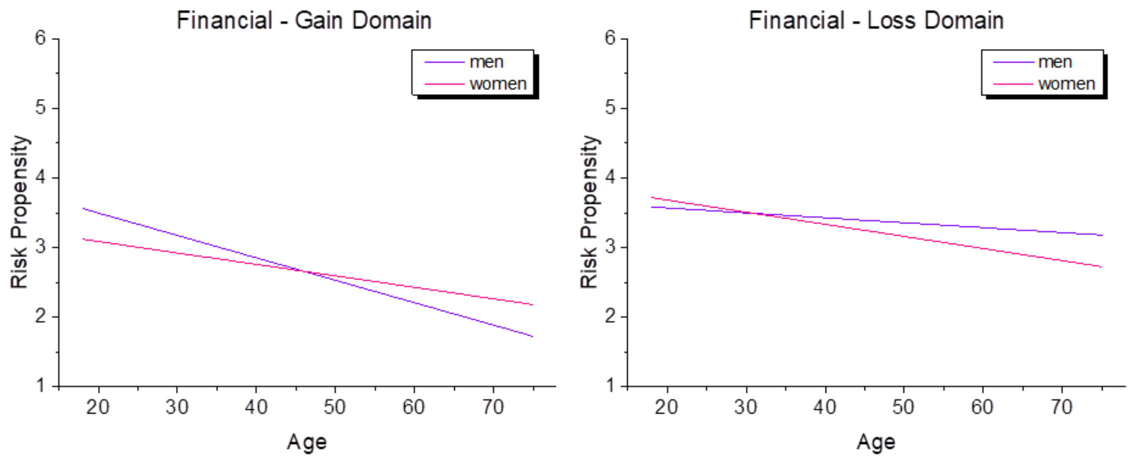


Figure 6. 1 Financial risk propensity as a function of age and gender. The best-fitting age slopes are based on multiple regression analyses conducted separately for men and women.

6.4 Discussion

In Study 5, I tested the young male hypothesis in a large English-speaking sample. I assessed risk taking with validated decision scenarios from the Adult Decision-Making Competence measure (A-DMC; Bruine de Bruin, Parker, & Fischhoff, 2007). The scenarios were framed either in terms of potential gains or losses, which have been shown to influence choice preferences between sure and risky options (Tversky & Kahneman, 1981). I focused on financial risk taking, focusing my investigation on the context in which I previously found the strongest support for the young male hypothesis (i.e., suggestive support in Study 3 and strong support in Study 4). Results indicated that age was inversely associated with financial risk taking (H1), in both gain and loss domains. In addition, men reported greater financial risk taking than women (H2), but only when choices were worded as gains.

A key objective of Study 5 was to examine if support for the young male hypothesis is replicable in the financial domain, using decision scenarios rather than self-report questionnaires. Consistent with the young male hypothesis, I found a significant Age × Gender interaction in the gain domain. Specifically, I confirmed the tendency of men to exhibit greater risk propensity than women declined with age when the outcomes are framed as gains and not as losses. Looked at from a different angle, in the loss domain, the Age × Gender interaction was not significant.

Although individuals are generally risk averse when outcomes are framed as gains, results indicate that young men are inclined to forego safe options in the gain domain, in an attempt to maximize financial outcomes. This behavior is consistent with the evolutionary perspective that young men are compelled to follow a high risk—high reward strategy. By achieving greater financial gains, they can display to potential mates characteristics such as social dominance, confidence, and ambition, all of which are highly desired by women seeking a romantic partner (Baker & Maner, 2008; 2009). I did not observe the same pattern of results in the loss domain, where individuals are generally inclined to be risk seeking. In all, my findings indicate that young men are uniquely risk seeking under specific conditions: in the financial domain, when outcomes are framed in terms of potential, but uncertain, gains. I interpret this as strong, yet qualified, support for the young male hypothesis.

In the final chapter, I will summarize my findings across all studies and provide an overall assessment on the young male hypothesis. Also, I will discuss limitations of the current research and propose future directions that could further enrich understanding of individual differences in risk-taking behavior.

CHAPTER VII: General Discussion

7.1 Introduction

Risk is an important feature of decision-making. Yet, there is a lack of convergence on the concept of risk, especially across disciplines (i.e., economics, psychology, biology; Mirshra, 2014), and methodological approaches to risk preferences vary accordingly (i.e., lotteries, self-report, behavioral tasks). The term risk is often used interchangeably with similar concepts, such as hazard, danger, and uncertainty (Winterhalder, 2007). However, these related concepts may be associated with negative outcomes (McNeil, Frey, & Embrechts, 2005), whereas risk is a broader concept that can be associated with either positive or negative outcomes.

The Young Male Syndrome (YMS; Wilson & Daly, 1985) refers to the tendency for young men to engage in more risk-seeking behavior (i.e., criminal acts, dangerous driving, homicides) than women or older adults. Evidence for this phenomenon stems primarily from archival data, but primary experimental or cross-sectional research is relatively scarce and inconclusive. I therefore systematically tested the young male hypothesis in five studies. The hypothesis proposes that the general tendency for men to be more prone to risk than women Byrnes, Miller, & Schafer, 1999) is stronger among younger than older adults. Looked at from a different angle, the hypothesis proposes that the general tendency for risk propensity to decline with age (Rolison, Hanoch, & Wood, 2013) is stronger among men than women. On this basis, I tested the following specific hypotheses.

H1: Age is inversely related to individuals' risk propensity

H2: Men evince greater risk propensity than women

H3: Age and gender interact, such that men's (compared to women's) greater risk propensity is more pronounced among younger (than older) adults. Complementarily, the inverse association between age and risk propensity is stronger among men than women.

7.2 Summary of Findings

Tables 7.1 – 7.3 provide an overview of my findings in each study. In Table 7.2, I summarize the empirical support for H1, which proposed that age is negatively associated with risk propensity. This hypothesis received considerable support, with some exceptions. Study 3, in particular, produced null findings; a pattern that may be attributable to the restricted age range and relatively small sample size in this study. I discuss these issues in more detail below

Table 7. 1

Age differences in risk propensity across studies (H1)

Domains	Study 1 (*N* = 259)	Study 2 (*N* = 2608)	Study 3 (*N* = 163)	Study 4 (*N* = 407)	Study 5 (*N* = 1015)
General	Supported	Supported			
Career/occupational		Supported	Null		
Financial		Supported	Null	Supported	
Financial gain frame					Supported
Financial loss frame					Supported
Leisure/sports/recreational		Supported	Null	Supported	
Health			Partial		
Safety			Null		
Health and safety				Null	
Social			Null	Null	
Ethical				Null	

Table 7.2 summarizes the empirical evidence for H2, which specified that men have greater risk propensity than women. This hypothesis received overwhelming support. Below, I discuss the few domain-specific exceptions to this general pattern in light of the extant literature.

Table 7. 2

Gender differences in risk propensity across studies (H2)

Domains	Study 1 (*N* = 259)	Study 2 (*N* = 2608)	Study 3 (*N* = 163)	Study 4 (*N* = 407)	Study 5 (*N* = 1015)
General	Supported	Supported			
Career/occupational		Supported	Supported		
Financial		Supported	Supported	Supported	
Financial gain frame					Supported
Financial loss frame					Null
Leisure/sports/recreational		Supported	Supported	Supported	
Health			Supported		
Safety			Supported		
Health and safety				Supported	
Social			Supported	Null	
Ethical				Null	

Table 7.3 presents an overview of the evidence for the young male hypothesis (H3) – the primary focus of my thesis. This hypothesis received support, albeit of a highly domain-specific nature. To be precise, support for the young male hypothesis was limited entirely to the financial domain. Furthermore, Study 5 indicated that this support is limited to contexts in which financial outcomes are framed as gains (rather than losses). I discuss the limitations and broader implications of these key findings below.

Table 7. 3

Age x Gender interaction on risk propensity across studies (H3)

Domains	Study 1 (*N* = 259)	Study 2 (*N* = 2608)	Study 3 (*N* = 163)	Study 4 (*N* = 407)	Study 5 (*N* = 1015)
General	Null	Null			
Career/occupational		Contrary	Null		
Financial		Null	Partial	Supported	
Financial gain frame					Supported
Financial loss frame					Null
Leisure/sports/recreational		Contrary	Null	Supported	
Health			Null		
Safety			Null		
Health and safety				Null	
Social			Null	Null	
Ethical				Null	

Next, I revisit each of my five studies, in chronological sequence. Study 1 assessed risk propensity with a single question (Dohmen et al., 2011). This question evaluates individuals' general willingness to engage in risky activities. Participants were members of the Dutch general public, who were enrolled in a representative online panel of Dutch households. Age was negatively associated with risk propensity (supporting H1). Furthermore, men were more willing to take general risks than women (supporting H2). However, Study 1 findings did not support the young male hypothesis, as the Age × Gender interaction was not significant (H3).

Recognizing the importance of conceptualizing risk propensity as a domain-specific phenomenon (Weber et al., 2002), Study 2 assessed risk propensity within the financial, occupational, and leisure/sport domains (as well as general risk propensity), using a single item to capture each domain. As in Study 1, participants were members of the Dutch general public, who were enrolled in a representative online panel of Dutch households.

Results for general risk propensity (i.e., the "Dohmen item") replicated Study 1 findings: age was negatively associated with general risk propensity (supporting H1), men were more prone to general risk-taking than women (supporting H2), but the interaction between age and gender was not significant (no support for H3). Turning to the specific financial, occupational, and leisure/sport domains, my findings were more complicated. Results revealed significant Age × Gender interactions in the occupational and leisure/sports domains, but the simple effects contradicted the young male hypothesis. Specifically, the greater risk propensity of men (compared to women) was more (rather than less) pronounced among older (compared to younger) adults. Furthermore, the inverse association between age and risk propensity within these domains was more (rather than less) pronounced for women than men. Before interpreting these contradictory findings (to H3), it is important to determine their robustness and replicability. I did so in Study 3.

Although Study 2 took an important preliminary step toward examining domain-specific risk preferences, it did not include a number of key domains. I addressed this by increasing the diversity of domains in Study 3. Study 3 implemented a valid risk propensity measure, the Risk-Taking Index (Nicholson et al., 2005), which included five domains: recreational, health, career, financial, social, and safety. I recruited English-speaking participants from an online platform and from the University of Southampton participant pool.

Surprisingly, age was not significantly associated with risk propensity in any domain, contradicting Studies 1-2 and prior research (no support for H1). A possible explanation for these null findings could be the restricted age range (18-58 years) and the relatively small sample size (compared to Studies 1-2). Results did, however, strongly support H2: men scored higher on risk propensity than women in each domain, replicating Studies 1-2 and prior research (Byrnes, Miller, & Schafer, 1999). Study 2 results in the occupational and leisure/sport domains contradicted the young male hypothesis, but Study 3 did not replicate these contradictory findings. Instead, results revealed non-significant Age × Gender interactions in all five domains. Although there was a general lack of support for the young male hypothesis, an indicative pattern emerged in the financial domain; consistent with the young male hypothesis, the greater financial risk propensity of men (compared to women) tended to be more pronounced among younger than older adults.

Study 4 introduced a further methodological improvement, by implementing a widely used, reliable, and validated risk propensity measure: the DOSPERT scale (Blais & Weber, 2006). The DOSPERT assesses self-reported risk propensity across five domains: ethical, financial, health/safety, recreational, and social. Each domain is assessed with multiple items. In addition, the DOSPERT measures perceived risks and perceived benefits associated with these domains, enabling me to control for these variables and, by so doing, achieve more precise tests of the young male hypothesis. By using various crowdsourcing platforms, I was also able to recruit a large English-speaking sample with a wide age range, to address the limitations of Study 3.

H1 received domain-specific support: age was inversely related to risk propensity in the financial and recreational domains. H2 also received domain-specific support: men were more prone to risk than women in the financial, health/safety, and recreational domains. Neither H1 nor H2 received support in the social or ethical domain. Crucially, for the first time, I found strong domain-specific evidence for the young male hypothesis. In the financial and recreational domains, the greater risk propensity for men (compared to women) was more pronounced among younger than older adults. Complementarily, the negative association between age and risk propensity in these domains was stronger among men than women.

Studies 1-4 used self-reported measures to assess risk propensity. Due to inherent limitations of self-reports, Study 5 evaluated risk propensity via choice scenarios, which are a commonly used and validated measure in the literature (Kogan & Wallach, 1961). Specifically, I focused on financial scenarios, because this domain had, to that point, provided the strongest support for the young male hypothesis (i.e., suggestive support in Study 3 and strong support in Study 4). Although Study 4 also supported this hypothesis in the recreational domain, Study 2 revealed contrary evidence in the same domain (labeled leisure/sports in that study).

Results revealed that age was inversely associated with financial risk taking, in both gain and loss domains (supporting H1). In addition, men reported greater financial risk taking than women, but only when outcomes were framed as gains (qualified support for H2). Supporting the young male hypothesis (H3), the tendency for men (compared to women) to take more financial risks in the gain domain declined with age. Looked at from a different angle, in the gain domain, the inverse association between age and risk taking was stronger among men than women. The young male hypothesis was not supported when outcomes were framed as losses. Individuals are generally risk averse when outcomes are framed as gains, yet young men bucked this trend; they took risks in the gain domain, in an attempt to maximize financial outcomes. This finding is consistent with the evolutionary perspective advanced in R-S Theory that young men are compelled to follow a high risk—high reward strategy, which will maximize their resources and appear more attractive to females (Baker & Maner, 2009; Farthing, 2005; Kelly & Dunbar, 2001; Wilson & Daly, 1985).

7.3 Limitations and Future Directions

For the reported studies, I relied on samples from Western cultures (Australia, Canada The Netherlands, U.K., U.S.A.). Hence, the data are limited in the extent to which they are capable of demonstrating cross-cultural consensus. Note, however, that Farsang and Kocsor (2016) presented their secondary analyses on homicide data comparing Hungarian, Australian, and U.S. samples, and found that culture did not clearly moderate the way age and gender were related with risk propensity.

Across four out of the five studies, I used self-report measures. Self-report measures, such the “Dohmen question” (or similar items within domains) and the DOSPERT scale, have been criticized on two counts: (1) for their lack of incentive compatibility with behavioral measures (no monetary reward), and (2) for their vulnerability to self-presentational concerns (Edwards, 1957; Schwarz, 2006). An additional source of skepticism related to self-reported measures is their weak correlation with behavioral measures of risk taking (van Huizen & Alessie, 2016; Weber et al., 2002).

Finally, I collected almost all samples on online platforms (e.g., LISS panel, CrowdFlower, and Prolific Academic). In spite of its advantages, such as offering access to participants with unique characteristics (e.g., older adults) and allowing efficient data collection, online research has also attracted criticism. Critics argue that online sampling introduces systematic bias because participants in online surveys share certain specific characteristics (e.g., relatively low income). Some of these issues, however, are also inherent in traditional survey research (Wright, 2005). Furthermore, I used a variety of samples, including a representative sample of the Dutch general public, University of Southampton undergraduates, and online platforms.

The present research also raises pressing questions and directions for future research. For example, because self-report measures of risk propensity and behavioral risk-taking tasks are only weakly correlated (Mata et al., 2018), future research could implement financial risk-taking tasks, such as the Balloon Analogue Risk Task (BART; Lejuez et al., 2002), to test the young male hypothesis. Other domain-specific tasks, such as the Columbia Card Task (CTT; Figner et al., 2009), could provide a further novel context for testing the hypothesis.

7.4 Broader Implications

The current findings indicate that men evinced greater financial risk propensity than women, which was more pronounced among younger than older adults. Looked at from a different angle, age was inversely associated with financial risk propensity and this inverse association was stronger among men than women. This young-male-specific risk taking was especially evident when the financial outcomes were framed as gains (instead of losses). Therefore, the contribution of the present research is twofold. First, the young male hypothesis can be domain-specific and, second, young men depart from the general tendency toward risk aversion in the context of financial gains.

To begin with, male tendencies for financial earnings and consumption in terms of maximizing purchasing rather than focusing on savings partially reflect the allocation of resources to mating competition according to evolutionary perspective (Furnham, 1999; Kruger & Arbor, 2008). Particularly, Darwin (1871) argued that men who succeed in competitions have more offspring and these can shape traits that foster success, although occasionally they can lead to detrimental consequences. All in all, this behavior is a high risk-high reward strategy (Kruger & Arbor, 2008). Darwin was initially puzzled by this behavior but he concluded that displays of prestigious consumer goods could be an honest signal of male value, available resources, and skills (Colarelli & Dettman, 2003) Therefore, male displays of wealth and social status may facilitate mating competition.

During ancestral times, men with greater financial resources married younger women, married more women, and produced offspring earlier (Low, 1998). On the contrary, men who did not have substantial resources or status were unable to establish long-term relationships. Across societies, male reproductive success is a function of social and economic status (Hopcroft, 2006). Even in current foraging societies that are relatively egalitarian, men with higher status have more mating opportunities (Hill & Hurtado, 1996). Several laboratory studies have provided evidence of this behavior. For example, Roney (2003) found that men reported stronger ambition and desire to earn money when in the presence of attractive women. This effect was even seen when the men simply viewed photographs of attractive women.

Furthermore, research suggests that age differences in financial risk taking are more amplified for men compared to women that are reduced abruptly in later life for men closing the gender gap in older age (Mata et al., 2011; Rolison et al., 2013). This may reflect men's changing attitudes toward financial risks (Riley & Costa, 1992) employing far more conservative strategies as they get older (e.g., close to retirement; Jianakoplos & Bernasek, 2006). Among women, risky behavior varied a little with age. Specifically, in young adulthood at age of 18 years, women are more risk averse, less willing, and less enthusiastic to engage in risky financial affairs (Chen & Vople, 2002). Evolutionary perspective postulates that men's changing behavior reflects a shift of resource allocation for mating effort towards paternal effort (Tuljapurkar, Puleston, & Gurven, 2007). It seems that male mating effort peaks in young adulthood in part because young men may not have partners or offspring to invest in. This can increase their attractiveness to females because they would have more resources available for prospective partners and their potential offspring (Hill & Kaplan, 1999; Kruger & Arbor, 2008). Prospect drawbacks are that young men tend to save less and spend more, creating debts which can lead to financial ruin (Kruger & Arbor, 2008; Kruger & Kruger, 2016). For instance, past findings indicate that romantically motivated male employed financial strategies which lead to ostentatious consumption of conspicuous products and excessive spending (Wilson & Daly, 2004; Griskevicius et al., 2007; Roney, 2003). In the U.S., young men are more likely to purchase sports cars or cars of well-known luxury brands (Macesich, 2014) to impress women (Griskevicius et al., 2007; Hennighausen et al., 2016).

In general, this mating display is identified as a broad category of physiological investment that includes direct competition (intrasexual competition among young men) as well as indirect competition for assets and attributes that make one attractive (Hill & Kaplan, 1999). Occasionally, rivalry escalates to aggressive displays and even criminal acts in the pursuit of status, dominance, and access to mates (Byrnes, Miller & Schafer, 1999). A characteristic example is the territorial conflicts among urban street gangs to maintain control over resources, such as securing access to money (i.e., drug trafficking) and goods (Brantingham et al., 2012; Valasik & Tita, 2018). These conflicts are usually armed and extremely violent, and have a significant impact on social policy ("Ending Gang Violence and Exploitation", 2016).

In conclusion, financial risk taking is an identifiable characteristic of young men, involving conspicuous wealth display, which functions as a mating strategy. From an evolutionary perspective, such high risk-high reward behavior may be more prevalent in environments that foster faster life history strategies (i.e., early reproductive maturity, frequent mating, and little investment in social relationships or offspring (Nettle, 2010).

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Footnotes

1. In Chapter 4, I also examined whether the recruited subgroups (students vs community sample) were accountable for the age null finding. I performed an independent t-test to identify any significant differences. Indeed, my analyses revealed statistically significant differences between samples in: recreational (M_{uni} = 1.82, *SD* =1.00 and M_{online} = 2.21 , *SD* = 1.12), career (M_{uni} = 1.53, *SD* =0.82 and M_{online} = 2.19 , *SD* = 1.13), financial (M_{uni} = 1.50, *SD* =0.93 and M_{online} = 2.24, *SD* = 1.23), and social(M_{uni} = 1.93, *SD* =0.89 and M_{online} = 2.39, *SD* = 1.22) domains: $t(162) = -2.05$, $p = .042$; $t(162) = -4.09$, $p < .001$; $t(162) = -4.10$, $p < .001$; $t(162) = -2.63$, $p < .01$ respectively. Indeed, including subgroup variable in my main analyses produced some significant main age effects however the main effect of gender became non-significant in all domains. In this case, I consider the restricted age limit (18-58 years) in Study 3 primarily responsible for the null finding and future study should address it by collecting a larger sample consisting of a wider age range. In addition, I presume the emerged pattern in the financial domain (compatible with the Age x Gender interaction) only indicative of the young male hypothesis which should be considered under caution.
2. In Chapter 5, the variable of risk perceptions was treated as covariate. Previous findings suggest that risk perceptions and risk preferences are highly dependent on domain .For example, Bonem, Ellsworth, & Gonzalez (2015) identified that older and young adults significantly differ in their ratings on risk perceptions across domains (e.g., social risks perceived less risky than the health/safety and ethical risks). Therefore, I tested if risk perceptions were related to the variability in main and interaction effects. The analyses revealed that the main effect of age may be subject of individuals' risk perceptions, especially in ethical ($B = .02$, $\beta = .13$, $t(406) = 2.63$, $p < .01$), health ($B = .02$, $\beta = .12$, $t(406) = 2.41$, $p < .05$), recreational ($B = .02$, $\beta = .14$, $t(406) = 2.80$, $p < .001$), and social ($B = -.02$, β

= -.17, $t(406) = -3.48$, $p<.001$). Nevertheless, I did not find any significant findings related to the gender effect. In addition, the Age × Gender interaction was only significant in ethical ($B = -.02$, $\beta = -.14$, $t(406) = -2.77$, $p<.01$), health ($B = -.02$, $\beta = -.15$, $t(406) = -2.92$, $p<.01$), and social ($B = -.01$, $\beta = -.10$, $t(406) = -2.03$, $p<.05$) domains. These results replicated past findings (Bonem, Ellsworth, & Gonzalez, 2015; Kim, Park, & Kang, 2018) on age differences and risk perceptions particularly in ethical, health, and social risky decisions. However, domain-specific perceptions of risk do not seem to count of the young male effect in domains such as financial and recreational domains in which H3 was initially found significant. Thus, risk perceptions may be a predictive variable of the dependent variables (i.e., risk attitudes) but they are not responsible for the main effect of gender or the young male hypothesis which was the main focus of this dissertation.

3. In Chapter 6, it was important to provide further evidence that the age and gender effects differ for loss and gain frames in the financial domain. Considering an omnibus repeated measures test, the results indicated significant effects of the Frame x Age interaction ($F = 1.60$, $p<.01$, $eta^2 = .09$) and the Frame x Age x Gender interaction ($F = 1.46$, $p<.05$, $eta^2 = .07$) but not the Frame x Gender interaction ($F = .09$, $p = .769$). Thus, it seems that the combined effect of wording scenarios as gains or losses and individuals ‘age is not the same between men and women. Therefore, these results provide satisfactory evidence exploring the Gender x Age interaction in framing scenarios even further.