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M A S T E R T H E S I S

Attractiveness Bias and Potential Impact on HR Decisions: Statistical Evidence from a Natural Experiment

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Abstract

This paper explores the attractiveness bias in the context of HR decisions managers face. Influencing factors – such as gender, race, age and profession – are isolated and observed separately. The data used stems from a television show involving participants who face trade-offs between the personality and attractiveness attributes of potential partners as a natural experiment to measure discrimination on the basis of physical appearance. Evidence of strong gender differences in attractiveness bias is found, with women caring significantly more about physical attributes than men. This finding is robust to a number of other important characteristics including age, race, occupation, and geographical region. The potential impact on a number of HR decisions, including staffing, hiring and recompensing as well as implications for social and organizational behaviour are discussed.

JEL codes: attractiveness bias, organizational decision-making, behavioral biases in HR management, gender-specific differences in decision-making, natural experiment in behavioral economics.

Аннотация

В данной работе рассматривается влияние привлекательности при принятии решений в области управления персоналом. Факторы воздействия – такие как пол, национальность, возраст и профессия – изолированы и исследованы отдельно. Данные собраны на основе эксперимента в естественных условиях: телевизионного шоу, в котором участникам необходимо выбрать партнера на основании либо физической либо личностной привлекательности. Таким образом, представляется возможность измерить уровень дискриминации на основе внешнего вида. В результате исследования выявлены различия в том, насколько много внимания внешности уделяют мужчины и женщины. Данные позволяют сделать вывод, что женщины склонны уделять намного больше внимания внешности, чем мужчины. Выявленная закономерность устойчива к другим важным характеристикам, таким как возраст, национальность, профессия, и географический регион. В работе также обсуждается влияние данных предубеждений на ряд решений в области управления персоналом, включая кадровое наполнение, набор новых сотрудников и распределение вознаграждений, а также потенциальное воздействие на поведение работников на предприятии.

Ключевые слова: склонность к предубеждениям на основе внешности, организационное принятие решений, предвзятость в управлении человеческими ресурсами, гендерные различия в процессе принятия решений, естественный эксперимент в поведенческой экономике.

Short Tabular Overview

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Автор	Мария Унчовска
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Описание цели, задач и основных результатов	<p>В данной работе рассматривается влияние привлекательности при принятии решений в области управления персоналом. Факторы воздействия – такие как пол, национальность, возраст и профессия – изолированы и исследованы отдельно. Данные позволяют сделать вывод, что женщины склонны уделять намного больше внимания внешности, чем мужчины. Выявленная закономерность устойчива к другим важным характеристикам, таким как возраст, национальность, профессия, и географический регион. В работе также обсуждается влияние данных предубеждений на ряд решений в области управления персоналом, включая кадровое наполнение, набор новых сотрудников и распределение вознаграждений, а также потенциальное воздействие на поведение работников на предприятии.</p>

Declaration of Authorship

I hereby declare that I have written this Master Thesis myself, independently and without the aid of unfair or unauthorized resources. Whenever content has been taken directly or indirectly from other sources, this has been indicated and the source referenced. This Master Thesis has not been previously presented as an examination paper in this or any other form in Russia or abroad. This Master Thesis is identical with the thesis assessed by the examiner.



Marie Uncovska

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Introduction

Gender differences in human behaviour and social outcomes have long been studied by social scientists including anthropologists, sociologists, psychologists, and, most recently, economists. Economists have found men and women to elicit different preferences in consumption and investment markets, the labour market, as well as the dating and marriage markets.¹ Interest in the latter social interaction follows from the seminal work by Gary S. Becker (1973) who formalized the marriage decision as one based on assortative matching of partner attributes such as age, education, wealth, and physical appearance. To take an example, in the case of positive sorting over physical appearance, a beautiful female is most likely to form a match with a good looking male, and vice versa.

In this paper, gender differences in the demand for physical appearance, or ‘attractiveness’, is studied. This is done by analyzing unique data from a television dating show involving participants who at first choose a dating partner based on the *personality* attribute only, and in the second stage are able to reject their ‘personality partner’ after the *attractiveness* attribute is revealed. Given the random assignment of partner beauty to participants (the decision makers), the television show serves as a natural experiment to examining gender differences in attractiveness discrimination. Based on a simple discrete choice framework, women are found to discriminate (reject their personality partners) more than men.

The Issue of Attractiveness Bias

Attractiveness bias denotes the ‘differential treatment of individuals based on their physical appearance’ (Whitley and Kite 2009).

This paper first and foremost aims to answer the question ‘*Which gender discriminates more based on attractiveness?*’. It analyzes gender differences in the dating market, where (similar to labour hiring decisions) a number of studies have found gender differences in

¹For a recent survey on gender differences in preferences, see Croson and Gneezy (2009).

preferences for physical appearance or beauty. Most existing studies find men to care more about the beauty of their potential partner than women (Sprecher *et al.*, 1994; Fisman *et al.* 2006; Croson and Gneazy, 2009; Hitch, Hortaçsu, and Ariely, 2010). On the other hand, a handful of recent studies find the opposite with women discriminating more on the basis of looks than men (Belot *et al.*, 2008). This paper attempts to synthesize these findings and integrate them into the organizational context.

In a second step, it is examined which other personal characteristics (variables) impact attractiveness bias and to what extent they do so. Variables analyzed include age, race, and profession. Hereby, the individual and combined impact of these variables is scrutinized and evaluated. Finally, the findings are extrapolated on the general organizational and labor market context.

Research Gap

The present study is motivated by and adds to two main streams of literature. First, the study of cognitive biases and their effect on organizational behavior; second, the research on gender-specific differences in behavior.

While many cognitive fallacies have been extensively analyzed and covered in academic research in relation to their effect on organizational behavior, the attractiveness (or, in some sources, attractivity) bias has found little coverage in academic literature. Additionally, very little research has been conducted outside the laboratory setting.

Nonetheless, attractiveness bias can have grave impacts on organizational behavior: from sub optimal hiring and selection decisions, to questions of cooperation vs. competition within the organization, remuneration and promotion policies, and team dynamics. Especially the hiring and selection process is said to have a fundamental effect on the success of not only the individual in question, but also the hiring organization (Gatewood, Feild, and Barrick, 2008). If the hiring process itself is however already beset by bias, it will lead to inferior decisions, high employee turnover and otherwise avoidable costs. That fair and unbiased remuneration and promotion policies are essential not only to the workings of the firm, but also for higher aims such as social justice is without question. But also team dynamics and questions of cooperation vs competition can be negatively affected by bias.

In order to prevent these detrimental effects, managers first need to be aware of the existence of this mental fallacy. Only then can they take concrete action against them.

1 Decision-Making and Attractiveness Bias in the Context of Organizational Behavior

The present study relates to three main groups of studies within the economics literature. First, it contributes to recent works on descriptive behavioral decision theory. Hereby, the effect different cognitive biases have on organizational decisions is analyzed. Special scrutiny is placed on decision-making and problem-solving processes.

The second group of studies this paper relates to concerns itself with gender-specific differences in the decision-making process. The findings build on experiments such as the Iowa Gambling Task and (Weller, Levin, and Bechara, 2010; van den Bos, Homberg, and de Visser, 2013) and new insights from the neurochemical field (Cosgrove *et al.*, 2007; Ashare *et al.*, 2013).

Finally, the third group of academic literature this paper links to is research on preferences in partner selection (Sprecher *et al.*, 1994; Fisman *et al.* 2006; Croson and Gneazy, 2009; Hitch, Hortaçsu, and Ariely, 2010), which finds a general preference for partner homogeneity as well as a strong male preference for physical attractiveness in their partners compared to the female preference for attributes related to social status.

1.1 Decision Theory

According to the Stanford Encyclopedia, decision theory is ‘concerned with the reasoning underlying an agent’s choices’. From mundane, everyday decisions such as what to eat for lunch to life-changing choices such as career selection – decisions are an indispensable part of human existence. As Albert Camus once famously said, ‘Life is the sum of all your choices’. Understandably, this makes decision theory a medley of intellectual disciplines. Philosophers, historians, mathematicians, and, most recently, economists have been seeking the rationale for human decision making.

Decision theory can be regarded from a *normative* and a *descriptive* point of view. The

former aims to provide a framework about *how decisions should be made*, while the latter analyzes the decision-making process itself and seeks to answer *how decisions are made* (Hansson, 2005; p. 7f). This paper focuses on the descriptive aspects of decision theory, as it aims to shed light on one of the underlying biases affecting human choice: *attractiveness bias*.

Historically, decision theory is based on three pillars: rationality, uncertainty and, consequently, the utility theory. Instead of leading to a more comprehensive, perfectly rational decision-making strategy, most recent research has however begun to cast doubt on these three fundamentals (Buchanan and O’Connell, 2006). Over the years, both contextual and psychological constraints have been identified by a number of authors, from Simon’s bounded rationality theory (Simon, 1982) to Tversky’s and Kahneman’s two-system-model (Tversky and Kahneman, 1981) and Savage’s subjective expected utility theory (Savage, 1951). In the following, these three fundamentals as well as most recent developments in the field will be discussed more in detail.

Rationality

According to the Oxford dictionary, **rationality** is defined as ‘behavior that is goal-oriented, reflective (evaluative), and consistent (across time and different choice situations)’. The assumption of human choice as ‘rational’ dates back to Aristoteles and his view of mankind as a creature distinguished by a rational principle (*‘rational animal’*). While widely criticized and debated in philosophy, economists have continued to assume rationality as an underlying principle to human action until well into the 20th century (Sen, 1997). Some of the most influential economic models are based on the concept of the *‘homo economicus’* – namely the idea that ‘humans as consistently rational and narrowly self-interested agents who usually pursue their subjectively-defined ends optimally’ (Rittenberg and Tregarthen, 2012). Among other influential economic thinkers, Adam Smith, David Ricardo or Vilfredo Pareto all based their theories on the concept of the *‘homo economicus’*.

In 1938, Lionel Robbins proposed the **rational choice theory**, a framework for modeling economic behavior (Sen, 2008). The basic premise of the rational choice theory is that social (or organizational) behavior is made up out of the sum of individual choices, which follow a clear *rationale*. Robbins assumes that under complete information, individual agents are able to assign *complete* and *transitive* preferences among different options. Taking into account the available information, probabilities of events, and potential costs and benefits in determining these preferences, the agent is then assumed to act consistently in choosing the self-determined best choice of action.

There are several problems with this framework: first, irrational choices are explained only by the agent's lack of information. However, the existence of perfect information in real-life situations is doubtful at best. Second, the rational choice theory ignores the agent's cognitive limitations: appropriately analyzing all associated information (costs, benefits and uncertainty) takes up significant resources and is prone to be affected by several biases and behavioral heuristics. Especially the latter point gave rise to behavioral economics, a field that aims to account for the behavior of economic actors such as it is, rather than assuming idealized instrumental rationality.

In response to the limitations of the rational choice model, in 1982 H. A. Simon published the **bounded rationality model**. The core of the model is precisely the limitation to human rationality – be it of cognitive or temporal nature or caused by external context. In this context, individuals no longer seek to maximize their utility by making the optimal choice, but rather by obtaining the most satisfactory solution (*'satisficing'*) – making choices that are only 'good enough'.

Empirical studies done by Tversky and Fox (1995), Thaler (1994) and Bowles and Gintis (2002) further shed doubt on the classical rationality assumption. While Tversky and Fox demonstrate investor irrationality¹, Thaler focuses on systematic mental biases that color human judgment. In 'Quasi Rational Economics', Thaler explores cognitive biases caused by mental accounting², intertemporal choices³ and the fairness bias⁴. Bowles and Gintis (2002) go a step further away from the *'homo economicus'* concept towards a more cooperative, reciprocal model of human behavior, coining the term *'homo reciprocans'*. Hereby, humans are seen as cooperative agents aiming to improve their environment. In an experimental one-shot game, Bowles and Gintis find that human decision is often framed by social mechanisms such as *'reward'* and *'punishment'*, leading to cooperation even though there is no reciprocation possible.

¹Tversky and Fox analyze investor behavior in an extensive empirical study and find that investors have a preference for risk-averse choices in gains and choose risk-seeking behavior in losses. Additionally, there is an overall indifference for large losses compared to risk-averse behavior for small losses (Tversky and Fox, 1995)

²'Coding, categorizing and assigning values to economical outcomes', (Thaler, 1994; p. 25f.)

³Decisions done at one point of time that influence the possibilities available at a future point in time; mostly concerned with what and how much to do at various points of time; influenced by relative value assigned to future payoffs (Thaler and Shefrin, 1994)

⁴The concept of 'fairness' alters behavior: agents do not pursue utility-maximizing strategies (Kahneman, Knetsch, and Thaler, 1986)

Risk and Uncertainty

In order to make informed decisions, the associated *risk* needs to be taken into account. While risk itself plays a prominent role in today's research environment, it found its way into standard business vocabulary only after World War II, when Frank Knight first distinguished between *risk* and *uncertainty*. The former hereby refers to a situation in which the probability of an outcome can be calculated; the latter denotes the opposite case, in which outcome probabilities cannot be mathematically determined (Frank, 2012).

Uncertainty in decisions was, by then, no novelty. Giacomo Cardano mused about probability puzzles during the Renaissance; Blaise Pascal and Pierre de Fermat pondered over the likelihood of great riches in a game of dice; Bernoulli laid the groundwork for risk management by introducing binary probability distribution. In '*An Essay towards solving a Problem in the Doctrine of Chances*' (1763), Bayes describes the relationship between the probability of a hypothesis before and after receiving evidence. Based on the conditional probability axiom, it enables updating the probabilities of hypotheses when given evidence. In relation to decision theory, Bayes' theorem finds wide application: a Bayesian decision-maker will make use of Bayesian probabilities to compute expected outcomes and update his or her beliefs.

Risk and uncertainty is a key part of decision making, as it serves to assess the expected outcomes on any given action. However, humans are notoriously bad at not only assessing risk, but moreover interpreting probabilities.

On the one hand, an 'extraordinary ability to compute' (Arrow, 1982) is being ascribed to the average decision-maker: the theories modeling decision-making assume the agents to be able to correctly estimate and calculate the underlying probabilities, which is not necessarily reflected in reality. On the other hand, even when probabilities are given, decision-makers are prone to a number of different biases and do not evaluate the risk mathematically. Research by Teigen and Brun (1999) shows that *context* alone can modify human judgment of probabilities: people let themselves be distracted by the usage of phrases such as 'likely' and 'unlikely' to assess the probability of any given event. Bilgin and Brenner (2013) and Tversky and Kahneman (1981) conclude that humans tend to neglect base rate probabilities and underweight individual predictions⁵; Donohue and Levitt (1998) analyze how we

⁵In an experimental study, Bilgin and Brenner asked respondents how likely they would be to bring an umbrella if the weather forecast suggested 30% probability of rain in Seattle (known for its humid climate) and Phoenix (known for rather hot and dry climate). The likeliness of a respondent bringing an umbrella to Seattle was significantly higher than to Phoenix; respondents were *adding* their perceived base probability of rain to the probability mentioned in the weather forecast. Tversky and Kahneman show similar results in a series of studies on heuristics and fallacies in decisions under uncertainty.

continuously over-value low and under-value high probabilities.

Based on these findings, Tversky and Kahneman (1981) go on to develop the ‘two-system-model’ of thinking, postulating that some decisions are based on rational, analytical thinking, while others are done more or less automatically, marked by heuristics and intuition. It is especially these findings that reinforce the need for a more comprehensive view on decision-making and a more profound analysis of underlying biases.

Measuring Utility

In order for decision-makers to be able to assign *preferences* to different outcomes and make them comparable, they first must assign *values* to each and every outcome. As not every outcome can be valued in monetary terms, ‘**utility**’ as a measure of preferences over a certain set of options enables them to do so and thus forms the foundation of a wide branch of economics. The concept of utility was first mentioned by none other than Adam Smith. In ‘*The wealth of nations*’ (1776), he differentiated between ‘*value in use*’ and ‘*value in exchange*’, with the former referring to the utility of some particular object and the latter denoting the ‘power of purchasing other goods which the possession of that object conveys’. Later, Jeremy Bentham used the utility calculus to defend equality; Jevon, Menger, and Walras developed the relationship between utility and demand and established the concept of *marginal utilities*; Pareto created the concept of *Pareto efficiency* around utility theory (Stigler, 1950).

The first formal application of utilities to decision theory came only in the middle of the 20th century, when von Neumann and Morgenstern formulated the **expected utility hypothesis**. Initiated by an intellectual puzzle posed by Nicholas Bernoulli in 1713 and solved by Daniel Bernoulli in 1738⁶, von Neumann and Morgenstern seek to explain popular choices that contradict the expected value criterion. Where Bernoulli utility functions (u) only represent preferences over *monetary outcomes*, the von Neumann and Morgenstern theorem (U) denotes preferences over *lotteries of monetary outcomes*. In this way, Bernoulli utility can hardly be distinguished from ordinary utility functions over consumption bundles,

⁶The St. Petersburg paradox refers to a theoretical lottery game that leads to a random variable with infinite expected value, nonetheless seems to have little value to the players. At the core of the problem is a sequential game of ‘*heads or tails*’, for which a casino offers to pay 2 dollars for each ‘heads’, doubling the amount every round. The game ends with the first ‘tails’. The expected value of the game is $EV = \infty$, thus meaning that participants should be willing to pay *any price asked* to participate. However, this suggestion was encountered with widespread disbelief. The solution proposed by Daniel Bernoulli includes the introduction of utility functions and the presumption of a decreasing marginal utility of money. Von Neumann and Morgenstern later expanded on this concept.

while the expected utility hypothesis enables the examination of the effects of uncertainty as well as including the attitude towards risk.

Albeit clearly factoring in a wider range of variables, the expected utility hypothesis still does not provide a complete, comprehensive decision model. First, the model is limited to assessing choices with an objective and known probability distribution over outcomes. Going back to Knight's (1921) distinction between *choices under risk* and *choices under uncertainty*, most real-life situations can be ascribed to the latter, while von Neumann and Morgenstern's expected utility hypothesis only is applicable to the former. Additionally, the theorem does not consider the *context of choice* such as reference points⁷ (Rabin, 2013) or inconsistencies within preferences among the same choice of individuals (Tversky and Kahneman, 1981)⁸.

To address the limitations of the expected utility hypothesis – namely the objectivity of the probability distribution over choices and the lack of contextualization of options – several alternative models have been developed. They are usually referred to as **subjective expected utility theories** and encompass works by Savage (1954) as well as Kahneman and Tversky (1979).

Leonard Savage's **representation theorem** addresses choices under *uncertainty* rather than *risk* and combines two concepts: first, a personal utility function, second a subjective probability distribution over different choices (Karni, 2008). This way, individual *beliefs* related to the probability distribution over outcomes are included in the theorem. According to Savage, individual beliefs and thus subjective probability distributions can be deduced from their preferences and are state-dependent. While certainly a powerful tool, the core weakness of the theory lies in this deductibility of subjective probability distributions from preferences, as it models an output variable (preference) to assess an input variable (probability distribution). Additionally, numerous experiments have shown that individuals do not behave in a manner consistent with Savage's decision model, such as the Allais (1953) or Ellsberg paradox (1961). Adding to this, in 1979 Kahneman and Tversky first published their paper on **prospect theory**, which relates to the context the choice is presented in to assess a subjective probability distribution over multiple options. Kahneman and Tversky assume that losses and gains are valued differently, which leads to individuals making inconsistent choices based on whether they are based on *perceived losses* or *perceived gains*. This

⁷The 'history' or 'starting point' of every individual faced with a choice. The expected utility theorem assumes that holding wealth constant, two identical individuals will show the same risk attitude and utilities. However, this does not consider loss aversion – if one individual had previously lost a large sum of money, she will exhibit a more risk-averse attitude than her otherwise identical counterpart.

⁸Tversky and Kahneman (1981) demonstrate that the preferences among the same choice vary '*depending on how these choices are presented*'.

concept is often referred to as ‘loss-aversion theory’ and denotes the preference for avoiding losses to acquiring equivalent gains. In the context of behavioral decision making, this leads to a so-called *‘fourfold pattern of risk attitudes: risk-averse behavior when gains have moderate probabilities or losses have small probabilities; risk-seeking behavior when losses have moderate probabilities or gains have small probabilities’* (Kahneman and Tversky, 2013).

Kahneman and Tversky demonstrate this in practice, proving that when presented with two equal choices, one shown in terms of potential losses and the other formulated in terms of potential gains, the latter option will be chosen. However, despite presenting a comprehensive alternative to the expected utility hypothesis, the difficulties inherent in applying prospect theory in economics have made an evaluation of the concept difficult (Barberis, 2013).

Aside from the critique of utility-based decision models, the concept of utility itself has been widely criticized. Joan Robinson denoted utility as a ‘circular, non-testable concept’ (Robinson, 1964); Albert further questioned the empirical demonstrability of utility (Albert, 1998); numerous authors further postulate that ‘beliefs and desires are vague’ and thus cannot be clearly assigned as utilities (Stigler, 1950).

Summary

Historically, economists paid little tribute to behavioral and psychological factors in decision-making. Discrepancies and irregularities in observable events to the prevalent mathematical models were ascribed to the agents’ incomplete information. The critical examination of the three fundamentals of decision theory - namely rationality, uncertainty and risk and utility theory – over the past 50 years has given rise to a new field in economics: **behavioral decision theory**. Behavioral decision research denotes an approach to judgment and decision-making that centers around subjective expected utility and departs from normative theories such as the classical utility theory or Bayes’ theorem. It has developed considerably since the 1950s, and now provides many important insights into managerial behavior. A core component of behavioral decision theory is the research into different cognitive fallacies that color human judgment, of which the following section provides a brief overview.

1.2 Organizational Decision-Making

Organizational decision making, which is at the core of the present study, encompasses both individual and collective decisions.

While the scope of the individual decision varies with management level (see Figure 1.1), the sum of all individual choices adds up to determine a company's success or failure. In order to avoid detrimental choice behavior in organizations, managers need to establish unbiased decision-making frameworks and take direct action against heuristics in judgment. In academic literature, different approaches to informed decision-making have been identified (see e.g. Fayol, 1960; Collins and Guetzkow, 1964; Delbecq and Van de Ven, 1971; Simon, 1982). Table 1.1⁹ summarizes the key attributes of six of these models.

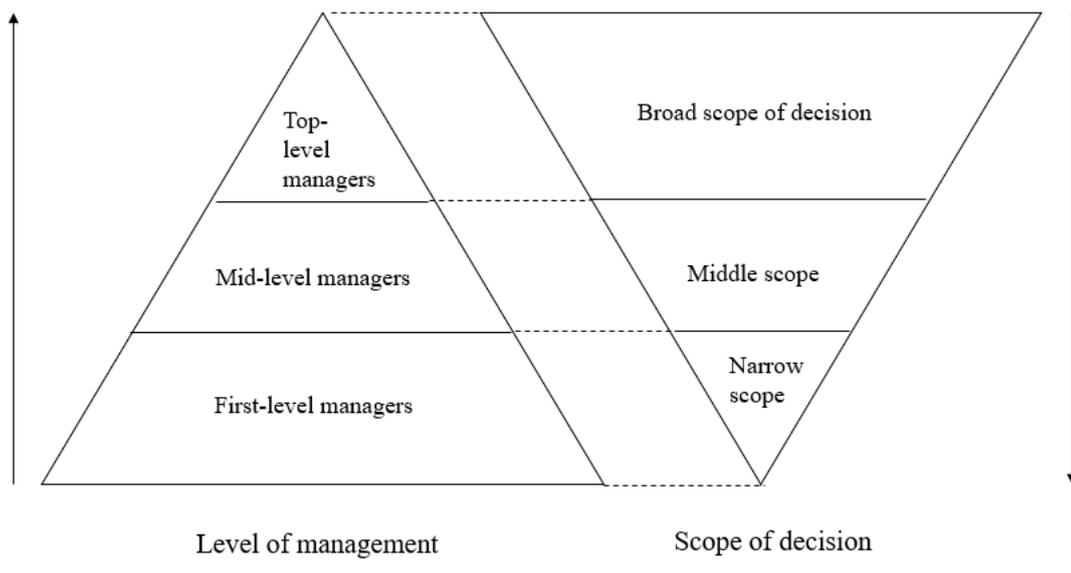


Figure 1.1: Scope of organizational decision making. Reproduced from: Langton, N., Robbins, S. P., and Judge, T. A. (2013). *Fundamentals of organizational behaviour*. Chapter 6 *Pearson Education Canada*.

The logic used to systemize these decision-making models distinguishes between so-called *closed* and *open systems*, the key difference between them being that the former assumes all variables involved to be either known or knowable, while the latter assumes the variables to be unknown in their specifics as well as number. This makes *closed system models* deter-

⁹Extracted from: Nutt, P. C. (1976). Models for decision making in organizations and some contextual variables which stipulate optimal use. *Academy of management Review*, 1(2), 84-98

ministic and proactive in their nature, while *open system models* are adaptive and reactive (Nutt, 1976)¹⁰. According to this classification, closed system models are more appropriate for first level managers, as most data is known (or knowable), goals and responsibilities are clearly divided, and tasks are characterized by repetitiveness. Compared to this, open system models are more applicable in decisions with increasing uncertainty and complexity, such as top-level managers face. This is especially true in situations with unknown (or unknowable) goals, a strong interaction between the goals and the environment as well as a high number of individuals involved.

¹⁰Following this, models [1] and [2] (bureaucratic model and normative decision theory) can be characterized as close system logic, while models [3] and [4] (behavioral and group decision model) belong to intermediate system logic, with models [5] and [6] (conflict equilibrium and open system model) qualifying as open system logic.

Table 1.1: ORGANIZATIONAL DECISION-MAKING MODELS

Model	Decision Criteria	Key Ingredients	Key Assumptions
Bureaucratic Model [1] (Fayol, 1960)	Maximum efficiency	(1) Define decision maker's jurisdiction (2) Appoint experts to office and invest power in office holder (3) Rules, procedures, and precedents depict decision premises (4) Refer decisions "up" hierarchy (5) Rewards based on adherence to master plan	Goals known Master plan to judge action is a given Tasks repetitive or predictable Environment does not influence choices Resources adequate
Normative Decision Theory [2] (Savage, 1951)	Maximum subjective expected utility	(1) States of nature (2) Alternatives (3) Probability distribution for different states (4) Utilities for each alternative (5) Criteria to determine utilities	Goals known Information obtainable Resources available Prediction feasible Criteria for judgment are known
Behavioral Decision Theory [3] (Simon, 1982)	Satisficing	(1) Identifying acceptable states of nature and generating alternatives (2) Sequential generation of information on alternatives (3) Processes: searching, learning, choosing (4) Satisficing replaces optimizing in decision processes	Goals known Information on alternatives not fully available, justifying search for them Consequences of alternatives cannot be fully assessed Resources interact with decision processes

Continued on next page

Table 1.1 – *Continued from previous page*

Model	Decision Criteria	Key Ingredients	Key Assumptions
Group Decision Making [4] (Collins and Guetzkow, 1964)	Satisfice objectives set by group	<ul style="list-style-type: none"> (1) Forming groups (2) 'Coalescing' - setting boundaries and rules (3) Processes (4) Control for initially set goals 	<ul style="list-style-type: none"> Goals known and consistent with organizational goals Synthesis of preferences possible and feasible Implementation likelihood increased by participation Resources and information available
Conflict Equilibrium [5] (March and Simon, 1976)	Resolution of conflict by consensus	<ul style="list-style-type: none"> (1) Decision alternatives cause conflict (individual and group) (2) Processes include bargaining, persuading and politicking (3) Compromise as viable outcome (4) Outside, contextual factors (e.g. perceptions, rewards, dependencies, opportunity cost) strongly influence choice 	<ul style="list-style-type: none"> Goals known Organization seeks to minimize conflict Time pressure causes preliminary choice, proceeded by reevaluation and search for new alternatives
Open System [6] (Gore, 1964)	Survival (organization), acceptability (client)	<ul style="list-style-type: none"> (1) Problem causes stimulus (2) Response is adaptive and incremental process (3) Constraint on decision maker set by client (4) Control through social norms and feedback loops 	<ul style="list-style-type: none"> Goals unknown and unknowable Informal norms greater pressure than formal norms Strong interaction environment - decision Reacting better than planning

1.3 Cognitive Fallacies in Organizational Behavior

Vast research efforts have been put into pursuing an understanding of how our minds function in making decisions. For half a century, behavioral economists have compiled data on the heuristics and biases that color our judgment. While useful and necessary in most daily situations, these ‘mental shortcuts’ and ‘routines’ we so often base our judgment on are deeply flawed and often lead to irrational, suboptimal choices. These fallacies are dangerous precisely because they are so hardwired into our thinking process, because they are invisible to us. Especially to managers, whose decisions directly influence the success or failure of an enterprise, these mental traps pose an especially critical threat. To overcome this threat, *awareness* of this problem can be the best defense (Hammond, Keeney and Raiffa, 1998). According to Glendon, Clarke, and McKenna (2016), cognitive fallacies stem from **attribution errors**. Attribution theory in general is concerned with how individuals interpret external or internal stimuli and translate them into behavior and stems from Gestalt psychology. Hereby, external or internal stimuli are modified by underlying beliefs, which in turn structure the cognitive process that determines behavior (see Figure 1.2). Attributions are made in the course of this sense-making process: first, to ‘*enable an individual to predict events, and second, to help them to exert control over events*’ (Glendon, Clarke, and McKenna 2016). The errors made in the course of the attribution (‘attributional effects’) are then referred to as cognitive biases or heuristics. The following section serves to provide a brief overview of the most common mental fallacies and traps encountered in human decision-making.

The Fundamental Attribution Error

The fundamental attribution error refers to the tendency to overemphasize the influence of internal causes as opposed to external ones when evaluating behavior. However, the fundamental attribution error only occurs when evaluating other people’s behavior; it reverses when trying to causally explain an agent’s own behavior (Maruna and Mann, 2006). Thus, a manager might be tempted to attribute mistakes made by a subordinate to personal characteristics rather than external context. Evidence found by Martinko and Gardner (1987) and Crant and Bateman (1993) suggests that this influences the way managers interact with their subordinates. Reason (2016) suggests this bias to be circumvented by the ‘*substitution test*’, which involves mentally replacing the individual in question with a fictive character with the same experience, qualifications and background and assessing the likeliness of him behaving in the same way under the prevailing circumstances.

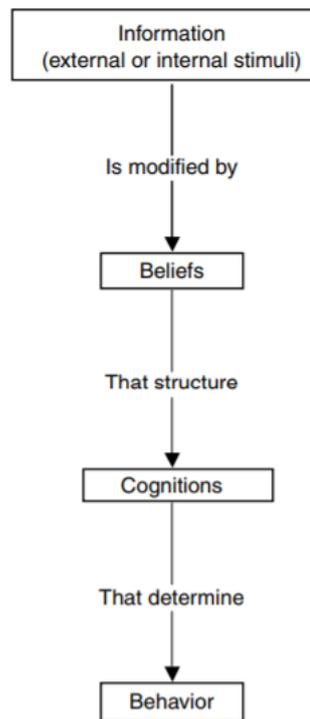


Figure 1.2: General attribution sequence. Reproduced from: Glendon, A. I., Clarke, S., and McKenna, E. (2016). Human safety and risk management, p. 82. *Crc Press*.

Self-Serving Bias

The self-serving bias is, in some ways, closely related to the fundamental attribution error and describes the cognitive process by which individuals take credit for personal success but reject responsibility for personal failures (Shepperd, Malone, and Sweeny, 2008). The bias is caused by the need to protect and enhance self-esteem (Hughes and Beer, 2013) and avoid blame (Bradley, 1978). In the organizational context, the self-serving bias can have detrimental effects to team structures, promotion policies, risk management¹¹, and future planning¹² (Larwood and Whittaker, 1997).

¹¹The self-serving bias might cause an overestimation of the risk stemming from external factors and an underestimation of risk stemming from the managers' own shortcomings.

¹²Managers tend to overestimate their own capabilities and underestimate their flaws (Larwood and Whittaker, 1997).

Availability Heuristics

The availability heuristics was first described by Tversky and Kahneman (1974) and stands for the tendency to overestimate the likelihood of occurrence of events. It is caused by the usage of the heuristics that an event is *'likely or frequent if instances of it can be readily brought to mind'* (Glendon, Clarke, and McKenna 2016). This leads to individuals exaggerating the probability of events that are either easy to imagine or recall or especially dramatic. Additionally, Lichtenstein *et al.* (1978) was able to prove that the risk of rare negative events happening tends to be overestimated, while the contrary holds for more common adverse effects¹³. This is due to a higher exposure to accounts of rare events (be it through media or direct communication). For executives, this poses a significant challenge, especially when it comes to risk management and planning activities. One approach to overcoming this bias is using a *'systemic approach to hazard evaluation, such as an expert system or safety auditing'* (Glendon, Clarke, and McKenna 2016).

False Consensus Bias

The false consensus bias (often simply referred to as 'consensus bias') denotes the egocentric *'overuse of self-related knowledge in estimating the prevalence of attributes in a population'* and can be partially traced back to the availability heuristics (Krueger and Clement, 1994). Ross, Greene, and House (1977) find evidence for this bias in four separate studies, in which respondents consistently exhibit the tendency to think that their own beliefs are universally shared. For managers, this highlights the necessity for clear and transparent communication to avoid misunderstandings. Additionally, in the absence of consensus, executives need to avoid the assumption that individuals with a differing point of view are defective in some way.

Anchoring Bias

Anchoring bias (also known as 'focalism') refers to the unconscious disproportional importance placed on the first piece of information obtained (Strack and Mussweiler, 1997). In the course of the decision-making process, anchoring occurs when an initial piece of information is used to make subsequent judgements. Once beliefs have been established, removing the related association is challenging, even though the initial data is proven to be inaccurate or irrelevant (Hammond, Keeney, and Raiffa, 1998). Mussweiler, Strack and Pfeiffer

¹³In a series of 5 experiments with 600 adults, respondents for example estimated the loss of life caused by murders to be higher than that brought about by strokes – even though the death toll for strokes is ten times higher than that of murders (Lichtenstein *et al.*, 1978).

(2000) suggest that considering the opposite and enumerating reasons that speak *against* the anchor help reduce the bias.

Confirmation Bias

Confirmation bias relates to *'the seeking or interpreting of evidence in ways that are partial to existing beliefs'* (Nickerson 1998). Simply speaking, this refers to individuals seeking out information that *confirms* or *supports* their hypothesis, instead of applying the scientific method of *testing* their assumptions. In a business setting, confirmation bias can lead to flawed decisions in all areas: from faulty market research to regrettable hiring decisions or bad investment choices. As one of the most detrimental fallacies executives face, it can be avoided by deliberately seeking evidence that contradicts the viewpoints in question.

Status Quo Bias

Both Samuelson and Zeckhauser (1988) and Kahneman, Knetsch, and Thaler (1991) coined the term 'status quo bias' with their research in the early 1990s. This mental fallacy connotes the disproportional preference for maintaining the current state, even under conditions which might be less favorable than an alternative. The status quo bias is closely related to loss aversion¹⁴, remorse avoidance¹⁵ and the endowment effect¹⁶. For organizations, the biggest threat in the status quo bias is the inflexibility and inertia it causes. Due to its entrenchment in routine processes and patterns, a suggested countermeasure to the status quo bias is the breaking up of these structures. An introduction of an external viewpoint as well as the usage of objective measures to assess alternatives and compare them to the status quo would also be recommendable. Bostrom and Ord (2006) develop the so-called *'reverse test'* to circumvent the status quo bias: by rephrasing the question from *What happens if I change the observed parameter?* to *What happens if I do not change the observed parameter?*, the decision-makers are forced to defend their conservation of the status quo.

¹⁴The preference for avoiding losses rather than receiving equivalent gains (Kahneman, Knetsch, and Thaler (1991))

¹⁵Remorse (also often called regret) avoidance describes the fear that a decision will be suboptimal in retrospect and is closely associated to risk aversion. The *'regret theory'* was first proposed by Graham Loomes and Robert Sugden in 1982.

¹⁶The endowment effect designates the hypothesis that individuals ascribe a higher value to items merely because they own them (Kahneman, Knetsch, and Thaler (1991)).

1.4 Attractiveness Bias

While most of these concepts have been extensively analyzed and covered in academic research in relation to their effect on organizational behavior, the **attractiveness** (or, in some sources, **attractivity**) **bias** has found little coverage in academic literature. According to Whitley and Kite (2009), attractiveness bias denotes the ‘*differential treatment of individuals based on their physical appearance*’. That individuals which are perceived to be physically attractive receive better treatment in many domains of everyday life is almost a truism (Lee, Pitesa, Pillutla, and Thau, 2015). This effect is reinforced by the *implicit personality theory* formulated by Asmore (1981), according to which single personal attributes (such as personality traits of outward appearance) are linked to inferences and expectations about other personal attributes. Eagly *et al.* (1991) demonstrate that perceived ‘attractiveness’ or lack thereof is connected to a number of other personal dimensions, such as social and intellectual competence. However, little analysis has been done to what extent this affects organizational behavior.

Dipboye, Fromkin and Wiback (1975) first demonstrate that attractiveness bias is also prevalent in a workplace setting¹⁷. Cann, Siegfried and Pearce (1981) found that sex and outward physical attributes of a subject affect the hiring decision, with males with favorable physical attributes being favorably discriminated¹⁸. Judge, Hurst and Simon replicated these results using longitudinal data from the Harvard Study of Health and Life Quality (2009). However, the aforementioned studies focus solely on attractiveness bias in *candidate selection decisions* and do not differentiate between gender-specific differences in attractiveness bias (‘*Do women discriminate more based on physical attractivity or vice versa?*’). While it is true that selection decisions are ‘*among the most important determinants of career success*’ (Gatewood, Feild, and Barrick, 2008), attractivity bias prevails throughout all domains of the workspace.

Hamermesh and Biddle (1994), Mobius and Rosenblat (2006) and Johnson (2010) analyze the effect of outward appearance on remuneration and promotion, finding a significant wage premium for more attractive individuals. Hamermesh and Biddle (1994) find that individuals lacking attractivity are punished by a textit ‘plainness penalty’ in their remuneration independently from their field of occupation – an effect true for both genders. However,

¹⁷In a study with 30 college students, respondents were asked to evaluate fabricated resumes on suitability for managerial position. Both gender and attractivity discrimination were found to be significant.

¹⁸In this study, 96 male and 148 female respondents were asked to evaluate the qualifications of ‘unattractive’, ‘average’ and ‘attractive’ candidates. Respondents were either asked to first rate specific qualifications and then formulate a hiring decision or vice versa. It was found that while the order of the rating/hiring decision did not affect the hiring decision, sex and attractiveness did.

unattractive women are found to have lower labor force participation and marry men with less human capital. Applying status generalization theory¹⁹, Johnson finds that individuals perceived as less attractive tend to get promoted less. In addition to this, Mobius and Rosenblat (2006) reach the conclusion that higher physical attractiveness increases self-confidence, which in turn tends to raise perceived competence. However, even when controlling for self-confidence, individuals with higher attractiveness exhibit greater social and communication skills, which increase their favorable impression with employers and thus boosts their wages.

The effect of attractiveness bias on interpersonal relationships and the willingness to cooperate was explored by Mulford, Orbell, Shatto, and Stockard (1998). Using a version of the prisoner's dilemma in a laboratory setting, Mulford (*et al.*) find that not only are subjects more likely both to enter a game and cooperate with individuals they perceive as attractive, but also point out some differences in gender: men whose self-perception is 'attractive' cooperate more often than 'average' men, while the contrary is true for women. In addition, subjects with a higher self-perceived attractiveness showed a preference for cooperation with other attractive individuals. In the organizational context, Lee *et al.* propose that the '*two fundamental types of interdependence in organizations—cooperation and competition—result in an opposing pattern of attractiveness discrimination*'. This signifies that decision-makers discriminate in favor of individuals they perceive as attractive when the aim is to cooperate, while discriminating against attractive individuals when they expect to compete with them. This is especially important for team dynamics, interpersonal relationships such as between employer and employees and all questions of collaboration.

Gender-specific differences in attractiveness bias were further examined by Luxen and Van De Vijver (2006) and Agthe, Spörrle and Maner (2010). The latter suggest that when an individual is of the same sex as the decision-maker, attractive individuals are discriminated against. Luxen and Van De Vijver reach similar results and interpret them from an evolutionary intersexual perspective, in which intra-gender competition causes discrimination. This shows the interdependency between a decision-makers choice and the individual being evaluated. Lee *et al.* (2015) suggest framework of *task-related interdependence* to model when and why decision-makers discriminate based on attractiveness (see Figure 1.3).

¹⁹Status generalization theory refers to the '*process by which statuses of actors external to a particular interaction are imported and allowed to determine important features of that interaction*' (Webster and Driskell, 1978), such as for example white male executives rising to executive positions disproportionately to their abilities.

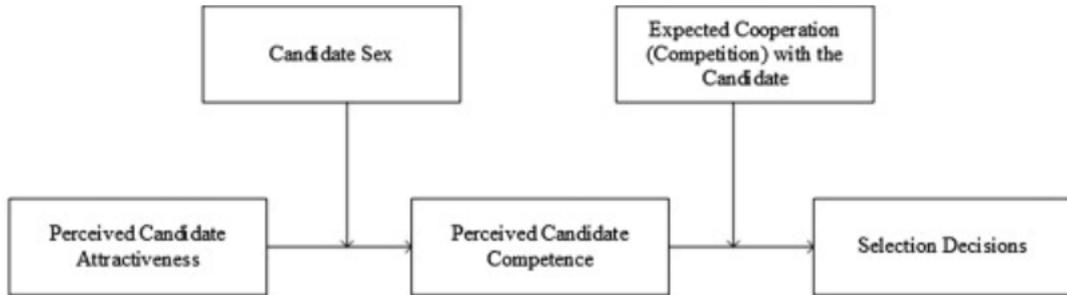


Figure 1.3: Task-related interdependence. Reproduced from: Lee, S., Pitesa, M., Pillutla, M., and Thau, S. (2015). When beauty helps and when it hurts: An organizational context model of attractiveness discrimination in selection decisions. *Organizational Behavior and Human Decision Processes*, 128, 15-28.

While these studies all yield significant results, research outside the laboratory setting is limited. Hamermesh (2006) aims to circumvent this problem and analyzes different photographs accompanying elections to office in the American Economic Association. He concludes that an exogenous increase in outward perceived attractiveness raises a candidate's chance of success, with men benefitting from a higher *'beauty premium'*. However, the study is based on attractiveness ratings done by four PhD students, which, mainly due to the subjective nature of attractiveness, might render a limitation of the representativeness of the study.

All in all, it can be said that even though research on attractiveness discrimination can be found in academic literature, it lacks two important factors: first, general insights into the gender-specific differences in attractiveness discrimination (*'Do women discriminate more based on attractiveness than men?'*); second, the application of data outside the laboratory setting. This study aims to bridge this research gap.

1.5 Gender-Specific Differences in Bias

That the inner biological workings of the brain diverge between both genders is a fact – 'sex-specific differences in dopaminergic, serotonergic, and gamma-aminobutyric acid (GABA)ergic markers indicate that male and female brains are neurochemically distinct' (Cosgrove, Mazure, and Stanley, 2007). In most recent years, most probably due to the influx of women into the workforce, academic research has focused extensively on these gender-based differences in decision-making. How exactly these biological differences affect the human decision-making process is, however, still a largely open question.

When it comes to general behavioral traits, one finding is consistent across academic

literature: women are more risk-averse than men (Powell and Ansic, 1997; Jianakoplos and Bernasek, 1998; Croson and Gneezy, 2009). These findings are closely related to the results of the Iowa Gambling Task²⁰, in which women on average perform more poorly than men (Weller, Levin, and Bechara, 2010) and are found to exhibit higher loss aversion bias than men (van den Bos, Homberg, and de Visser, 2013). Independently from the Iowa Gambling Task, Gächter, Johnson and Herrmann (2007) find women to exhibit more low-averse behavior even in risk-free scenarios. The Iowa Gambling study renders additional insights into the decision-making process of both genders: while women tend to consider all aspects of a problem, men process information more selectively and focus on global aspects of the information (van den Bos *et al.*, 2013). Furthermore, females tend to understand and integrate both subjective and objective information and include all available details (Mayers-Levy and Maheswaran, 1991). While this leads to advantages in many different contexts, the Iowa Gambling test relies solely on objective information.

Building on findings from Cosgrove *et al.*, Ashare, Norris, Wileyto, Cacioppo and Strasser (2013) examine these gender-specific differences in the context of behavioral biases. In their research, Ashare *et al.* analyze the evaluation of affective stimuli (such as the positivity offset and negativity bias²¹) based on differences in serotonin-receptor genes²². Ashare *et al.* (2013) find gender differences in the functioning of the serotonin receptor, implying there is a biological basis for gender differences in decision-making and information processing process. Ladenburg and Olsen (2008) conduct an empirical study to assess gender-based differences on the anchoring bias, finding that women are significantly more susceptible to being influenced by an initial piece of information in their subsequent decision-making. This paper aims to enrich the existing literature by examining gender-based differences in attractiveness discrimination.

²⁰The Iowa Gambling Task (IGT) refers to a psychological experiment to simulate decision-making. It was first developed by researchers at the University of Iowa, to which it owes its name. In the experiment, respondents were presented with four virtual decks of cards composed of ‘reward’ and ‘punishment’ cards. Due to this mixture of cards, some decks can be classified as ‘bad’, while others are counted as ‘good’ decks. The goal of the game is to maximize the amount of money won over the entire course of the game.

²¹The positivity offset is an effect in psychology in which individuals rate neutral situations as moderately more positive than they really are. This stands in direct contrast to the negativity bias, which states that when experiencing positive and negative stimuli of equal intensity, the negative stimulus will have a greater effect on the general state of well-being than the positive one.

²²Serotonin is a neurotransmitter that regulates the tonus of blood vessels as well as the general sense of well-being, which is why it is sometimes also labelled the happiness hormone (*incorrectly so, as it is not a hormone*)

1.6 Preferences in Partner Selection

Economists have found men and women to elicit different preferences in consumption and investment markets, the labour market, as well as the dating and marriage markets.²³ Interest in the latter social interaction follows from the seminal work by Gary S. Becker (1973) who formalized the marriage decision as one based on assortative matching of partner attributes such as age, education, wealth, and physical appearance. To take an example, in the case of positive sorting over physical appearance, a beautiful female is most likely to form a match with a good looking male, and vice versa.

Ever since, a multitude of academic literature strove to answer what men and women look for in their partner. Especially online-dating sites prove to be a goldmine in this area of research: Fisman *et al.* (2006) use data from a speed dating experiment to assess partner preferences and find that while women put more weight on their potential partner's intelligence and race, men discriminate more based on attractiveness. In addition to that, Fisman *et al.* observe that in the partner selection process, men discriminate negatively against women whose intelligence and ambitions exceed their own. These findings are supported by a follow-up study two years later, in which Fisman *et al.* (2008) further discern the same-race preference in dating, identifying a stronger same-race bias in women than men which only decreases with older or more attractive subjects. These findings are consistent with most academic research in the area, postulating that men discriminate more strongly based on attractiveness (Sprecher, Sullivan, and Hatfield, 1994)²⁴ – or, to quote evolutionary psychologist Buss (1994, p. 58): *'men's greater preference for physically attractive mates is among the most consistently documented psychological sex differences.'* Bjerk (2009) surmises that the above-described preferences might as well be based on biological factors, with men having an *'innate tendency to favor beauty'*. Alternatively, he suggests that both genders have the same underlying preferences, which vary only due to different earnings outcomes across genders²⁵.

²³For a recent survey on gender differences in preferences, see Croson and Gneezy (2009).

²⁴Sprecher, Sullivan, and Hatfield (1994) use nationwide data from the National Survey of Families and Households to establish partner preferences for men and women, finding a significant tendency for male respondents to prefer physically attractive women, while females prefer men with higher income levels.

²⁵Bjerk argues that individual utility is increasing both with a partner's attractiveness and their income while marginal utility decreases with high individual earnings. This leads to higher preferences for attractiveness in high-earnings individuals, which, on average, still tend to be male. Additionally, the situation reverses for low-income individuals, who attain a higher utility from a partner's high earnings than from their attractiveness. *Hence, even if males and females have ex ante identical underlying preferences, males and females can still have different priorities on average in the marriage market if males generally enter the marriage market with higher earnings trajectories than females.'*

In addition to this, Regan *et al.* study the differences in preference based on short-term and long-term partnerships. They observe that while women indeed place more value on characteristics pertaining to social status and men prefer physical attributes for long-term romantic relationships, both men and women discriminate strongly based on physical attractiveness when it comes to short-term romantic relationships.

Hitch, Hortaçsu and Ariely (2010) study the economics of match formation using a data set acquired from an online dating platform to devise a model of partner preferences. They identify several factors determining partner selection: similarities in ‘age, education levels, and physical traits such as looks, height, and weight’ seem to be the prevalent variables. This is in line with Kalmijn (1998), who postulates that partner selection is largely based on homogeneity. This however does not necessarily reflect a specific *preference* for a partner with similar attributes as the decision-maker but might rather be based on the disproportional amount of time individuals spend surrounded with others *similar to themselves*.

Summary

Contrary to what economic models postulated up until the 1950s, the decision-making process is laden with irrational thought patterns, cognitive fallacies and heuristics. The three pillars decision theory is based on - rationality, risk and uncertainty, and utility theory all have been shown not to reflect reality accurately. New, adjusted models have arisen in their stead, trying to compensate for the flaws inherent in their predecessors: be it Simon’s *bounded rationality model*, Bowles and Gintis’ *homo reciprocans*, Tversky and Kahneman’s *prospect theory* or *two-system-model* or the *subjective expected utility theory*.

Different cognitive biases have been extensively documented and analyzed in academic literature. From attribution errors to mental accounting, anchoring and confirmation biases - researchers have identified countless mental traps that color the decision-making process. The effect of these biases on organizational structures has been at the core of a multitude of research papers aiming to aid managers and executives to make better, more informed choices.

More recently, probably due to the high influx of women not only into the labor market, but also into executive positions, researchers have started looking into gender-specific differences in decision-making. While some consensus prevails on general risk attitude and basic information processing (inclusive for women vs. selective for men), many realms of gender-based differences have been left unexplored. One of such is the attractiveness bias, which is at the core of this paper. There seems to be a consensus that men discriminate more strongly according to attractiveness (Sprecher *et al.*, 1994; Fisman *et al.* 2006; Croson

and Gneazy, 2009; Hitch, Hortaçsu, and Ariely, 2010). On the other hand, a handful of recent studies find the opposite with women discriminating more on the basis of looks than men (Belot *et al.*, 2008).

Applying findings from literature on preferences in partner selection, this study aims to synthesize these findings and extrapolate them on the organizational context. And while these preferences in partner selection might not at a first glance relate to the organizational context, they certainly shed light on the question which gender discriminates more strongly based on attractiveness. Pollard (1999) and Lee (2005) both observe significant effects of implicit or unconscious biases in professional settings, especially so in hiring and selecting processes. Talerico (2014) further argues that such implicit biases give rise to a **systemic bias**²⁶ in the hiring and promotion process, which is designed to favor attractive applicants.

1.7 Hypotheses

Based on the preceding academic literature, this paper aims to demonstrate that:

Hypothesis 1. *Outward physical appearance and perceived attractiveness are correlated with selection decisions.*

Hypothesis 1.1. *The correlation between perceived attractiveness and selection decisions displays a significant difference between both genders.*

Hypothesis 2. *The impact of the attractiveness bias is independent from individual characteristics such as age, race, region and profession.*

²⁶Systemic bias refers to the underlying tendency of a process within an organization/institution to be biased towards a particular outcome. This can for example refer to a racially biased university admission process or, on the contrary, a scholarship program that favors minorities (affirmative action).

2 Data and Methodology

The data in this paper are based on the reality television dating show *Dating in the Dark*, first created and aired in the Netherlands (*Daten in het Donker*) on April 6, 2009. The concept and format of the show has been reproduced in a number of other countries including Australia, Brazil, Denmark, Germany, France, Norway, Sweden, Turkey, the United Kingdom, and the United States. The analysis is based on a total sample of 45 episodes from Australia (7), Brazil (6), Netherlands (8), UK (13), and the USA (11).¹

2.1 The Dating Experiment

Dating in the Dark follows a group of three men and three women who reside in separate parts of a luxury house, and are unable to interact with participants of the opposite gender, except for when occupying the ‘dark room’ (where they are unable to see anything).² The first compulsory meeting and date involves the entire group of participants, during which they sit around a table inside the dark room and introduce themselves to others, learning everyone’s voices, character and personality types. Following this date, each participant is allowed to invite another participant of the opposite gender for a private one-on-one date inside the dark room. Participants then go on multiple and repeated dates with their partner of choice, progressively learning and becoming mentally attracted (or not) based on the *personality* trait only.

To somewhat alleviate the informational problems between partners, the host provides participants with personality profiles showing which contestants are best matched based

¹The available episodes were streamed and viewed at (i) the official television channels that broadcasted the show (e.g. the Dutch version can be found at www.rtl.nl/liefde/dateninhetdonker/home/), and (ii) a number of private channels on YouTube (www.youtube.com) by entering the search term “*Dating in the Dark*” for the AUS, UK, and US versions, and “*Romance no Escuro*” for the Brazilian version of the show. For a sample episode (USA version, Season 1, Episode 1), see <http://www.youtube.com/watch?v=i7DH0bWGBrM>. A full summary of country-specific shows and other details can be found at <http://en.wikipedia.org/wiki/DatingintheDark>

²In five of the episodes from the UK, there were 4 males and 4 female contestants. Also, during one ‘special edition’ of the show, the distribution of gender was made unequal with 3 male and 4 female participants present.

on a compatibility test. Similarly, depending on the episode, the host shows the male and female groups some video footage of inside their own homes; reveals some of the personal items brought to the show; or invites sketch artist to draw each participant's impression of their partner.

Following the one-on-one dates, each participant decides if they wish to observe the physical appearance of another participant, i.e. their 'personality' partner. To do so, a participant must first invite their partner (via an email message) and then wait for them in the dark room. Participants who do not wish to reveal their appearances leave the show immediately, without informing the other gender group. This action mainly results when contestants dislike the personality of each potential partner, and thus cannot identify a 'soul mate' on the show. Those who do comply, then enter the dark room for one last time and reveal their looks to each other in succession. While being revealed in the light, a participant cannot observe or hear any reactions, with their personality partner standing silently at the other end of the dark room.

Finally, after learning about the physical appearance of their personality partner, *each* participant makes one final and important decision on *whether or not to go on a formal date after the show?* Participants reveal their preferences by either walking to the main balcony ('Yes'), or by exiting the main entrance door of the house ('No'). By choosing to meet on the balcony signals that participants prefer each other's physical and mental attributes. On the other hand, walking away from their personality partner reveals distaste for the person's physical appearance. Thus, in the second stage of the show, participants are able to reject their personality partners based on the attractiveness attribute alone. The latter is used in this study as a decision variable signifying discrimination based on physical appearance.

It is also possible for participants to be found mentally attractive by (and later to reveal their looks to) more than one member of the opposite sex (this situation will loosely be referred to as 'many-to-one matching'). In such situations, during the final decision, this 'popular' decision maker faces a multinomial set of partners with different personality and beauty attributes available. However, each member of the multiple interested party still faces the desired singleton choice set of partners (that is, whether or not to wait for the popular individual) and makes a choice purely based on the partner's physical attributes. In such a case of many-to-one matching, the popular decision maker ('one') is unable to clearly discriminate based on the personality and looks of a single partner, since differences *across* partner attributes determine the final choice. To identify such choice behaviour and preferences, it would be required to directly measure the 'personality' and 'attractiveness' attributes, which is unfortunately not possible. To this end, the choice behaviour of the 'one' participant when many-to-one matching is present is not recorded. Overall, this leads

to a smaller sample of decisions than possible when only one-to-one matching prevails. The latter issue as well as participants walking out prior to revealing their looks (that is, not finding a ‘personality partner’ at all) results in a total sample of 222 revealed choices.³

2.2 Participant Characteristics

Table 2.1 below defines and summarizes the main observed participant characteristics.

Table 2.1: SAMPLE PARTICIPANT CHARACTERISTICS

Variable	Description	μ	σ	Min.	Max.
Age	Years of age	27.02	4.62	18	48
Gender	= 1 if female 0 if male	0.53	0.50	0	1
Race	= 1 if White 2 if Black 3 if Hispanic	1.41	0.75	1	3
Occupation	= 1 if low skilled ^a 2 if average skilled ^b 3 if high skilled ^c	1.9	0.79	1	3
Region	= 1 if United States 2 if United Kingdom 3 if Australia 4 if Brazil 5 if Italy 6 if Netherlands 7 if Denmark	3.06	1.82	1	7

^a e.g. student; ^b e.g. high school teacher; ^c e.g. business manager

In addition to the above decision variable, a limited set of revealed participant charac-

³The total number of participants that appeared over the sampled episodes is 281. Four percent (11) of these individuals correspond to the ‘popular’ type described above, who attracted more than one personality partner. The remaining 48 contestants failed to find a personality partner and hence walked out after the first stage of the show/experiment.

teristics was recorded, including: the age of participants, gender, racial background, and occupation. The age and occupation variables were displayed on the screen next to each participant's name at the start of an episode, while the gender and race characteristics had to be visually observed and recorded (by the researcher). The variables were assigned numeric values (1-3 for race and occupation-related variables, 1-7 for the region variable) in order to enable a later analysis.

The average age of participants was 27, with the youngest and oldest participant being 18 and 48 years old, respectively. Within the sample, there are slightly more female decision makers (54%), indicating that more men (than women) left during the first stage of the experiment (could not find a personality partner), or had more than one personality partner (see the discussion above). In terms of racial background, the majority of contestants were white (75%), followed by the hispanic (17%) and black groups (8%). Due to the young age of participants, the sample distribution of occupations is comprised of relatively fewer senior professionals: low-skilled (36%), average-skilled (38%), and high-skilled (26%).

2.3 Empirical Approach

To better understand the choice behaviour and preferences that can be inferred from the data, let the utility that participant i derives from dating partner j be given by

$$u_{ij}(p_j, a_j; \beta_i) \tag{2.1}$$

where p_j is the *personality* attribute of partner j ; a_j is the *attractiveness* attribute of j ; and $\beta_i \in [0, 1]$ denotes the relative utility weight participant i attaches to a_j (where the utility weight on p_j equals $1 - \beta$). Since no direct or subjective measures of p_j and a_j are obtained, it is not possible to estimate the corresponding preference parameters using a structural econometric model. Nevertheless, given the design of the experiment, individuals can be indirectly identified eliciting a particular range of the utility weight attached to the physical attributes of a partner, β_i .

Recall that during the second stage of the experiment, participant i is observed to make a partner choice based on a_j conditional on i being mentally attracted to j (that is, $\beta_i \neq 1$). Let y_{ij} represent an indicator variable of this 'Yes/No' decision that equals 1 if i prefers j after observing a_j , and 0 otherwise. Then, there exist three possible parameter β_i ranges that could be encountered. First, there are participants (decision makers) of the type "*I like the personality, and I like the looks*" (accept p_j , accept a_j), and for whom $y_{ij} = 1$. These individuals are content with both their partner's personality and outward appearance attributes, and hence could assign a utility weight to perceived attractiveness

from the entire range $0 \leq \beta_i < 1$. On the other hand, there also exist those participants of the type “*I like the personality, but I don’t like the looks*” (accept p_j , reject a_j), for whom we can observe both the decision $y_{ij} = 1$ and $y_{ij} = 0$. For those contestants who decided to go on a date with their personality partner (‘Yes’), it is known that $\beta_i < 0.5$ since they do not prefer the looks of their partner, however still promise to go on a date with them after the show (for these individuals; partner looks are less important than personality). Finally, participants who decide not to go on a future date ($y_{ij} = 0$) reveal a higher relative preference for attractiveness $\beta_i > 0.5$, i.e. looks are more important than personality. The latter type of individuals is labeled as ‘*attractiveness discriminators*’.

The main focus in this paper is to test for gender differences in the choice behaviour of the latter type of individuals. To do so, the analysis is based on regressions of the form

$$\text{DISCRIMINATE}_{ij} = (\delta_0 + \delta_1 X_i + \delta_2 X_j + \delta_3 X_i X_j) \text{FEMALE}_i + \delta_4 Z_{ij} + \epsilon_{ij} \quad (2.2)$$

where the dependent variable equals 1 if participant i rejects partner j upon observing his or her Attractiveness, and 0 otherwise; FEMALE_i is an indicator variable that equals 1 if participant i is a female, and 0 if a male; $X_i = [\text{Age}_i, \text{Race}_i, \text{Occupation}_i]$ and $X_j = [\text{Age}_j, \text{Race}_j, \text{Occupation}_j]$ are vectors of other personal characteristics describing participant i and partner j ; Z_{ij} includes show-specific variables, namely the ‘Region’ (or country) of production; and ϵ_{ij} is an *iid* random error term capturing the unobserved variables and other idiosyncratic preference shocks. As any observed degree of gender differences in beauty discrimination may also depend on other ‘own’ and ‘partner’ characteristics, corresponding interaction terms to control for such heterogeneity have been included.

3 Results

3.1 Preliminary Data Analysis

First, a preliminary data analysis is conducted to assess the applicability of the data to the research question. To this aim, attractiveness discrimination rates are computed for each group. To this end, participants are classified based on their gender (male or female), their age (young for participants ≤ 30 years of age, mature for participants above 30 years old), their race (white, black or hispanic), their occupation (low skill, average skill and high skill professions) and the geographic region they live in (US, UK, Australia, Brazil, Italy, Netherlands or Denmark). To test for differences between the discrimination rate means, a parametric Z-test of differences is conducted. For within-region comparison, the UK is taken as a base scenario (due to its large sample size).

This preliminary analysis of the data shows at a first glance that Hypothesis 1 can be proven: participants clearly discriminate based on the outward appearance - or attractiveness - alone.

Table 3.1 reports rates of discrimination on the basis of physical appearance for different groups of individuals. Overall, 29% of the participants rejected their ‘personality’ partner, suggesting that looks do matter in general. At the same time, strong gender differences in beauty discrimination are present with females discriminating 34% of the time, compared to a rate of 22% by males. Hence, based on the raw data, women seem to place a relatively greater utility weight on physical appearance than men ($p = 0.01$). The latter result contradicts that found by Fisman *et al.* (2006), where male students were found to care more about looks than females in their speed-dating experiment. Our finding is however consistent with a more recent study by Belot *et al.* (2008) based on the Dutch television game show ‘Does (s)he share or not?’, where the authors find women to discriminate more against the least attractive player than men do so.

There are no apparent differences in beauty discrimination across age, race, and occupation type; with most of these subgroups rejecting their personality partners at an average rate of about 30%. However, we do observe a significantly higher rate of attractiveness discrimination by participants based in the United Kingdom (38%) relative to those in the

Table 3.1: ATTRACTIVENESS DISCRIMINATION BY GROUP

	n	Discrimination Rate	Test of Difference	
Overall	283	0.29 (0.45)		
Male	132	0.22 (0.42)		
Female	151	0.34 (0.48)	0.01	$\hat{p}(female) > \hat{p}(male)$
Young	211	0.29 (0.45)		
Mature	72	0.28 (0.45)	0.85	$\hat{p}(mature) \neq \hat{p}(young)$
White	211	0.29 (0.45)		
Black	28	0.25 (0.44)	0.66	$\hat{p}(black) \neq \hat{p}(white)$
Hispanic	44	0.30 (0.46)	0.93	$\hat{p}(hispanic) \neq \hat{p}(white)$
Low skill	104	0.24 (0.43)		
Avg skill	104	0.31 (0.46)	0.28	$\hat{p}(avgskill) \neq \hat{p}(lowskill)$
High skill	75	0.32 (0.47)	0.24	$\hat{p}(highskill) \neq \hat{p}(lowskill)$
US	57	0.25 (0.43)		
UK	89	0.38 (0.23)	0.04	$\hat{p}(uk) > \hat{p}(us)$
Australia	39	0.23 (0.43)	0.05	$\hat{p}(aus) < \hat{p}(uk)$
Brazil	40	0.30 (0.46)	0.18	$\hat{p}(bra) < \hat{p}(uk)$
Italy	6	0.17 (0.41)	0.14	$\hat{p}(ita) < \hat{p}(uk)$
Netherlands	40	0.25 (0.44)	0.07	$\hat{p}(ned) < \hat{p}(uk)$
Denmark	12	0.08 (0.29)	0.02	$\hat{p}(den) < \hat{p}(uk)$

'Discrimination rate' is the proportion of participants that chose not to date their 'personality partner' after the partner's looks were revealed. Young if age ≤ 30 ; Mature if age > 30 . Standard deviations in parentheses. The resulting p-values from parametric Z-tests of differences between sample proportions are reported in the fourth column. For within-region comparison, the UK is taken as a base scenario (due to large sample size).

United States (25%), Australia (23%), and the Netherlands (25%). The 15 percentage point (positive) difference in beauty consciousness is broadly consistent with the more than 110% increase in expenditure on cosmetic surgery and other beauty enhancing treatments by British households between 2005 and 2010 (BAAPs 2010), compared to a notably lower 77% increase observed in the USA since the year 2000 (ASPS 2010). This type of social development (of 'keeping up *physical* appearances') in the UK is also supported by the

growing number of men and especially teenagers receiving beauty treatments (with individuals from the latter group entering the dating market for the first time).

3.2 Gender Gap

To further explore the above gender gap and potential within-gender heterogeneity, a linear probability model of participant decisions (Eq. 2.2) is estimated. Hereby, the dependent variable (the discrimination rate) equals 1 if participant i rejects partner j upon observing his or her attractiveness, and 0 otherwise; $FEMALE_i$ is an indicator variable that equals 1 if participant i is a female, and 0 if a male; $X_i = [Age_i, Race_i, Occupation_i]$ and $X_j = [Age_j, Race_j, Occupation_j]$ are vectors of other personal characteristics describing participant i and partner j ; Z_{ij} includes show-specific variables, namely the ‘region’ (or country) of production; and ϵ_{ij} is an *iid* random error term capturing the unobserved variables and other idiosyncratic preference shocks. As any observed degree of gender differences in beauty discrimination may also depend on other ‘own’ and ‘partner’ characteristics, corresponding interaction terms to control for such heterogeneity have been included.

Table 3.2 presents the marginal effect estimates for different model specifications. The first model version (1) is limited to the basic independent variables: gender, age, race and occupation. The second model form (2) includes the region term, while the third model adaptation (3) further focuses on the interaction between ‘own’ and ‘partner’ characteristics. The third model adaptation (3) is then expanded to observe both genders separately, excluding decision-makers of the opposite gender completely. This is done in order to isolate gender-specific effects on to the other independent variables. The overall achieved R^2 (the proportion of the variance in the dependent variable explained by then model) is respectively 3% for model variant (1), 6% for model variant (2) and 8% for model variant (3). Considering the gender-split model version, the R^2 is 11% for only ‘female’ decision-makers and 8% for ‘male’-only agents.

The mean propensity of rejecting a personality partner on the basis of outward appearance is found to be approximately 15 percentage points higher for females relative to males. This estimate of the main gender effect is robust to almost all of the presented specifications at a 1% significance level for all three model variations. Age, occupation and race yield no significant results on the discrimination rate in none of the specified model forms. As observed above, the ‘region’ variable is significant for some geographic regions: both the US and Australia exhibit a significantly lower discrimination rate than the UK (US and Australia by roughly -15%) for the second model variant (2), and US -20% for the

Table 3.2: THE EFFECT OF PARTICIPANT AND PARTNER ATTRIBUTES ON THE PROBABILITY OF ATTRACTIVENESS DISCRIMINATION

	(1)	(2)	(3)		
			All	Male	Female
<i>Constant</i>	0.106 (0.103)	0.204 (0.190)	0.243 (0.320)	0.345* (0.200)	0.347 (0.502)
<i>Mature</i>	-0.005 (0.063)	0.018 (0.066)	0.055 (0.078)	-0.027 (0.089)	0.180 (0.131)
<i>Female</i>	0.145*** (0.056)	0.149*** (0.056)	0.147** (0.067)		
<i>Occupation</i>	0.060* (0.035)	0.047 (0.035)	0.028 (0.040)	-0.008 (0.054)	0.048 (0.070)
<i>White</i>	-0.001 (0.076)	0.021 (0.158)	-0.057 (0.179)	-0.018 (0.115)	-0.200 (0.341)
<i>Black</i>	-0.082 (0.106)	-0.090 (0.159)	-0.060 (0.184)	-0.063 (0.158)	-0.162 (0.362)
<i>Region USA</i>		-0.154** (0.078)	-0.198** (0.093)	-0.294** (0.134)	-0.117 (0.137)
<i>Region AUS</i>		-0.157* (0.088)	-0.165 (0.105)	-0.270** (0.132)	-0.094 (0.165)
<i>Region BRA</i>		-0.076 (0.170)	-0.081 (0.310)	-0.139 (0.246)	-0.110 (0.500)
<i>Region ITA</i>		-0.217 (0.171)	()	()	()
<i>Region NED</i>		-0.128 (0.087)	-0.156 (0.095)	-0.083 (0.148)	-0.225 (0.140)
<i>Region DEN</i>		-0.279 (0.095)	-0.156 (0.095)	-0.083 (0.148)	-0.225 (0.140)
<i>Mature Partner</i>			0.154** (0.076)	0.199* (0.107)	0.097 (0.113)
<i>Occupation Partner</i>			-0.027 (0.041)	-0.024 (0.056)	0.017 (0.062)
<i>White Partner</i>			0.093 (0.241)	0.077 (0.126)	0.115 (0.363)
<i>Black Partner</i>			0.181 (0.251)	0.184 (0.164)	0.134 (0.372)
Number of Obs.	283	283	222	102	120
R^2	0.03	0.06	0.08	0.11	0.08

Linear probability model; robust standard errors in parentheses. The dependent variable in all regressions is 'Discriminate'; that is set to 1 if the participant chose not to date their 'personality partner' after the partner's looks were revealed, and 0 otherwise. 'Female' is an indicator variable that takes on a value of 1 if the participant is female, and 0 if male. 'Mature' is an indicator variable that equals 1 if the participant is > 30 years old, and 0 otherwise. * significant at 10%; ** significant at 5%; *** significant at 1%.

third model version (3)). In addition to this, significant results can be observed for the male-only model version: men in the US and Australia discriminate less than their female counterparts, by almost 30% in both cases. This is significant on a 5% significance level for the specified parameters. As to the interaction term, neither occupation nor race of the partner demonstrate significance in any of the specified model forms. However, the age of the partner seems to matter: mature partners get rejected, on average, 15.4% more in the general model variant and 20% more in the gender-specific model adaptation for female decision-makers only. These results are significant on a 5% respective 10% significance level.

The gender-split models point towards two main gender-based differences: first, the above-described regional differences in discrimination rates, with men from the US and Australia discrimination significantly less than their female counterparts; second, the higher age-based discrimination by male participants. Especially the second lies in line with most academic research, which points towards males seeking, on average, younger female partners (see e.g. Buss, 1989).

Perhaps a bit surprisingly, none of the other attributes yield significant results. Academic research into different sociographic preferences for men and women often highlights the female preference for partners with higher social status (Becker, 1973; Buss, 1994; Croson and Gneezy, 2009), which does not reflect in the described model. Looking into more detail in the gender-specific differences in participant attributes (see Table 3.3), we can see only marginal differences in occupation levels (the average occupation level is 0.294 point higher for male participants).

Table 3.3: GENDER-SPECIFIC PARTICIPANT DIFFERENCES

Gender	Variable	Mean	Std. Dev.	Min	Max
Female	Occupation	1.757	0.7633	1	3
	Age	25.966	3.90	18	40
Male	Occupation	2.051	0.795	1	3
	Age	27.909	4.686	19	48

This would point towards Bjerk's (2009) thesis that preferences in partner selection naturally do not vary across genders but are caused by disparities in income distribution. Bjerk argues that individual utility is increasing both with a partner's attractiveness and their income, while the marginal utility of a partners' income decreases with high individual earnings. This leads to higher preferences for attractiveness in high-earnings individuals, who, on average, still tend to be male. Additionally, the situation reverses for low-income individuals, who

attain a higher utility from a partner's high earnings than from their attractiveness. This hypothesis will be further examined in section 3.3.

3.3 The Effect of Participant-Partner Similarity on Attractiveness Bias

Academic literature emphasizes the importance of partner similarities for partner selection. Exemplary, Hitch, Hortacısu and Ariely (2010) argue that similarities in 'age, education levels, and physical traits such as looks, height, and weight' seem to be the prevalent variables in partner choice. This '*birds of a feather flock together*'-principle in partner selection is in line with Kalmijn (1998), who postulates that partner selection is largely based on homogeneity.

In order to deepen the analysis of the above-described interaction between participant and partner characteristics and any potential similarities between partners, the linear probability model was expanded (see table 3.4). Hereby, in a first step, the effect of similarities between partners was analyzed (see model version (1) in table 3.4). In a second step (model version (2) in table 3.4), the effect of differences between partners, such as an age or income gap, were subjected to analysis. In both models, interaction terms were included to control for the additive effects of gender on other independent variables. Again, male and female decisions were observed together and separately for both models in order to isolate gender-specific effects on to the other independent variables.

The results of this analysis complement the above-discussed sociographic preferences, as occupation is the only factor rendering significant results in all model variants. Considering first participant-partner similarities, significant results are observed for similarities on occupation. Hereby, the female-specific model variation renders significant results at a 5% significance level, with women discriminating slightly more against partners of the same social status than their own (19.5 percentage points). Looking at the interaction term '*same occupation × female*', this finding is reinforced: in situations where both partners have the same occupation, women tend to discriminate significantly more in the general model form as well. Going into further detail, we can see that women tend to discriminate less against partners with a higher occupational status than their own (0.203 percentage points; 5% significance).

These findings are in line with research conducted by Becker (1973), Buss (1994) and Croson and Gneezy (2009) and point towards disproving the same-preference theorem (Bjerk, 2009), as women clearly show higher discrimination rates against partners with the same occupation level, with men displaying no such tendencies.

Table 3.4: THE EFFECT OF PARTICIPANT-PARTNER SIMILARITY ON ATTRACTIVENESS DISCRIMINATION

	(1)			(2)		
	Male	Female	All	Male	Female	All
<i>Both mature</i>	-0.020 (0.083)	-0.028 (0.094)	-0.030 (0.082)			
<i>Same occupation</i>	-0.110 (0.083)	0.195** (0.089)	-0.115 (0.081)			
<i>Same race</i>	-0.041 (0.107)	-0.100 (0.116)	-0.063 (0.093)	-0.062 (0.106)	-0.085 (0.111)	-0.132 (0.089)
<i>Age $j > age i$</i>				0.090 (0.102)	0.124 (0.093)	0.075 (0.101)
<i>Occupation $j > occupation i$</i>				-0.028 (0.105)	-0.203** (0.090)	-0.048 (0.103)
<i>Both mature $\times female$</i>			0.011 (0.116)			
<i>Same occupation $\times female$</i>			0.314*** (0.119)			
<i>Same race $\times female$</i>			-0.017 (0.093)			0.112 (0.093)
<i>(Age $j > age i$) $\times female$</i>						0.083 (0.133)
<i>(Occup. $j > occup. i$) $\times female$</i>						-0.136 (0.133)
Number of Obs.	102	120	222	102	120	222
R ²	0.02	0.04	0.06	0.01	0.05	0.05

Linear probability model; robust standard errors in parentheses. Constant term included in models. The dependent variable in all regressions is ‘Discriminate’; that is set to 1 if the participant chose not to date their ‘personality partner’ after the partner’s looks were revealed, and 0 otherwise. ‘Both mature’ is an indicator variable that takes on a value of 1 if both the participant and partner are > 30 years old, and 0 otherwise. ‘Same occupation’ is an indicator variable that takes on a value of 1 if the participant and partner have the same occupation level, and 0 otherwise. ‘Same race’ is an indicator variable that takes on a value of 1 if both the participant and partner are of the same racial background (white, black, hispanic), and 0 otherwise. i denotes the participant, j denotes the partner. * significant at 10%; ** significant at 5%; *** significant at 1%.

Results Summary

Overall, this study sheds light on a little-researched topic and gives valuable insights on attractiveness bias using unique data from a natural experiment. Both the first hypothesis and sub-hypothesis,

Hypothesis 1 *Outward physical appearance and perceived attractiveness are correlated with selection decisions.*

Hypothesis 1.1 *The correlation between perceived attractiveness and selection decisions displays a significant difference between both genders,*

could be confirmed. Outward physical appearance is correlated with selection decisions, with evidence of strong gender differences in attractiveness bias confirmed. Women are found to care significantly more about physical attributes than men. This finding is robust to a number of other important characteristics including age, race, occupation, and geographical region. The second hypothesis,

Hypothesis 2 *The impact of the attractiveness bias is independent from individual characteristics such as age, race, region and profession,*

could be only partially confirmed. While attractiveness discrimination is independent from age and race, both occupation and region show a weak impact on attractiveness bias. In the case of occupation, evidence for strong gender-based differences were found: while men exhibit no special preference for the sociographic status of their counterpart, female participants strongly discriminate against partners of their own social standing and in favor of partners with a higher occupational level. This finding is robust to a number of characteristics, tested with a control term and significant at a 5% significance level.

As to the regional differences, a connection between the country's beauty spending and the level of attractiveness bias might be assumed. However, such a (cultural) impact on attractiveness bias would be imprudent to conclude hereupon and warrants further research.

4 Discussion

In the following, the results will be discussed in the organizational context. While the preferences analyzed in the previous section might not at a first glance relate to the business context, they certainly shed light on a subconscious bias affecting daily behavior. Pollard (1999) and Lee (2005) both observe significant effects of implicit or unconscious biases in professional settings, especially so in hiring and selecting processes. Additionally, such mental traps might give rise to systemic biases in companies and organizations. Biased selection, hiring, promotion and compensation systems undermine the efficient functioning of a firm by selecting suboptimal candidates or creating career advancement systems not rooted in merit and accomplishments, thus giving rise to a whole range of behavior not aligned to the organization's goals. As Anton Chekhov said: *'People should be beautiful in every way - in their faces, in the way they dress, in their thoughts, and in their innermost selves.'* Deciding based on just one of these implies a lack of appreciation for the remaining factors, which will only rarely be aligned with the company's interest.

To avoid the detrimental effect of such biases, practical implications for HR managers will be provided based on the functional areas of HR management and organizational decision-making theory. Moreover, concrete recommendations for actions and process structures inside organizations will be provided. Lastly, limitations of the present study will be analyzed and discussed.

4.1 Practical Implications and Recommendations for HR Managers

First, and maybe most importantly, it needs to be stated that attractiveness bias can, in some areas, be justified and contribute to the success of the organization. This might be true for sales or even certain PR positions, where good looks have proven to increase the success rates of the individual (Hosoda, Stone-Romero, and Coats, 2003). However, it is important to keep in mind that this is only true in *specific* areas and should thus be limited to these.

One of the key findings of this present study is that attractiveness bias prevails throughout

all ages, occupations and races to the same degree. Looking into academic literature, this is in line with for example findings by Marlow, Schneider, and Nelson (1996), who discover that there is only a negligible difference between experienced and inexperienced managers when it comes to attractiveness discrimination. For organizations, this implies the need to train managers on all levels to counteract subconscious biases; not just these in junior positions. Developing and instituting mandatory anti-discrimination trainings and guidelines should thus be given in the organizational setting. Additionally, the lack of significant differences between occupation levels means that attractiveness bias is equally relevant for all types of organizations, with high-skill or technical positions being no exception.

Second, weak evidence of attractiveness discrimination being influenced by geographic region is found. This implies that attractiveness bias is, to a certain degree, ingrained in a country's culture. As observed in the case of the UK as well as Brazil, increased spending on beauty products as well as cosmetic surgery and other beauty enhancing treatments might be a good indicator for this. To put this in context of the Russian market: according to BusinessStat (2015), within the period between 2009 and 2013, Russia's beauty market grew by 46%. In addition to this, the sales value of Russia's cosmetic market in 2015 reached nearly 14 billion dollars, placing Russia 4th in Europe. This could point towards a stronger attractiveness discrimination in Russian firms when compared to the US or the Nordic countries analyzed in this study – however, additional research is needed to prove this culture-specific differences in attractiveness bias.

For managers working abroad or with international teams, this highlights the need for increased awareness of these cultural differences in cognitive biases. Lastly, women are found to discriminate significantly more than men (on average by 15%). This is a factor not to be overlooked: in the US as well as in Europe, HR departments are mainly dominated by women. According to the Bureau of Labor Statistics data (2016), over 70% of HR managers are female in both countries. Recruiting, which involves the attraction of applicants *'with the necessary knowledge, skills, abilities, and other characteristics that will help the organization achieve its goals'* (Noe *et al.*, 2013), are areas crucial to circumventing the attractiveness bias, as it is the place where an individual makes a first impression on the organization. As Gatewood, Feild, and Barrick (2008) postulate, the first impression is especially susceptible to attractiveness bias: the outward physical appearance (including personal style or lack thereof and hygiene factors) might easily overweight the objective qualification for a position.

HR managers already are aware of the importance of a uniform recruitment and selection system (starting for example with the formulation of neutral, objective job requirements)

and a neutralized selection process. However, how does this translate into practice? As attractiveness bias impacts selection decision most (Huffcutt et al., 2011), the following aims to provide recommendations specific to the selection and hiring process. From a more practical perspective, this could for example include **anonymized applications**, which aim to level the playing field in the first step of the selection process or a **trimodal approach** to selection decisions. Should these measures prove difficult to implement (e.g. due to cost or time constraints or low acceptance), minor adjustments in existing processes can serve to counteract attractiveness bias. In the following, these three recommendations will be discussed in more detail.

Minimizing attractiveness bias in pre-selection decisions

Anonymous applications target the first selection step (preselection) in personnel selection procedures, that is, the sighting the application documents before the interview invitation as compared to actual hiring decisions. In the concept of anonymous applications, applicants are to refrain from taking a photograph and stating certain biographical and personal data, such as name, address, date of birth, age, marital status or citizenship (see Döse, 2012). Thus, the core focus of anonymized applications are the objective factors, such as work experience and education of a candidate. Unlike the conventional application, no year numbers are given so that no conclusion on the age is possible. The goal is to focus the personnel decision-makers on the first selection decision to the qualification and professional aptitude of the candidate and avert subconscious biases, subjective feelings, possible prejudices or stereotypes. There are several ways to realize anonymous application procedures:

- Anonymized online application forms for online applications at the homepage of an organization
- Anonymized application forms that are made available to the applicant online or in another form. The completed forms are returned either digitally or by post directly to the organization
- Subsequent anonymization, e.g. a neutral body of the organization blacks out all relevant personal information

After completing the first round of selection and deciding which candidates will be invited to the job interview, the personnel decision-makers then receive the complete documents of the candidates concerned. In the main selection process, the anonymity is removed and the applicant has the opportunity to present his strengths unfiltered. The anonymization of

the application documents deprives personnel managers of the subjective information basis and can be regarded as a means of increasing the objectivity in the preselection decision.

Since the discrimination rate is highest in the first selection stage and falls in the course of an application process (see Krause et al., 2010, p.4), the use of anonymous application procedures could be a successful tool for less discriminatory job placement.

Internationally, anonymous applications have long been used in recruitment procedures (see Krause *et al.*, 2012) and researched through various model projects in different countries (including Sweden, France, Switzerland, the Netherlands). As Åslund and Skans (2012) find, such anonymous applications level the playing field in the screening process. These findings support the results of a study conducted by Watson and Johnston in 2017, during which they find that discrimination by attractiveness significantly decreases when companies forego an applicant's personal information in the first screening process.

International experience shows that the chances of being invited to a job interview are increasing for certain groups of applicants by anonymized applications. The disadvantage of such a process for many companies and institutions is the additional work involved in recruitment and the delay in the selection process. There are also two major difficulties in the implementation and practicability of anonymous application procedures: On the one hand, more efficient methods for anonymization must be developed and, on the other hand, the characteristics to be anonymized must be defined. However, in terms of the non-objective candidate feature of physical attractiveness, the anonymous application process, if handled efficiently and methodically standardized, seems to be a tried and tested means against discrimination.

Minimizing attractiveness bias in selection decisions

The same holds for the interview process itself, where the physical attractiveness as the first information of an applicant can influence the assessment and thus the further course of the conversation both positively and negatively. As a result, attractive candidates may be perceived as more competent, more appropriate, and more likely to be persuasive, as they are given more time to talk because of their attractiveness by the interviewer (Huffcutt et al., 2011). Often, interviews are not well-structured enough to minimize the impact of extraneous candidate characteristics for bias. Schuler and Marcus (2006, p. 220) therefore advocate the use of a multimodal interview on the basis of the trimodal model of aptitude diagnostics, which will be described more in detail below.

Personnel selection-relevant instruments can generally be divided into various categories: on the one hand, personality-oriented procedures which in turn split into characteristics-

oriented and simulation procedures, and, on the other hand, biography-oriented procedures.

Biography-oriented methods of personnel selection

The historical analysis of characteristics and behavior (training, special knowledge, grades, work experience, etc.) forms the common basis of biographical procedures. These personnel selection procedures aim to build a predicted behavioral prediction based on past behavior. The instruments include the analysis of application documents (including curriculum vitae), biographical interviews or job interviews and, in rare cases, biographical questionnaires. This should provide information about the previous fields of activity of the applicant and the related work success as well as conclusions about his personal and professional qualities (Schuler and Marcus 2006). The biographical interview or job interview also serves to get to know each other personally and to determine the attitudes and values of an applicant with relevance to the requirement profile of the position in question. At the same time, the applicant should be informed about the company, the requirements and fields of application of the respective position. This interview can be carried out completely openly or partially or fully structured (questionnaire and course are set partly or completely in advance). The advantages of these procedures are the high acceptance of candidates and the comparatively low effort, since no comprehensive competences of the personnel decision makers are necessary for the evaluation. Basically, the instruments used are verifiable or at least in principle verifiable and relate to the professional background and the professional past of the applicant.

Personality-oriented recruitment methods

In many organizations, conventional biography-based recruitment procedures are now complemented by psychological tests that are character-based. Such character-oriented procedures aim to capture the candidate's stable and cognitive characteristics (e.g. intelligence or ability to concentrate, personality traits, attitudes). There is a large number of standardized test procedures for the acquisition of cognitive and non-cognitive properties from differential psychology and aptitude diagnostics for this approach to personnel selection (for a review and meta-analysis, see Schmidt and Hunter, 2008). Intelligence, performance or personality tests, for example, can be used as character-oriented personnel selection tools. The results of such tests are objectively and directly comparable, which counteracts any potential biases.

Performance tests, on the other hand, are primarily aimed at drawing conclusions about the individual skills of applicants, for example, their ability to concentrate or their speed of reaction. In addition, it is often a matter of measuring physiological and task-specific

abilities (Krohne and Hock 2007), based on the concrete job requirements of the position to be filled. Again, the results are usually well comparable. However, in both methods, the required effort is significantly greater than in biography-oriented selection process, the applicant acceptance, however, much lower.

Simulation-oriented methods focus on situation-specific behavior of an applicant in various work-typical contexts (eg assessment center, work samples, etc.). With simulation-oriented methods, performance or performance for specific occupational requirements is to be recorded in realistic simulations. Decisive for the validity of the procedure is the content validity, in specific the content of the tested activity with the actual occupational activity and its central elements. This procedure is often used by applicants (for example, new entrants) who have few biographical information.

Trimodal approach of occupational aptitude diagnostics

The trimodal approach of vocational aptitude diagnostics assumes that the different procedures are based on their own (validation) logic and accordingly different methods are required to record the characteristics. In other words: the trimodal approach refers the joint use of the three approaches and thus should allow a multifaceted consideration of an applicant. The use of all three diagnostic approaches is optimal, as a complete diagnosis can only be made by using several different procedures. Additionally, the different occupational aptitude diagnostic methods are prone to different kind of biases – a combined use of all three minimizes the overall bias.

Minimizing attractiveness bias in selection decisions through minor adjustments to existing processes

The usage of trimodal processes or the implementation of an anonymized application is, however, restricted by resources and time available for selection decisions. In addition, both require a certain level of acceptance and standardization throughout the labor market as not to place firms which employ them at a disadvantage compared to peers with less costly and time-consuming processes.

Thus, simpler methods can be employed to counteract attractiveness bias: more **balanced ratios of men and women** conducting the interviews is one of these. As the famous saying goes: *beauty lies in the eye of the beholder*, which is especially true for the perception of beauty for men and women. Balanced ratios of interviewer genders could thus lead to a drastic reduction of attractiveness bias: what she perceives as attractive could be

perceived neutrally by him and vice versa.

Interviews conducted over the **telephone** can further help to level the playing field in selection processes. Withholding the applicant's appearance until later stages of the application process reduces both positive and negative effects of attractiveness bias and is both time and cost-efficient to implement.

Minimizing attractiveness bias from an applicant's perspective

Applicants themselves can play a significant role in averting attractiveness bias. Rather mundane and obvious actions such as keeping a professional dress code and maintaining a professional composure and atmosphere during the interview to appropriate mannerisms and language can go a long way in deterring bias. Additionally, the focus of the interview should in any case be steered towards an applicant's objective qualifications. However, these actions can only go so far in diminishing the negative effects of the attractiveness bias. As Shanani, Dipboyle and Gehrlein (1993) find, attractiveness bias in face-to-face interviews affects most significantly female applicants with low perceived attractiveness. Further research into the so-called *beauty is beastly*-effect suggests that high perceived attractiveness can be disadvantageous to female applicants applying for traditionally male positions, with this effect reversing when they apply for typically female positions (Johnson, Podratz, Dipboyle, and Gibbons, 2010). No such effects were found for male applicants (Johnson *et al.*, 2010). These findings seem to point towards the obvious advantage of keeping average looks for female applicants; a feat easier said than done.

In a recent research paper on mitigating the effects of the attractiveness bias, Johnson, Sitzman and Nguyen (2014) find that acknowledging appearance counteracts the negative effects of the *beauty is beastly*-effect. In their paper, Johnson *et al.* analyze the effect of highly attractive female applicants acknowledging their looks when applying for typically masculine positions in three separate studies, finding a positive correlation between this *acknowledgement intervention* and reduced attractiveness bias. Exempting this study, very little academic research has focused on testing methods alleviating or even eliminating such bias, highlighting the need for further research.

4.2 Limitations

There are two main concerns with the present study: first, the external validity, second, its applicability to the business context. Regarding the first, it could be argued that the participants of the show are not representative of the population. While it is true that primary data on attractiveness bias in organizations would be ideal, it is hard to obtain and difficult to quantify. The underlying bias is slow-acting, which would require data collected extensively over the course of many years, as well as implicit, which makes it very hard to discern from a large amount of data. The clear advantage of the present study is that the *reject* or *accept* decision of participants at the end of the show makes the bias *explicit*, while naturally controlling for personality traits. As to the representativeness of participants, it can be contended that the demographic characteristics of the participants do not greatly differ from population means regarding race and occupation. Especially the latter proves to be of great advantage when compared to laboratory experiments, where participants tend to be very homogeneous (Belot *et al.*, 2012).

As to the applicability of the results on the business context, it can be argued that deeply ingrained behavioral heuristics and biases are not limited to personal life and greatly affect the professional context. While there is a consensus in academic research that attractiveness bias is prevalent in the workspace (see for example Hamermesh and Biddle, 1994; Mobius and Rosenblat, 2006; and Johnson 2010), little effort has been put into analyzing gender-specific differences of this particular phenomenon. Additionally, this study is unique due to shedding light on the effect other personal characteristics, such as age, race and occupation, have on attractiveness bias.

Lastly, it could be said that the context of a TV show leads to a form of Hawthorne effect: participants might modify their behavior due to the fact that they are aware of being observed. However, evidence found by Beetsma and Schotman (2001), Levitt (2004), and Belot *et al.* (2012) suggests otherwise. Especially the last stipulates that while participants might be tempted to modify their behavior away from '*frowned upon*' actions such as racial discrimination, attractiveness carries no such stigma.

Conclusion

To conclude, this present study has three main findings: first, perhaps surprisingly, women are found to discriminate based on outward physical appearance more than men (by 15%). This contradicts most findings in academic literature based on laboratory experiments (Sprecher et al., 1994; Fisman et al., 2006; Croson and Gneazy, 2009; Hitch, Hortaçsu, and Ariely, 2010); however, it is in line with recent research conducted by Belot (2012) in TV game show settings. Second, attractiveness bias is independent from age, race, and occupation. This is mostly in line with recent findings by Marlow, Schneider, and Nelson (1996). Lastly, regional allocation has weak effects on attractiveness discrimination. This implies that attractiveness bias is, to a certain degree, ingrained in a country's culture and highlights the need for additional research into this area.

Given the highly stylized nature of the interactions on this television show, one must use extraordinary caution in trying to draw general conclusions from these results. However, due to the subconscious nature of cognitive biases, some general recommendations and implications for HR managers can be formulated. These include, but are not limited to: an implementation of a system of checks and balances and code of conduct; the neutralization of the selection process; the education of employees about cognitive biases; the usage of quantifiable performance control measures as well as promotion and compensation tied to objective goals and milestones. An unbiased, efficient process based on merit and accomplishments should be the logical consequence of such measures.

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