

The Gender Gap in High Ranking Positions – a Literature Review into the Supply Side of the Gender Gap

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Abstract

This thesis provides a literature review into the subject of the gender gap in high-ranking positions. Causes that can be categorized inside the supply side of this phenomenon will be reviewed and three different categories will be discussed: gender differences in ability, gender differences in preferences, and gender differences in perceived ability. Women tend to shy away from competition, and also underperform in competition against men. In the areas of ability, perceived ability, preferences for risk, and preferences for other regarding preferences, results are much more ambiguous. The disappearance of the gender gap in high-ranking positions does not seem efficient nor welfare improving.

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1. Introduction

In all parts of the world, female senior executives, and notably female Chief Executive Officers (CEO's) are exceedingly exceptional in large corporations (Oakley, 2000). In 2005 it was found that women occupied approximately 50 percent of jobs in the United States, while still 95 percent of senior managers were man. And to make matters worse, women were earning 40 percent less than their male counterparts (The economist, 2005; Ragins et al, 1998). Even recently, in 2013, women only occupied 17.8 percent of board members in the biggest publicly-listed companies in the European Union (European Commission, 2014). While entry and mid-level managerial positions do show more progress with respect to women occupying these positions, the high-ranking -like CEO positions- show a lack of progress. Currently only 4.6 percent of CEO positions at S&P 500 companies are held by women (Catalyst, 2015). Next to an unequal distribution in occupations, also discrimination in wages occurs in that women face differential returns to the same characteristics (Booth, 2009).

Recruiting and retaining the best employees, making the best use of human resources, and elaborating on productivity and competitiveness are all factors that would imply that the under-utilisation of women's skills is a lost resource for the economy and society as a whole (European Commission, 2015). In order to remove this seemingly costly barrier, it is important to firstly identify causes before implementing possible solutions into organizational climate to assure equal job opportunities for women. Since the 90's, much research is done into the subject of the gender gap- all focussing on different aspects- and possible policy implications. This thesis will give a literature review on the subject of the gender gap and examine why women have not yet risen to the top in the same quantity that men have. This research will make use of arguments and findings in both the economic and psychological field.

There are two very different types of causes that try and explain the lack of the female gender in high-ranking positions. Sources of this phenomenon lay both in the supply and demand side of the labour market. The former includes behavioural and cultural aspects like gender differences in abilities, preferences with respect to risk, impatience and competition, and also introduces stereotyping. The latter includes barriers created by corporate practices that favour the recruitment, retention, and promotion of the male

gender over females. It involves discrimination in the working place, characteristics of the market –like for example firm size, industrial segregation, and occupational segregation-, and the position of individuals in the web of social relations that supply information and support. An example is a study by the World Economic Forum in 2005 that shows that possible causes of the gender gap are obstructive attitudes, and legal and social systems using maternity laws and benefits to punish women economically for the having of children, and discouraging men from sharing family duties. This phenomenon crosses all cultural boundaries and professions and has an effect on the female gender in all countries (World Economic Forum, 2005). In the United States alone, 49 percent of women occupying high-rank positions are childless, in comparison to 19 percent of men (Hewlett, 2002). Furthermore women show a highly non-linear negative relationship between time off and income (Bertrand et al., 2010). Another noteworthy study is the one conducted in 1993 by Marshall. He posed that organizational cultures are based on values and characteristics associated with manlike gender-role stereotypes. These automatic features of culture should be taken into account as barriers to advancement for women (Tharenou, 1999). Much research has been done into this demand side of the gender gap, and exceedingly agree on the findings and recommendations.

The subject of the supply side of the gender gap has gotten a great deal of scrutiny over the last five years. Studies show considerable ambiguous results. Different implications should thus be made for both categories of barriers created by corporate practices and for behavioural and cultural barriers since the latter are rooted much deeper and thus would be expected to be altered much less easily (Oakley, 2000). Which side of the market plays a bigger part in explaining the gender differences in advancement to executive levels remains a question unanswered till this day. This paper will look in depth into the supply side of the puzzle why women are underrepresented in top positions.

The research question discussed in this thesis concerning the gender gap is the following: *Which supply factors help to explain the gender gap in high-ranking positions?*

Even though women constitute nearly half of the United States' labour force and their occupation in managerial positions grew to 43 percent in 1995, in top positions there is still no place for women (Ragins et al. 1998; Catalyst, 2015). It has been half a century since the start of the upcoming of women's rights, and most women are still stuck half-way the corporate world in middle management (Halpern & Cheung, 2008). The situation where gender pay gaps are typically wider at the top of the wage distribution than at lower levels is acknowledged as the 'glass ceiling'. This metaphor is used to analyse inequality between the two genders in the workplace while moving up the hierarchy (Akpinar, 2012; Yap and Konrad, 2009). The concept of the glass ceiling is however still a very ambiguous one because some investigations have looked at levels of authority, others at positions in the corporate hierarchy, others at earnings, and others at occupations. According to the Federal Glass Ceiling Commission, the glass ceiling refers to the unseen, yet unbreachable obstruction that keeps minorities and women from rising to the upper levels of the corporate ladder, regardless of their qualifications or achievements (Cotter et al., 2001). This focus on positions in the corporate hierarchy will be used throughout this literature review.

The phenomenon of women specifically not reaching the top positions could be labelled as an extraordinary one that can be attributed to increasing levels of competition up the corporate ladder (Bertrand et al., 2010). The corporate ladder can be considered a tournament where a large amount of people competes for promotions to a few top positions and jobs (Wozniak et al., 2010). Competition preferences thus play a critical role in obtaining high-ranking positions and could therefore also play a specific role in explaining the difference in the number of females and males in high-ranking positions.

Three main categories of supply factors can be mentioned in light of this research: gender differences in ability, gender differences in preferences, and gender differences in perceived ability. By assigning characteristics of both genders to the specific sections, this thesis will classify different causes to the supply side of the gender gap.

A first category that contains factors that help explain the gender gap is differences in ability between men and women. Several decades of research by different psychologists proves that individual characteristics such as general cognitive ability and personality

traits can be clearly linked to success in a broad range of jobs (American Psychological Association, 2004). If a significant difference in ability would be found between both genders, then the gender gap in high-ranking positions can thus be partly explained by uncontrollable and unchangeable sources of human nature. Elements that can be thought of are differences in performance under a competitive environment, differences in cognitive ability, and lastly differences in genetic factors like hormone production.

A second category covers preferences. It is often hypothesized that gender differences in domains like consumption, investment and –most relevant- the labour market are caused by preference differences between the genders. This thesis reviews the literature on gender differences regarding preferences in economic experiments. Gender differences in risk preferences, gender differences in competition preferences, and gender differences in other-regarding preferences are all concepts that have to be taken into account when discussing causes of the gender gap.

A last group of causes could originate in differences in perceived ability. If men would perceive their ability much better than women do, this would help explain the gender gap and explains why women underperform in for example competitive settings. In this subject there should be allowed for overconfidence, differences in belief, and stereotyping.

Gneezy, Niederle, and Rustichini performed a study in 2003 that used a similar classification of causes. Like most other relevant experiments and studies, the design was done in the following way. To test whether men and women differ with respect to performance in competitive settings –taking in mind the competitive character of the high-ranking jobs- and to control for discrimination, controlled experiments are performed. A task or maze has to be completed in both a competitive and non-competitive setting. In the benchmark treatment, the payoff depends on the own performance of individuals. Individuals are payed a fixed piece rate for every maze solved. To compare findings with results found in a competitive setting, both performances under a piece rate and under tournament settings are studied. Competition effects are observed in a tournament setting: payoffs are proportionally to the number of mazes solved (Gneezy et al., 2003). This allows the researcher to isolate

one factor of a decision –e.g. risk preferences- from other factors. What they found was that women perform worse in a competitive environment. In tournaments they find a significant gender gap, while this phenomenon did not occur when participants were paid according to a piece rate.

Another benchmark study is the one by Niederle and Vesterlund conducted in 2007. They first examine differences in ability to perform in a competitive environment by letting individuals solve computerized mazes. Then introduce uncertainty without competition, and lastly measure performance of both genders in single-sex tournaments. They found that when given a choice between a piece rate or a winner-take-all tournament compensation scheme, females strongly prefer and chose the piece rate while men went for the tournament setting. These results remained significant after controlling for confidence and risk aversion. The strength of experimental economics lies in the fact that many findings and studies are replicated in different contexts to check for the validity and robustness of results. Throughout this thesis these concepts will be discussed and a literature review will debate findings of studies with the just mentioned set-ups from over the last 20 years.

This paper is organized as follows. In section 2 gender differences in ability are discussed. Section 3 will go about gender differences in preferences regarding competition, risks and other-regarding preferences. The last section of the main theory will be discussed in section 4 and will contain gender differences in perceived ability. The final section provides a conclusion and discussion.

2. Gender Differences in Ability

Economists and policy makers have observed gender differences in all sorts of areas, ranging from consumption, to investment, and the labour market. But what factors generate this gender gap? All different sorts of studies in this subject have been performed with mixed results. In this section the existence of gender differences in ability will be examined.

Although sex differences in general intelligence have been rejected, differences in cognitive abilities have been extensively considered in the psychological field and literature. There is generous evidence from economics and psychology that cognitive ability is a powerful predictor of economic and social outcomes: cognition is among others essential in decision making and processing information (Gottfredson, 2002; Heckman et al., 2006). There exists a possibility that women are underrepresented in high-ranking positions because of 'innate differences' between the two genders (Summers, 2005). There has been a lot of controversy about this speech by Summers on innate differences and still no conclusive verdict has been reached. A review into sex differences in cognitive abilities shows no evidence for the inferiority of either gender (Halpern, 2012). Three major differences in cognitive abilities that have been reported by a wide range of psychological and neuropsychological literature favour women in verbal abilities, and are favouring men in spatial- and arithmetical abilities. Even though gender differences in language abilities remains a controversial topic since not all studies show supporting results, the most common-found results are that women score better in a variety of verbal tests, show faster language development, have a broader vocabulary, more accurate speech production, greater fluency, and lastly perform better on word list learning tasks. With regard to spatial abilities, men -without doubt- outperform women in tasks like navigation and geographical orientation. This significant effect is however small. Studies in the subject of gender differences in mathematical skills also show significant results in different age categories (for a review see Ardila, Roselli, Matute, & Inozemtseva, 2011). Scientists have not yet agreed on the origins of these mentioned differences but both biological as environmental factors should be taken into account. Effects of these differences found in verbal-, spatial-, and arithmetical abilities on competition and the gender gap have not been well-defined, but

it can be clearly seen that to be efficient, well-performing, and high-achieving in high ranking positions, all these three categories of abilities will correlate with performance.

Another question that comes to mind then is whether there exist genetic factors that influence gender differences in ability: sex differences in hormone production and their effects on behavior and decision-making. Different studies have found that hormones correlate with specific parts in the human brain that could influence behaviour (Aleman et al., 2004; Driscoll et al., 2005). If the gender gap in competition could be largely explained by genetic factors, trying to close it would not prove optimal for an efficient labor market. Comparisons can be used to analyse sex differences in hormone production and possibly the bio-behavioral responses to stress and challenges (Bateup et al., 2002). There is a large literature recording the role of testosterone in competitiveness. In men, the link between testosterone and competition is clear: it is complementary (Booth et al., 1989). For females, the connection appears not so clear-cut. A study into the female rugby game showed interesting results. The study explored relationships between testosterone production in anticipation of, and in response to aggressive and physical competition among women. Women did not experience a testosterone-related elevation after winning that was experienced by males, nor did the losers experience the decline in testosterone levels that were observed in men. This could be explained by the expectation that female respond differently to challenges: more directed toward creating and maintaining relations (Taylor et al., 2000). However, self-selection has to be considered, and the fact that the setting of the experiments is in teams rather than individuals (Bateup et al., 2002). With self-selection it is meant that some women self-select their way into the rugby sport, and that consequently this group might not be representative for the whole female population. Another similar study from 2005 was conducted with individuals participating in a rowing ergometer competition. Behavioral assessments included measures of previous rowing experience, dominance, competitiveness, bonding with teammates, pre- and post-competition mental state and performance. Results show –in contrast to the previous mentioned study- that in anticipation of competition, women experiences a decline in testosterone levels, while for men again an elevation was found. An interesting result was that once a higher testosterone level prior to competition was found, this was related to subsequently poor performance. This would imply that men have a disadvantage in

competitive settings. Effects measured in reaction to competition during the event phase show a rise for men, and a decline in levels for women. Again a contrasting finding. For both genders, higher testosterone levels were linked to worse performance. Findings thus imply that testosterone levels do not always positively influence performance and that the direction of this effect may not hold as competitors gain experience. Further findings show that female athletes seek to prepare for the challenge by interacting with teammates and they reveal that their thoughts before competition include concerns about for example 'encouraging their teammates to get prepared' (Kivlighan et al., 2005). This subject of altruism will be discussed later in this thesis. Moreover, testosterone has been associated with lower offers and more rejections in ultimatum games, it influences financial risk taking, and the likelihood of choosing a career in the finance field (Buser, 2012).

Next to testosterone, also research has been done into the hormone oxytocin and the oestrogen level in women and their impact on economic decision-making. Various studies find ambiguous results ranging from no impact of levels on altruism, trust, fairness, and risk aversion to increased giving in trust and ultimatum games (Kosfeld et al., 2005; Zak et al., 2009; Zethraeus et al., 2009). Another biological factor that influences competitiveness in women is the effect of the menstrual cycle and hormonal contraceptives. Thomas Buser (2012) finds that the likelihood of preferring a competitive environment is strongly and significantly influenced by and over the menstrual cycle and the intake of hormone contraceptives. This effect is not a result of the menstrual cycle on performance, risk aversion, or overconfidence.

Next to hormonal differences, personality traits could also account for a part of the gender gap in competitiveness. Personality characteristics that are most discussed and studied are the so called 'Big Five': openness to experience, conscientiousness, agreeableness, extroversion, and neuroticism. More and more research tries to understand the relationship between the 'Big Five' and labour market outcomes (Borghans et al., 2008). Agreeable, Müller and Schwieren (2012) find that neuroticism, a trait found more specific for women, negatively correlates with tournament entry. Controlling for it reduces the gender gap. Almås et al (2014) also focus on the different personality characteristics of the 'Big Five' and their relation to tournament entry, but however find no significant relationship. More research is necessary.

Societies and groups have different gender roles. Many researchers argue whether gender differences are caused by evolution or by socialization. A first stream of research that sheds light on this question is a look across cultures. If behaviour differs per gender and per culture, this supports the view that nature or socialization plays a role in explaining the gender gap (Croson & Gneezy, 2009). This effect has an influence on preferences and perceived ability as well. Indeed, different papers find an impact of culture on the gender gap (Gneezy et al., 2009; Cardenas et al., 2014). Sex differences in cognitive abilities have also been related to cultural influences and education background (Ardila et al., 2011). The way behaviour and thoughts are formed is “established early in life through a continuous series of dynamic interactions between genetic influences and environmental conditions and experiences” (Fox, Levitt, & Nelson, 2010, pp .28). From this it can be easily concluded that the society people live in has a far-reaching influence on how people develop their cognitive abilities (Thurstone & Thurstone, 1941; Halpern, 2012). Furthermore, gender differences in cognitive abilities show to be related to educational levels. Groups with higher levels of education show significantly better performance on neuropsychological tests. This has to be taken into account once comparing western with non-western cultures: educational levels and culture are intertwined (Ostrosky et al., 1985; Roselli & Ardila, 2003). Another result shows that children from low socio-economics status are much less willing to compete. This holds when controlling for confidence, performance, risk-, and time preferences, social preferences, and psychological traits (Niederle, 2014, pp. 25; Almås et al., 2014).

Another last aspect considered is that women might be less able to compete in competitive environments. Selection procedures for high paying jobs and promotions are mostly based on tournament-like competition to select the highest performers (Buser, 2012). Later in this thesis competitive preferences will be discussed, but a first part of this story lies in the fact that women may be less effective than men in competitive environments. Gneezy, Niederle, and Rustichini find that females see lower performance gains from engaging in a competitive setting (2003). They find that for mixed-gender groups, males show significant better performance once the competitiveness in a setting is increased but no such thing was found for females. The difference between the tournament setting and the piece rate is that payment is uncertain, and it depends on the performance of others. There were no effects of risk

aversion or uncertainty on gender differences in mean performance and the found results can thus be described to women being less effective than men in competitive environments. A follow up study by Hurley conducted in 2005 tests for the robustness of the results found and includes a new additional task next to solving mazes: matching pictures. Men improve more than women in both tasks, implying that men are more competitive than women regardless of the task specified (Hurley, 2005). Another complementing study assessing whether men and women respond differently to competitive pressure in a setting with large monetary rewards (Grand Slam tennis tournaments) finds that both men as women adopt a less aggressive playing strategy once at crucial junctures of the game. No signs of the existence of a gender gap was thus found (Paserman, 2010).

In conclusion, three major differences in cognitive abilities between the two genders are differences in verbal abilities, spatial, and arithmetical abilities. Origins of these differences could be described both to biological as environmental factors. Sex differences in hormone production influence behaviour, but no clear-cut general conclusion can be made since a great deal of ambiguous results exists. Next to hormone influence and personality traits, cultural aspects could be of influence. Of course the origin of the causes of the gender gap should be considered when deciding if closing it proves efficient and utility maximizing for individuals and society. Most effects mentioned do not appear to be of large influence to the gender gap, implying the difference in ability is a significant but not the central and leading cause in explaining why men defeat women under competition and the gender gap in high-ranking positions.

3. Gender Differences in Preferences

A next category of causes of the gender gap in high-ranking positions can be attributed to difference in preferences between men and women. With regard to preference differences, this thesis will focus on 3 relevant factors with regard to the supply side of the labour market: risk preferences, competition preferences, and social preferences. If men show to prefer more risky jobs, have more preferences for competition, and have less other regarding preferences, this would help explain part of the gender differences in the higher positions of the labour market (Croson & Gneezy, 2009).

3.1 Risk preferences

In the labour market, every decision individuals make involves risk and risk taking. Already in 1974, King showed that individuals who are more willing to take risks work in riskier occupations, and a correlation exists between occupational risk and expected income. This is backed up by findings of Skriabikova, Kriechel, and, Dohmen (2014): individuals that take more risks more frequently choose majors that prepare for occupations with larger earning variance. If women prefer and choose less risky career paths, this can explain part of the gender gap. In this section, literature examining gender differences in risk preferences is reviewed.

The fact that women are more risk averse than men seems indisputably true. This has been proven repeatedly by different studies that use a variety of settings: abstract games, contextual experiments, and field studies (Croson & Gneezy, 2009; Eckel & Grossman, 2008b; Byrnes et al., 1999; Scotchmer, 2005; Holt & Laury, 2002; Dohmen et al., 2005; Fehr-Duda et al., 2006; Levin et al., 1988, Hartog et al., 2002). For example, Sunden and Surette (1998) find that gender is significantly related to asset allocation. Holt and Larry vary the size of a lab experiment using gambles and find that there exists differences between low-payoff and high-pay off decisions between the genders. Women invest their pension assets more conservatively than men do (Hinz et al., 1997). Married women invest less in common stock than men (Bajtelsmit & VanDerhei, 1997). In summary, with regard to portfolio selection and high stakes decisions, men are more

risk prone in lab settings as well as in investment decision in field settings (Croson & Gneezy, 2009). The reasons behind this phenomenon and accompanying conclusions however are still open for discussion.

A first explanation offered for the gender gap in risk taking is based on differences in emotional reactions to situations with more risk. Women seem to experience emotions more strongly than men experience them, and this unquestionably affects the utility function of women with respect to a risky choice (Harshman & Paivio, 1987). The female gender describes more nervousness and fear before negative outcomes and this explains why women are naturally more risk averse (Brody, 1993; Fujita et al., 1991). Furthermore there is an effect of emotions on the perceptions of probabilities in gambles: anger makes individuals more risk loving. Together with the fact that women tend to be more fearful while men tend to feel anger in identical situations, women will thus evaluate a gamble as being more risky and behave more risk averse (Grossman & Wood, 1993; Lerner et al., 2003).

Another reason is the difference in interpretation of a risky situation. Setting should be considered here: there exists a considerable difference between uncontrollable risk and situations with risk where effort matters. For this section only the latter will be considered since controlled experiments and the competitive environments of high-ranking positions both are settings in which effort has an influence on performance and outcomes. Men are more likely to perceive a risky situation as a challenge while women tend to see them as threats that stimulates avoidance. This is however with respect to a small amount of situations, this finding is very setting dependent. There also exists the influence of framing: whether a gamble is described as a gain or a loss. A literature review by Croson and Gneezy (2009) found that women are more risk averse than men in gains gambles, but less evidence exists for loss gambles. Women are less stimulated by challenging, ego-involving situations than men: there exist different motivation between genders (Arch, 1993; Block, 1983). Of course the question that arises here is how traits like ambition or challenge seeking differ from competitiveness or the degree of risk preferences.

There are a few side notes and weaknesses worth mentioning with regard to the influence of risk preferences on the gender gap. Firstly, evidence whether risk

preferences change with age is ambiguous and there exists little evidence on the stability of risk preferences (Sahm, 2012; Sutter et al., 2013). Another factor is that it is hard to measure risk attitudes and a great amount of studies have measured with error. So do Filippin and Crosetto (2014) argue that gender differences in risk attitudes systematically correlate with features of the elicitation method used, the availability of a possible safe option, and in what way probabilities are presented: framing effects. They correctly pose the critique that no research has been done whether, and to what extent, the observed results are driven by the characteristics of the elicitation task at hand. Three elicitation methods that are most widely used are the Eckel and Grossman¹ task, the Investment Game², and the Holt and Laury³ (HL) risk method. The former two show systematic gaps, while the HL task method shows different results: no significant difference in risk attitudes between men and women. Risk attitudes are a hidden construct that cannot be measured directly nor perfectly, and they conclude that there exist significant differences between risk preferences between men and women, but it is an economically unimportant one (Filippin & Crosetto, 2014). Sceptics have also raised concern that individuals who participate in these studies have been potentially exposed to the attributes and characteristics of the occupations they have worked in for a longer time, shaping and altering their preferences (Fouarge et al., 2014).

Next to this there is the note that once women did 'make it'/became professional, there appear no differences in risk attitudes between women and men (Croson & Gneezy, 2009): this would indicate selection effects. Selection effects would imply that people that are more risk-taking tend to choose managerial positions. Models imply that winner-take-all games favour males, but successful females maintain greater skill on average (Falaschetti, 2007; Scotchmer, 2005). Atkinson et al. (2003) compared investment behavior of fund managers -and thus occupying a high position in the labour market- between the genders, and showed that differences in behavior could be attributed to investment knowledge and wealth constraints rather than performance or

¹ In the Eckel and Grossman task subjects make a single choice, picking one out of an ordered set of lotteries. Subjects are faced with five lotteries, characterized by a linearly increasing expected value and a greater standard deviation (Eckel & Grossman, 2002, 2008a).

² In the investment Game subjects decide how to allocate a given endowment between a risky lottery and a safe account. The task is framed as an investment decision (Gneezy & Potters, 1997; Charness & Gneezy, 2010).

³ The Holt and Laury method is the most popular risk elicitation method in the literature and constitutes the most widely known implementation of a multiple price list format applied to risk. For a more extensive review see Croson & Gneezy (2009) or Holt and Laury (2002).

risk. Croson and Gneezy (2009) show that there are significant differences in decision making between 'non-managerial' population and managers, and that fewer women selected these positions, but those that did appear to have similar risk preferences than men. This could be because of selection effects, or because of adaptive behavior to the specific context requirements (Croson & Gneezy, 2009).

Lastly, two other aspects are of influence. Culture not only influences ability, but also causes gender differences in risk taking (Croson & Gneezy, 2009). Additionally, the gender composition of the group individuals that people were assigned to in a controlled experiment plus the gender mix of the school they attended affect individuals their risk preferences. The just mentioned limits will be discussed more extensively under preferences for competition. Girls in same-gender experimental groups are less risk averse than girls in mixed gender experimental groups (Booth, 2009). Gender differences in behaviour found in studies might thus not reflect gender traits but could merely reflect social learning (Booth & Nolen, 2012).

In conclusion, different factors play a role in the phenomenon that women seem to be more risk averse than men. Differences in emotions, emotional reactions, and the interpretation of a risky situation all play a significant role. A sidenote worth mentioning is however the fact that not all studies agree on the extent to which risk preferences and attitudes are important in explaining the gender gap. The elicitation method at hand influences these risk preferences, and again selection effects and gender composition are involved.

3.2 Competition preferences

In this section, the gender difference with regard to attitudes toward competition will be reviewed. In section 2 actual performance in a competitive setting was discussed: men seem to perform better under a more competitive setting relative to women. In this section it will be looked at whether women additionally shy away from competition and which other factors influence preferences for competition. Most studies show that women are more unwilling than men to engage in competitive environments (Datta Gupte et al., 2005; Domen & Falk, 2006; Niederle & Vesterland, 2007). Men and women

thus react differently to competitive incentives.

Like mentioned, most studies show the existence of a gender gap in performance between genders once in a competitive setting. A study by Stokes, Steele-Johnson, and Narayan (2007) distinguished male/male from female/female teams to isolate the effects on performance and examine effects of competition. Results favourably showed only male/male teams had greater performance. In another study, Gneezy and Rustichini (2004) showed again that the male gender improved performance more in a competitive setting. They do however mention a concern regarding the situation in which the experiments are conducted: the group composition could be of influence (Gneezy & Rustichini, 2004).

With regard to gender composition in competitive settings and controlling for risk attitudes, women appear to perform better in single sex competitive environments and equally well in mixed gender ones (Gneezy et al., 2003; Niederle & Vesterlund, 2011). Another study into this same subject is by Delfgaauw, Dur, Sol, and Verbeke (2013). In their study regarding competitive incentives on a professional manager and their team, they find there exists a strong effect of the gender of the manager and the gender composition of the team on performance. Male-led teams show more response to competition when a larger part of the team exists out of males. With most experiments being conducted on college students, this setting must be taken into account. Of course there is a question arising then: does the change in performance in an experiment arise because single-sex environments (like single-sex schools) modify preferences? Since 1980 different studies and psychologists have looked into this subject and they seem to agree on the fact that interaction between genders influences behaviour (Maccoby, 1998; Brutsaert, 1999). Girls from single-sex schools will have different preferences for risk and competition than female participants from coed schools. This consequently biases results and might additionally suggest that observed gender differences reflect social learning rather than inherent gender traits. A study shows that single-sex schools indeed have greater task emphasis and competition in comparison with coeducation independent schools (Trickett et al., 1982) and another more recent one shows that girls from single sex schools behave more boy-like even when randomly assigned to mixed-sex experimental groups (Booth & Nolen, 2009). It would be wrong to state that the average women avoids competitive behaviour more than the average men, this is

dependent on the setting of the experiment and the group of participants chosen. This is a tricky point to control for however, since most experiments are conducted with students, as they are a convenient group to study.

Next to gender composition, another factor considered is the choice of incentive schemes: women tend to shy away from competition. Once participants in experiments get the choice between a competitive or non-competitive setting, it can be seen that the majority of females prefer the non-competitive setting, while men prefer the tournament incentives (Niederle & Vesterlund, 2007; Croson & Gneezy, 2009). In the study by Niederle and Vesterlund (2007), participants of the same ability are tested in their choice into a competitive environment. They study whether men and women differ in their preference for a type of compensation scheme that they receive for the job or task specified. During a laboratory experiment, individuals of both genders solve a real task in both a competitive and non-competitive environment. Results show a gender gap in tournament entry that cannot be explained by performance or risk preference, but rather by gender differences in preferences for performing under competition. Women thus shy away from competition while men embrace it. Incentives have a strong impact on performance, both in group incentive schemes as in individual behaviour (Nalbantian & Schotter, 1997). One suggested explanation for this is *backlash*: female participants are more penalized than male candidates for assertive negotiation behavior. This would imply it is thus rational choice for women to avoid negotiation in some situations (Bowles et al., 2007; Eckel & Grossman, 1996; Croson & Gneezy, 2009). Another more recent study however finds that men too shy away from competition. Dargnies (2011) finds a significant gender gap in entry in the individual tournament setting, but once a team tournament is considered, no gender gap exists. Men enter significantly less when they are part of a team rather than alone. This seems to be linked to uncertainty regarding the ability of their teammates and fear to be victim of free-riding behaviour. An interesting finding by different studies with the same subject is that women who did choose and prefer the competitive environments performed equally well as that of men in those settings (Vandegrift & Brown, 2005; Gupta et al., 2005). So again self-selection effects have to be considered.

Even though the exact proportion of which the different causes are of influence on the gender gap remains unclear, a study conducted on high schools in the Netherlands show

that gender differences in competitiveness account for about 20 percent of the gender difference in track choice of education. This is the first study that proves that preference for competition actually explains choices made in real life and not merely in laboratory settings (Buser et al., 2014). They show that even though boys and girls display similar levels of academic ability, boys choose more prestigious tracks (like more math- and science- intensive tracks). To assess academic track choices of students, they control for both subjective and objective academic ability by not only measuring grades but also beliefs about the difficulty of the tracks. This study thus shows external validity of traits measured in the lab and demonstrates their external relevance. Two other studies also focus on the external relevance of competitiveness on education choices. Zhang (2012) conducts an experiment on middle schools in China and the likeliness of their students to take a very competitive entry exam for high schools. He finds no gender gap in tournament entry however, nor in entry rates of taking the exam. The second study by Reuben, Wiswall, and Zafar (2013) find that competitiveness is positively correlated with earnings expectations. Their findings support that of Buser, Niederle, and Oosterbeek and show that experimental variables are of importance even when including various control variables. Overall, there is clearly more work to be done to prove the external relevance of preferences for competitiveness as a trait that accounts for education and labor market choices.

Concluding this part, as the competitiveness of a setting increases, the participation as performance of women decreases relative to that of men in most settings. Cultural, biological, and genetic factors all help explain the gender gap in competition. Nurture and nature, willingness and ability are of influence and no clear-cut relation can be drawn. The question still unanswered is what weight to give the components, and how they interact with each other.

3.3 Social preferences

Other-regarding preferences have replaced pure egoism in many economic models (Linde & Sonnemans, 2015). That individual social preferences differ, and thus change utility functions independently, is a generally accepted fact. However, social preferences may also differ between men and women. Women may have different other-regarding preferences than men in which other people's payoffs and inequity aversion may play a role. A competitive environment always generates winners and losers, and if there exists a difference in other regarding preferences between the genders, this would generate differences in choices.

Kamas & Preston (2009) and Niederle & Vesterlund (2011) find a relationship between social surplus maximisers -and thus the degree to which people have other regarding preferences- and willingness to compete in tournaments. Other experiments show that social concerns influence decisions under risk: individuals become more risk averse in a socially disadvantageous position (Linde & Sonnemans, 2012). Ferrer-i-Carbonell and Ramos (2010) show that risk-averse individuals are in general also more inequality averse.

A literature review on gender differences in preferences by Croson and Gneezy (2009) shows that social preferences are modelled in the form of altruism, envy, inequality aversion, or reciprocity. They furthermore find that the social preferences of women are more context dependent than those of men: their social preferences are more malleable and situational specific. Evidence is based on ultimatum- and dictator games, trust games, and the Prisoners Dilemma games. Results show that differences in social preference can be explained by differential sensitivity of men and women to the social conditions in the experiment. Small differences in design could have an effect on social cues and this would lead women to appear more other-regarding in some experiments than others (Gilligan, 1982). Indeed, they find great-context sensitivity in women in both ultimatum games as dictator games. Examining trust and reciprocity, studies show that women trust less than, or the same as men, but results are again more context-sensitive than those of the opposite gender. Gender effects are sensitive to protocol and context (Chermak & Krause, 2002). Both men and women are utility maximizing, but the utility

function of both genders differ. That of men is less sensitive to the experiment conditions, information about the other party, and to actions of the other party (Croson & Gneezy, 2009). A paper by Balafoutas, Kerschbamer, and Sutter (2012) shows that when controlling for beliefs, risk, and distributional preference, the gender gap in tournament entry is completely eliminated.

However, not all evidence points the same way. There do not seem to be large differences in average contributions in public good games, and men show to be more strategic in this aspect (Gaechter et al., 2014). Balliet, Li, Macfarlan, and Van Vugt (2011) also conclude that the relationship between sex and cooperation in social dilemma games does not prove statistically relevant. They find that during same-sex interaction cooperation games, men were more cooperative than women. During mixed-sex interaction games, it was however again confirmed that women appear more cooperative than men (Balliet et al., 2011).

Andreoni and Vesterlund (2001) find that when altruism is expensive, women seem to be more kind, but once it is cheaper, men prove to be more altruistic. They show that men are more responsive to price changes. They use a dictator-game model that focusses on altruism separate from strategic concerns and look at sex differences on both the levels and variation in the price of giving. In addition they find that men are more prone to being either perfectly selfish or perfectly selfless. Women are more likely to share evenly. By showing that differences in altruism depend on the price, this result unifies the just discussed literature that thus far would have shown fractioned (Andreoni & Vesterlund, 2001). Papers that replicate the results of Andreoni and Vesterlund and that thus show that females are more focused on equity and men on efficiency include Visser and Roelofs (2011) and Fisman, Jakiela, and Kariv (2014).

Another interesting recent finding is by Vesterlund, Babcock, and Weingart (2014) who use preferences for contribution to a public good in combination with interests in discrimination and differences in beliefs about the behavior of other individuals. They expected women to volunteer more often than men but find that the average investment of both genders are the same. Again however, preference for the extremes are found for men: they were more likely to invest very seldom or very often (Niederle, 2014).

In conclusion, the message about gender differences in altruism is more mixed than once predicted (Niederle, 2014). The findings tend to point in the direction that females have more of an interest in equality and justice while men have a focus on efficiency. The implication is then that women would be expected to choose positions that create benefits for others, which are traditionally not high-ranking positions. This may help explain the gender and wage gap (Croson & Gneezy, 2009). If there would exist systematic differences in altruism by gender, this would have major implications for economic theorists and empirical researchers. Such sex differences may influence models on bargaining, household decision making, intergenerational transfers, and most relevantly sex-specific solicitation strategies.

3.4 Conclusion

In conclusion, this literature review finds gender differences in reaction towards competition, with women shying away from competition, and women underperforming once competing. When controlling for beliefs about perceived ability and risk aversion, the gender gap is still significantly present. With respect to gender differences in altruism, results seem more ambiguous but it clear that men and women differ in how their utility depends on other people's payoffs. Women appear to be more risk averse than man, but also react differently to the framing of risks and there exists selection effects. Furthermore different elicitation methods make constructing a valuable conclusion very difficult. There thus exists a lack of a unified result and the questions in which way and to what extent the preferences for competition, risk, and social preferences per gender contribute to the gender gap cannot yet be answered but a significant role can be ascribed to all three separate factors (Niederle, 2014).

4. Gender differences in perceived ability

Since 1987, the importance of understanding the priors to perception of ability have caused a great amount of studies into this subject and its linkages to differences in career and educational choices (Eccles, 1994). Reasonably, people are more likely to pursue careers in fields and domains in which they feel competent. If they would believe some specific careers or positions would take more work for them than for other people, this would discourage them to pursue such spots. This section will discuss confidence, stereotypes, and reactions to feedback on performance and differences of the just mentioned factors between genders.

Another explanation related to the supply side of the gender gap in competition could relate to confidence, and then specifically: overconfidence. Niederle and Vesterlund (2007) argue that one third of the gender gap in tournament entry can be accounted for by gender differences in confidence. Buser, Niederle, and Oosterbeek (2014) find a fitting result and argue that once controlling for performance, slightly over 30% over the gender gap in differences in tournament entry can be explained by differences in confidence.

Literature shows that both genders show traits of overconfidence, but men show more overconfidence in uncertain situations than women (for a review see Croson & Gneezy, 2009). Soll and Klayman (2004) show that all participants exhibited overconfidence in a lab experiment regarding evaluating the correctness of their own previously given answer to a certain question, but men were more biased. Niederle and Vesterlund (2007) show that men are specifically more overconfident in their relative performance solving mathematical problems, and that this positively influences entry decisions into competition. In 2011, Niederle and Vesterlund again published a review on this subject and show that the overall evidence does show gender differences in beliefs with respect to confidence and relative performance explain a part of the puzzle, but that this does not eliminate the whole gender gap.

Like mentioned before, many executive level jobs require a high amount of risk-taking. A next role addressed in this section is stereotypes: beliefs about the ability and preferences of men and women (Croson & Gneezy, 2009). Since the 1990, the concept of

the threat that exists when one is in a situation of doing something for which a negative stereotype about one's group applies exists and had been labelled the 'stereotype threat' by Steele. It presents a degree of self-threat and is expected to influence people's performance negatively (Gneezy et al., 2001). There has been found an overestimation of women's risk aversion in laboratory settings (Eckel & Grossman 2002a) and investment behavior (Atkinson et al., 2003).

A recent study in 2009 has been conducted on hundred high school girls and their soccer performance in relation with their beliefs of the stereotype that girls are not good at soccer. Results show that the belief that girls' performance in soccer is poor is negatively correlated with performance but that this relationship was mediated by perceived ability. Performance was thus related to gender stereotypes and this highlights the role of personal beliefs and perceptions on performance (Chalabeav et al., 2009). Another survey study investigated gender differences in ability perceptions in male dominated professions. They find conflicting results namely that both male and female professions used in this study (Engineering, Statistics, Medicine, and Estate Management) perceive the same ability to carry out their jobs. The reason they mention for this result is that women who enter these non-traditional fields have higher instrumental characteristics: being goal-directed, task-oriented, and independent. All traits just mentioned boost ones self-concept which explains why there is no difference between the genders in their ability perception (Osarenren & Ogunleye, 2009).

Stereotypes highlight differences between groups and play an important cognitive role. Since they are however only localized around group features that are most distinctive, they may cause distorted judgment and biased behavior. Bordalo, Gennaioli, and Shleifer (2014) present a model of stereotypes in which a decision maker assessing a group recalls only that group's most representative or distinctive types relative to other groups. What they find regarding gender stereotypes is that their model provides a unified account of various evidence regarding the gender gap in education and in labor markets. They show women are less likely to participate in math tasks than men because they underestimate their own math skill, even in non-competitive settings. Secondly they prove women's willingness to compete is shaped by their self-stereotype in the competitive environment. Women are unwilling to compete in mixed gender math tournaments, but willing to compete in single-gender math tournaments and against

men in areas that are stereotypically neutral or stereotypically female. Competition between genders –and then specifically in high-ranking positions in this case- evokes each gender to its self-stereotypes and thus exacerbates existing differences (Bordalo et al., 2014).

Another explanation is that men enter the tournament more than women because they are less averse to feedback. People use performance information to make decision, both for themselves as for others (Klein et al., 2010). Providing information on the relative performance does reduce the gender gap in tournament entry, but to which extent is still unclear (Niederle & Vesterlund, 2011). Azmat and Iriberry (2014) study the effect of providing information on relative performance on performance under two incentive schemes. Participants perform a real-effort task and results show that relative performance feedback has a positive effect on performance under a piece-rate scheme, but no effect on performance with a flat-rate. They control for all sorts of demographic differences but find no significant differences next to gender. Final conclusions are that the provision of feedback on performance can create gender differences in performance because men and women respond differently to such feedback. Women tend to incorporate negative feedback more than men (Niederle & Vesterlund, 2007).

Again, to answer the question in which extent perceived ability has an influence on the gender gap more research has to be done. But what can be stated as a fact is that differences in confidence and the existing of incorporating stereotypes both contribute. Additionally, feedback on performance is also incorporated significantly different between men and women and adds to the gender gap.

5. Conclusion & Discussion

Even though equal opportunities for both men and women has been a great concern and priority in many countries, gender differences in competitive high-ranking positions seem very hard to overcome (Gneezy et al., 2003). The last twenty years have seen an enormous amount of studies into gender differences in preferences and behavior. Summarizing the evidence discussed, gender differences with respect to competition prove considerable and significant. Women tend to shy away from competition, and also underperform in competition against men. In the areas of preferences for risk and other regarding preferences, results are much more mixed. Women seem to be more concerned with equalizing payoffs while men have a higher preference for efficiency. Results on gender differences in risk aversion also show no unified result, which is expected to be largely due to the complex character of risk preferences. Regarding perceived ability and actual ability, results also show less robust. Stereotypes appear to play a large role while ability does not seem to be a leading cause in explaining why women are defeated under competition and the existence of the gender gap in high-ranking positions. Apart from these main findings, selection effects, the choice of incentive schemes, and the composition of the group seem to influence results.

In order to be able to judge whether equality in the labor market -and then specifically in high-ranking positions- is what we want as a society and economy, it is important to interpret the studies of gender differences in psychological attributes in a correct way. One side to the story is that closing the gender gap can help to create a more equal and cohesive society and will motivate women's performance and improve their economic independence (European Commission, 2015). But after researching reasons that help explain the gender gap, a more equal climate in high-ranking positions does not prove to be efficient nor beneficial after all. It seems gender differences cannot be largely attributed to abilities and discrimination, but that a significant role is played by gender differences in preferences. From a well-being and individual utility perspective, this would thus imply that equalization would not prove optimal. Closing the gender gap would then indicate more women occupying those competitive high-ranking positions while this thesis shows that on average, women do not specifically seem to fit and prefer these positions. Only the women who self-select their way into these spots show to be of

high ability, and also to prefer occupying in a highly competitive environment. An effective policy that would be successful in ensuring gender equality but respecting the mentioned differences is a market design to stimulate institutions and education to help both sexes make choices reflecting their underlying preferences (Niederle, 2014). To furthermore ensure an adequate representation of women in top positions, some ways to achieve additional female participation in competitive fields could be to design environments that are single-sex, with a focus on teams rather than individuals, or where there exist different incentive schemes for both genders.

Once again it should be mentioned however, that to what extent discussed factors play a role in explaining the gender gap remains unclear. And by all means, this thesis solely focused on the supply side of the labor market and no focus nor attention has been paid to the role of the demand side of the problem. For example, the structure of institutions, social systems and rules, and discrimination could all still also largely contribute to explaining the gender gap. Other confounding variables could also be present and should be accounted for when interpreting results.

Next to this, external validity of course still has to be proven for most studies and results. And even then, documenting results outside of the laboratory cannot always speak to the broader importance of external relevance (Niederle, 2014). Most studies discussed in this thesis use evidence from laboratory settings and lack bridges to actual preferences, ability, and perceived ability and choices observed in the actual world. What do the discussed results mean for further experimental research and methodology? Firstly it can be confidently stated that there exist systematic sex differences with regard to competition. This implies experimenters may need to take great care in balancing their studies to make sure both genders are equally represented since findings could otherwise be due to the gender composition of their sample instead of economic factors. Evidence linking behavioral traits with actual behavior outside a lab setting is crucial to prove external validity. Next to this, it is important more research should be done into the subject of gender differences in preferences for competition and then namely how it is possible that women underperform under certain incentive schemes, and the existence of selection effects. The mentioned selection effects seem to be evident throughout a large part of this thesis and specifically in gender differences in

ability and gender differences in preferences. Since high-ranking positions show to be highly competitive, it is essential to find out whether found results are a consequence of this competitive setting, or other factors and elements accompanying high-ranking positions.

In summary, the found results suggest that preferences and ability with regard to competition can help explain the gender gap in high-ranking positions. To be able to make a robust statement concerning perceived ability, ability, and preferences for risk and other-regarding preferences and their role in explaining the gender gap, more research is needed.

6. References

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