The Effect of Rankings on

Judgment and Behaviour

by

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Declaration of Originality

I hereby declare that

    (i)   This thesis is my own work and has not been submitted for a degree at any university

    (ii)   The work of others is properly acknowledged.

    (iii)   The length of the thesis is less than 100,000 words inclusive of everything starting from the title page to bibliography.

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Copyright Declaration

To my parents

for their faith, endless love, and invaluable support

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Abstract

Rankings reveal important information about relative performance in competitive settings. Despite their widespread use, relatively little about their psychological impact on individuals' decisions and behaviours is known. Such a limited understanding of both the beneficial and detrimental effects of rankings may lead to undesirable and unintended consequences. In this thesis I try to fill that gap by investigating how rankings can affect our judgment in four main areas. First, I explore the effect of rankings on the perceived potential of performance improvement and how this influences individuals' aspiration levels. I also identify a factor that moderates this effect. Second, I examine the role of rankings in a competition between two commensurate rivals by exploring the relationship between rankings and predicted winning probabilities, and how this judgment is shaped by competitors' inferences about relative capabilities. Third, I explore the role of rankings on pay requests, and show how this effect is mediated by personal entitlement and moderated by the pay level of similarly ranked others. Finally, I show how rankings influence the decision to cooperate with similarly-ranked rivals under gain and loss situations.

The results suggest that the judgments and decisions of high-ranking individuals vary markedly from those of low-ranking individuals. Specifically, high-ranking individuals – in contrast to lower-ranked individuals – tend to set lower aspiration levels, predict lower winning probabilities when competing with commensurate rivals, demand higher pay, and are more sensitive about their cooperation decisions when the situational contexts change. I end

with a general discussion of the findings, their theoretical and managerial implications, and suggestions for future research.

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Chapter 1

Introduction

1.1 Motivation and Research Questions

Rankings enable the direct comparison of competitors and help facilitate our decision making process. As a result, they have become increasingly common across many different domains. For instance, judgment about the quality of universities is often based on the rankings published in Business Week or in the US News and World Report. In business, relative corporate performance and perceptions of esteem are often judged based on their Fortune 500 ranking. Forced-rankings or tournament compensation systems, which rank employees' performance relative to their colleagues, have been implemented in several large companies, such as Microsoft and Dell, in order to help them evaluate and pay their employees. The world of sport also uses rankings to present and evaluate athletes' performances.

A position within rankings implies competence, which in turn can lead to different payoffs. For instance, the average salary increase of MBA students graduating from the top ten business schools is approximately 30% higher than the average salary increase of students graduating from the bottom ten business schools (Global MBA Ranking, 2013). Similarly, the earnings of star athletes are more than ten times higher than the average earnings in their respective sport (Allen et al., 2012). Additionally, the top ten websites appearing on the first

page of Google's search results received 89.71% of all click-through traffic, as compared to the next ten results (usually appearing on the second page), which received only 4.37% (Bullas, 2010).

Despite the widespread use of rankings and the importance of rank positions, relatively little is known as to how rankings affect people's judgments and decisions. The previous literature has identified some factors that can be influenced by rankings, including well-being (Boyce et al., 2010; Clark et al., 2009), competitive behaviour (Poortvliet et al., 2009; Garcia and Tor, 2007; Garcia et al., 2006) and power (Keltner et al., 2003; Gilbert and Miles, 2000).

However, in many fields where rankings are used, there exist other fundamental yet important judgments and decisions which can potentially be influenced by rankings. For instance, judgments which are critical in competitions are the setting of one's aspiration level, the assessment of relative capabilities and the estimation of one's likelihood to win (e.g. Windschitl et al., 2003). These judgments are fundamental to various kinds of decision such as the level of effort and time required to prepare for a competition, the decision to enter a new market, to apply for a job, or to bet on a contest. It is therefore worth exploring how these judgments can be influenced by rankings. In addition, in the field of management, employee entitlement is a core concept (Naumann et al., 2002); failure to fulfil employee entitlement could lead to counterproductive behaviour which might subsequently harm organisations' interests (Paul et al., 2000). Since ranking systems have been implemented in many organisations, it is critical to understand whether or not they influence employee entitlement. Similarly, cooperative behaviour is also at the heart of management success (Smith et al., 1995). With organisations attempting to promote cooperation and teamwork to increase their performance, particularly at times of crisis, it is important to explore whether or not rankings promote or inhibit the cooperation intentions of individuals.

1.2 Summary of Thesis and Main Findings

In this thesis I seek to explore the effects of rankings on four important judgments: aspiration level, predicted winning probability, pay entitlement, and cooperation intention. The rationale behind these selected judgments is based on the literature review of why rankings matter, as discussed below.

People are affected by rankings for two main reasons: the desire to be better than others in the dimension being ranked and the rewards associated with rankings (to be discussed in detail in Chapter 2). The first reason prompts individuals to compare themselves with others. This comparison can be made against one specific person or all individuals being ranked. By comparing oneself with all individuals, he is likely to see how he performs relative to others. The motivation to perform better than others will then lead him to focus on upward comparison, and as a consequence, he will see how his performance can be improved. This eventually influences his *aspiration level*. On the other hand, individuals may compare themselves specifically to just one person. In this case, individuals are likely to estimate their capabilities relative to the capability of the other person. As self-assessment is likely to be overrated whereas the assessment on others are often accurate (Epley and Dunning, 2000), individuals are likely to perceive themselves superior than others who have similar performance. This could eventually affect their predicted *winning probability* against a comparison person.

The second reason, the rewards associated with rankings, creates an expectation of how much one should receive when occupying a certain rank. This in turn influences their *pay entitlement*. Additionally, as the competitive feelings between those with similar performance or ranks are particularly strong (Tesser, 1988), when individuals with similar ranks receive different rewards, the strong competitive feelings could affect their *decisions to*

cooperate with their commensurate rivals. Figure 1.1 summarises the rationale behind the selected factors.

Figure 1.1: Rationale Behind the Selected Factors
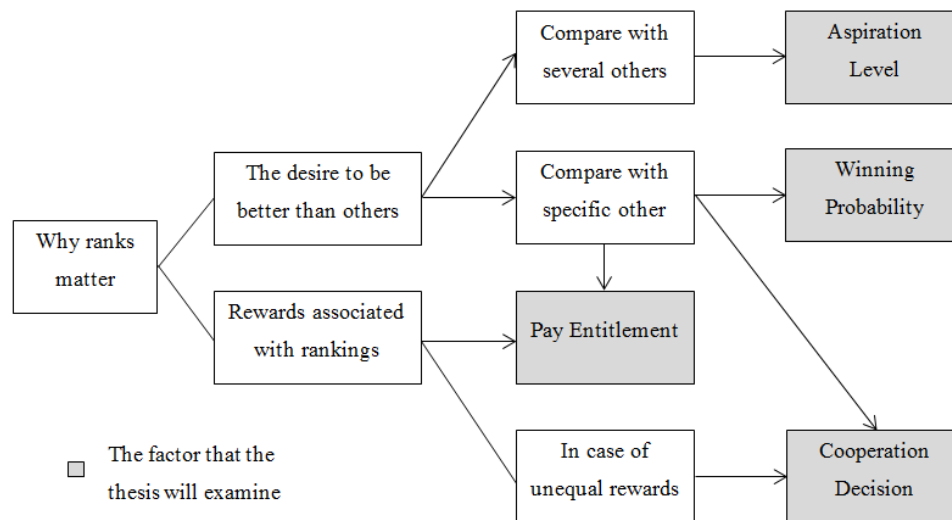
As shown in Figure 1.1, the four factors are connected to one another through the selection process. In addition to this process, the selected factors are also related to one another through social comparison. Specifically, social comparison is one of the main factors that drive the *aspiration level* and *pay entitlement*: individuals are influenced by others' performance when setting their aspiration level, and are influenced by others' pay when evaluating their own pay. Additionally, social comparison intensifies competitive feelings between two commensurate rivals, and these competitive feelings in turn affect *cooperation decisions*. Lastly, as individuals make a social comparison, they are motivated to view themselves as positively as possible but tend to view others accurately (self-enhancement). Consequently, they are likely to perceive their capabilities to be better than others. This can subsequently influence the *predicted winning probability*.

Even though past research has shown how social comparison is associated with the four factors (as discussed in Chapter 2), it has yet explore how rankings interact with social

comparison, which in turn affects the selected factors. As rankings are ubiquitous, understanding the effects of rankings on these factors could help individuals, as well as organisations, be aware of how rankings can affect their judgments, and perhaps be able to minimise the unintended consequences arising from the use of rankings. This thesis thus seeks to investigate the effects of rankings on these factors.

The rankings in this thesis refer to performance rankings, i.e. individuals' performance in a task is described in terms of relative ranks (e.g. #3 out of 200), rather than scores or percentiles. To test hypotheses, I predominantly use the decision-making approach together with field, experimental and behavioural studies. To show the robustness of the effects, the studies in each chapter are varied in both scenarios and samples used. This thesis is structured as follows. Chapter 2 reviews relevant literature. Chapter 3 explores the relationship between rankings and individuals' aspiration levels. Chapter 4 analyses how individuals' perception of winning a competition varies as a function of relative rank. Chapter 5 investigates the effect of rankings on pay entitlement. Chapter 6 shows how the cooperation decisions of individuals from different ranks are influenced by situational contexts and frames. Finally, chapter 7 discusses the implications and future research directions.

In my thesis I present four main findings. First, rankings are associated with individuals' aspiration levels. Since high-ranking individuals, as well as those with no ranking information, consider they have less possibility of improving their performance, they tend to have lower aspiration levels than low-ranking individuals. This effect is moderated by self-efficacy such that the aspiration level of individuals with high self-efficacy tends to be more strongly influenced by rankings than that of individuals with low self-efficacy. Second, rankings are associated with predicted winning probability. Higher-ranked individuals perceive a lower discrepancy between their capabilities and those of similarly ranked rivals', which in turn leads to lower predicted winning probabilities. Third, rankings influence pay

requests through feelings of entitlement. Higher-ranked individuals demand higher pay because they feel more entitled. This relationship is moderated by the pay level of a similarly ranked person, such that the ranking effect on pay request is more pronounced when the pay level is high rather than low. Fourth, the cooperation decisions of high-ranking individuals are more sensitive to situational contexts (gain vs. loss) or frames (positive vs. negative) than those of low-ranking individuals. The first group decides to cooperate with similarly-ranked rivals more when in the context of loss or negative frame than gain or positive frame, whereas the cooperation intention of the latter does not change in both contexts. This difference in cooperation decisions is driven by the difference in competitive feelings towards rivals.

1.3 Contributions

1.3.1 Theoretical Contributions

The previous literature on the influence of rankings on judgements and behaviours has shown how rankings can be used as a standard that creates unequal competitive feelings across rankings (Poortvliet et al., 2009; Garcia and Tor, 2007; Garcia et al., 2006), as a signal of success and power (Keltner et al., 2003; Gilbert and Miles, 2000) and as a determinant of well-being (Boyce et al., 2010; Clark et al., 2009). This thesis contributes to this body of literature by showing how individuals use rankings as a tool to infer their potential to improve their performance, relative capabilities, entitlement, and competitiveness. In turn, these four judgments influence related decisions. As a result, I also contribute to four other related fields.

First, this research introduces another factor that determines the level of aspiration. Previous research in this area has suggested that the level of aspiration is determined based on individual traits (Sears, 1941; Frank, 1935), the discrepancy between reference points and

current performance (Cyert and March, 1963), and the attractiveness of the aspiration level (Wofford et al., 1992; Riedel et al., 1988; Campbell, 1982). In this thesis I show that the level of aspiration can also be influenced by the perceived potential to improve, which can be inferred from rankings.

Second, the thesis advances our understanding of the factors that determine the predicted winning probabilities. Past research has suggested that in estimating one's skill relative to others, and predicting competition outcomes, individuals are influenced by non-motivational factors, namely the differential information between themselves and others (e.g. Kruger et al., 2008) with an egocentric focus on the information of their own side (e.g. Windschitl et al., 2008). In this thesis I show that individuals can also be influenced by a motivational factor, namely self-enhancement, as measured by the perceived relative capabilities inferred from rankings.

Third, past research on entitlement has focused on gender difference, rather than performance feedback, as a determinant of pay entitlement (e.g. Pelham and Hetts, 2001; Major and Forcey, 1985). However, as employees' pay is often based on their performance (Prendergast, 1999), it is important to explore whether or not their feelings of pay entitlement are influenced by performance feedback. Understanding this could help reduce the chance of unfulfilled entitlement, which could lead to counterproductive behaviour in the workplace (e.g. Fisk, 2010). In this thesis I contribute to this line of literature by revealing how ranking feedback influences employees' pay requests.

Fourth, previous literature on the effect of rankings on competitive behaviour has suggested that individuals in high and low ranks are equally competitive and less likely to cooperate with similarly-ranked rivals (Garcia and Tor, 2007; Garcia et al., 2006). In this thesis I argue, using empirical evidence, that this finding is not universal since it depends on the situational context (gain vs. loss) or frames (negative vs. positive).

1.3.2 Managerial Practices

This research offers several important insights as to how rankings can influence judgment and behaviour. The findings benefit particularly practitioners who either use or consider using rankings as a form of performance feedback. First, the findings that ranking information helps low-ranking individuals perceive higher potential to improve and set higher aspiration levels suggests that organisations can use rankings as a way to stimulate individuals with low performance to set higher aspiration levels. For instance, rather than informing employees only their absolute performance, managers could also inform their ranks within a comparison group to help them see how much they can improve, and subsequently increase their aspiration levels. Rankings, however, may have less effect on low self-efficacy individuals because they tend to set relatively low aspiration levels even when they occupy low ranks. Consequently, organisations may need to particularly encourage this type of individuals to set higher aspiration levels.

Second, rankings may inhibit cooperation intentions, which may be an issue for organisations promoting teamwork. However, cooperation intentions among high-ranking individuals can be promoted by framing situations or payoffs in terms of loss rather than gain. For instance, rather than describing the benefit their potential partner will gain from cooperating with them, it may be more effective for individuals to describe the loss their partner can reduce. This helps increase the chance that the partner will agree to cooperate. Nevertheless, as low-ranking individuals tend not to cooperate, regardless of the frame types, organisations may still need to provide incentives, particularly to those with low ranks, to induce their cooperation behaviour.

Third, understanding the influence of rankings on pay entitlement helps organisations learn more about employees' pay expectations. Specifically, it is important to pay high-ranking employees similarly to the pay of other highly-ranked colleagues. However, for low-

ranking employees, it depends on whether or not they believe the pay of their similarly-ranked colleagues is justified. This understanding enables organisations to not overpay or underpay either their own employees or prospective candidates. Overpayment can lead to unnecessary costs whereas underpayment can result in employees' dysfunctional behaviour counter to an organisation's interests, or else result in organisations losing attractive candidates to rivals.

The findings in this thesis also benefit individuals who are being ranked by helping them become aware of how rankings can influence their judgments and decisions. For example, the findings show that individuals may use rankings to infer their capability relative to their rivals'. This inference, however, may be biased in certain individuals, leading to an overestimation of their prediction of competition outcomes. Specifically, unlike high-ranking individuals, low-ranking individuals believe their capability is superior to similarly-ranked competitors'. Consequently, low-ranking individuals are likely to predict relatively high winning probabilities, which could subsequently influence other decisions, such as the decision to enter a competition in the first place. Additionally, the finding that high-ranking individuals feel less competitive in a loss-framed rather than a gain-framed situation suggests that high-ranking individuals who want their rivals to cooperate with them may need to frame the payoff negatively rather than positively to increase the acceptance chance of their rivals.

Chapter 2

Literature Review

2.1 Social Comparison

In order to evaluate something, judging whether it is good or bad, big or small, heavy or light, we often do so by making a comparison. Comparisons can be made against various standards including standards in the past (e.g. Conway and Ross, 1984), potential alternatives of outcome (e.g. Miller and Turnbull, 1990) or objective standards (Festinger, 1954). One common type of comparison is social comparison (Wood, 1989), which refers to the comparison of our attributes, skills or abilities with those of others. Social comparison occurs relatively frequently in daily life, and shapes the way people perceive themselves (Mussweiler, 2003a, 2003b; Wood, 1989). For instance, people usually compare themselves with their best friends in order to judge their level of cheerfulness (Mussweiler and Ruter, 2003). Students' reaction to their grades depends largely on the grades of their classmates' (Felson and Reed, 1986). The way people perceive their career is influenced by the career of their colleagues (Bernstein and Crosby, 1980). An individual's happiness also does not depend on their own income, but rather the incomes of others (Easterlin, 1995).

Festinger (1954) suggests that social comparison be used as an alternative comparison choice for people when objective standards for making a comparison are not available. However, subsequent research (e.g. Buunk and Gibbons, 2007; Klein, 1997) indicates that Festinger (1954) might understate the power of social comparison. Specifically, people tend

to compare themselves with others even when objective standards are available. For example, Klein (1997) has shown that individuals whose risk level of a car accident is high (60%) but lower than average (80%) identified themselves as a safer driver, and were less concerned and less likely to change their behaviour than those whose risk level is low (30%) but higher than average (10%). In another study, participants performed an ability task and were given both absolute and relative feedback. They were then asked whether, in order to win a prize, they would like to perform the same ability task again and reach a certain score, or to participate in a chance task. If relative standards are unimportant in the presence of objective standards, participants with a good performance in absolute terms, regardless of their relative performance, should choose the ability task more often than those performing poorly. However, Klein (1997) found that those whose performance from the first task was above average (regardless of their absolute performance, high or low) were more likely to choose to repeat the same task. These findings suggest that even when objective standards are available, people still compare with their peers.

Perhaps the interest in social comparison information happens subconsciously. Gilbert et al. (1995) argue that social comparison occurs automatically, whether we intend it or not. For example, by being subliminally primed with a young person, participants have a younger perception of themselves compared to being subliminally primed with an elderly person (Stapel and Blanton, 2004). Similarly, participants who were subliminally exposed to a high degree of aggressiveness rated themselves more aggressive than those who were primed with a lower standard (Mussweiler et al., 2004).

Automatic social comparison is subsequently followed by "a more systematic and thorough review of the target vis a vis self" (Buunk and Gibbons, 2007). For instance, upon hearing about the enormous success of somebody's career, individuals may initially engage in an automatic social comparison, which in turn produces unpleasant feelings about

themselves. However, as they subsequently reflect on the advantages that the person may have (e.g. luck, talent), or the reasons why the person is successful (e.g. he/she is hard-working), these initial negative feelings become less intense. This reasoning may alter their initial views, and enable individuals to be more rational in their judgment (Buunk and Gibbons, 2007).

Research has shown that the intensity of social comparison in this reasoning stage depends on situations. In other words, there are certain situations which promote the desire for social comparison more than others. For example, the need for social comparison is particularly strong in times of uncertainty, stress, or change (Buunk, 1994; Festinger, 1954). By learning how others facing similar experiences are faring, individuals feel more comfortable and a greater sense of relief (Locke and Horowitz, 1990). Competitive situations are also likely to intensify the need for social comparison (Gibbons and Buunk, 1999). Where individuals have to compete against one another in order to win, they tend to compare themselves more against others rather than focusing on themselves or on objective standards (Klein, 1997).

2.1.1 Purposes of Social Comparison

Social comparison occurs for many reasons and has many different purposes. The main purpose suggested by Festinger (1954) is to serve the need to learn more about the self. Specifically, he asserts that people have a desire to accurately evaluate themselves and to understand more about their own abilities and opinions. A comparison with others provides the opportunity for them to do so. A further purpose of social comparison is to build and maintain a positive self-image. This is especially true when comparing against "inferiors", which can lead people to develop a positive view of themselves (Wills, 1981). Failures might even turn into successes when compared to worse performances (Corcoran et al., 2011). For

this reason, social comparison can help preserve self-esteem and make people feel valuable. The third purpose of social comparison is to serve the need for self-improvement (Taylor and Lobel, 1989). By comparing with "superiors", people can learn and improve their practices in order to perform better (Corcoran et al., 2011). Students, for example, are likely to compare themselves against those who have performed better, and who they perceive can help them improve (Huguet et al., 2001).

The first three purposes serve as strategic reasons for people who deliberately make comparisons with others. However, the existence of spontaneous social comparison suggests that social comparison might also occur for non-strategic proposes. According to Corcoran et al. (2011), these purposes are to effectively communicate and efficiently use limited cognitive resources.

Social comparison information can help people communicate effectively with others (Corcoran et al., 2011). For example, people will interpret the sentence "Smith is athletic" differently, depending on their background and their subjective definition of "athletic". To create mutual understanding it may be necessary to describe and elaborate upon various dimensions of Smith's athletic abilities (e.g. his weight, how fast he can run). However, it is both easier and more effective to communicate that "Smith is athletic" by comparing Smith with a relevant and common standard such as university or Olympic athletes. By communicating using a comparison, the other person can understand more precisely how athletic Smith is. Relative comparisons therefore help to serve the purpose of communication, i.e. that incoming information can be properly interpreted and outgoing information can be effectively conveyed.

Automatic social comparison can also help people make efficient use of their limited cognitive resources (Corcoran et al., 2011). In order to determine one's level of success, for example, it may be necessary to consider several aspects related to success, such as past

achievements, income, savings, living conditions, and even grades in school. Considering and processing all this information requires considerable cognitive effort. However, success can easily be judged by comparing it with the success of friends, which requires only the comparable information that they have in common. For example, savings information or school grades of friends might not be available, and thus are not included in the comparison. Consequently, this limits the amount of information one has to process, enabling remaining cognitive resources to perform other tasks.

2.1.2 Comparison Targets

In order to make an accurate evaluation of the self, people select comparison standards which are similar (Festinger, 1954). In this instance, this refers to the similarity in related attributes, such as age, sex or experience, rather than the critical dimension, such as performance or outcomes (Wheeler, 1966). Comparing performance or outcomes with those who have dissimilar attributes provides little information about the self (Gastorf and Suls, 1978). For example, comparing the skills of a chess novice with the skills of an expert does not convey much information about how skilful the novice is. Even though the expert can perform much better than the novice, this does not necessarily mean that the novice is unskilled. Performance difference in this case is the result of difference in experience, rather than a difference in skill.

In addition to choosing similarities to compare, people can also choose to compare upwards and downwards, depending on the purpose of the comparison. An upward comparison – a comparison with those who are superior – serves a self-improvement purpose (Gibbons and Buunk, 1999). To serve this purpose, comparison targets are often those whose performance is slightly (as opposed to considerably) better (Corcoran et al., 2011). Performance can then be improved by the increase in self-efficacy (e.g., Vrugt and Koenis,

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2002). However, upward comparison can lead to lower self-evaluation (Collins, 1996; Taylor and Lobel, 1989) and induce negative feelings such as dissatisfaction, anger, envy and jealousy (Tesser et al., 1988), particularly if individuals focus on the fact that they are inferior to their comparison targets (Buunk et al., 1990). For these reasons, upward comparison is sometimes avoided and individuals choose to compare downwards instead (Will, 1981).

A downward comparison – a comparison with those who are in an inferior position – serves a self-enhancement purpose. Thinking they are better than others makes people feel good about themselves, and thus helps protect and improve their own self-view (Wills, 1981). A person whose self-view is likely to be threatened tends to engage in this type of comparison (Wills, 1981). For instance, a woman who is depressed with breast cancer tends to compare herself against those who have a worse condition (Wood et al., 1985). Individuals experiencing failure also will be more eager to learn about others' performance when they expect it to be poor than when they expect it to be good (Pyszczynski et al., 1985).

Even though it seems that upward comparison is often associated with negative affect, and downward comparison with positive affect, this is not necessarily the case. Buunk et al. (1990) argue that both comparison directions can produce both positive and negative feelings. By comparing upwards, people can learn either that they are worse than others, or that there is a possibility for them to be better. Similarly, by comparing downwards, people can learn either that they are better than others, or that there is a chance they may get worse. In both types of comparison, the affective responses from the comparison are likely to depend on the aspect of comparison which is more salient. For instance, if people perceive that the outcomes are out of their control and thus it is unlikely for them to improve, comparing upward will induce negative feelings. On the contrary, if people see there is a chance of improvement, upward comparison will lead to positive responses.

2.1.3 Multiple Comparison Targets and Rankings

In addition to comparisons with people with similar attributes or comparing upwards or downwards, research has also shown that people are also concerned about the end point of the distribution. Wheeler et al. (1969) demonstrated that when individuals learned about their own performance and their position within a comparison group, but were not informed about the range of group's performance, they attempted to estimate the range by asking to see the score of the *best* performers rather than the performance of those who occupied a similar rank. However, once they had been able to estimate the performance range, they then became curious to learn about the performances of those ranked nearby.

Concern for the endpoint suggests that individuals may take into account multiple comparison targets to arrive at their judgments or decisions. Specifically, when multiple comparison targets are available, individuals may compare their performance with not only one comparison target, but with a range of targets within the distribution[1]. Multiple comparisons may lead individuals to be concerned about their position within the distribution. This concern for rank has been shown in various studies (e.g. Boyce et al., 2010; Powdthavee, 2009; Brown et al., 2008). For example, Brown et al. (2008) illustrated that people's satisfaction regarding their income depends not only on their relative income but also on the position of their income relative to the comparison group. An increase in income alone will not necessarily increase happiness if it does not increase the individual's rank. In other words, an individual's happiness will increase only when their rank increases (Boyce et al., 2010).

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[1] This concept is similar to the Range Frequency Theory (Parducci, 1965), which states that judgement on an item is dependent on its position or rank within its comparison set.

2.2 The Psychology of Rankings

Rankings are found in so many situations in people's everyday lives that it would appear to be an essential component of our society. For example, an organisation's structure is often hierarchical. Decision making processes also involve the use of rankings, ranging from the least desirable options to the most desirable ones. People's interest in rankings is also reflected in their widespread use across various sectors including the worlds of academia, sport, and business. The extensive use of rankings suggests that rankings matter to humans far beyond their use as a tool serving informational purposes.

2.2.1 Why Do Ranks Matter?

Ranks serve as a signal of quality (Huberman et al., 2004). Attaining high ranks conveys higher qualities and competences and, therefore, the benefits and rewards for such achievements are relatively high. For example, since male attractiveness is dependent on social rank, higher-ranked males are likely to attract more females (Powdthavee, 2009). Additionally, highly-ranked employees earn much more than those of lower rank, a gap which is increasing. Specifically, in 2000 the average income of an American CEO was 531 times higher than the income of the average worker, compared to 1980 where the differential was a factor of 42 (Frank, 2005). Similarly, the real income of the top one-percent of US earners has more than doubled since 1979, whereas median US real income has remained relatively constant (Frank, 1999). These lucrative incomes in turn accentuate the importance of attending top universities, which is one of the main factors in obtaining highly-paid positions (Frank, 1999). As a consequence, universities compete to attain a higher rank in order to attract the best students.

Achieving a high rank is also associated with power. Lower-ranked individuals were ready to conform to the opinions and beliefs of higher-ranked individuals, even when it was

to their own disadvantage (Ridgeway et al., 1998). In negotiation, high-ranking individuals gain higher benefits than their low-ranking counterparts (Ball and Eckel, 1996). Similarly, higher-status individuals are able to sell their products to lower-status individuals at a higher price than vice versa (Ball et al., 2001). Those in high ranks are also perceived and treated more favourably than those in low ranks by, for example, being respectful or cooperative (Heffetz and Frank, 2008; Weiss and Fershtman, 1998).

Perhaps another reason why rank matters is that individuals enjoy feeling superior. More precisely, an individual's utility increases as they become better than others in the dimension they value. As such, they feel competitive towards others (Clark and Oswald, 1998), and are willing to increase their effort to protect themselves from being below average, and to increase their chances of being better than average (Kuhnen and Tymula, 2012). They are even willing to take more risk if the outcome associated with the risky option may provide an opportunity to improve their position which the certain outcome cannot do (Hill and Buss, 2010).

The preference for being better than others leads to endless competition until they become the best. Obviously, any tool that highlights this comparison, including rankings, is likely to induce competitive feelings and influence judgment and behaviour. For instance, Tran and Zeckhauser (2012) and Blanes i Vidal and Nossol (2011) showed that ranking feedback lead individuals to work harder and obtain better performance overall. Even when the ranking feedback does not lead to financial rewards, individuals tend to sabotage the performance of others in order to improve their rank (Charness et al., 2010). Kuhnen and Tymula (2012) also demonstrated that by simply telling individuals that ranking feedback may be available is enough to increase productivity i.e. solving more problems.

2.2.2 The Effects of Rank on Judgement and Behaviour

The rewards from achieving a high rank, as well as the desire to be better than others, motivate people to try and achieve a higher rank. In turn, this motivation influences different kinds of judgment and differentiate the behaviour of those in high ranks from those in low ranks.

2.2.2.1 Life Satisfaction

Research has consistently shown that individuals' satisfaction in life depends on their rank position within a comparison group such as family, neighbours, or colleagues (Boyce et al., 2010; Clark et al., 2009). Specifically, individuals tend to compare their incomes with each comparison target in the group. This comparison, however, is not symmetric (Ferrer-i-Carbonell, 2005) since upward comparisons (i.e., the number of higher earners) are weighted more than downward comparisons (Boyce et al., 2010). This implies that higher-ranked individuals tend to influence the judgment of one's income more than lower-ranked individuals. Each comparison that an individual is better (worse) than another will increase (decrease) satisfaction (Boyce et al., 2010). In other words, an individual's satisfaction will increase when their rank increases (Clark et al., 2009).

2.2.2.2 Attempt to Improve or Protect Ranks

Low-ranking individuals strive hard to improve their rank. Kuziemko et al. (2011) demonstrate that because individuals are averse to being ranked last, those in the penultimate position tend to choose options that prevent them from falling into last place, and those in last place tend to choose options that enable them to improve their position. In one of their experiments, when individuals were asked to choose whether they wanted to receive a guaranteed payment or to play an equal expected-value lottery, individuals in the last two positions were more likely to play the lottery than others. Kuziemko et al. (2011) explain that

individuals in last place do so because the lottery provides them an opportunity to improve their rank whereas individuals in penultimate place do so in order to protect their position. Similarly, in another experiment, individuals are asked whether they wish to give an additional $2 to the person whose rank is just below or above their own. Their respective ranks will decrease if they give $2 to the rank below. Kuziemko et al. (2011) found that those in second-to-last position are more likely to give the money to the one above them while other ranks tend to give it to the one below.

Not only do people in the low ranks attempt to improve their positions, but people in the high ranks strive hard to protect theirs. For instance, Cummins (1999) shows that those near the top attempt to protect their position and their access to competitive resources by closely monitoring the cheating behaviour of lower-ranking individuals'. Clark et al. (2010) show that higher-ranked individuals exert more efforts on their job than lower-ranked individuals. The over time working hard to protect their position at the top results in an increase in productivity compared to those near the bottom (Kuhnen and Tymula, 2012). Similarly, Hannan et al. (2008) also demonstrated that ranking feedback improves the performance of high-ranking individuals more than the performance of low-ranking individuals.

2.2.2.3 Interaction with Others

Viewing themselves as inferior, lower-ranked people tend to have feelings of powerlessness and self-blame (Gilbert and Miles, 2000). As a result, they tend not to argue or defend themselves when being criticised by individuals in a higher position (Fournier et al., 2002) and often experience depression (Gilbert et al., 2002) and shame (Cheung et al., 2004). In contrast, high-ranking individuals tend to view themselves as successful and in a group are more likely than others to be independent, display self-centred behaviour (Keltner et al., 2003), and blame others (Gilbert and Miles, 2000). Having a high rank communicates

success, which increases pride and confidence (Sloman et al., 2003). In turn, when criticised by subordinates, high-ranking individuals tend to argue (Fournier et al., 2002). Those who are near the top, as judged by independent observers, also appear to be more competitive than the ones near the bottom (Chen et al., 2011).

2.2.2.4 Competitive Behaviour

High-ranking individuals are less likely to cooperate with their similarly-ranked partners (Poortvliet et al., 2009; Garcia and Tor, 2007; Garcia et al., 2006). Specifically, they are less willing to trade-off the financial gain from cooperation with their commensurate rivals in order to preserve their ranks (Poortvliet et al., 2009; Garcia and Tor, 2007; Garcia et al., 2006). In Study 3 of Garcia et al. (2006), individuals are asked to choose whether they want to cooperate with similarly-ranked rivals. Their profits from cooperation will increase but be less than their rivals, which in turn threatens their rank. Garcia et al. (2006) find that those near the top are less likely to choose to cooperate when compared to those far away from the top. This is because as individuals get closer to the top, or the standard in general, the social comparison becomes more intense and competitive feelings towards rivals are stronger.

Nevertheless, the bottom also serves as a standard, which people tend to avoid since they dislike being ranked last. Consequently, the social comparison concern is also intense among those near the bottom, leading them to be competitive and display similar behaviour to those near the top (Garcia et al., 2006). Poortvliet et al., (2009), however, argue that the competitive behaviour of low-ranking individuals is manifested only when individuals pursue performance goals (i.e. when focusing on competing with others). Since performance-goal individuals focus on outcompeting others, they are less likely to cooperate if others benefit from cooperation more than they do. On the other hand, low-ranking individuals with mastery goals (i.e. focusing on self-improvement or improving their own performance) are

more likely to cooperate even though others benefit more from the cooperation. The reason for this is that the opportunity for self-improvement is high when individuals have a low rank, enabling mastery-goal individuals to focus on their own benefits stemming from cooperation rather than the differential benefits. However, as their ranks increase, the room for improvement diminishes. Mastery-goal individuals are then less committed to self-improvement (Nicholls, 1984) and so redirect their attention to competing with their competitors (Tesser et al., 1988). This, in turn, makes both mastery-goal and performance-goal individuals become more competitive when they are in high ranks.

Additionally, Garcia and Tor (2007) suggest that competitive behaviours are displayed only when rank is threatened. Specifically, high- or low-ranking individuals are willing to cooperate with their commensurate rivals, and tolerate the social comparison pain from cooperation by letting the rivals gain better benefits, if this does not change their rank. Garcia and Tor (2007) conclude that it is the upward comparison in scale (i.e. rankings being threatened), rather than the upward comparison in task (i.e. performance being threatened), that is necessary to initiate competitive behaviour of those near the standards, i.e. near the top or the bottom of rankings.

Even though past literature has identified various kinds of behaviour that can be influenced by rankings, our understanding of the effects of rankings is still limited. Without a thorough understanding, the extensive use of rankings may result in undesirable and unintended consequences. As shown in Figure 2.1, this thesis extends the past literature by examining how rankings influence 1) individuals' aspiration levels, 2) predicted winning probabilities, 3) pay entitlement, and 4) cooperation decisions in different situational contexts and frames. In the next four sections, I review relevant literature on these four areas.

Figure 2.1: Literature Map
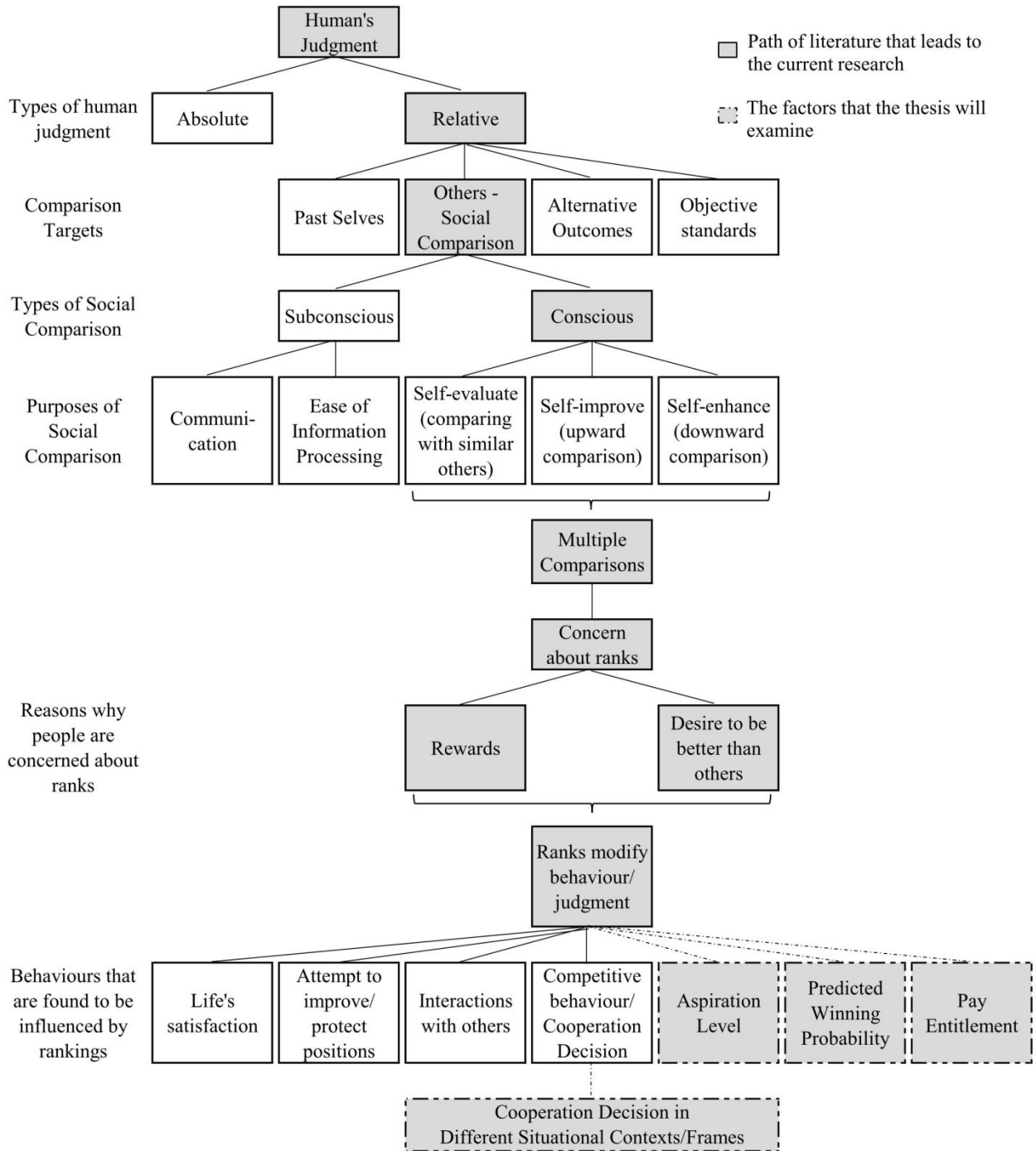
2.3 Aspiration Levels

The term "aspiration level" was initially defined by Hoppe (1930) as "the expectations, goal-settings or demands in connection with one's own future performance" (p. 10)[2]. This definition, however, was ambiguous and hard to operationalise. Consequently, subsequent definitions of the term have provided a more precise meaning. For example, Frank (1935) referred to it as the "level of future performance in a familiar task which an individual, knowing his level of past performance in that task, explicitly undertakes to reach" (p. 119). For Siegel (1957), it is "the notion of level of aspiration is invoked in reference to the goal-striving behaviour of an individual when he is presented with a task whose outcome can be measured on an achievement scale. Level of aspiration refers to the particular achievement goal for which the person strives." (p. 253). Schneider (1992) regarded aspiration level as "the smallest outcome that would be deemed satisfactory by the decision maker, given the current choice situation" (p. 1053). From a cognitive perspective, aspiration level can also be viewed as an attempt of individuals to combine and process the available information in order to form an expectation about their future performance, and eventually the level of aspiration (Meyer and Gellatly, 1988).

These definitions all had one thing in common, namely the specific level of performance that individuals want to achieve in a task. Using this definition, the level of aspiration can be perceived as equivalent to the "desired goal state" (Campion and Lord, 1982; Locke et al., 1981). In fact, research into the level of aspiration and goals are closely related, and the two terms are often used interchangeably (e.g. Campell, 1982; Locke et al., 1970). For this reason, this thesis considers *aspiration* level as being similar to *goal* level, and as such reviews the related literature in both areas.

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[2] The original quote was in German and was translated into English by Gardner (1940), p. 61.

2.3.1 Determinants of Aspiration Levels

The determinants of aspiration level or goal level can be summarised and categorised into three groups, namely individual traits, performance feedback, and the attractiveness of aspiration levels.

2.3.1.1 Individual Traits

Early literature on aspiration levels considers it to be an individual trait (e.g. Sears, 1941; Frank, 1935) subject to considerable individual differences. Frank (1935) asserts that the level of aspiration is derived from individuals' characteristics, which are relatively stable and task-independent. In other words, individuals' performance standards (i.e. aspiration or goal levels) in any task tend to be generic, and can be applied in many situations (Bandura, 1976).

Frank (1935) argues that there are three needs within each individual that influence aspiration levels. The first is the accurate prediction of future performance level, the second is the need to seek success, which leads to a high level of aspiration regardless of current performance, whilst the third is the need to avoid failure, which leads to a level of aspiration below future performance. Which of these three needs is dominant, and determines the direction and degree of the discrepancy between the level of aspiration and current performance depends on the type of person (Frank, 1935). An individual who is likely to keep "his feet on the ground" has a tendency to keep his new aspiration level similar to the level of current performance. An individual who likes to has "his head in the clouds" tends to have an unrealistically high level of aspiration. An "ambitious" individual is likely to have a reasonably high level of aspiration. Finally, a "cautious" individual is likely to make his level of aspiration lower than his current performance.

Similarly, Sears (1941) treats aspiration level as an individual trait, linking it to motivation. Specifically, individuals who have a strong drive to succeed tend to set their aspiration levels higher than their current performance. However, individuals who tend to be insecure and self-protective tend to set their aspiration levels lower than their current performance. VandeWalle et al. (2001) also suggest that goal orientation influences aspiration levels. Individuals who focus on learning and developing competence (a learning-goal orientation) tend to set a high goal or high level of aspiration. On the other hand, individuals who focus on avoiding negative judgment (an avoiding-goal orientation) are likely to set a low level of aspiration.

2.3.1.2 Performance Feedback

Aspiration Level Based on Current Performance

Performance feedback motivates individuals to set an initial level of aspiration or goal (Latham and Yukl, 1975). More precisely, performance feedback or feedback from similar tasks serve as a basis that individuals use to infer their ability and make a forecast about their future performance, from which an aspiration level can be formed (Vrugt and Koenis, 2002; Campion and Lord, 1982; Erez, 1977; Lopes, 1976; Wilsted and Hand, 1974).

An aspiration level can be higher or lower than current performance. A level of aspiration which is higher than current performance motivates individuals to strive harder, whereas one which is lower than current performance tends to relieve stress and anxiety about performance (Frank, 1941). However, the common approach of using feedback as an informative clue about performance improvement, such as in training or coaching (Quaglia and Cobb, 1996; Frank, 1941), suggests that individuals given feedback are generally motivated to perform better in the future. As a result, it is suggested that the level of aspiration is generally adjusted to be slightly above the current performance, with the aim of

improving performance (Campion and Lord, 1982; Simon et al., 1954; Hertzman and Festinger, 1940).

Aspiration Level Based on Success and Failure

Due to a limited capacity for processing information, individuals adjust their level of aspiration in response to feedback by categorising a continuous outcome, relative to a reference point, into a success or a failure (Frank, 1935). Performance at or above the reference point is perceived as a success whereas performance below this point is perceived as a failure (Quaglia and Cobb, 1996). A reference point may be either past performance, the current level of aspiration, or the performance of others (social performance).

Past Performance and Current Aspiration Level as a Referent Point

Where the reference is past performance, individuals tend to increase their level of aspiration as their performance improves (i.e. a success), and decrease it as their performance declines (i.e. a failure) (Vance and Colella, 1990; Cyert and March, 1963). Vance and Colella (1990), for instance, show that when receiving positive feedback, individuals aimed to further improve their performance by increasing their goals.

Where the current aspiration level is the reference point, the discrepancy between current performance and current aspiration tends to have a positive effect on the level of future aspiration (Lant, 1992; Steisel and Cohen, 1951; Pennington, 1940). Specifically, individuals tend to adjust the aspiration level upwards when the current performance is equal to or higher than the current aspiration level, and downwards when the current performance is lower than the current aspiration level (Campion and Lord, 1982; Simon et al., 1954; Child and Whiting, 1949; Pennington, 1940).

The current level of aspiration can also act as an anchor by itself, and can be used by decision makers in an organisation to form their new level of aspiration (Mezias et al., 2002).

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Based on anchoring and adjustment heuristics (Tversky and Kahneman, 1974), an individual's subsequent judgment tends not to deviate much from the anchor (Cyert and March, 1963). Hence, it is likely that the high level (low) of current aspiration, which serves as an anchor, will be followed by a relatively high (low) level of aspiration in the future. Evidently, Lant (1992) has shown, using classroom simulations, that the current aspiration level positively influences the future aspiration level.

By categorising performance feedback based on these two referent points, it has been suggested that successes and failures are often followed by a respective increase or decrease in aspiration level. Nevertheless, some individuals may not react to feedback in this manner, i.e., they tend to respond to a success by lowering their level of aspiration or to a failure by increasing it (Moulton, 1965). Researchers have offered many explanations for this atypical shift in aspiration level. For example, Atkinson (1957) suggests that this effect is the result of the differences in an individual's motivation to achieve successes and avoid failures. Individuals who fear failure and have low achievement motivation are more likely to react atypically, i.e., by raising their level of aspiration after a failure and lowering it after a success (Moulton, 1965).

Niemivirta (1999) contends that the atypical shift of aspiration level is connected to the different ways in which people perceive the controllability of situations, i.e. the level of control over actions, outcomes, or the external environment. For example, if individuals perceive a task as being outside their control (i.e. it happens by chance) they may attribute their past successes to luck, and may believe that they will not be lucky in the future. Consequently, they lower their goals, meaning that the level of aspiration is likely to change in an atypical manner. On the other hand, if individuals believe that their success is the direct result of their skills – a factor which is relatively stable and controllable – they may expect to perform similarly well in the future. In such situations they may raise their goals.

Social Performance as a Referent Point

Where information is available, individuals also take the performance of others into account when forming their own level of aspiration. Specifically, their level of aspiration tends to form in the direction that decreases the gap between their own performance and the performance of others. For example, Festinger (1942) and Gould and Lewis (1940) show that when participants learned that their performance was below the performance of a fictitious group of people who performed the same task, the discrepancy between their current score and their expected score, which represented the level of aspiration, increased. Since future performance is positively correlated with the level of aspiration (Zander and Newcomb, 1967; Dey and Kaur, 1965), the increase aims to improve future performance, in turn reducing the gap between self-performance and the performance of others. On the contrary, when participants learned that their performance was above average, the discrepancy between their score and the expected score decreased. Additionally, Hilgard et al. (1940) and Anderson and Brandt (1939) demonstrate that the difference between the aspiration score and the current performance score was positive in children who performed lower than the average, but negative in children who performed above average. This suggests that below average children tended to increase their level of aspiration whereas above average children tended to decrease it. Chapman and Volkmann (1939) also suggest that individuals tend to adjust their level of aspiration based on their perception of the skill level of the comparison group. The level of aspiration is lower when individuals are told about the performance of those whom they regard as superior compared to an identical performance by those whom they regard as inferior.

2.3.1.3 Attractiveness of the Aspiration Level

Individuals choose their level of aspiration by evaluating the attractiveness of each possible aspiration level, and then select the most attractive one. One factor that determines

the attractiveness of each aspiration level is the probability of achievement (Oettingen et al., 2001; Wofford et al., 1992; Campbell, 1982; Hilgard, 1942). Aspiration levels perceived as being impossible to reach are less likely to be selected (Oettingen et al., 2001; Campbell, 1982). Evidently, Locke (1968) shows that individuals tend to accept the goals set by the experimenters only if they think those goals can be achieved. Additionally, the adjustment of the aspiration level based on success and failure (Moulton, 1965; Child and Whiting, 1949) suggests that feedback influences the perceived probability of goal attainment, which in turn determines the level of aspiration (Feather and Saville, 1967). Another factor that influences the attractiveness of each aspiration level is the perceived value of the outcome (Wofford et al., 1992; Hilgard, 1942; Frank, 1941). Incentives such as rewards for a particular performance level or praise from others can motivate individuals to aim for higher levels of aspiration and to have more commitment (Riedel et al., 1988).

2.3.2 The Effects of the Aspiration Level on Performance

The level of aspiration, or goal, is a target for individuals to achieve. Individuals with a specific goal tend to exert more effort and perform better than individuals with no goal. For example, Kausler (1959) provided one group of participants with a sample arithmetic test and asked them to state their level of aspiration (i.e. how many maths problems they thought they could solve) prior to doing the actual test. The other group of participants was also given the sample test but was not asked to state their level of aspiration. Kausler (1959) found that the group required to indicate their level of aspiration performed better than the other group, having controlled for mathematical ability.

Additionally, individuals adjust their effort to match with the difficulty of the goals (Bryan and Locke, 1967). Individuals consider the goal, or the level of aspiration to be a "psychologically neutral point of reference" (Heath et al., 1999), and react differently when

performance is below and above the goal. Specifically, they tend to increase their level of effort and are more motivated to work as their performance approaches their goals, and lower their level of effort as their performance moves beyond their goal levels (Heath et al., 1999). Hence, for two individuals who have the same performance but different goals, the one whose performance has reached his goal (i.e. having a lower goal level) is less likely to work one unit harder to achieve better results. However, the other, who has the same performance but has yet to reach their goal (i.e. having a higher goal level), is motivated to work harder in order to achieve it.

As a result, if all other factors are equal, individuals with higher goals are more likely to outperform those with lower goals. For example, Dey and Kaur (1965) asked participants to perform a letter cancellation task, with one group assigned a high output goal and the other a low output goal. The first group achieved a higher output than the second. Similarly, Zander and Newcomb (1967) tested the effect of goal setting in a field study in communities who were trying to fundraise, and found that communities whose goals were higher than their performance in the previous year raised more money relative to their previous performance than communities whose goals were below their previous performance. Locke (1968) notes, however, that even though individuals with difficult goals outperform those with easy goals, the former tend to reach their goals less frequently than the latter.

However, in the case that goals are assigned by someone else, the goals will increase performance only when they are accepted by the performers (e.g. Erez and Zidon, 1984). Individuals who are assigned difficult goals tend to reject them more often than those assigned easy goals (Locke, 1968). However, once the goals are accepted, individuals are motivated to try as hard as possible to achieve them. Individuals who abruptly stop working towards their goals are often those who believe that the goals are impossible to reach, and subsequently abandon them (Locke, 1968).

Since goals or aspiration levels play a crucial role in predicting performance, it is important to understand how they are formed. Research in this area has been scarce (Oettingen et al., 2001; Karoly, 1993) and that which has been conducted has focused mainly on individual traits, the discrepancy between current performance and reference points, and the attractiveness of the aspiration level as determinants of aspiration level. This thesis contributes to the literature by introducing another determinant of the aspiration level, the perceived potential to improve, which can be inferred from an individual's rank.

2.4 Comparative Performance Prediction

Comparative performance prediction, or the evaluation of one's performance relative to that of others, plays a crucial role in decision making in competitions. As in most competitions, two or more parties compete over the same issue, determining the outcome requires predicting not only one's own performance, but also the performance of competitors. These predictions, however, are far from straightforward. Research has consistently shown that predictions or evaluations of the self are likely to be different from either predictions or evaluations of others by the self (Moore, 2007; Pronin et al., 2002; Epley and Dunning, 2000; Krueger, 1998) or predictions or evaluations of the self by others (John and Robins, 1994).

2.4.1 Egocentric Focus in Comparative Performance Prediction

One widely-documented finding is that when predicting the outcomes of a competition, people tend to be egocentric, focusing solely on themselves (e.g. their own capabilities, achievements, and strengths) and ignoring (or at the least paying less attention to) their competitors (Radzevick and Moore, 2008; Moore and Kim, 2003; Windschitl et al., 2003). For example, both Windschitl et al. (2008) and Windschitl et al. (2003) show that participants' perceived likelihood of beating a competitor who undertook an identical task depended on their perceived capabilities to do the task rather than their perception of their

competitor's ability in the task. Evidence of excessive focus is found also in a decision to enter a competition. Moore et al. (2007) show that in deciding whether or not to enter a potential market, potential entrants tended to think mostly about their own strengths and weaknesses, and barely mentioned their competitors' strengths and weaknesses.

One reason why people are egocentric is that they have more information about themselves than others. Differential information makes knowledge about oneself more salient, easier to access (Kuiper and Rogers, 1979; Ross and Sicoly, 1979), and more reliable (Windschitl et al., 2008). For example, Kruger et al. (2008) asked participants in the computer lab to predict the winning probability when someone they were familiar with (e.g. a high school acquaintance) competed with someone sitting next to them in the lab (a co-participant). The authors argued that as individuals have more knowledge about their acquaintances than their co-participants, they tend to focus on the strengths and weakness of acquaintances more than co-participants, and so based their likelihood judgment on this information. As a consequence, the likelihood judgment was a function of the knowledge participants have on their acquaintance rather than the knowledge of their co-participant. Additionally, Radzevick and Moore (2008) showed that even when individuals predict the winning probability of a competition between two teams whom they know equally, they are more likely to seek out information regarding their own assigned team than information regarding the other team. The eventual result of this is differential information between the teams, and a subsequent egocentric focus on their own team. This finding also suggests that the egocentric tendency does not necessarily apply only to the excessive focus on the self. Individuals also tend to pay too much attention to a focal actor, which can be their own team or someone else with whom they are familiar. This more generalised egocentric effect is often referred to as myopic focus (Radzevick and Moore, 2008).

The egocentric focus can be minimised by acquiring more information about others (Moore and Small, 2007). Kruger et al. (2008) demonstrated this by asking participants to ascertain the likelihood of victory in a hypothetical war between their fictitious army and another army. The result suggested that when participants were given a larger amount of information about their competitor army, they tended to focus less on their own army.

Since individuals focus excessively on themselves rather than others when predicting competition outcomes, they overestimate the competition or their relative standings when their own side (e.g. absolute strength) is strong compared to when their own side is weak (Kruger et al., 2008; Radzevick and Moore, 2008; Kruger and Burrus, 2004; Moore and Kim, 2003; Windschitl et al., 2003; Kruger, 1999). Radzevick and Moore (2008) showed that when predicting the winning probability between two sport teams who were equally strong (e.g. in the major league), people tended to predict that their team had a higher chance of winning than when the two teams were equally weak (e.g. in a minor or women's league).

The self-focus behaviour also leads people to inappropriately adjust for the effect of competition difficulty on the self and others (Windschitl et al., 2008; Moore, 2007; Moore and Cain, 2007; Moore and Kim, 2003; Windschitl et al., 2003). Specifically, individuals' assessment regarding their own performance is likely to be more extreme than their assessment regarding the performance of others (Moore and Cain, 2007). Seeing the task as easy (hard) results in them thinking they are very good (bad) at the task, and in turn leads them to seeing others as being less so. Consequently, people predict a higher chance of winning when the task is perceived as easy, despite the fact that other competitors can also perform relatively well. On the other hand, people predict a lower chance of winning when the task is perceived as hard, even though other competitors may also perform relatively poorly (Moore and Kim, 2003). This overestimation of winning in a simple task, and underestimation of winning in a hard task, influences the decision to enter a market

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competition (Moore and Cain, 2007; Moore et al., 2007). Moore and Cain (2007) show that even though people were able to anticipate many entrants in an easy market, they still decided to enter confidently. However, in a difficult market, even though people forecasted there would be a low number of entrants, they still decided not to enter.

In addition to the difficulty of the competition, people also inappropriately adjust upon the introduction of shared benefits (e.g. giving extra time in an exam for the entire class) and shared adversities (e.g. giving more unrelated work to complete prior to an exam). Specifically, they will focus intensively on how much they would gain from the shared benefits, or how much they would suffer from shared adversities, focusing less on how these benefits or adversities would also affect others (Windschitl et al., 2003). As a result, Windschitl et al. (2003) show that participants increased their chance of winning when a shared benefit was introduced and reduced their chance of winning when a shared adversity was introduced, despite the fact that these shared benefits and shared adversities would affect the entire group of participants.

These prior works have investigated the impact of non-motivational factors, i.e. the excessive focus on the self or their own team and the differential information between the self and others, on comparative performance prediction in competitions. In fact, when making a comparative judgment, motivational factors, particularly self-enhancement, can also play a crucial role.

2.4.2 Self Enhancement Bias in Comparative Judgment

People in general are self-enhanced, meaning that they are motivated to evaluate themselves as favourably as possible (Moore and Small, 2007; Taylor and Brown, 1994, 1988; Shrauger, 1975). This is perhaps because maintaining a positive image of self is a way of protecting, and indeed increasing, self-esteem (Sedikides and Gregg, 2008), an important

factor for general well-being (Tesser, 1988). Self-enhancement can be achieved by augmenting the positive aspects of self, and by preventing negative information from harming the self (Sedikides and Gregg, 2008). Since the unpleasant emotions arising from receiving negative feedback are stronger than the pleasant emotions from receiving positive feedback, protecting oneself from negative feedback seems to be a more urgent priority than elevating positive feedback (Baumeister et al., 2001). As a result, people are more motivated to avoid becoming the undesirable self than to try and become the desirable self (Heppen and Ogilvie, 2003; Carver et al., 1999). Gramzow et al., (2003) demonstrated that students with low GPAs, when asked to report their past GPAs at the beginning of the new semester, tended to exaggerate their actual marks more than high-scoring students. The exaggeration level, which represented the degree of self-enhancement, was measured by the difference between reported GPA and actual GPA. Acknowledgement of low actual GPAs could negatively affect students who performed poorly, and therefore these students try to avoid this by reporting higher-than-actual GPAs. However, since high-GPA students had already experienced a positive effect, the additional utility gained from elevating their actual GPAs was less than low-GPA students, making it less necessary for high-GPA students to elevate their actual scores.

Self-enhancement bias can be looked at from two perspectives, namely comparing the self-rating and the rating of others by the self, and by comparing the self-rating and the rating of the self by others (Kwan et al., 2004).

From the first perspective, self-enhancement bias refers to the differential view of individuals on themselves and on others. This method of measuring self enhancement emanates from social comparison research (Festinger, 1954), which focuses on individuals' drive to compare with others. Generally speaking, self-enhanced individuals are those who view themselves more favourably than they view others (Kwan et al., 2004).

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Research has consistently shown that across multifarious traits and abilities, people evaluate themselves more favourably than they evaluate others (Brown, 1986; Alicke, 1985), particularly in those aspects which they consider more desirable and valuable (Messick et al., 1985). For example, individuals perceive themselves to be fairer than others (Messick et al., 1985), see their marriage as being better than others' (Buunk and VanYperen, 1991), consider themselves more skilled at driving a car (Svenson, 1981), and are less susceptible to biases (Pronin et al., 2002). The tendency to positively view oneself as superior than others is also manifested when individuals predict the likelihood of experiencing desirable and undesirable events. For instance, people believe they are less vulnerable to victimisation (Perloff and Fetzer, 1986) and health problems (Weinstein, 1982) than others, but are more likely than others to love their postgraduate job and to live beyond 80 (Weinstein, 1980).

There are two possibilities that can explain the self-superior view. First, individuals hold an accurate view of self but a negative view of others. Second, individuals hold a positive view of self but an accurate view of others. Epley and Dunning (2000) have suggested that it is actually the second possibility that leads to self-superior views, since the rating of others tends to be more accurate than the rating of self. In one of their studies, one group of participants was asked how much of the money earned from participating in the study they were willing to hypothetically donate to charity, and how much they thought their peers would donate. The other group was asked how much they would actually donate. The results showed that the prediction of peer donation was much closer to the actual donation than the prediction of self-donation, suggesting that assessments on peers were more accurate than assessment on self.

From the second perspective, self-enhancement is measured by comparing the evaluation of self and the evaluation on self by others. Kwan et al. (2004) suggest that this way of measuring self-enhancement came from Allport (1937) and his concept of self-

insight, defined as "the relation between what a man thinks he is to what others (especially the psychologist) think he is" (p. 221). According to this view, self-enhanced individuals are ones who perceive themselves more favourably than others perceive them. Subsequent research has provided evidence that people were also self-enhanced according to this view (e.g. John and Robins, 1994). For example, John and Robins (1994) asked participants to perform a group interaction task, getting them to evaluate their own performance as well as that of their peers. The participants' performances were also evaluated by the trained psychologist observers. Self-evaluation, peer-evaluation, and evaluation by the observers were then compared. The results suggested that individuals tended to evaluate their own performance slightly better than they were evaluated by their peers and the observers.

Even though the previous literature has investigated how self enhancement influences comparative judgment, the role of self enhancement in predicting competition outcomes has yet to be explored. Competitions, particularly those involving ranking feedback, normally foster the role of social comparison, which in turn provides the opportunity to self-enhance. Hence, it is likely that the prediction of competition outcome (i.e. the likelihood of winning) will be influenced by self-enhancement. As self-prediction of competition outcomes can subsequently affect confidence and influence the decision as to whether to enter a competition e.g. whether or not to enter a potential market (Moore, 2007; Moore and Cain, 2007), the understanding of how self-enhancement affects this prediction could help individuals make a less biased decision. This thesis contributes to this understanding by examining how people in different ranks can be self-enhanced, and how this affects the prediction of winning probability.

2.5 Pay Entitlement

Entitlement refers to an individual's expectation or belief that they are owed a benefit, reward, payment or privilege (Major, 1993; Lerner, 1987). An individual may feel entitled to certain things because of their identity, qualifications or achievements (Lerner, 1987), and this feeling of entitlement influences their evaluation as to whether their outcomes are fair or just (Campbell et al., 2004).

Although entitlement is generally considered the result of individuals' beliefs or expectations, the *what* of expectation varies across areas (Naumann et al., 2002). From a legal perspective, entitlement is viewed as an individual's legal and economic right (e.g. da Silva Cornell, 1994): the law, rather than the individual, is the antecedent of entitlement. Where there is a dispute, it is generally resolved via the legal system (Naumann et al., 2002). Marxist theories hold that people are entitled to what they *need*, rather than what they *achieve* (Naumann et al., 2002). For instance, an individual with two children should earn more than a single person without dependents because the parent needs to support his or her family. Marketing research views entitlement as a customer expectation regarding the services and products firms should provide (Boyd III and Helms, 2005). Management literature, and equity theory (Adams, 1963) in particular, views entitlement as the earnings (e.g. salary or rewards) resulting from an individual's input or contribution. Specifically, income entitlement is perceived as the pay that individuals expect to receive as compensation for their work (Moore, 1991). This view of entitlement is the focus of this research.

2.5.1 Determinants of Income Entitlement

An individual's sense of income entitlement hinges critically on comparison processes (e.g. Major, 1994). Researchers have identified two major comparison approaches that individuals use to determine pay entitlement. First, it is suggested that individuals use their

past income as a basis to evaluate their current pay (Major, 1989; Pritchard, 1969). Secondly, individuals use the income of others to judge the fairness of their pay (Pelham and Hetts, 2001; Bylsma and Major, 1992; Major and Forcey, 1985).

The self-comparison approach maintains that individuals use their past income or expectation of their future income to evaluate their current income and shape their sense of entitlement (Moore, 1991; Major, 1989). For example, despite similar educational backgrounds and experiences, women typically earn less than men (Levitan et al., 1971), meaning that their self-comparison standard is lower. As a result, women feel less entitled to the same pay as men (Major, 1994). However, Major (1994) argues that individuals use this approach only when the information regarding others' income is unavailable or not salient, or when comparison targets are too dissimilar. In other words, individuals preferred to compare with others rather than compare with their past income. Evidently, Austin et al. (1980) found that when providing individuals with information regarding their past income and that of others, individuals focus on the incomes of others more when rating their satisfaction and considering the fairness of their pay.

The social comparison approach argues that individuals compare and evaluate their salary against the salaries of others in order to judge the fairness of their pay (Major and Forcey, 1985; Adams, 1963; Festinger, 1954). Individuals, however, tend to have a specific pattern as to how they choose their social comparison target, i.e. they tend to compare their earnings with people who are similar to them, or else who are in a similar situation (Major, 1989; Major and Testa, 1989). Women and men, for example, tend to have different comparison groups (Major and Forcey, 1985). When given a choice, both sexes chose to compare their incomes with the average income of the same sex as opposed to that of the opposite sex or indeed the combined average income of both sexes (Major and Forcey, 1985). Zanna et al. (1975) argue that this comparison behaviour may be the result of the availability

and salience of information, and may also stem from the similarity of the characteristics of colleagues of the same sex. This, in turn, creates gender-specific standards with women's pay expectations based on women's standards and men's on men's standards. As women typically earn less than men, despite similar educational backgrounds and experiences (Levitan et al., 1971), women's tendency towards same-gender comparison will result in lower pay entitlement (Major and Testa, 1989).

However, the effect of gender alone cannot influence pay entitlement. Specifically, the influence of gender on pay entitlement disappears when individuals are only informed about the incomes of others and when information regarding the specific comparison group is not made available (e.g. Major et al., 1984). Bylsma and Major (1992) show that when providing individuals with information regarding the pay of others and their performance feedback, the individuals' sense of pay entitlement was influenced by this information rather than the gender. More precisely, individuals with higher performance and individuals who learn that others receive relatively high pay tend to request higher pay for themselves, regardless of their genders.

The tendency for individuals to compare their salary with their own historic salaries or with the salaries of those who have similar qualifications or who are in a similar role also leads to different comparison standards for high- and low-status groups. This, in turn, leads to differences in entitlement levels (O'Brien and Major, 2009; Hogue and Yoder, 2003). When income is evaluated by comparing it with past earnings or the current income of others in a similar role, low-status individuals tend to be satisfied with their pay even if it is considerably less than high-status individuals. Thus, low-status individuals have lower entitlement levels and believe that their outcomes are justified.

However, in order to identify a person of a similar status who can act as a standard for comparison, individuals first need to know their own rank or position within society. Cook

(1975) argues that if such information is not available, individuals will not perceive the distribution of outcomes as unfair. Rather, they tend to believe that the outcomes they receive align with their rank or position.

Additionally, it is suggested that social comparison information will affect the feelings of entitlement only when individuals believe the distribution of outcome is legitimate (Bylsma et al., 1995; Major, 1994). In other words, to infer that one should receive the same outcomes as others, it is necessary to believe that both current outcomes and the outcomes of the comparison standard are justified (Bylsma et al., 1995). Hence, unlike the concepts of want or expectation, which are influenced by comparisons regardless of legitimacy, beliefs about entitlement depend considerably on whether or not the outcomes are fair or just (Major, 1994).

Deciding whether something is legitimate can be determined in several ways, including whether or not an individual believes that the observed outcome distributions follow the norm of distributive justice such as equality, power, or need (e.g. Sampson, 1975); how much others contribute to their own outcomes (Gurin, 1985); and how much an individual's input and attributes are translated into outcomes (Major, 1994).

The process of deriving entitlement can be summarised by Moore's (1991) theoretical model of entitlement. In this model, an individual receives an outcome, and then compares their outcomes with their own expectations (i.e. their past outcomes) and with the outcomes of others (Adams, 1963). If there is no difference between their outcome and the outcomes of others, then entitlement in this scenario hinges mainly on expectations (Cook, 1975). If there is a difference, the individual will attempt to determine whether or not it stems from a dissimilarity between themselves and others, and whether this dissimilarity is legitimate in the current situation. For example, if the dissimilarity is one of qualifications, it is generally accepted that the less qualified person should receive a lower outcome. No response is made

to legitimate differences. However, in a case where the outcome difference cannot be justified, feelings of anger and resentment may arise (Crosby, 1976). Individuals will then use a specific distribution principle in order to estimate or reallocate the appropriate amount of outcomes that they perceive as justified.

Although other factors that influence income entitlement are not the focus of this research, it is worth noting that entitlement is also influenced by other factors, including the perceived value of inputs and outcomes (Adams, 1963), the economic ideals of a society (O' Brien and Major, 2009), and a company's recruitment process and performance appraisal (Fisk, 2010).

2.5.2 The Effects of Entitlement

Feelings of entitlement have been found to influence the way individuals evaluate outcomes and their attitude and behaviour concerning perceived differences in outcomes. Individuals with higher entitlement levels are more likely than those with lower entitlement levels to fall short of their expectations (Naumann et al., 2002), and are thus more likely to display dissatisfaction. For example, a higher entitlement level has been found to be associated with lower job satisfaction (King et al., 1993), lower pay satisfaction (Sweeney et al., 1990), higher absence rates (Huseman et al., 1987), and counterproductive behaviour at work (Fisk, 2010).

Entitlement can also provoke feelings of resentment and deprivation (Major, 1989). Relative deprivation theory (Crosby, 1976) considers entitlement to be one of the strongest causes of feelings of deprivation. If an individual's sense of entitlement is violated, feelings of injustice and deprivation arise (Mikula, 1993). For example, executives who have been laid off and re-employed in a lower position at a lower level of pay often feel that they are entitled to a better post with higher earnings (Feldman et al., 2002). As a result, they are

likely to feel deprived, which subsequently leads to a negative attitude regarding their current work.

Entitlement also increases the willingness to help others (Lerner, 1987). In a study conducted by Miller (1977), one group of participants was offered a temporary job on the condition that were it accepted, they would be paid $2 and an underprivileged family would receive $1. The second group of participants were told they would be paid $3. The results suggested that participants in the first group felt more incentive to work than those in the second group. However, the donation to the underprivileged family motivated individuals to work only when individuals felt the amount of pay they received was fair for their work. Once it fell below what they considered appropriate (i.e. they and the family each received $1), the incentive to help others was not sufficient to maintain the same level of commitment as those in the first group. In other words, if feelings of entitlement are not threatened, individuals are more willing to work to help the family than to keep all the pay for themselves.

Perceptions of entitlement and social comparison also influence the amount of effort that workers put into their jobs. Cohn et al. (2012) discuss a situation where two workers, paid the same wage, worked as a pair but performed an identical task individually. They showed that when both had their wages cut, both of their performances were affected negatively. However, when only one worker had their wage reduced, that worker's performance decreased by half, a considerably greater drop than when the group's wage was cut, whereas the performance of the other worker remained at roughly the same level. Cohn et al. (2012) argue that the worker whose wage was cut was influenced by social comparison, which in turn influenced the effort they put into their work.

A violation of feelings of entitlement can result in negative effects on employees, such as a poor attitude to work, job satisfaction and work effort. All of these factors go

against an organisation's interest, as noted above. In order to minimise these negative consequences, it is necessary for organisations to understand how their employees' entitlement develops.

To date, the attempt to identify the antecedents of pay entitlement has been limited. Past research has mainly focused on gender differences, rather than performance feedback, as a determinant of pay entitlement (e.g. Pelham and Hetts, 2001; Major and Forcey, 1985). One exception is the work of Bylsma and Major (1992), who showed that pay entitlement was a function of performance feedback and social comparison. Specifically, individuals' higher performance and the higher pay of comparative persons lead to higher pay entitlement. However, in their paper, information to help participants determine whether or not the pay of others is justified (e.g. the performance of the comparative persons) was omitted. As such, participants were likely to assume that the pay of others was justified, and demand their pay based on what others earned. The effect of others' pay may have disappeared had participants learned about the performance of the person being compared. This is because the pay of such a person does not necessarily activate individuals' sense of entitlement if they believe the pay is not justified (i.e. if the person being compared performs poorly performed but is highly paid). This research aims to fill this gap in literature by investigating how ranking feedback interacts with feelings of entitlement, as well as social comparison information, while controlling for the performance of the comparison person, all of which determine the pay request of an employee.

2.6 Prospect Theory and the Framing Effect

Prospect theory suggests that individuals' decision-making is influenced by its context (Kahneman and Tversky, 1979). In contrast to expected utility theory, one of the cornerstones of neoclassical economics, which posits that individuals choose the option that gives the

highest expected outcome regardless of the context, prospect theory proposes that individuals consider the situational context when making a decision. According to this theory, the initial process of decision-making is to restructure a problem and then simplify it. Each possible outcome of the problem is determined relative to a reference point, such as past outcomes, and is categorised as either a gain or a loss. This process is referred to as the editing stage. Subsequently, individuals enter the evaluation stage, where they determine the value of each outcome based on its prospect and chose the outcome that provides them with the highest value possible (Puto, 1987).

More specifically, Kahneman and Tversky (1979) proposed that prospect theory had four properties. First, an outcome is evaluated relative to a reference point. Individuals perceive any outcome higher than the reference point as a gain and any below the reference point as a loss. Since people tend to rely on their past experience to evaluate outcomes, the most influential reference point is perhaps the status quo (Kahneman and Tversky, 1979). For example, the perception about one's exam score is likely to be influenced by one's past score. If the new score is higher (lower) than the past score, it will be viewed as a gain (loss). The second feature of prospect theory is loss aversion. Prospect theory posits that individuals perceive a loss to be more disturbing than an equivalent gain is pleasing; as such, a loss of £100 generates more dissatisfaction than the satisfaction gained by a win of £100. The third property is diminishing sensitivity. As the size of a gain or a loss becomes larger, its marginal value decreases. As a result, the value function of a decision maker exhibits a concavity when a gain is made while a loss reveals convexity. For example, the increase of £10 from £1000 is perceived to be lower than the same increase of £10 from £50. This "gain concavity" and "loss convexity" suggests that people tend to be risk averse when dealing with positive outcomes and risk-seeking when dealing with negative outcomes. For instance, people would choose a certain payoff of £100 over an alternative payoff of £200 with a 50% chance of

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success. However, they would generally prefer a 50% chance of losing £200 to the alternative of a definite loss of £100. The fourth property is probability weighting. Prospect theory suggests that individuals use subjective, rather than objective, probabilities to calculate the utility of an outcome. They do so by transforming objective probabilities into subjective probabilities. Low probabilities are overweighted and high probabilities are underweighted, relative to objective probabilities.

Prospect theory is often used to explain the framing effect (see Kuhberger (1998) for a review). The framing effect is a situation in which individuals have different preferences for choices that are the essentially the same but described differently. Consider, for example, the Asian disease problem (Tversky and Kahnema, 1981). People were informed about an Asian disease predicted to kill 600 people. The first group of individuals (the gain-frame condition) was asked to choose whether to adopt programme A, which would save 200 people, or programme B, which had a one-third probability of saving all 600 people, and a two-thirds probability of saving nobody. The second group of individuals (the loss-frame condition) was also told about the Asian disease, but was asked to choose whether to adopt programme C, which would let 400 people die, or programme D, which had a one-third probability that no one would die, and a two-thirds probability that everyone would die. In fact, the choices of these two conditions are identical, except that they are described differently: for A and C, it is guaranteed that 200 would be saved and 400 would die; for B and D, there is a one-third chance that everyone will survive, and a two-thirds chance that nobody will. Despite the identical outcomes of programme A and C, 72% of individuals in the first group chose programme A, but only 22% of individuals in the second group chose programme C. This finding can be explained by prospect theory, which suggests that individuals, manipulated by framing, evaluate an outcome as a gain or a loss relative to their reference point. Individuals in the gain-frame condition are risk-averse, and therefore perceive saving 200 lives as being

more attractive than the risky option with the equal expected value. On the contrary, individuals in the loss-frame condition are risk-seeking, and perceive the risky option to be more attractive.

2.6.1 Types of Framing Effects

According Levin et al. (1998), there are three main types of framing effects. The first is risky choice framing, such as in the aforementioned Asian disease problem. This type of framing involves making a choice between a risk-free and a risky option with an equivalent expected value. The two options are described both in terms of gains (positive frames) or losses (negative frames). Positively-framed individuals tend to choose a risk-free option, whereas negatively-framed individuals tend to choose a risky option (Tversky and Kahneman, 1981).

The second, and perhaps simplest, type of framing is attribute framing. For this type of framing, only one attribute in a particular context is manipulated. A plan, for example, can be described as having an 80% chance of success or 20% chance of failure. In attribute framing as opposed to risky choice framing, rather than asking individuals to choose between the risk-free and risky options, individuals are asked to evaluate a positive-labelling option or a negative-labelling option by, for example, rating their satisfaction. For instance, individuals might be asked to rate the quality (high or low) of ground beef which was labelled as 75% lean (positive frame) or 25% fat (negative frame) (Levin and Gaeth, 1988). In most cases of attribute framing, individuals tend to rate the positive frame alternative more favourably than the negative frame alternative (Levin et al., 1998). These findings, however, cannot be explained by prospect theory because the theory focuses mainly on the preference changes of options involving risk being framed differently, rather than changes in the evaluation of objects or attributes (Levin et al., 1998). Levin and Gaeth (1988) argue that the findings can

be explained by the difference in information encoding. Positive (negative) description of attributes leads individuals to encode information in a way that triggers favourable (unfavourable) associations in memory, resulting in a more favourable evaluation of a positive frame attribute than a negative frame attribute. This difference in information encoding may also direct individuals' attention to positive or negative aspects of attributes, which in turn influence their evaluations (Levin et al., 1985).

The third type is goal framing. For this type of framing, the descriptive information of the situation or goal is manipulated. Even though the ultimate goal is the same, a positively-framed goal directs one's attention to its positive consequences or benefits of pursuing this goal, whereas a negatively-framed goal draws one's attention to the negative consequences of not pursuing this goal. Goal framing is often used to evaluate whether a positive or negative frame is more effective in persuading individuals to act or not to act. For instance, the sentence "Research shows that women who do 'Breast Self-Exam' have an increased chance of finding a tumor in the early, more treatable stage of the disease" (Meyerowitz and Chaiken, 1987, p. 504) focuses on the positive consequence of taking an action. However, the sentence "Research shows that women who do not do 'Breast Self-Exam' have a decreased chance of finding a tumor in the early, more treatable stage of the disease" (Meyerowitz and Chaiken, 1987, p. 504) draws readers' attention to the negative consequence of not taking action. It is suggested that the negatively-framed information was more powerful in persuading individuals to do a breast self-exam than the positively framed information (Meyerowitz and Chaiken, 1987). This effect can be explained by loss aversion: individuals perceive a loss as larger than the same amount of gain (Levin et al., 1998). Thus, information focusing on negative consequences of not taking an action has a higher impact on judgment than information stressing the positive consequences of taking an action.

2.6.2 Prospect Theory, the Framing Effect, and Social Decision Making

One important field of research that is influenced by the effects of framing is social decision-making. Social decision-making refers to situations where individuals' decisions not only affect their own outcomes but also the outcomes of at least one other person (Pruitt and Kimmel, 1977). The outcome can either depend solely on the decision of the individual (e.g. Poppe and Valkenberg, 2003) or on the decision of both parties (e.g. Neale and Bazerman, 1985). If it is only the individual making a decision, they will typically be confronted with the dilemma as to whether to choose a lower but higher-than-other outcome or a higher but lower-than-other outcome. For instance, one may need to decide whether to cooperate with another person and receive a personal payoff of £30 and £40 for others, or not to cooperate and receive a personal payoff of £20 and £10 for others. In a situation where the outcome also depends on another's decision, as in a negotiation, the individual is conflicted between choosing a risky option and a compromise option. While a better outcome may be obtained in the former, there is a chance that the offer will be rejected and they end up with nothing; for the latter, the outcome is typically lower, but the probability of ending up with nothing is lower as well. This type of situation is referred to as a social interdependent situation.

In these situations, individuals develop their frames by comparing prospective outcomes with a reference outcome. For positive-frame situations, prospective outcomes are higher than a reference outcome, and therefore are perceived as gains. Individuals view a compromise or a concession, if any, as a decrease in their gains. On the other hand, for negative-frame situations, prospective outcomes are lower than a reference outcome, and are perceived as losses, leading individuals to perceive the compromise or the concession as an increase in their losses (Kahneman, 1992; Bazerman, 1983).

The way that choices or situations are framed influences social decisions. For example, in a situation where the outcome is affected by the decisions of both parties, loss-

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frame individuals tend to become more argumentative, and are less likely to reach an agreement (Neale and Bazerman, 1985; Bazerman et al., 1983). Neale and Bazerman (1985) demonstrated that individuals negotiating profits (gain frame) perceived negotiation as an opportunity for profit maximisation and were less averse to making a concession. In contrast, even though the final outcomes were identical, individuals negotiating expenses (loss frame) viewed negotiation as an opportunity for expense minimisation, and tended to have higher demands for their shares, and an impasse was more likely to be reached (Bazerman et al., 1983). Consequently, when negatively-framed individuals were paired with positively-framed individuals, and were asked to divide a certain amount of money between themselves and the other persons, negatively-framed individuals tended to obtained higher shares than their positively-framed partners (Bottom and Studt, 1993).

McCusker and Carnevale (1995) also demonstrated the effect of framing on resource sharing. When individuals were asked to indicate how much of their private resources they would like to give to the public (loss frame), the indicated amount was less than when they were asked how much they would like to take from the public (gain frame). This effect was pronounced despite the fact that the give and take frames would have resulted in the same net outcome had individuals indicated the same amount.

Gain- and loss-frame individuals are also different in their tendency to be influenced by the frames of others. Gain-frame individuals are found to be more sensitive to other people's outcomes than loss-frame individuals (e.g. de Dreu, 1996; de Dreu et al., 1994a, 1992a, 1992b). For example, de Dreu et al. (1992a) demonstrated that gain-frame individuals are more cooperative when others are in a loss frame than when they are in a gain frame. This is perhaps because gain-frame individuals want to decrease the frame asymmetry, or because it might be in their nature to be caring and helpful when others are in trouble. However, since loss-frame individuals are more own-outcome oriented than gain-frame individuals, they are

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less likely to be influenced by the frame of others (de Dreu et al., 1992a). Therefore, cooperative behaviour is observed less often when individuals are in the loss frame.

In addition, de Dreu et al. (1992b) argue that unlike a frame of loss-frame individual, a frame of gain-frame individual tends to be influenced by the frame which is communicated by the other person. Specifically, when the other person communicates his/her gain frame, the individual's gain frame is reinforced. In addition, when the loss frame of the other person is communicated, the individual changes their gain frame into a loss frame. By changing the gain frame into a loss frame, the individual becomes less cooperative and more concerned about their own outcomes. As a result, an individual who was initially gain-framed demands less and concedes more when the other person communicates a gain frame rather than a loss frame (de Dreu et al., 1992b). However, for the loss-frame individual, the communication of the other person' loss or gain frame does not influence the individual's frame. Hence, loss-frame individuals tend not to reach a concession, regardless of the frames of others.

Additionally, gain-frame individuals are more concerned about outcome differences (de Dreu, 1996; de Dreu et al., 1994b). de Dreu et al. (1994b) demonstrate that gain-frame individuals tend to prefer having similar outcomes to others rather than better outcomes than others when they expect to cooperate with them in the future. However, if they do not expect future cooperation, having similar outcomes is as attractive as having better outcomes. Loss-frame individuals, however, are less concerned about outcome differences. They tend to be more individualistic, meaning they choose options that maximise their own outcome, regardless of the outcomes of others (Poppe and Valkenberg, 2003). In sum, the findings from past literature suggest that loss-frame individuals tend to be more own-outcome oriented, less cooperative, concede less, and demand more than gain-frame individuals.

Various mechanisms contribute to the behavioural differences of gain- and loss-frame individuals when making social decisions. First, Peeters and Czapinski (1990) argue that

individuals with a negative (loss) frame pay more attention to the stimuli (such as loss outcomes), and engage in more cognitive activities than individuals with a positive (gain) frame. As a result, loss frame individuals, compared to gain frame individuals, are more likely to focus on their own outcomes rather than on the outcomes of the other person (de Dreu et al., 1994b). Second, since individuals are more averse to a loss than they are attracted to an equivalent gain (Kahneman and Tversky, 1984), the motivation to prevent a loss is stronger than the motivation to acquire the same size of gain (de Dreu et al., 1994b). As a result, in a negotiation when a situation is framed as a settlement of expenses, individuals are less likely to make a concession than when a situation is framed as a settlement of profits, because they are more motivated to protect their loss (Carnevale, 2008). Third, since individuals are risk-averse in a gain frame, they tend to prefer a sure outcome associated with a compromise option rather than a risky but better outcome, associated with a non-compromise option. As such, they are generally more willing to compromise rather than risking non-agreement (Bazerman et al., 1983). Loss-frame individuals, on the other hand, are more tolerant to risk taking, and thus have a lower tendency to cooperate or make a concession (Carnevale, 2008).

Even though the literature has shown that individuals with different frames make different social decisions, this thesis argues that their decisions also depend on their rank position. Specifically, this thesis shows how individuals from different ranks and in different situational contexts (loss vs gain) or situational frames (negative vs positive) make different social decisions. The social decision in this thesis is studied in the context of cooperation. More precisely, individuals were asked to decide whether or not to cooperate with their rivals in similar ranks. The cooperation decision affects both their own and their rivals' outcomes. If individuals decide to cooperate, their outcomes will increase more than when they decide not to cooperate, but less than the outcomes of their rivals. However, if they decide not to

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cooperate, their outcomes will increase by the same amount as their rivals. By examining when and why individuals decide to cooperate, this thesis aims to provide a better understanding of the interaction of rankings and frames on cooperation behaviours.

Chapter 3

The Effect of Rankings on Aspiration Level

3.1 Hypotheses

Performance feedback is one of the main factors that individuals use to help them set their aspiration level. However, as individuals' judgments are relative, and often influenced by social comparison (Festinger, 1954), others' performance can also have an effect on an aspiration level. For example, previous research has demonstrated that individuals whose performance is above average are likely to set lower aspiration levels than those whose performance is below average (Festinger, 1942; Gould and Lewis, 1940). Similarly, rankings which show comparative performance relative to a whole group are likely to influence aspiration levels. Specifically, ranking feedback can help individuals see the potential to improve or worsen their performance through a comparison with, respectively, the top or bottom. Nevertheless, as feedback is usually a tool for performance improvement (Quaglia and Cobb, 1996), individuals possessing ranking feedback are likely to focus more on how much their performance can be improved rather than weakened. Evidently, Wheeler et al. (1969) demonstrated that when given choices, individuals seek to acquire information regarding the performance of the top person, rather than the performance of those who occupy similar rankings or those in low-ranking positions. This finding suggests that individuals are likely to compare themselves with the top-ranked person instead of the bottom-ranked. As the performance of the top-ranked person indicates the best performance

that can possibly be achieved, the distance between one's own rank and the top rank relative to the group conveys one's potential to improve. More precisely, as one gets closer to the top, it is less likely that they can perceive significant potential to improve. Consequently, I predict the following:

H1: High-ranking individuals will perceive lower potential to improve compared to low-ranking individuals.

The room for improvement then serves as a basis in setting an aspiration level: individuals are likely to set an aspiration level that they think is possible to achieve (Campbell, 1982). This suggests that if individuals believe their performance will worsen, they are likely to set the aspiration level lower than their current performance, leading to a negative discrepancy between aspiration level and performance. On the other hand, if they perceive the potential to improve their performance, they are likely to set the aspiration level higher than current performance, resulting in a positive discrepancy. The absolute level of discrepancy, however, depends on how much individuals believe their performance can diminish or improve. For example, if individuals think that they have a relatively high potential to improve, the discrepancy is likely to be positive and high. Given that high-ranking individuals perceive a lower potential for performance improvement than low-ranking individuals (Hypothesis 1), I predict the following:

H2: The discrepancy between the aspiration level and current performance of high-ranking individuals will be lower than that of low-ranking individuals.

Without information about others' performance, individuals will rely on their own performance in order to set aspiration levels. Since individuals in general are motivated to perform better, their aspiration levels tend to be slightly above their current performance

(Campion and Lord, 1982; Simon et al., 1954; Hertzman and Festigner, 1940). Hence, the discrepancy between their aspiration level and performance is likely to be positive but relatively low, similar to high-ranking individuals. Given that the discrepancy of high-ranking individuals is lower than that of low-ranking individuals (Hypothesis 2), I predict the following:

H3: The discrepancy between the aspiration level and current performance of individuals with no ranking information will be similar to that of high-ranking individuals, but lower than that of low-ranking individuals.

The relationship between ranks and aspiration levels is likely to be moderated by self-efficacy. Self-efficacy refers to the perception of "how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982, p.122). Individuals with high self-efficacy levels tend to believe in their ability to succeed. As a result, whenever they see room for improvement, they will probably consider themselves able to improve the performance and set their aspiration level accordingly. On the contrary, low self-efficacy individuals tend not to believe in themselves or their own potential. Even though they see the significant potential of improvement (being at a low rank), they are unlikely to believe in their ability to achieve it. Consequently, they are likely to set low aspiration levels as when they see low potential to improve (i.e., being at high ranks). Taken together, I predict the following:

H4: Self-efficacy will moderate the effect of rankings on aspiration levels such that high self-efficacy individuals will set higher aspiration levels when their ranks are high as opposed to when their ranks are low, holding constant the performance in both situations. However, low self-efficacy individuals will set relatively low aspiration levels regardless of rank.

The Present Studies

The four hypotheses were tested across four studies. Study 1 explored the relationship between rankings and aspiration levels using a numerical search task competition wherein participants were required to find two numbers in a matrix and complete as many matrices as possible in a timed period. However, since there was the possibility that the findings in Study 1 could be influenced by a ceiling effect from the number of matrices given to participants, Study 2 addressed this shortcoming and also included a control condition where no ranking information was provided. Study 3 showed that information about the number of competitors is a necessary condition for rankings to influence aspiration levels. Finally, Study 4 showed how self-efficacy moderates the effect of rankings on aspiration levels.

3.2 Study 1

Participants

A total of 120 students from two MBA classes at Chulalongkorn University in Bangkok participated in the study. Participants were approached twice after their classes.

Design and Procedure

The study consisted of two parts. In the first part, participants were asked to perform the matrix task, requiring them to find two numbers in a matrix that added up to 10. They were asked to first insert their student IDs on the cover page. Each participant was given 30 matrices and asked to sequentially solve as many of them as possible in five minutes. They were also told that they would be informed about their scores and rank at the end of the next class. Participants received 50 Baht (equivalent to around one British pound) for participating, and an additional five Baht for each matrix solved correctly. The exact scenario was as described below.

This study consists of two parts. The first part will start shortly. The second part will start in the next class.

In the first part, you will be competing with your classmates in a numerical search task. You will be given a set of 30 matrices (2 matrices per page). Each matrix contains 12 numbers similar to the one shown below. For each matrix, your task is to find two numbers in that matrix that add up to 10. For example, the correct answers for the matrix below are 3.58 and 6.42. You can answer by drawing a circle around the correct numbers.

9.38	6.74	8.17
5.15	6.61	3.06
9.71	0.91	4.88
3.58	4.87	6.42

Please sequentially solve each matrix, and do not move on to the next matrix until you have answered the current one. Your score will be measured based on the number of matrixes that are correctly solved in 5 minutes. Your score will then be compared and ranked with the scores of your classmates. You will learn your score and your rank in the second part of the study.

You will earn 50 baht for participating in this study and 5 baht for each matrix you correctly solve. You payment will be made after you finish both parts of the study.

In the second part of the study, your rank and score will be revealed and you will need to answer questions regarding your performance. The second part of the study will start at the end of the next class. If you have any questions, please raise your hand now.

The matrix sheet was collected after five minutes. The experimenter checked the answers of each participant, and gave one mark to each matrix solved correctly. After this, the experimenter ranked participants based on their scores. The first rank was assigned to the top performer. Participants with the same score were randomly assigned rank. For example, four participants who solved nine matrices were randomly assigned ranks from tenth to thirteenth.

In the second part of the study, participants were told about their score, their rank, and the number of participants. Specifically, they were informed, "You have correctly solved … matrices. There were a total of 60 students participated in this competition. Your rank is … (Rank #1 represents the best performer)".

They were then told that they were about to enter the same competition again. However, before the next competition started, they needed to answer a number of questions. Specifically, they were informed, "In the second part, your task is again to correctly solve as many matrices as you can in 5 minutes. Before the competition starts, please answer the questions below". To measure the aspiration level, participants were asked, "How many matrices do you expect to solve in the next competition?" (minimum=0, maximum=30). To minimise the effect from the number of matrices given to participants they were also asked, "Please predict whether in the next competition, your performance will improve or worsen by how much percent?" (Participants chose whether or not their performance will improve (+ sign) or worsen (- sign), and then decided by how much percent). To measure the perceived potential to improve, participants were asked, "Please predict the maximum number of matrices you think you can solve correctly" (minimum=0, maximum=30), and "How many matrices do they think the most skilled person can solve correctly in five minutes?" (minimum=0, maximum=30). Finally, participants were asked, "To what extent do you think the score reflects your ability in the task?" (1=not at all, 9=very much). After the questionnaire had been completed by all the participants, they were given another set of 30 matrices and were asked to sequentially solve as many matrices as possible in five minutes.

Results

Since there were 60 students in this study in each class, the top twenty performers were categorised as "high-ranking", the bottom twenty as "low-ranking", and the rest as "intermediate-ranking". Eight students did not participate in the second part of the study. As

such, there was a total of 112 valid responses. The extent to which participants believed the score reflected their ability in the task was included as a covariate in all analyses.

In both competitions, high-ranking participants performed significantly better than intermediate-ranking participants, who also performed better than low-ranked participants (First competition: $F(2, 109)=197.869$, $p=0.000$, $\eta^2=0.784$; linear trend: $F(1, 109)=393.102$, $p=0.000$, $\eta^2=0.783$; Second competition: $F(2, 109)=9.670$, $p=0.000$, $\eta^2=0.151$; linear trend: $F(1, 109)=17.415$, $p=0.000$, $\eta^2=0.138$). The Shapiro-Wilk test of normality was not significant in both competition (First competition: df=112, $p=0.252$; Second competition: df=112, $p=0.298$), suggesting that the performance scores of the two competitions were normally distributed.

As predicted, the discrepancy between the number of matrices participants expected to solve in the next competition and their actual scores in the first competition decreased with rank, such that the discrepancy of high-ranking participants was lower than that of low-ranking participants ($F(2, 107)=4.032$, $p=0.021$, $\eta^2=0.070$; linear trend: $F(1, 107)=5.157$, $p=0.025$, $\eta^2=0.046$). Additionally, the predicted percentage of performance improvement decreased with rank: high-ranking participants predicted their performance would improve less than low-ranking participants did ($F(2, 105)=6.614$, $p=0.002$, $\eta^2=0.112$; linear trend: $F(1, 105)=8.661$, $p=0.004$, $\eta^2=0.076$).

Similarly, the discrepancy between the predicted maximum number of matrix and actual scores was a function of rankings, i.e. the discrepancy of high-ranking participants was lower than that of low-ranking participants ($F(2, 107)=7.140$, $p=0.001$, $\eta^2=0.118$; linear trend: $F(1, 107)=13.311$, $p=0.000$, $\eta^2=0.111$). Finally, the discrepancy between the predicted score of the most skilled person and their actual scores also decreased with rank: the discrepancy is lower for high-ranking participants than low-ranking participants ($F(2,$

108)=18.363, p=0.000, η^2=0.254; linear trend: F(1, 108)=36.000, p=0.000, η^2=0.025). Table 3.1 shows the means and standard deviations of all dependent variables by rank.

Table 3.1: Study 1's Means and Standard Deviations of Dependent Variables by Rank

Rank	Mean	S.D.	Rank	Mean	S.D.
Average Scores in the First Competition			Discrepancy between the Predicted Maximum Scores and Scores in the First Competition		
High (1-20)	15.51	2.16	High (1-20)	3.13	4.58
Intermediate (21-40)	10.62	1.19	Intermediate (21-40)	5.78	2.84
Low (41-60)	6.64	2.27	Low (41-60)	6.89	5.41
Average Scores in the Second Competition			Discrepancy between Predicted Scores of the Most Skilled Person and Scores in the First Competition		
High (1-20)	14.64	4.31	High (1-20)	8.56	4.32
Intermediate (21-40)	13.92	3.90	Intermediate (21-40)	11.54	4.79
Low (41-60)	10.86	3.46	Low (41-60)	16.83	8.15
Discrepancy between Aspiration Levels and Scores in the First Competition			Discrepancy between Scores in the Second and First Competitions		
High (1-20)	1.24	4.00	High (1-20)	-0.87	4.08
Intermediate (21-40)	3.19	2.17	Intermediate (21-40)	3.30	4.06
Low (41-60)	2.94	3.22	Low (41-60)	4.22	3.55
Predicted Percentage of Performance Improvement (%)			Discrepancy between Aspiration Levels and Scores in the Second Competition		
High (1-20)	7.51	26.39	High (1-20)	2.18	4.86
Intermediate (21-40)	26.19	21.70	Intermediate (21-40)	-0.11	4.33
Low (41-60)	24.59	25.57	Low (41-60)	-1.28	4.57

In terms of actual performance improvement, the level of score improvement (scores in the second competition minus scores in the first competition) of high-ranking participants was lower than that of intermediate and low-ranking participants (F(2, 108)=18.168,

p=0.000, η^2=0.252; linear trend: F(1, 108)=31.535, p=0.000, η^2=0.226). Specifically, the performance scores of high-ranking participants in the first and second competitions were not significantly different (F(1, 38)=1.781, p=0.190, η^2=0.045). However, the scores of low-ranking and intermediate-ranking participants in the second competition were significantly higher than their scores in the first competition (Low ranks: F(1, 35)=50.794, p=0.000, η^2=0.592; Intermediate ranks: F(1, 36)=24.391, p=0.000, η^2=0.404). The findings suggest that the relationship between rank and actual performance improvement was in the same direction as the relationship between rank and aspiration levels.

To test whether participants in each ranking condition set an appropriate level of aspiration (i.e. the level they are able to achieve), aspiration levels were compared with scores from the second competition. The results suggest that the aspiration level of high-ranking participants was statistically higher than their actual performance (F(1, 37)=7.677, p=0.009, η^2=0.172). However, the aspiration levels of intermediate- and low-ranking participants were not statistically different from their actual performance (Intermediate ranks: F(1, 36) = 0.023, p=0.880, η^2=0.001; Low ranks: F(1, 35)=2.813, p=0.102, η^2=0.074). Additionally, the results of a one-way ANOVA using the discrepancy between the aspiration levels and scores from the second competitions as the dependent variable, and ranks as the independent variable, suggested that the discrepancy increased with rank: the discrepancy was higher for high-ranking participants than low-ranking participants (F(2, 107)=5.575, p=0.005, η^2=0.094; linear trend: F(1, 107)=10.678, p=0.001, η^2=0.091).

Discussion

The results suggest that high-ranking individuals thought their potential to improve was low, as reflected in the discrepancy between predicted maximum scores and scores in the first competition, and in the discrepancy between the predicted scores of the most skilled

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person and scores in the first competition. Consequently, high-ranking individuals formed their aspiration level close to their current performance. In contrast, low-ranking individuals believed that their performance could be significantly improved, and therefore set their aspiration level much higher than their current scores. The predicted percentage of performance improvement follows a similar pattern.

Nevertheless, even though high-ranking individuals set their level of aspiration close to their current performance, their level of aspiration was still unrealistically high. This resulted in their future performance being lower than their level of aspiration. On the contrary, despite the fact that intermediate- and low-ranking individuals set their level of aspiration much higher than their current performance, this level of aspiration seemed appropriate, as reflected in the insignificant difference between their aspiration levels and scores in the second competition.

In this study, the number of matrices provided to participants might be seen as a ceiling, thus restricting the aspiration level of high-ranking participants. Additionally, by asking, "How many matrices do you expect to solve in the next competition?" it could be argued that participants are encouraged to form an expectation about their future performance which may not precisely be their level of aspiration. Study 2 addresses these issues, and also includes the control condition, which provides participants no information about their rank.

3.3 Study 2

Participants

A total of 89 participants participated in the study. Participants were approached in Green Park and Hyde Park in London and asked to voluntarily complete a one-page questionnaire.

Design and Procedure

Participants were randomly assigned to one of the three between-subjects conditions (control-no ranking information, high, and low ranks). Participants read the following scenario, and answered questions. Information about rank was omitted for participants in the control condition.

Imagine that yesterday you participated in a matching card competition with 500 players. In the competition, each player was given the same set of cards on a computer screen. All cards were faced down. Players can see the face of each card by clicking on it. The task was to match sixteen pairs of two identical cards. After each pair of cards is matched, the matched cards will disappear from the screen, as illustrated below. Each player was required to match all the cards **as quickly as possible**. After the competition, each player was ranked based on the time spent on matching all the cards. The 1st rank belongs to the one who spends shortest time.
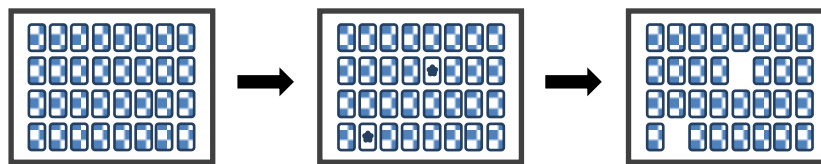
| All cards are faced down. | A pair of cards is matched. | The matched pair disappears from the screen |

From the competition yesterday, you matched all the cards within 120 seconds, and you ranked the 3rd (498th) out of 500 players. Today you will be participating in the same competition again.

Participants then responded to the three questions: To measure the level of aspiration, participants responded to the questions, "How much time do you aim to complete the task (in seconds)?" (minimum=0, no maximum), and "How much time do you expect to match 16 pairs of two identical cards (in seconds)?" (minimum=0, no maximum). To measure the perceived potential to improve, participants responded to the question, "How much time do you think most talented person can match 16 pairs of two identical cards (in seconds)?" (minimum=0, no maximum).

Results

The aim to complete the task served as the level of aspiration. Since the performance of high and low-ranking individuals was held constant in this study, there is no need to subtract the relevant dependent variables (e.g. aspiration level) from the current performance. The results of one-way ANOVA with the dependent variable *aspiration level*, and the between-subjects factor *rank* showed that rank significantly influences aspiration level ($F(2, 86)=6.602$, $p=0.002$, $\eta^2=0.133$). More precisely, participants in the control condition set their aspiration level at a similar level to high-ranking participants, and both group set their aspiration level lower than low-ranking participants: the contrast -1 (control), -1 (high-ranking), and 2 (low-ranking) was significant ($F(1, 86)=12.975$, $p=0.001$, $\eta^2=0.131$). Similarly, rank influences performance expectation ($F(2, 86)=6.618$, $p=0.002$, $\eta^2=0.133$). Participants' expectations in the control condition were not significantly different from the expectation of high-ranking participants, and both groups expected lower future performance than low-ranking participants. The contrast -1 (control),   -1 (high-ranking), and 2 (low-ranking) was significant ($F(1, 86)=12.344$, $p=0.001$, $\eta^2=0.126$). The results of a within-subjects ANOVA with two proxies of aspiration level (score aims and score expectations) as a within-subject factor indicated that participants generally set their aims lower than their expectations ($F(1, 88)=27.247$, $p=0.000$, $\eta^2=0.236$).

Additionally, rank influences the perceived potential to improve ($F(2, 86)=9.279$, $p=0.000$, $\eta^2=0.177$). Participants in the control condition and high-ranking condition had similar predictions about the performance of the most talented person; however, the two groups predicted that the most talented person would perform worse than the low-ranking participants predicted. The contrast -1 (control), -1 (high-ranking), and 2 (low-ranking) was significant ($F(1, 86) = 16.515$, $p = 0.000$, $\eta^2=0.161$). Table 3.2 shows the means and standard deviations of aspiration levels, and the predicted scores of the most talented person by rank.

Table 3.2: Study 2's Means and Standard Deviations of Dependent Variables by Rank

Rank	Mean	S.D.	Rank	Mean	S.D.
Level of Aspiration (Aim)			Predicted Scores of the Most Talented Person		
Control	97.93	17.81	Control	63.67	28.93
High (#3 out of 500)	95.59	23.36	High (#3 out of 500)	73.72	31.79
Low (#498 out of 500)	80.33	19.55	Low (#498 out of 500)	44.73	15.40
Level of Aspiration (Expectation)					
Control	90.43	22.74			
High (#3 out of 500)	84.31	33.69			
Low (#498 out of 500)	67.00	19.23			

Note: The unit of the results is second. The lower numbers communicate better performance. Thus, the results need to be interpreted in a reverse manner.

Discussion

The results again show that rank influences the perceived potential for performance improvement, which in turn influences the level of aspiration. Specifically, low-ranking individuals perceived higher potential to improve their performance, and thus set their aspiration level higher than high-ranking individuals. Individuals without ranking information behaved similarly to high-ranking individuals, implying that, in general, individuals do not see a stronger possibility of improvement and therefore tend to be conservative when setting their aspiration level. This suggests that ranking information mostly benefits poor performers by helping them see their own potential to improve.

Study 3 aims to show that the information about the number of competitors is a necessary condition for rankings to influence aspiration levels.

3.4 Study 3

Participants

A total of 280 participants, recruited from Amazon Mechanical Turk, participated in a between-subjects questionnaire study online in exchange for $0.20.

Design and Procedure

Participants were randomly assigned to one of four conditions with the between-subjects factor *rank* (high vs. low) and the between-subjects factor *number of competitors* (control-no information vs. 100 competitors). Participants read the following scenario and answered questions.

> Imagine that yesterday you competed in a competition which required you to solve 10 numerical problems on the computer. Each problem was presented one after another, and participants cannot move on to the next problem unless they have correctly solved the current problem. After the competition, each participant was ranked based on the time he or she spent on solving all 10 numerical problems. The 1st rank belongs to the one who spends the shortest time.

> Imagine further that, from the competition yesterday, you solved 10 numerical problems within 600 seconds, and you were ranked *#9 (#9 out of 100 competitors, #90, #90 out of 100 competitors)*. Today you will be participating in the same competition again.

To measure the level of aspiration, participants responded to the question: "In the next competition, how much time do you aim to solve 10 numerical problems?" (minimum=0, no maximum). To measure the perceived potential to improve, participants responded to the question: "How much time do you think the most talented person will spend to solve 10 numerical problems?" (minimum=0, no maximum). To test participants' perception regarding their ranks, they were asked: "How do you perceive your rank? (1=very bad, 9=very good)". To check the understanding in answering the questions, participants were also asked, "What

is your rank in the competition yesterday?" (minimum=1, maximum=100), and "How many competitors competed in the competition yesterday? (100, 500, 1000, 2000, and Unknown)"

Results

Twelve participants did not correctly answer the attention check questions and were discarded from the analysis. As in Study 2, the performance of high- and low-ranking individuals was held constant in this study. Therefore, there is no need to subtract the relevant dependent variables (e.g. aspiration level) from the current performance. The results of a two-way ANOVA with aspiration level as the dependent variable, rank (high vs. low) and number of competitors (control vs. 100 competitors) as between-subjects factors indicated that low-ranking participants set higher aspiration levels than high-ranking participants did ($F(1, 254)=4.190$, $p=0.042$, $\eta^2=0.016$). The main effect of number of competitors was not significant ($F(1, 254)=0.054$, $p=0.816$, $\eta^2=0.000$). The interaction effect for rank x number of competitors was partially significant ($F(1, 254)=3.028$, $p=0.083$, $\eta^2=0.012$). As shown in Figure 3.1, the aspiration level of high and low-ranking participants did not significantly differ in the control condition ($F(1, 121)=0.050$, $p=0.823$, $\eta^2=0.000$). However, high-ranking participants adopted a significantly lower level of aspiration than low-ranking participants when they were informed about the number of competitors ($F(1, 133)=6.887$, $p=0.010$, $\eta^2=0.049$).

Similarly, the results of a two-way ANOVA with the perceived potential to improve, as represented by the predicted score of the most talented person as the dependent variable, and rank (high vs. low) and number of competitors (no information vs. 100 competitors) as between-subjects factors, indicated that low-ranking participants perceived a higher potential to improve than high-ranking participants did ($F(1, 254)=17.626$, $p=0.000$, $\eta^2=0.065$). The main effect of number of competitors was not significant ($F(1, 254)=0.024$, $p=0.877$,

η^2=0.000). The interaction effect for rank x number of competitors was significant (F(1, 254)=7.370, p=0.007, η^2=0.028). As shown in Figure 3.2, the perceived potential to improve of high and low-ranking participants did not significantly differ in the control condition (F(1, 121)=1.019, p=0.315, η^2=0.008). However, when the number of competitors was provided, low-ranking participants perceived a significantly higher potential to improve than high-ranking participants (F(1, 133)=25.814, p=0.000, η^2=0.163). Table 3.3 shows the means and standard deviations of aspiration level, predicted performance of the most talented person, and the rating of rank perception by rank and number of competitors.

Table 3.3: Study 3's Means and Standard Deviations of Dependent Variables

by Rank and the Number of Competitors

Rank	The Number of Competitors		Rank	The Number of Competitors	
	No Info	100		No Info	100
Level of Aspiration			Rank Perception		
High (#9)	437.38	461.72	High (#9)	5.59	6.67
	(114.56)	(125.61)		(2.24)	(2.08)
Low (#90)	432.42	400.54	Low (#90)	4.24	3.10
	(130.50)	(144.42)		(1.95)	(2.34)
Predicted Performance of Most Talented Person					
High (#9)	308.11	358.28			
	(135.36)	(138.18)			
Low (#90)	282.18	237.43			
	(149.15)	(138.20)			

Note: The unit of the results is second. The lower numbers communicate better performance. Thus, the results need to be interpreted in a reverse manner. Standard deviations are in parentheses.

Finally, the results of a two-way ANOVA with rank perception as a dependent variable, and rank (high vs. low) and number of competitors (no information vs. 100 competitors) as between-subjects factors indicated that low-ranking participants perceived

their rank to be worse than high-ranking participants ($F(1, 254)=83.362$, $p=0.000$, $\eta^2=0.247$). The main effect of number of competitors was not significant ($F(1, 254)=0.011$, $p=0.915$, $\eta^2=0.000$). The interaction effect for rank x number of competitors was significant ($F(1, 254)=17.001$, $p=0.000$, $\eta^2=0.063$). As shown in Figure 3.3, rank perception of high- and low-ranking participants was significantly different in both control and 100-competitor conditions; however, the statistical significance in rank perception in the 100-competitor condition was slightly stronger (Control-no ranking information: $F(1, 121)=12.709$, $p=0.001$, $\eta^2=0.095$; 100-competitor condition: $F(1, 133)=87.533$, $p=0.000$, $\eta^2=0.397$).

Figure 3.1: Mean Level of Aspiration by Rank and the Number of Competitors
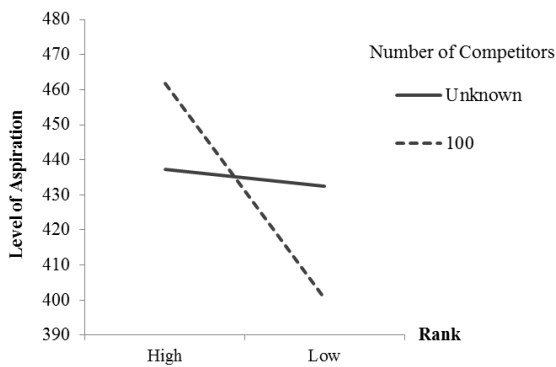
Figure 3.2: Mean Predicted Performance by Rank and the Number of Competitors
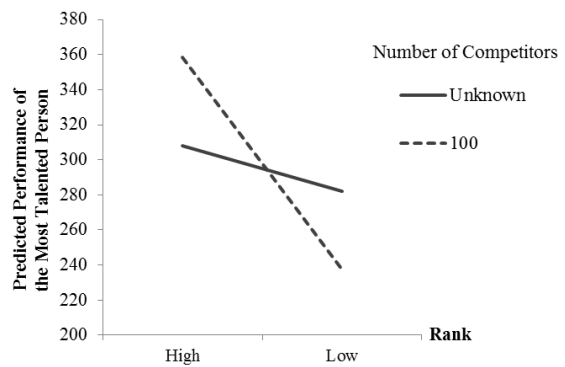
Figure 3.3: Mean Rank Perception by Rank and the Number of Competitors
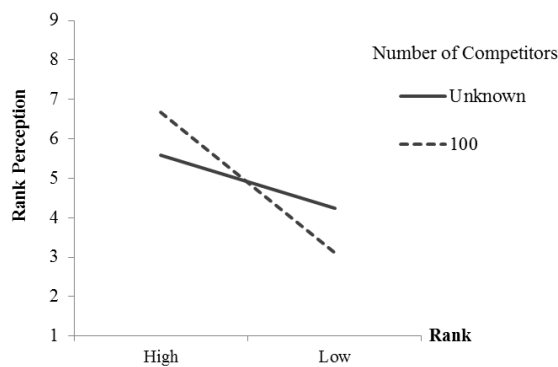
Discussion

The results suggest that when individuals were not informed about the number of competitors, ranking information did not influence the perceived potential to improve, and as such the aspiration level. Even though high-ranking participants in both control and 100-competitor conditions perceived their rank to be better than low-ranking participants, the difference in rank perception between high and low-ranking individuals was decreased when individuals were not told how many competitors there were as compared to when participants were provided with this information. This smaller difference was not strong enough to differentiate the perceived potential to improve and the aspiration level of high-ranking individuals from those of low-ranking individuals. Hence, in order for the effect of rankings on the level of aspiration to be made manifest, individuals need to be informed about the number of competitors.

3.5 Study 4

Study 4 aimed to test whether individual differences in self-efficacy moderated the relationship between ranks and the level of aspiration.

Participants

A total of 100 participants, recruited from Amazon Mechanical Turk, participated in a within-subjects questionnaire study online in exchange for $0.20.

Design and Procedure

Participants were asked to assume both a high rank (#6 of 500) and a low rank (#490 of 500) in a counter-balanced within-subjects design. Half of the participants started with a high rank and the other half with a low rank. The exact scenario read:

Imagine that yesterday you competed in a competition which required you to solve 10 numerical problems. After the competition, each participant was ranked based on the time he or she spent on solving 10 numerical problems. The 1st rank belongs to the one who spends the shortest time.

Imagine further that, from the competition yesterday, you solve 10 numerical problems within 600 seconds, and you are ranked #6 (#490) out of 500 competitors. Today you will be participating in the same competition again.

Participants were then asked the following questions. To measure the level of aspiration, participants responded to the question, "In the next competition, how much time (in seconds) do you aim to complete the task?" (minimum=0, no maximum). To measure the perceived potential to improve, participants responded to the question, "How much time (in seconds) do you think the most talented person will spend to solve 10 numerical problems?" (minimum=0, no maximum). Next, participants moved on to the other condition, and answer the same questions. To check attention in answering the question, after participants completed the two conditions, they were asked "What is your latest rank in the competition?" (minimum=1, maximum=500). Finally, participants rated the 10-item general self-efficacy scale of Schwarzer and Jerusalem (1995) as follows (1=not at all true, 4=exactly true).

1. I can always manage to solve difficult problems if I try hard enough.

2. If someone opposes me, I can find the means and ways to get what I want.

3. It is easy for me to stick to my aims and accomplish my goals.

4. I am confident that I could deal efficiently with unexpected events.

5. Thanks to my resourcefulness, I know how to handle unforeseen situations.

6. I can solve most problems if I invest the necessary effort.

7. I can remain calm when facing difficulties because I can rely on my coping abilities.

8. When I am confronted with a problem, I can usually find several solutions.

9. If I am in trouble, I can usually think of a solution.

10. I can usually handle whatever comes my way.

Results

Participants who did not answer the attention check question correctly and did not answer all 10 items on the self-efficacy scale were discarded from the analysis. In total, there were 75 valid responses. As in Studies 2 and 3, the performance of high and low-ranking individuals was held constant. Therefore, there is no need to subtract the relevant dependent variables (e.g. aspiration levels) from the current performance. There was no significant order effect of rank (*high/low* vs. *low/high*) on the dependent measures (Aspiration level – high rank: $F(1, 73)=3.815$, $p=0.055$, $\eta^2=0.050$; low rank: $F(1, 73)=2.735$, $p=0.102$, $\eta^2=0.036$; Predicted performance of most talented person – high rank: $F(1,73)=2.027$, $p=0.159$, $\eta^2=0.027$; low rank: $F(1,73)=0.008$, $p=0.929$, $\eta^2=0.000$), so the data was combined for the subsequent analyses. The results replicated the findings of the previous studies: high-ranking participants set their aspiration level lower than low-ranking participants ($F(1, 74)=8.915$, $p=0.004$, $\eta^2=0.108$), and predicted that the most talented person will spend more time in the next competition than low-ranking participants ($F(1, 74)=92.289$, $p=0.000$, $\eta^2=0.555$).

The self-efficacy score was the sum of the rating of ten self-efficacy items. The Cronbach's Alpha for the ten items was 0.856. Participants were categorised into high and low self-efficacy groups by a median split, with those whose scores were higher than the median placed in the high self-efficacy group and the rest in the low self-efficacy group. The results of a two-way ANOVA with the aspiration level as the dependent factor, self-efficacy level (high vs. low) as the between-subjects factor, and rank (high vs. low) as the within-subjects factor suggested that there was a significant interaction effect for rank and self-efficacy level ($F(1, 73)=4.012$, $p=0.049$, $\eta^2=0.052$). The main ranking effect was significant ($F(1, 73)=10.366$, $p=0.002$, $\eta^2=0.124$), and the main effect of self-efficacy was not significant ($F(1, 73)=0.311$, $p=0.579$, $\eta^2=0.004$). As shown in Figure 3.4, high self-efficacy participants

set higher aspiration level when their ranks were low than when their ranks were high ($F(1, 33)=11.651$, $p=0.002$, $\eta^2=0.261$). However, the aspiration level of low self-efficacy participants was not significantly different in both ranking conditions ($F(1, 40)=0.867$, $p=0.357$, $\eta^2=0.021$). Table 3.4 shows the means and standard deviations of aspiration level and predicted scores of the most talented person by rank and self-efficacy level.

Table 3.4: Study 4's Means and Standard Deviations of Dependent Variables

by Rank and Self-Efficacy Level

Rank	Self-Efficacy Level		Rank	Self-Efficacy Level	
	High	Low		High	Low
Level of Aspiration			Predicted Scores of the Most Talented Person		
High (#6 out of 500)	489.71 (110.13)	467.20 (191.99)	High (#6 out of 500)	417.21 (131.28)	363.32 (162.66)
Low (#490 out of 500)	385.00 (166.74)	442.80 (159.65)	Low (#490 out of 500)	236.47 (179.99)	196.85 (117.21)

Note: The unit of the results is second. The lower numbers communicate better performance. Thus, the results need to be interpreted in a reverse manner. Standard deviations are in parentheses.

Figure 3.4: Mean Level of Aspiration by Rank and Self-Efficacy Level
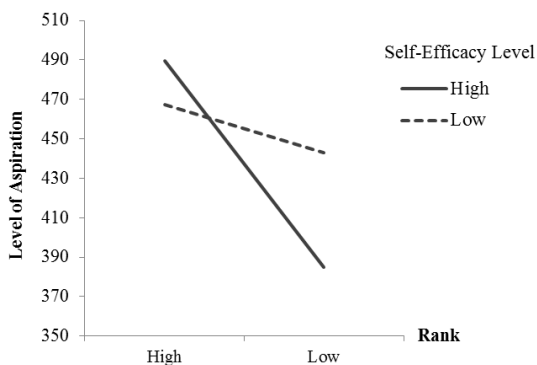
Figure 3.5: Mean Predicted Performance by Rank and Self-Efficacy Level
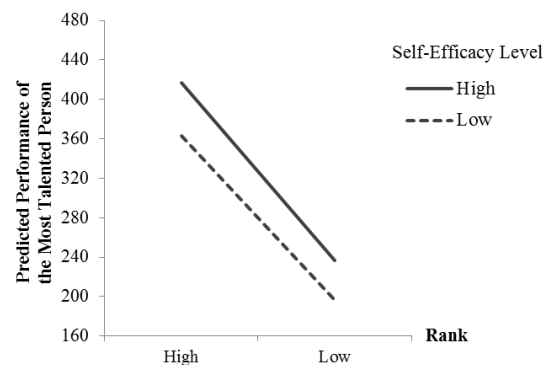
The results of a two-way ANOVA with predicted performance of the most talented person as the dependent factor, self-efficacy level as the between-subjects factor, and rank as

the within-subjects factor suggested that there was no significant interaction effect ($F(1,$ $73)=0.154$, $p=0.696$, $\eta^2=0.002$), as shown in Figure 3.5. The main ranking effect was significant ($F(1, 73)=91.137$, $p=0.000$, $\eta^2=0.555$). The main effect of self-efficacy level was not significant ($F(1, 73)=2.526$, $p=0.116$, $\eta^2=0.033$).

Discussion

The results suggest that the effect of ranking on the aspiration level comes mainly from high self-efficacy individuals. The non-significant interaction effect for rank and self-efficacy and the significant ranking effect on predicted performance of the most talented person suggest that both high and low self-efficacy individuals infer the potential to improve their performance from their ranks in a similar way; both groups perceived higher potential to improve when their ranks were high than low. However, only high self-efficacy individuals, who strongly believe in their own ability, set their level of aspiration according to their perceived potential. Low self-efficacy individuals, despite seeing the potential to improve when their ranks are low, do not believe in their own ability to improve, and therefore set relatively low aspiration levels regardless of their rank.

3.6 General Discussion

Across the four studies, I showed that rankings influence individuals' perception about their ability to improve, and that this perception influences their level of aspiration. Low-ranking individuals believe that the potential to improve their performance is higher than high-ranking individuals, and in turn set higher aspiration levels (Study 1). However, in order for low-ranking individuals to do this, they need to see that their rank is relatively low by referring to the number of competitors (Study 3). Only providing the ranking information paints a less clear picture of how good or bad their rank is, and therefore weakens the effect of rankings on the level of aspiration. The ranking effect is also moderated by individual

differences in self-efficacy, such that high-efficacy individuals set lower aspiration levels when their rank is high as opposed to when their rank is low, but low-efficacy individuals set a similar level of aspiration regardless of rank (Study 4).

Ranking feedback is useful particularly to poor performers as it helps them perceive their potential to improve. Without this information, individuals in general tend to perceive lower potential to improve and set a similarly low level of aspiration as high-ranking individuals (Study 2). However, even with a relatively low aspiration level of high-ranking individuals, they are less likely to achieve their goal whereas low-ranking individuals were able to achieve theirs (Study 1).

These findings contribute to the growing literature on the influences of rankings on judgment and behaviour by identifying another factor, namely aspiration level, which can be affected by ranking feedback. The findings also contribute to the literature on aspiration levels by suggesting the potential to improve, inferred from rankings, as another antecedent of individuals' aspiration level. In comparison to other antecedents such as average performance, rankings may be more effective in terms of motivating individuals to improve their performance. Since individuals tend to reduce the discrepancy between their performance and average performance (Festinger, 1942; Hilgard et al., 1940), there may be a case that individuals will set lower aspiration levels than their current performance. More precisely, if their current performance is higher than average, in order to reduce this discrepancy individuals are likely to set lower aspiration levels than their current performance, leading to a poorer future performance. Ranking feedback, on the other hand, creates a forward looking view by making individuals see the top rank as the limitation on their performance, and infer their potential to improve from this point of reference. As a result, everybody, with the exception of the person in the top position, tends to set aspiration levels higher than their current performance, thus leading to performance improvement.

From a practical point of view, the findings suggest that the use of rankings helps individuals infer their own potential to improve, and adjust their level of aspiration accordingly. Without ranking feedback, individuals with poor performance may not come to know that they have high potential to improve. As a result, they tend to set relatively low aspiration levels. Since the previous literature has suggested that individuals tend to adjust their effort to match the difficulty of aspiration level (Bryan and Locke, 1967), those with a higher aspiration level is more likely to achieve better results. Consequently, without ranking information, the low aspiration level of poor performers may result in them achieving a poorer performance than they should.

The findings also suggest that low self-efficacy individuals, particularly those with a low rank, should be encouraged to set a higher level of aspiration. Alternatively, organisations may need to increase the level of individuals' self-efficacy, which eventually leads them to set a higher aspiration level. This can be achieved by, for example, providing adequate training to improve individuals' abilities to work on a task or providing strategies about how they can successfully tackle a task (Gist and Mitchell, 1992).

In many situations, organisations set goals for their employees. Research has found that assigned goals will help improve performance only when individuals accept these goals (Erez and Zidon, 1984). If employees perceive the goals to be too hard, they may abandon them (Locke, 1968). As a result, assigned goals may not lead to an improvement in performance. By learning how employees with different performance levels set their goals, organisations can determine the appropriate goal levels that employees are likely to accept. As a consequence, an improvement in performance can be expected, which could help organisations plan more realistically.

Future work could extend these findings in many important ways. For instance, it would be interesting to investigate how differently-ranked individuals adjust their aspiration

level over time. As competitions progress, low-ranked individuals who improve their performance and move closer to the top ranks may gradually lower their aspiration level. Additionally, those who are stuck at a low rank may discover they have low potential to improve and may also lower their aspiration level. As a result, as the competitions progress, individuals may rely less on ranking information. Furthermore, the present analysis focuses mainly on the positive aspect of the comparison between an individual's own rank and the top rank, which helps lower-ranked individuals see their potential to improve. However, as low-ranked individuals perceive they are still far from the top, they may feel demotivated, which could potentially lead to feelings of lower self-worth (Crocker et al., 2003). Future work can also investigate this negative consequence. Additionally, future work could also examine whether or not rankings affect individuals' effort and preparation level. Research (e.g. Bryan and Locke, 1967) has suggested that individuals tend to adjust their effort according to their aspiration levels, i.e. those with higher aspiration levels tend to exert more effort. Consequently, as the aspiration level of low-ranking individuals is higher than that of high-ranking individuals, the first group may put in more effort than the second group. However, it may still be possible that low-ranking individuals set high aspiration levels because they believe that their performance will increase by default. If this is the case, they may not try as hard as high-ranking individuals. This remains an open avenue for future research.

Chapter 4

The Effect of Rankings on Predicted Winning Probability

4.1 Hypotheses

In order to predict the likelihood of winning, individuals need to evaluate both their own capabilities and the capabilities of their competitors. These evaluations, however, are not straightforward: self-ratings tend to be enhanced, whereas the ratings of others are often more accurate (Epley and Dunning, 2000). For instance, individuals often overestimated the amount they were willing to hypothetically donate to charity: i.e. the actual donation was *much* less than the amount they predicted they would donate. However, the amount they predicted their peers would donate was only *slightly* less than the amount their peers actually donated (Epley and Dunning, 2000).

The degree of self-enhancement, however, depends on the type of performance feedback. Poor performers are more likely than high performers to elevate themselves in relation to an objective measure, as acknowledging a poor performance generates negative feelings that poor performers seek to avoid (Gramzow et al., 2003). For instance, low-GPAs students are more likely than high-GPAs students to exaggerate their actual GPAs (Gramzow et al., 2003). By the same token, rankings, a particular form of performance feedback, are likely to influence the degree of self-enhancement: low-ranking individuals tend to be more self-enhanced than high-ranking individuals. Specifically, low-ranking individuals are likely to perceive themselves more positively than objectively warranted, whereas high-ranking

individuals tended to be more accurate. However, the two groups, when evaluating the performance of others, are likely to be accurate. As a consequence, when comparing their performance with commensurate performers, high-ranking individuals are likely to believe their competence to be close to similarly-ranked competitors'. However, low-ranking individuals are likely to judge their own capabilities as superior to similarly-ranked competitors. This leads to the following hypothesis:

H1: The differences in the perceived capability of self and commensurate competitors will be lower in high-ranking individuals than low-ranking individuals.

Differences in the perceived capabilities of high and low-ranking individuals result in differences in predicted winning probability. High-ranking individuals, who view themselves as the equals of their similarly-ranked competitors, are likely to predict lower probabilities of winning. In contrast, low-ranking individuals, who overestimate their capabilities in relation to their competitors', are likely to predict higher probabilities of winning. This suggests the following hypothesis:

H2: High-ranking individuals predict lower winning probabilities than low-ranking individuals.

The Present Studies

These two hypotheses were tested in four studies. Study 1 used field data from the Premier League from 2011 to show the effect of rankings on predicted winning probabilities. However, as findings from field data can be influenced by many factors in addition to rankings, Study 2 removed this limitation by experimentally manipulating rankings in a questionnaire study. Nevertheless, one may argue that when predicting winning probability, individuals may rely on their own beliefs about their skills instead of their ranks. Study 3

ruled out this alternative explanation, showing that the effect of rankings on predicted winning probabilities is still pronounced even when controlling for participants' prior beliefs about their capabilities. The first three studies, however, did not explicitly show that the differences in predicted winning probabilities are in fact the result of perceived capability differences. Study 4 demonstrated this, and it also showed that the effect did not change when participants were paired with slightly higher- or lower-ranked competitors.

4.2 Study 1

Participants

One hundred and one Premier League Football (US soccer) fans (50 Arsenal fans and 51 West Ham United fans) were recruited for the study. The fans were approached before the start of two home games in Spring 2011. Only the fans wearing their team's t-shirts or scarves were approached.

Design and Procedure

Arsenal and West Ham United were chosen because of their respective Premier League positions in week 38 of the season 2010/11. Arsenal had a high ranking, 3rd out of 20 Premier League teams, allowing them to compete for automatic promotion to the UEFA Champions League group stage, as the top 3 teams of the Premier League automatically qualify for the group stage of this prestigious competition. West Ham United, in contrast, had a low ranking of 20, requiring them to compete for position 17 to avoid relegation to the Football League Championship. Both London-based teams, Arsenal and West Ham United, faced opponents, who were ranked slightly above them. Arsenal's game was against Manchester United, who were ranked 1st, and West Ham United faced the Blackburn Rovers, who were ranked 16th.

The football fans approached were asked to complete a short questionnaire, which took about three minutes. The questionnaire informed participants about the Premier League position of their supported team and the respective position of the away team. Participants were then asked to predict the winning probability of their team (minimum=0%, maximum=100%), the winning probability of the respective away team (minimum=0%, maximum=100%), the outcome (final score) of the upcoming game (minimum=0, no maximum), and the number of years of fandom (minimum=0, no maximum).

Results

The number of years of fandom was included as a covariate in all analysis. The results of a one-way ANOVA, with the winning probability of the home (supported) team as the dependent variable, the relative rank of the team (high rank vs. low rank) as the independent variable and the number of years of fandom as the covariate, indicate that fans of the lower-ranked team (West Ham United) predicted a significantly higher winning probability for their team than fans of the higher-ranked team (Arsenal) ($F(1, 96)=14.301$; $p=0.000$; $\eta^2=0.130$). Similarly, fans of the lower-ranked team predicted a significantly lower probability of an away team victory compared to fans of the higher-ranked team ($F(1, 96)=16.191$; $p=0.000$;

Table 4.1: Study 1's Means and Standard Deviations of Dependent Variables by Rank

Rank	Mean	S.D.	Rank	Mean	S.D.
Predicted Winning Probability of the Home Team (%)			Score Difference (Supported team - Opponent)		
High (Arsenal)	56.63	19.19	High (Arsenal)	0.59	1.14
Low (West Ham United)	70.06	18.38	Low (West Ham United)	1.84	1.27
Predicted Winning Probability of the Opponent (%)					
High (Arsenal)	42.65	19.56			
Low (West Ham United)	27.98	17.49			

η^2=0.144). Finally, fans of the lower-ranked team predicted that their team will win with a significantly higher goal difference than fans of the higher-ranked teams (F(1, 96)=25.124; p=0.000; η^2=0.207). Table 4.1 shows the means and standard deviations of the predicted winning probabilities of the supported team, away team and score differences by rank.

Discussion

The results support the predictions: fans of the lower-ranked team predicted a higher winning probability than fans of the higher-ranked team. Fans of the lower-ranked team also predicted that their team's margin of victory would be greater when compared with the predictions of fans of the higher-ranked team, suggesting that the perceived capability differences between self and opponent are higher for lower-ranked teams than higher-ranked teams. This study, however, has several limitations. First, it is possible that the objective winning probability of the lower-ranked team was higher than the corresponding probability of the higher-ranked team. Second, the characteristics of the fans of the two teams might have differed systematically, thereby affecting revealed predictions. Third, the relative importance of winning the game for the fans might have differed between the two teams, with the lower-ranked team's desperate attempts avoid relegation influencing fans' perspectives. In the second study, these shortcomings are controlled by experimentally manipulating rankings. Study 2 also shows the robustness of the effect by varying the number of competitors.

4.3 Study 2

Participants

One hundred and twenty students from various universities in London participated in the study. Participants were approached in cafeterias and asked to complete a one-page questionnaire.

Participants were randomly assigned to one of the four following conditions: 2 (rank: high vs. low) x 2 (number of competitors: small (10) vs. large (100)) between-subjects design. In the questionnaire, participants were asked to imagine that they were about to enter an annual numerical problem-solving competition with 10 (100) people. For those assigned the high-ranking condition, they were told that last year their rank was 3 (out of 10/100); in the low-ranking condition they were told their rank was 8 out of 10 (98 out of 100). Participants were then asked to rate their winning probability against a competitor ranked one-step above them (minimum=0%, maximum=100%) and a competitor ranked two-steps higher (minimum=0%, maximum=100%). To capture the participants' views on their perceived relative capability, participants were asked to rate how hard it would be to win the competition against the competitor ranked one-step higher (1=not at all hard, 9=very hard). To capture the importance of winning, participants were asked to rate how important it would be for them to outcompete the competitor ranked one-step higher, and how important it would be for them to win (1=not at all important, 9=very important).

Results

The importance of winning was the average rating of the two questions: "How important would it be for you to outcompete the competitor ranked one-step higher?", and "How important would it be for you to win?". As shown in Figure 4.4, this importance of winning did not differ significantly between ranking conditions ($F(1, 116)=0.091$, $p=0.763$, $\eta^2=0.001$), and it was included as a covariate in all subsequent analyses. The results of a two-way ANOVA, with winning probability (when competing with one-step higher-ranked competitors) as the dependent variable, rank (high vs. low) and the number of competitors (10 vs. 100) as between-subjects factors, and the important of winning as the covariate, indicate that low-ranking individuals predicted a significantly higher winning probability than

high-ranking individuals ($F(1, 114)=4.140$, $p=0.044$, $\eta^2=0.035$). There was neither a significant main effect of the number of competitors ($F(1, 114)=1.953$, $p=0.165$, $\eta^2=0.017$), nor a significant interaction effect for ranking x the number of competitors ($F(1, 114)=0.155$, $p=0.694$, $\eta^2=0.001$), as shown in Figure 4.1. The results of the predicted probability of winning when competing with competitors ranked two-steps higher are similar, and the main ranking effect is even stronger ($F(1, 113)=8.949$, $p=0.003$, $\eta^2=0.073$). Again, as shown in Figure 4.2, the main effect of the number of competitors and the interaction effect for ranking x the number of competitors were not significant (Main effect: $F(1, 113)=1.855$, $p=0.176$, $\eta^2=0.016$; Interaction effect: $F(1, 113)=0.031$, $p=0.861$, $\eta^2=0.000$). Consistently, participants in the high-ranking condition expected that it would be harder for them to win as compared to participants in the low-ranking condition ($F(1, 115)=13.551$, $p=0.000$, $\eta^2=0.105$). The main

Table 4.2: Study 2's Means and Standard Deviations of Dependent Variables

by Rank and the Number of Competitors

Rank	The Number of Competitors		Rank	The Number of Competitors	
	Low (10)	High (100)		Low (10)	High (100)
Predicted Winning Probability with One-Step Higher-Ranked Competitor (%)			Hard-to-Win Rating		
High (#3)	41.11 (15.84)	46.32 (16.13)	High (#3)	6.37 (1.65)	6.23 (1.57)
Low (#8/#98)	47.71 (16.85)	52.34 (20.64)	Low (#8/#98)	5.43 (1.74)	4.83 (1.95)
Predicted Winning Probability with Two-Step Higher-Ranked Competitor (%)			Important-to-Win Rating		
High (#3)	33.89 (13.33)	36.91 (15.20)	High (#3)	6.45 (1.53)	5.98 (2.08)
Low (#8/#98)	41.19 (19.74)	48.20 (20.44)	Low (#8/#98)	5.45 (2.04)	6.77 (2.15)

Note: Standard deviations are in parentheses.

effect of the number of competitors and the interaction effect for ranking x the number of competitors were not significant (Main effect: $F(1, 115)=1.934$, $p=0.167$, $\eta^2=0.017$; Interaction effect: $F(1, 115)=1.407$, $p=0.238$, $\eta^2=0.012$), as shown in Figure 4.3. Table 4.2 shows the means and standard deviations of the predicted winning probabilities with one- and two-steps higher-ranked competitors, hard-to-win ratings, and important-to-win ratings, by rank and the number of competitors.

Figure 4.1: Mean Predicted Winning Probability with One-Step Higher-Ranked Competitor by Rank and the Number of Competitors
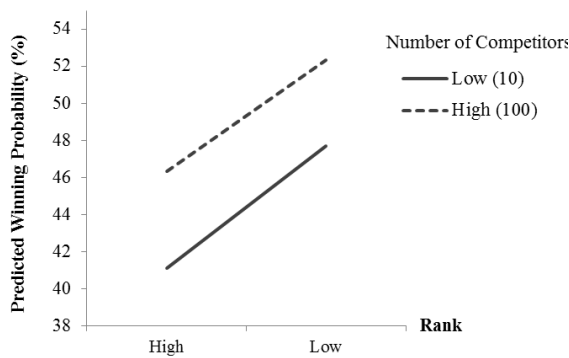
Figure 4.2: Mean Predicted Winning Probability with Two-Step Higher-Ranked Competitor by Rank and the Number of Competitors
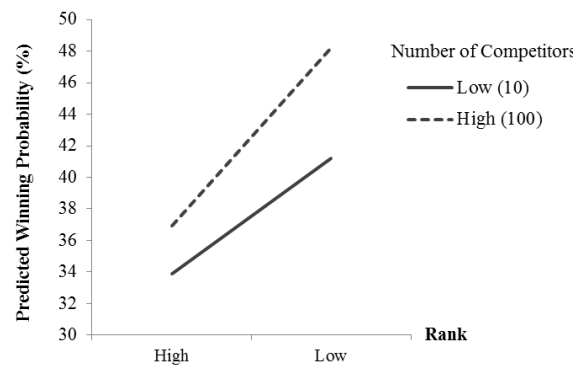
Figure 4.3: Mean Hard-to-Win Rating by Rank and the Number of Competitors
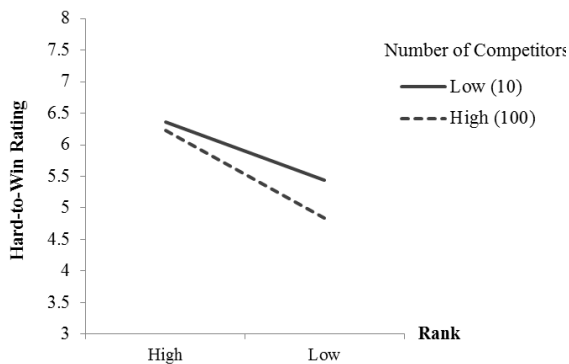
Figure 4.4: Mean Important-to-Win Rating by Rank and the Number of Competitors
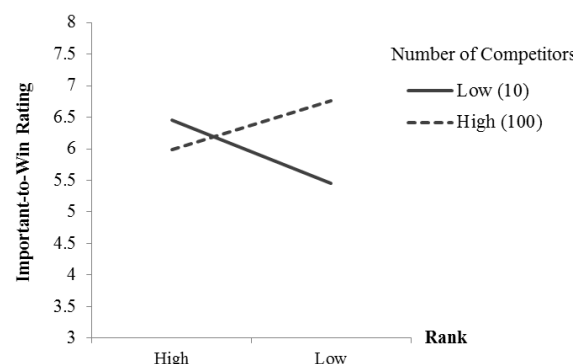
Discussion

The results of Study 2 replicate the findings from Study 1. Low-ranking individuals overestimated winning probability compared to high-ranking individuals. That high-ranking individuals found it harder to win suggests that the perceived similarity in capabilities between participants and their imagined competitors is stronger for high-ranking individuals than for low-ranking individuals.

One possible explanation of the findings in studies 1 and 2 is that people may have preconceived ideas about their own ability and limited information about their competitors'. Consequently, they may rely on these preconceived ideas when predicting winning probability. People who believe that their skills are average, or slightly above average, may perceive a lower chance of winning when they occupy the higher rank and a higher chance of winning when they occupy the lower rank. To minimise this effect, Study 3 controls for the preconceived ideas about individuals' ability.

4.4 Study 3

Participants

A total of 95 participants, recruited from Amazon Mechanical Turk, participated in a between-subjects online questionnaire study in exchange for $0.60.

Design and Procedure

Participants were randomly assigned to one of the two between-subjects conditions (high or low rank). Participants read, 'Imagine that last week you competed in a competition that involved your reasoning skills. You occupied the 3rd (98th) rank out of 100 competitors (The 1st rank belongs to the best performer). Now you are about to enter a similar competition that also involves your reasoning skills. However, in this competition you will compete head-to-head with a competitor who occupied the 2nd (97th) rank from the last competition.'

Participants were then asked to predict the winning probability (Between 0-100%), and rate the likelihood that they would win (1=not at all, 9=very likely). To capture the participants' views of their perceived relative capabilities, participants were asked to rate how hard it would be to win (1=not at all hard, 9=very hard). Finally, to assess participants' opinions about their actual abilities, they were asked to ignore the ranking information provided and give their own opinions regarding their actual reasoning skills (1=very bad, 9=very good). To check their attention in answering these questions, participants were also asked to indicate their given ranking information.

Results

Sixteen participants did not correctly answer the attention check question, and their responses were omitted from the analysis. The actual skill rating was included as a covariate in all subsequent analyses. The results of a one-way ANOVA with winning probability as the dependent variable, rank (high vs. low) as the between-subjects factor and the actual skill rating as the covariate, indicated that low-ranking participants predicted a significantly higher winning probability than high-ranking participants ($F(1, 76)=9.687$, $p=0.003$, $\eta^2=0.113$). Similarly, low-ranking participants also perceived they were more likely to win than high-

Table 4.3: Study 3's Means and Standard Deviations of Dependent Variables by Rank

Rank	Mean	S.D.	Rank	Mean	S.D.
Predicted Winning Probability (%)			Hard-to-Win Rating		
High (#3 out of 100)	50.31	16.15	High (#3 out of 100)	6.36	1.44
Low (#98 out of 100)	63.73	19.55	Low (#98 out of 100)	5.40	2.15
Likelihood-to-Win Rating			Actual Skill Rating		
High (#3 out of 100)	5.18	1.39	High (#3 out of 100)	6.67	1.51
Low (#98 out of 100)	6.30	1.52	Low (#98 out of 100)	7.08	1.44

ranking participants ($F(1, 76)=9.811$, $p=0.002$, $\eta^2=0.114$). Finally, higher-ranking participants expected that it would be harder for them to win in the competition with their similarly-ranked rival than lower-ranking participants predicted ($F(1, 76)=4.608$, $p=0.035$, $\eta^2=0.057$). Table 4.3 shows the means and standard deviations of winning probability, the ratings of the likelihood to win, hard-to-win, and actual skill by rank.

Discussion

The results of Study 3 show that the differences in predicted winning probability between high and low-ranking individuals were driven by rankings rather than by preconceived ideas about personal abilities. Thus far, the three previous studies did not explicitly ask participants for their perceived capabilities. This will be addressed in Study 4.

4.5 Study 4

Study 4 showed the effect of rankings on the perceived differences in capability between self and opponent in high- and low-ranking participants, when competing with a one-step higher-ranked competitor (Study 4a) and a one-step lower-ranked competitor (Study 4b).

4.5.1 Study 4a

Participants

There were 57 students from a university in Birmingham who participated in the study. Participants were approached in libraries and cafeterias and asked to complete a two-page questionnaire.

Design and Procedure

In this study, a within-subjects design is used to increase the reliability of judgment, as it is argued that individuals are more consistent in such designs (Camerer, 1995). To

reduce a potential carryover effect from one task to another, participants are categorised into two groups. In the first group, participants were asked to imagine that they were about to enter an annual numerical problem-solving competition with 100 people, and that last year they occupied the 3rd rank. This year, they would compete head-to-head with the person ranked 2nd in last year's contest. Participants were then asked to rate (i) how talented they were, (ii) how talented their competitor was (1=not at all, 9=very talented), (iii) how outstanding their performance last year was, and (iv) how outstanding their competitor's performance last year was (1=not at all, 9=very outstanding). On the second page of the questionnaire, participants were told that they occupied the 98th rank and were about to compete with a person who occupied the 97th rank. They were then asked to answer the four questions as they did on page 1. The second group started in the opposite position to group one: with the low-ranking condition, and then moved to the high-ranking condition.

Results

The perceived capability was the average rating of the two questions: "How talent are/is you/your competitor?", and "How outstanding is your performance/your competitor's performance?". Difference in perceived capability was the difference between the perceived capability of self, and the perceived capability of competitors by self. Four responses of perceived capability difference were considered outliers, following the procedure of Hoaglin and Iglewicz (1987)[3], and were omitted from the analysis. There was no significant order effect of rank (*high/low* vs. *low/high*) on perceived capability difference (high rank: $F(1, 51)=0.824$, $p=0.368$, $\eta^2=0.016$; low rank: $F(1, 51)=1.614$, $p=0.210$, $\eta^2=0.031$), so the data was combined for the subsequent analyses.

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[3] Any observations below $F_L - 2.2(F_U - F_L)$ or above $F_U + 2.2(F_U - F_L)$, where F_L and F_U are the lower and upper quartiles, are considered as an outlier.

As predicted, the results of a within-subjects ANOVA on the differences in capabilities as the dependent variable and ranks (high vs. low) as a within-subjects factor indicate that the difference in perceived capability is higher for low-ranking participants than for high-ranking participants ($F(1, 52)=27.850$, $p=0.000$, $\eta^2=0.349$). As shown in Figure 4.5, for individuals in the high-ranking condition, the differences between their perception of their own and their competitors' capabilities are partially significant ($F(1, 52)=3.861$, $p=0.055$, $\eta^2=0.069$). High-ranking participants believed their competitors' capability was slightly

Table 4.4: Study 4a's Means and Standard Deviations of Dependent Variables by Rank

Rank	Mean	S.D.	Rank	Mean	S.D.
Perceived Self-Capability Rating			Perceived Capability Difference (Self-Opponent)		
High (#3 out of 100)	6.96	1.43	High (#3 out of 100)	-0.25	0.94
Low (#98 out of 100)	4.46	1.82	Low (#98 out of 100)	0.63	1.32
Perceived Competitor's Capability Rating					
High (#3 out of 100)	7.22	1.42			
Low (#98 out of 100)	3.83	1.82			

Figure 4.5: Study 4a's Mean Capability Rating by Rank and Assessee

105
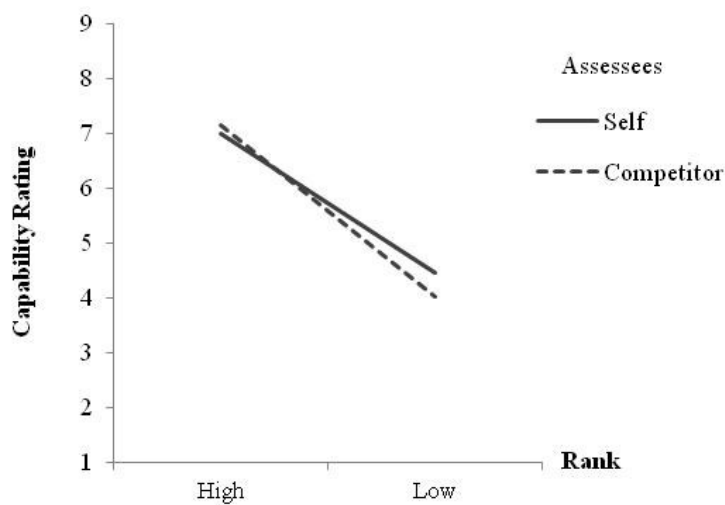
better than theirs. However, for the low-ranking condition, participants significantly perceive that their capabilities are better than their competitor's ($F(1, 52)=12.156$, $p=0.001$, $\eta^2=0.189$). Table 4.4 shows the means and standard deviations of perceived self-capabilities rating, perceived competitor's capabilities rating, and perceived capability difference by rank.

Discussion

The results of Study 4a show that low-ranking participants perceived their relative capabilities to be higher than the capabilities of their competitors whereas high-ranking participants believed their capabilities are slightly inferior to their competitors'. This suggests that low-ranking individuals tend to be more self-enhanced than high-ranking individuals. As a consequence, the first group found it easier than the second group to win against their competitors as shown in previous studies.

However, it may be the case that high-ranking participants perceive their rank difference (e.g. #2 vs #3) to be bigger than the rank difference of low-ranking participants (e.g. #97 vs #98). In this case, high-ranking participants may be as self-enhanced as low-ranking participants. Specifically, high-ranking individuals may view themselves as superior to their competitors, but as the difference in rank between 2nd and 3rd place seems greater, they therefore rate their abilities as on par with their competitor's. In contrast, as the difference between 97th and 98th place appears insignificant, low-ranking participants rate their abilities to be greater than their competitor's. Study 4b controls for the perceived rank difference and also shows that the effect of rankings on perceived capability differences still manifests itself even when participants are paired with lower-ranked competitors.

4.5.2 Study 4b

Participants

A total of 55 participants, recruited from Amazon Mechanical Turk, took part in a

within-subjects questionnaire study online in exchange for $0.60.

Design and Procedure

Similar to Study 4a, a within-subjects design is used to increase the reliability of judgment. To reduce a potential carryover effect from one task to another, participants are categorised into two groups. In the first group, participants were asked to imagine that last week they competed in a competition that involved their numerical skills, and that they ranked 3rd out of 100 competitors. Now, they would compete head-to-head with a competitor who was ranked 4th. Participants were then asked to rate (i) how talented they were, (ii) how talented their competitor was (1=not at all, 9=very talented), (iii) how outstanding their performance last year was, and (iv) how outstanding their competitor's performance last year was (1=not at all, 9=very outstanding). To control for the perceived rank difference, participants were also asked to rate how big the difference between their rank and their competitor's rank was (1=very small, 9=very large). To check participant's understanding and attention in answering the questions, there was one question that instructed them to simply skip a part of the questionnaire, and another question that asked participants to indicate the ranking information of their current competitor. On the next screen, participants were told that they occupied the 95th rank and were about to compete with a person who ranked 96th. They were then asked to respond to the same questions as on screen 1. The second group of participants started with the low rank then the high rank.

Results

Eleven participants did not answer the attention and comprehension questions correctly and were omitted from the analysis. The perceived capability was the average rating of the two questions: "How talent are/is you/your competitor?", and "How outstanding is your performance/your competitor's performance?". Difference in perceived capability was

the difference between the perceived capability of self, and the perceived capability of competitors by self. Three responses of perceived capability difference were considered outliers, following the procedure of Hoaglin et al. (1986), and were omitted from the analysis. There was no significant order effect of rank (*high/low* vs. *low/high*) on perceived capability difference for the high-ranking condition ($F(1, 42)=0.391$, $p=0.535$, $\eta^2=0.009$), but there was an order effect for the low-ranking condition ($F(1, 42)=6.979$, $p=0.012$, $\eta^2=0.142$). Thus, the order was included as a covariate in the subsequent analyses.

Table 4.5: Study 4b's Means and Standard Deviations of Dependent Variables by Rank

Rank	Mean	S.D.	Rank	Mean	S.D.
Perceived Self-Capability Rating			Perceived Capability Difference (Self-Opponent)		
High (#3 out of 100)	7.71	1.04	High (#3 out of 100)	-0.04	0.53
Low (#95 out of 100)	3.55	2.18	Low (#95 out of 100)	0.45	1.09
Perceived Competitor's Capability Rating			Perceived Rank Difference		
High (#3 out of 100)	7.74	0.92	High (#3 out of 100)	2.00	1.70
Low (#95 out of 100)	3.10	2.22	Low (#95 out of 100)	1.76	1.18

Figure 4.6: Study 4b's Mean Capability Rating by Rank and Assessee
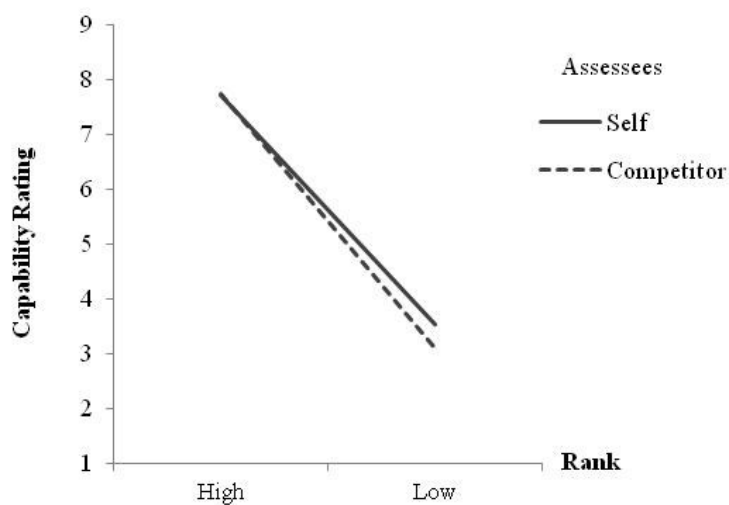
There was no significant difference in the perceived rank difference between the high- and low-ranking groups ($F(1, 40)=1.066$, $p=0.308$, $\eta^2=0.026$). Perceived rank difference was included as a covariate in all subsequent analyses. The results of a within-subjects ANOVA on the difference in capabilities as the dependent variable, ranks (high vs. low) as the within-subjects factor, and perceived rank difference and order as covariates, replicated the findings of Study 4a. The difference in perceived capability of high- and low-ranking participants is partially significant ($F(1, 38)=3.348$, $p=0.075$, $\eta^2=0.081$). As shown in Figure 4.6, the perceived difference between participant's capabilities and their competitor's capabilities are not significant in the high-ranking condition ($F(1, 38)=0.000$, $p=0.993$, $\eta^2=0.000$). However, low-ranking participants perception of superiority over their competitors was partially significant ($F(1, 38)=3.404$, $p=0.073$, $\eta^2=0.082$). Table 4.5 shows the means and standard deviations of perceived self-capabilities rating, perceived competitor's capabilities rating, perceived capability difference, and perceived rank difference by rank.

Discussion

The results of Study 4b reaffirm that the difference in differential capability rating of high- and low-ranking participants is in fact because low-ranking participants are more self-enhanced than high-ranking participants, rather than because low-ranking participants perceived the relative rank difference to be lower than high-ranking participants do.

4.6   General Discussion

Across the four studies, this chapter has shown that rankings influence individuals' perception of their own capabilities and of the capabilities of commensurate competitors, and that discrepancy in capability perception influences the predicted probability of winning a competition. High-ranking individuals, competing with similarly-ranked rivals, self-predicted a lower winning probability than low-ranking individuals competing with similarly ranked

rivals. The results were shown for field data (Study 1) and for experimental data (Study 2). The alternative explanation that the differential winning probability occurred because of differences in importance of winning between high- and low-ranking individuals was ruled out in Study 2. Likewise prior information about one's ability was eliminated as a possible explanation in Study 3. It was shown in Study 4 that judgment about winning probabilities is based on perceived relative capabilities.

The findings contribute to the growing literature on the importance of rankings and their influence on judgment and decision-making (Clark et al., 2010; Clark et al., 2009; Garcia and Tor, 2007) by investigating how rankings influence people's perceptions of winning and relative capability. These are crucial judgments about important organisational and individual decisions (e.g. whether or not to enter a market or a competition). The findings also contribute to the broader literature on performance prediction (e.g. Kruger et al., 2008; Radzevick and Moore, 2008; Moore and Cain, 2007; Moore and Small, 2007; Moore et al., 2007) by showing that the motivational factor, self-enhancement, can influence predicted winning probability, in addition to non-motivational factors that were widely demonstrated by past literature. Specifically, the findings show how people from different ranks can be self-enhanced and how this influences the prediction of competition outcome.

From a practical point of view, the results suggest that rankings might signal capabilities. Individuals might use rankings to infer relative capabilities when information about absolute performance is unavailable or hard to collect. In these situations, our findings suggest that individuals make differential inferences about their capabilities: comparisons between low-ranking individuals are associated with relatively high subjective winning probabilities and pronounced differences in capabilities, whereas comparisons between high-ranking individuals are associated with relatively low subjective winning probabilities and small differences in capabilities.

Even though this research presents several interesting findings, there are certain limitations which can serve as potential avenues for future work. First, there was no control condition in which individuals were not informed about rankings. Therefore, even though the findings show that there was a difference in predicted winning probabilities between high- and low-ranking individuals, it is still unclear whether or not the predictions of these two groups are different from the predictions of those without ranking information. Second, this thesis has focused mainly on individual decision-making. We know, however, that groups differ in many important ways from individuals (e.g. Charness and Sutter, 2012). As in many competitions, people compete in group, it is thus interesting to see whether the ranking effect on predicted winning probability extends to group decision-making. Third, it might be interesting to investigate how independent observers infer winning probabilities and capabilities of differentially ranked individuals, as many important decisions in organisations, such as hiring and promotion decisions involves judgment about the behaviour and skills of others (e.g. Harris and Schaubroeck, 1988). Fourth, it is also interesting to investigate how rankings influence other related aspects of confidence, such as betting and risk taking.

Chapter 5

The Effect of Rankings on Pay Entitlement

5.1 Hypotheses

Pay entitlement relies heavily on social comparison. Individuals use the outcomes of others with similar jobs or qualifications to determine whether or not their pay is fair (Moore, 1991; Major, 1989; Major and Forcey, 1985). However, even when individuals perceive a difference in outcome, they will feel entitled to the same outcome only if they consider it legitimate (Bylsma et al., 1995). Judging whether something is legitimate can be determined using various approaches, such as the contribution to outcomes (Gurin, 1985), or the extent to which an individual's input is translated into outcomes (Major, 1994).

Rankings, a signal of quality, can serve as a determinant of outcome legitimacy, which in turn influences pay entitlement. Since being near the top rank implies high competence, the outcomes of high-ranking individuals should be perceived by similarly-ranked others as being more justifiable than the same outcomes of low-ranking individuals. All else being equal, those who perceive that the outcomes of similarly-performing others are justified are likely to feel entitled to similar outcomes (Bylsma et al., 1995), and demand similar outcomes when negotiating their pay. This line of reasoning implies that high-ranking individuals, when finding out the pay of their similarly-ranked colleagues, should feel entitled to the same pay and should demand that it be similar to their colleagues.

In contrast, as being at low ranks implies poor performance, the outcomes of low-ranking individuals should be viewed as less legitimate than the same outcomes of high-ranking individuals. Perceiving the illegitimate outcomes of others, individuals with similar performance are less likely to feel they should receive the same outcome (Bylsma et al., 1995). Consequently, similarly-ranked individuals should feel less entitled to the same outcome, are less likely to be influenced by social comparison. As a result, they tend to demand lower pay than their colleagues. In short, when learning about the pay of similarly-ranked others, individuals in different ranks should have different entitlement beliefs, which in turn lead to different pay requests. High-ranking individuals are likely to request higher pay than low-ranking individuals since the first group believes the pay of similarly-ranked colleagues is legitimate and feels more entitled than the second group. This leads to the following hypotheses.

H1: Higher-ranked individuals will demand more pay than lower-ranked individuals, holding constant the pay level of similarly-ranked persons.

H2: Rankings are expected to affect pay requests through their effect on personal entitlement.

Without ranking information it is hard for individuals to determine the legitimacy of others' outcomes. Those who believe that the outcomes are less legitimate, such as those in low ranks, will feel less entitled to – and are less likely to demand – the same outcomes. Those who believe the outcomes to be legitimate, which is more likely to be the case (Cook, 1975), will feel that the outcomes received by others and their own outcomes align with performance. This suggests that they will be more tolerant to differences in outcome. As a result, when they learn about others' pay, they are less likely to demand the same pay as others. Compared to high-ranked individuals, who tend to demand a similar level of pay as their similarly-ranked colleagues, and low-ranking individuals who tend to demand lower

pay, the pay requests of individuals who do not possess ranking information should be similar to that of low-ranking individuals. Taken together, I predict the following:

H3: The pay requests of individuals who do not possess ranking information will be similar to that of low-ranking individuals, and will be lower than that of high-ranking individuals.

As others' outcomes decrease, differences in entitlement beliefs between high and low-ranking individuals should also decrease. Since being in a low rank confers incompetence, low-ranking individuals should feel that others' outcomes are more justified and feel more entitled to similar outcomes as others' outcomes decrease. As a result, they are likely to request similar pay when others' pay is low rather than high. On the other hand, the high capability which is inferred from being ranked highly should lead high-ranking individuals to feel that the pay of similar others is justified, regardless of the amount. As a consequence, they should feel entitled to the same outcomes as similarly-ranked others and demand similar pay, regardless of others' pay levels. Taken together, I predict that:

H4: Outcome levels will moderate the effect of rankings on pay requests such that when the pay of similarly-ranked others is high, high-ranking individuals will request higher pay than low-ranking individuals. However, when the pay is low, the pay request of high and low ranking individuals will be similar.

The Present Studies

The four hypotheses were tested across four studies. Study 1 investigated the effect of rankings on salary requests and showed how the effect is mediated by personal entitlement in a hypothetical situation of job change. Study 1 also showed that the effect of ranking was robust when comparing against the salary of both higher-ranked persons (Study 1a) and lower-ranked persons (Study 1b). However, one may argue the effect of ranking on pay

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requests can be driven by differences in the perceived importance of having similar pay, since high-ranking individuals may feel it is more important to have similar pay to their similar-ranked colleagues than low-ranking individuals do. As a result, the former demanded similar pay to their colleagues whereas the second group demanded lower pay. Study 2 ruled out this alternative explanation. Study 3 was a behavioural study which included a control condition, wherein no ranking information was provided. It showed how the ranking effect was moderated by the pay levels of the comparison person, and also showed that individuals from different ranks perceive the legitimacy of others' outcomes differently. Study 4 showed that not only were individuals in requesting positions (e.g. candidates) affected by rankings, but also those in the offering positions (e.g. recruiters): the latter tended to respond in a similar way as the former.

5.2 Study 1

5.2.1 Study 1a

Participants

A total of 204 college graduates, recruited from Amazon Mechanical Turk, participated in a within-subjects questionnaire study online in exchange for $0.30.

Design and Procedure

Participants were asked to assume high rank (#3 of 500) and low rank (#498 of 500) in a counter-balanced within-subjects design. Participants in the first group started with the high-ranking condition, followed by the low-ranking condition. Participants in the second group started with the low-ranking condition, followed by the high-ranking condition. The exact scenario read:

Imagine that you are an employee in a company. Your performance is ranked **#3 (#498)** out of 500 employees in the company (The 1st rank belongs to the best performer). You

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are looking for a new job. Your colleague, whose performance is ranked **#2 (#497)** in the same company, has just received an offer from a company, with a 20% increase in his/her salary. Another company has shown an interest in hiring you. You are negotiating a salary with them.

Participants then responded to three questions. Requested salary was assessed by the question, "What is the minimum increase in salary (in percentage) that you are willing to accept? _____%." (minimum=0, no maximum). Personal entitlement was the focus of the next question, "To what extent do you feel you deserve a 20% increase in salary from the new company?" (1=not at all, 9=very much). Finally, participants responded to the attention and manipulation check question, "What is your current rank in the imaginary company?" (minimum=1, maximum=500).

Results

Participants who did not answer the attention check question correctly were discarded from the analysis. Two participants completed both sets of questionnaires (high/low and low/high ranking conditions), and therefore their second responses were discarded. Two participants answered the minimum salary request in terms of salary amount (i.e. 50,000 and 45,000), rather than with a percentage, and thus were also discarded from the analysis. This left a total of 164 valid responses for analysis. There was a significant order effect of rank (*high/low* vs. *low/high*) on dependent variables (Minimum salary request – high rank: F(1, 162)=22.988, p=0.000, η^2=0.124; low rank: F(1, 162)=3.809, p=0.053, η^2=0.023; Personal entitlement – high rank: F(1, 162)=11.022, p=0.001, η^2=0.064; low rank: F(1, 162)=10.274, p=0.002, η^2=0.060). Thus, order was included as a covariate in the subsequent analyses. The results of a within-subjects ANOVA with the within-subjects factor *rank* (high vs. low), the dependent variable *requested salary increase*, and the covariate *order* showed that higher-ranked individuals requested higher salary increases than lower-ranked individuals (F(1,

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162)=33.881, p=0.000, η^2=0.173). Table 5.1 shows the means and standard deviations of salary increase and personal entitlement as a function of rank.

Table 5.1: Study 1a's Means and Standard Deviations of Dependent Variables by Rank

Rank	Mean	S.D.	Rank	Mean	S.D.
Requested Salary Increase (%)			Personal Entitlement Rating		
High (#3 out of 500)	18.95	6.74	High (#3 out of 500)	7.99	1.38
Low (#498 out of 500)	12.66	6.34	Low (#498 out of 500)	5.16	2.60

As predicted, the results also demonstrated the mediation effect for personal entitlement. The mediation analysis for a within-subjects design was carried out following Krull and MacKinnon's (2001) procedure. All the regressions were controlled for order. First, rank (high vs. low) was a significant predictor of the outcome variable, i.e. requested salary increase (b=6.290, p=0.000). Rank was also a significant predictor of the mediator, i.e. personal entitlement (b=2.835, p=0.000). Finally, personal entitlement was a significant predictor of requested salary increase (b=1.493, p=0.000), controlling for rank. The drop in this coefficient was significant (Sobel z=8.133, p=0.000), which confirmed that requested salary increase was mediated by personal entitlement.

5.2.2 Study 1b

Participants

A total of 204 college graduates, recruited from Amazon Mechanical Turk, participated in a brief within-subjects questionnaire study online in exchange for $0.30.

Design and Procedure

Participants were asked to assume high rank (#2 of 500) and low rank (#497 of 500)

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in a counter-balanced within-subjects design. Participants in the first group started with the high-ranking condition and then participated in the low-ranking condition. Participants in the second group started with the low-ranking condition, followed by the high-ranking condition. The exact scenario read:

> Imagine that you are an employee in a company. Your performance is ranked **#2 (#497)** out of 500 employees in the company. (The 1st rank belongs to the best performer). You are looking for a new job. Your colleague, whose performance is ranked **#3 (#498)** in the same company, has just received an offer from a company, with a 20% increase in his/her salary. Another company has shown an interest in hiring you. You are negotiating a salary with them.

Participants then responded to three questions: Requested salary was assessed by the question, "What is the minimum increase in salary (in percentage) that you are willing to accept? _____%." (minimum=0, no maximum). Personal entitlement was the focus of the following question, "To what extent do you feel you deserve a 20% increase in salary from the new company?" (1=not at all, 9=very much). Finally, participants responded to the attention check question, "What is your current rank in the imaginary company?" (minimum=1, maximum=500).

Results

Participants who did not answer the attention check question correctly were discarded from the analysis. Four participants completed both sets of questionnaires (high/low and low/high ranking conditions), and therefore their second responses were discarded. This left a total of 180 valid responses for analysis. There was no significant order effect of rank (*high/low* vs. *low/high*) on the dependent measure, requested salary increase (high rank: $F(1, 178)=2.429$, $p=0.121$, $\eta^2=0.013$; low rank: $F(1, 177)=0.418$, $p=0.519$, $\eta^2=0.002$), and no significant order effect on personal entitlement for the high-ranking condition ($F(1, 177)=0.633$, $p=0.427$, $\eta^2=0.004$). However, there was an order effect on personal entitlement

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for the low-ranking condition ($F(1, 177)$=8.913, p=0.003, η^2=0.048). Therefore, order was included as a covariate for the subsequent analyses. The results of a within-subjects ANOVA with the within-subjects factor *rank* (high vs. low), the dependent variable *requested salary increase*, and the covariate *order* replicated the findings of Study 1a: higher-ranked individuals requested higher salary increases than lower-ranked individuals ($F(1, 177)$= 107.341, p=0.000, η^2=0.378). Table 5.2 shows the means and standard deviations of requested salary increase and personal entitlement as a function of rank. Figure 5.1 compares the mean requested salary increase of Study 1a and Study 1b. Unsurprisingly, participants generally demanded higher salary increases when comparing themselves with lower-ranked colleagues than with higher-ranked colleagues.

Table 5.2: Study 1b's Means and Standard Deviations of Dependent Variables by Rank

Rank	Mean	S.D.	Rank	Mean	S.D.
Requested Salary Increase (%)			Personal Entitlement Rating		
High (#2 out of 500)	22.58	6.86	High (#2 out of 500)	8.28	0.98
Low (#497 out of 500)	14.26	6.85	Low (#497 out of 500)	5.05	2.63

Figure 5.1: Mean Requested Salary Increase by Rank and Comparison Direction

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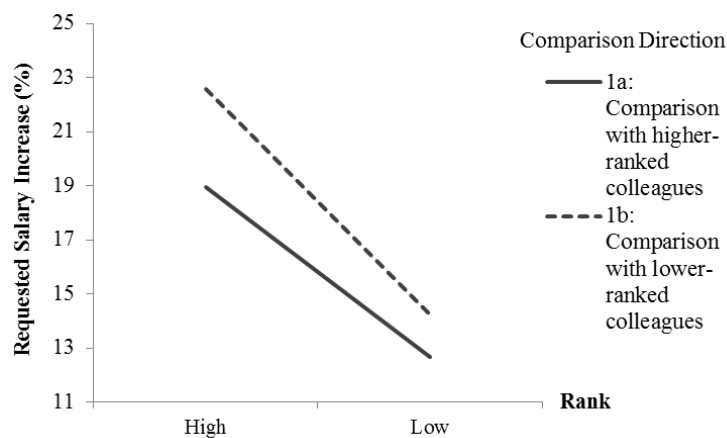
The results also demonstrated the mediation effect for personal entitlement. First, rank (high vs. low) was a significant predictor of the outcome variable, i.e. requested salary increase (b=8.312, p=0.000). Rank was also a significant predictor of the mediator, i.e. personal entitlement (b=3.236, p=0.000). Finally, personal entitlement was a significant predictor of requested salary increase (b=1.409, p=0.000), controlling for rank. The drop in this coefficient was significant (Sobel z=7.792, p=0.000), which confirmed that requested salary increase was mediated by personal entitlement. Note that all the regressions were controlled for order.

Discussion

Study 1 shows that performance rank is a better predictor of requested salary increase than the salary increase of a commensurate colleague. Even though the salary increase of the colleague can influence individuals' salary requests through anchoring (Tversky and Kahneman, 1974) or social comparison processes (Festinger, 1954), individuals tend to adjust their request based on their ranks, with higher-ranked individuals requesting higher increases than lower-ranked individuals. Study 1 also shows that perceived entitlement mediated the effect of rankings on requested salary increase. High-ranking individuals, compared to low-ranking individuals, felt more entitled to increases in salary similar to their colleagues, resulting in the former requesting a higher increase in salary, regardless of the comparison direction. However, one possible explanation for the ranking effect on salary request is that individuals from different ranks may have different concerns regarding relative pay. Pride may be more important for high-ranking individuals, and they may be more defensive than low-ranking individuals (Sloman et al., 2003; Fournier et al., 2002). As a result, this first group may be less tolerant to pay differences, feeling it is more important to receive similar pay as their colleagues. Study 2 addresses this issue.

5.3 Study 2

Participants

A total of 150 college graduates, recruited from Amazon Mechanical Turk, participated in a between-subjects questionnaire study online in exchange for $0.15.

Design and Procedure

Participants were randomly assigned to one of three between-subjects conditions (high, intermediate, and low ranks). Participants were then informed about their performance rank as an employee of a large US corporation. The exact wording was as follows:

> Imagine that you are an employee in a large company in the US. Your performance is ranked #3 (#251, #498) out of 500 in the company. (The 1st rank belongs to the best performer). You are looking for a new job. Your colleague, whose performance is ranked #2 (#250, #497) in the same company, has just received an offer from a company, with a 20% increase in his/her salary. Another company has shown an interest in hiring you. You are negotiating a salary with them.

Participants then responded to the three questions: Requested salary was assessed by the question, "What is the minimum increase in salary (in percentage) that you are willing to accept? _____%" (minimum=0, no maximum). To measure the concern about relative pay, participants responded to the question, "How important is it that the increase (in percentage) in your salary is no less than the increase in your colleague's salary? (1=not at all important, 9=very important)" Finally, to check participants' attention and understanding of the task, participants were asked, "What is your current rank?" (minimum=1, maximum=500).

Results

Eight participants did not correctly answer the attention check question, and were discarded from the analysis. As predicted, the importance of receiving similar pay did not differ significantly between ranking conditions ($F(2, 135) = 0.648$, $p = 0.525$, $\eta^2 = 0.010$;

linear trend: $F(1, 135) = 1.287$, $p = 0.259$, $\eta^2 = 0.009$). The results of a one-way ANOVA with requested salary as the dependent variable, ranks as the independent variable, and importance rating as the covariate revealed that the requested salary increase increased monotonically according to the participants' rank: higher-ranked individuals requested a significantly higher salary increase than lower-ranked individuals ($F(2, 134)=3.102$, $p=0.048$, $\eta^2=0.044$; linear trend: $F(1, 134)=6.202$, $p=0.014$, $\eta^2 = 0.044$). Table 5.3 shows the means and standard deviations of requested salary increase and importance of similar pay rating as a function of rank.

Table 5.3: Study 2's Means and Standard Deviations of Dependent Variables by Rank

Rank	Mean	S.D.	Rank	Mean	S.D.
Requested Salary Increase (%)			Importance of Similar Pay Rating		
High (#3 out of 500)	19.29	8.47	High (#3 out of 500)	6.09	2.57
Intermediate (#251 out of 500)	17.40	5.64	Intermediate (#251 out of 500)	5.79	2.83
Low (#498 out of 500)	15.29	6.32	Low (#498 out of 500)	5.40	3.21

Discussion

The results of Study 2 suggest that the effect of rankings on salary requests was not driven by the different level of concern about the relative pay of participants and their colleagues, but rather by the difference in entitlement beliefs as shown in Study 1a and 1b.

It is suggested that the decision-making approach used in the previous studies served as a basis to examine the various effects of behavioural decision making research, and it is believed to be appropriate and legitimate (Garcia et al., 2006; Kuhberger et al., 2002). Additionally, research has suggested that the difference between hypothetical and real decisions will become manifest particularly in studies involving "visceral emotional changes" as opposed to ones involving financial incentives (Kuhberger et al., 2002), as in the studies in

this chapter. I, however, seek to confirm that the ranking effect found in previous studies also manifests itself given *real* financial consequences. In the next study, the ranking effect on pay entitlement is explored by letting participants ask for real financial payoffs, rather than hypothetical ones. It also includes the control condition, where no ranking feedback was provided.

5.4 Study 3

Participants

A total of 159 college graduates (73 women, 86 men, average age 33) recruited from Amazon Mechanical Turk, participated in an online study in exchange for $1.00 plus a bonus payment which depended on the amount they requested, as explained below.

Design and Procedure

Participants were randomly assigned to one of six conditions with the between-subjects factor *rank* (control-no ranking information, high rank, and low rank) and the between-subjects factor *comparative bonus request* (high and low bonus requests of similarly-ranked rival). At the beginning of the task, participants were informed that they would be undertaking a timed numerical task, and would be paid a bonus in addition to the fixed payment. The exact scenario was the following:

> Welcome and thank you for participating in our study!
>
> The study will consist of a timed numerical task. After the timed task, you will answer a set of brief questions. To encourage you to perform as well as possible, we will pay a bonus in addition to the fixed payment stated in the HIT description. The currency units that we are using are denoted as ECU, where 100 ECU equals $1.

On the next screen, participants read the following task instructions.

The following is a timed numerical task that will be scored and compared to your peers who have also completed this task. The task will be scored according to <u>how fast you are without compromising accuracy</u>.

On the next screens you will be given 5 matrices. Each matrix contains 12 numbers similar to the one shown below. For each matrix, your task is to find the two numbers that add up to 10. For example, the correct answer for the matrix below is 3.58 and 6.42. You can submit your answer by clicking on the corresponding cells and then press the button CONTINUE.

9.38	6.74	8.17
5.15	6.61	3.06
9.71	0.91	4.88
3.58	4.87	6.42

Participants started their first matrix on the next screen. After they had completed the five matrices, they were randomly assigned to one of the ranking conditions: control (no ranking information), high (#2 of 196) or low (#122 of 196), and either a high (280 ECU) or a low (80 ECU) bonus request by another person (i.e. one who had already completed the task, whose rank was #3 or #123). Participants were then informed about their rank, the number of individuals who had completed the study before them, and the bonus request of the lower-ranked person. Specifically:

[Based on the results, you were ranked **#2 (#122)** out of **196** participants thus far.]

For this type of task, we typically pay a bonus of 100 ECU [to a person who performs relatively well (poor)]. However, we allow you to request your own bonus. The participant who was ranked **#3** (ranked **#123,** just before you) requested 80 (280) ECU.

The sentences in square brackets were omitted in the control condition. Participants in the control condition were then asked "What bonus (in ECU) do you think you should be

paid?" (minimum=0, maximum=1,000). Participants in the high and low-ranking conditions were asked "You are ranked **#2 (#122)** out of 196**.** What bonus (in ECU) do you think you should be paid?" (minimum=0, maximum=1,000).

On the next screen, all participants responded to five questions. The perceived justification of bonus requests was assessed by the questions: "To what extent do you feel it would be easy to justify 80/280 ECU?" (1=not at all, 9=very much). Participants were then asked to predict their own rank: "Disregarding the rank information that we gave you, what was your gut feeling about your own rank? Out of 196 participants, which rank did you expect?" Then, participants read the attention check question as follows:

> We are grateful to all the Amazon MTurks who participate in our studies. Indeed, you really help researchers like us tremendously. Sometimes when we ask questions, we are interested in what participants think, what their attitudes are, what their opinions are, etc. However, sometimes the questions can be quite long and oftentimes people do not take the time to read the entire question. In this question, we will ask you a question about which of the following spare time activities is most appealing to you. However, we do not want you to answer this question. Just skip this question entirely. We are using this question to make sure that people are reading the instructions carefully.
>
> Which of the following spare time activities is most appealing to you?
>
> ☐ Video games   ☐ Movies   ☐ Sports   ☐ Reading   ☐ Hiking

Finally, participants were asked about their gender and age. After completing the study, participants received the money for their participation and their bonus based on the amount requested.

Results

Seven responses were discarded from the analysis, constituting six participants who answered the attention check question and one who requested a bonus of $1,000, which, as per Hoaglin et al. (1986), was considered to be an outlier.

In all conditions, the performance of participants, i.e. total scores (the number of matrices correctly solved) and the average time spent on each matrix, was not statistically different, and was included as covariates in all subsequent analyses. The results of a two-way ANOVA with total score (i.e. the number of matrices correctly solved) as the dependent variable, and rank (control, high, and low) and comparative bonus request (high vs. low) as the between-subjects factors showed no main effect of ranking ($F(2, 146)=0.401$, $p=0.670$, $\eta^2=0.005$), of comparative request ($F(1, 146)=0.240$, $p=0.625$, $\eta^2=0.002$), or interaction effect for rank x comparative request ($F(2, 146)=0.200$, $p=0.819$, $\eta^2=0.003$). Similarly, the results of a two-way ANOVA with average answering time per matrix as the dependent variable, and rank (control, high, and low) and comparative bonus request (high vs. low) as the between-subjects factors showed no main effect of ranking ($F(2, 145)=0.477$, $p=0.622$, $\eta^2=0.007$), of comparative request ($F(1, 145)=0.000$, $p=0.988$, $\eta^2=0.000$), or interaction effect for rank x comparative request ($F(2, 145)=0.069$, $p=0.933$, $\eta^2=0.001$).

The results of a two-way ANOVA with the between-subjects factors *rank* (control, high, and low) and *comparative bonus request* (high vs. low), the dependent variable *requested bonus*, and the covariates *predicted rank, total score, and average answering time* indicated that there were the significant interaction effect for rank x comparative bonus request ($F(2, 142)=3.216$, $p=0.043$, $\eta^2=0.043$), the significant main effect of rank ($F(2, 142)=4.016$, $p=0.020$, $\eta^2=0.054$), and the significant main effect of comparative request ($F(1, 142)=188.326$, $p=0.000$, $\eta^2=0.570$). Specifically, when the comparative request was high, highly-ranked individuals requested higher bonus payments than low-ranked individuals and individuals without ranking information. The contrast -1 (no ranking information), 2 (high rank), -1 (low rank) was significant ($F(1, 70)=8.515$, $p=0.005$, $\eta^2=0.108$). However, as shown in Figure 5.2, when the comparative request was low, the bonus requests of the three groups with the same contrast (-1, 2, -1) were not significantly different ($F(1, 69)=0.463$, $p=0.499$,

η^2=0.007). Table 5.4 shows the means and standard deviations of bonus request and perceived justification rating by rank and comparative bonus request.

Table 5.4: Study 3's Means and Standard Deviations of Dependent Variables

by Rank and Comparative Bonus Request

Rank	Comparative Request		Rank	Comparative Request	
	High (280)	Low (80)		High (280)	Low (80)
Bonus Request			Perceived Justification		
Control	255.22 (110.16)	85.33 (40.15)	Control	5.78 (2.65)	6.46 (1.91)
High (#2 out of 196)	317.96 (89.12)	98.92 (41.22)	High (#2 out of 196)	7.15 (1.88)	7.15 (1.91)
Low (#122 out of 196)	231.73 (113.40)	85.03 (55.58)	Low (#122 out of 196)	4.88 (2.27)	7.16 (2.30)

Note: Standard deviations are in parentheses.

The perceived justification of the bonus request was asked through the question: "To what extent do you feel it would be easy to justify 80/280 ECU?" Similar to the bonus request, the results of a two-way ANOVA with the between-subjects factors *rank* (control, high, and low) and *comparative bonus request* (high vs. low), the dependent variable *perceived justification*, and the covariates *predicted rank, total score, and average answering time* indicated the significant interaction effect (F(2, 142)=3.810, p=0.024, η^2=0.051), the significant main effect of *rank* (F(2, 142)=3.534, p=0.032, η^2=0.047), and the significant main effect of *comparative request* (F(1, 142)=7.509, p=0.007, η^2=0.050). As shown in Figure 5.3, high-ranking participants in the high comparative request condition considered it easier to justify the bonus requested by the other person than participants in either the low or no ranking condition. The contrast -1 (no ranking information), 2 (high rank), -1 (low rank) was significant (F(1, 70)=11.156, p=0.001, η^2=0.137). However, the same contrast in the low

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comparative bonus request condition was not significant ($F(1, 69)=0.016$, $p=0.899$, $\eta^2=0.000$): participants in the three ranking groups did not differ in the justification rating.

Figure 5.2: Mean Bonus Request by Rank and Comparative Bonus Request
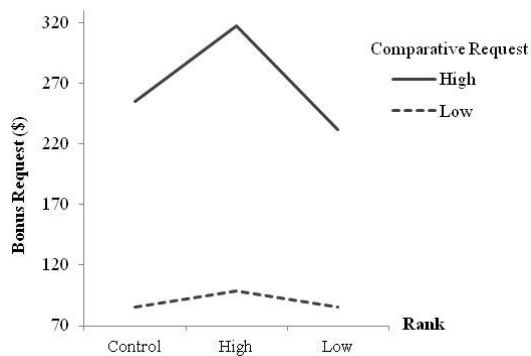
Figure 5.3: Mean Perceived Justification Rating by Rank and Comparative Bonus Request
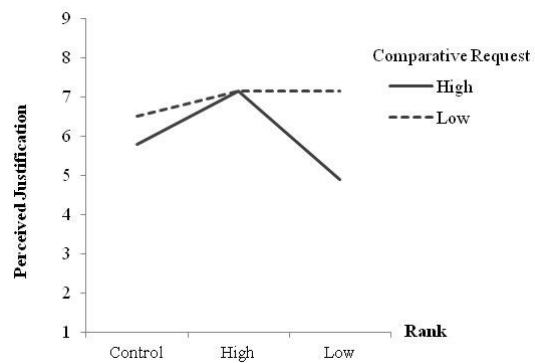
Discussion

Study 3 introduced monetary incentives in order to demonstrate that the findings can be generalised to situations which are not hypothetical. Individuals rely on rank, in addition to other people's requests, when requesting their own bonus. High-ranking individuals, in comparison to low-ranking individuals and those without rank, believed it was easier to justify the bonus request of the person in the comparison. Consequently, they felt more entitled, and requested a higher bonus than the other two groups. Once the bonus figure of the person in the comparison decreased, individuals in the low-ranking and no-ranking conditions considered it easier to justify the comparative bonus, and so were felt more entitled to a similar bonus amount. As a result, the ranking effect on the bonus request attenuates: the bonus requests of individuals in all ranking conditions were not different when the comparative bonus request was low. Study 3 also reveals that individuals without ranking information requested similar bonus amounts to those in the low-ranking conditions,

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suggesting that ranking feedback helps those with high performance to justify their pay requests and demand higher pay.

5.5 Study 4

Participants

A total of 308 participants recruited from Amazon Mechanical Turk, participated in an online study in exchange for $0.35.

Design and Procedure

Participants were randomly assigned to one of six conditions with the between-subjects factor *rank* (control-no ranking information, high rank, and low rank) and the between-subjects factor *role* (candidate vs. recruiter). The exact scenario for the recruiter condition read:

> Imagine that you are recruiting a new staff for your company and have found one candidate whose profile matches with the requirements. You are considering offering this candidate a position in your company, and are negotiating with him/her the salary.
>
> [The candidate was ranked **#3 (#283)** out of 300 employees in his/her previous company (The 1st rank belongs to the best performer).] You have learned from this candidate that his/her colleague [who was ranked **#4 (#284)]** in the same company has received an offer from another company with a 25% increase in salary.

The words in the square brackets were omitted in the control (no ranking information) condition. Participants assuming the recruiter role then responded to five questions. The first question assessed offered salary by asking, "What is the percentage increase in salary that you are willing to offer to this candidate? _____%." (minimum=0, no maximum). Secondly, entitlement belief was assessed by the following, "To what extent do you feel this candidate deserves a 25% increase in salary?" (1=not at all, 9=very much) and "To what extent do you feel it would be easy to justify a 25% increase in salary?" (1=not at all, 9=very

much). Finally, participants responded to two attention and manipulation check questions. One question instructed them to simply skip a part of the questionnaire and the other question asked "What is the rank of this candidate in his previous company? (If unknown, please answer "unknown")" (minimum=1, maximum=300).

The exact scenario for the candidate condition read:

Imagine that you are an employee in a company. [Your performance is ranked **#3 (#283)** out of 300 in the company (The 1st rank belongs to the best performer).] You are looking for a new job. Your colleague [, whose performance is ranked **#4 (#284)** in the same company,] has just received an offer from a company, with a 25% increase in his/her salary. Another company has shown an interest in hiring you. You are negotiating a salary with them.

The words in the square brackets were omitted in the control (no ranking information) condition. Participants assuming the candidate role then responded to the five questions: Requested salary was assessed by the question, "What is the minimum percentage increase in salary that you are willing to accept? _____%." (minimum=0, no maximum). Entitlement belief was assessed by the following questions, "To what extent do you feel you deserve a 25% increase in salary?" (1=not at all, 9=very much), and "To what extent do you feel it would be easy to justify a 25% increase in salary?" (1=not at all, 9=very much). Finally, participants responded to the two attention and manipulation check questions discussed above.

Results

Participants who did not answer the attention and manipulation check questions correctly were discarded from the analysis. In total, there were 269 valid observations. The results of a two-way ANOVA with the dependent variable *proposed salary,* and between-subjects factors *rank* and *role* showed that there was a significant difference between ranking conditions ($F(2, 263)=19.322$, $p=0.000$, $\eta^2=0.128$). Specifically, high-ranking participants

requested/offered higher salary increases than low-ranking and no-ranking participants, as shown in Figure 5.4. The contrast -1 (no ranking information), 2 (high rank), -1 (low rank) was significant ($F(1, 263)=31.774$, $p=0.000$, $\eta^2=0.108$). The main role effect and the interaction effect for rank x role were not statistically significant (Main effect: $F(1, 263)=0.128$, $p=0.720$, $\eta^2=0.000$; Interaction effect: $F(2, 263)=0.998$, $p=0.370$, $\eta^2=0.008$). Table 5.5 displays the means and standard deviations of proposed salary increase and entitlement belief by rank and role.

Table 5.5: Study 4's Means and Standard Deviations of Dependent Variables by Rank and Role

Rank	Role		Rank	Role	
	Recruiter	Candidate		Recruiter	Candidate
Proposed Salary Increase (%)			Entitlement Belief		
Control	22.71 (7.08)	21.19 (7.31)	Control	6.34 (2.15)	7.32 (1.79)
High (#3 out of 300)	25.38 (6.05)	26.98 (10.82)	High (#3 out of 300)	7.19 (1.92)	8.27 (1.00)
Low (#283 out of 300)	17.92 (9.10)	18.90 (6.96)	Low (#283 out of 300)	4.90 (2.67)	5.39 (2.26)

Note: Standard deviations are in parentheses.

Entitlement belief was the average rating of these two questions: "To what extent do you feel you deserve a 25% increase in salary?", and "To what extent do you feel it would be easy to justify a 25% increase in salary?". The Cronbach's Alpha was 0.920. Similar to the proposed salary, the results of a two-way ANOVA with entitlement belief as the dependent variable, and rank and role as the between-subjects factors indicated the significant main effect of rankings ($F(2, 263)=34.707$, $p=0.000$, $\eta^2=0.209$). Participants in the high-ranking condition felt that they (or their candidates) are more entitled to the similar salary increase as

the person in the comparison than participants in the low- and no-ranking conditions, as shown in Figure 5.5. The contrast -1 (no ranking information), 2 (high rank), -1 (low rank) was significant ($F(1, 263)=42.371$, $p=0.000$, $\eta^2=0.139$). The main role effect was significant ($F(1, 263)=11.619$, $p=0.001$, $\eta^2=0.042$), but the interaction effect for rank x role was not significant ($F(2, 263)=0.524$, $p=0.593$, $\eta^2=0.004$).

Figure 5.4: Mean Proposed Pay Increase by Rank and Role
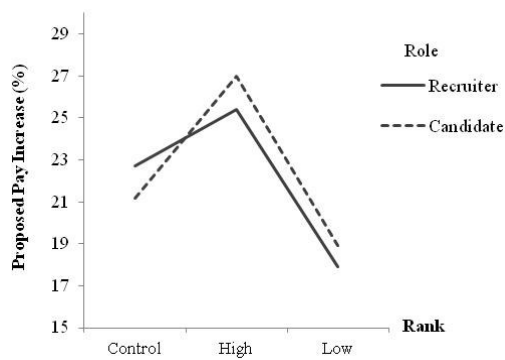
Figure 5.5: Mean Entitlement Belief by Rank and Role
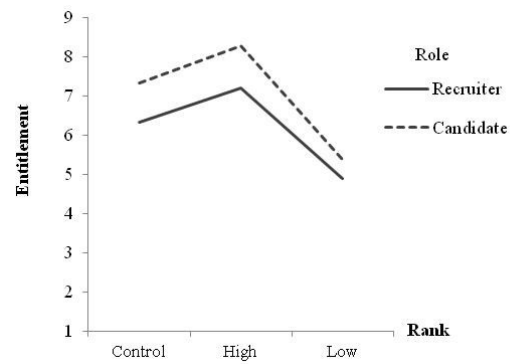
Discussion

The findings of Study 4 replicate those of Study 3, showing that ranking influences both requesting and offering individuals. High-ranking candidates and recruiters requested/offered higher pay than those in the low- and no-ranking condition. Additionally, both candidates and recruiters tend to agree on the amount of salary increase, i.e. the offered salary tends to be close to the requested salary. Even though recruiters rated entitlement belief for their candidates lower than the candidates did, this difference was not strong enough to make the offered salary lower than the requested salary in all ranking conditions.

5.6 General Discussion

Across the four studies I showed that rankings influence individuals' pay requests through entitlement beliefs. High-ranking individuals, when compared to low-ranking individuals, feel more entitled to the same pay as their similarly-ranked colleagues, and in turn demand higher pay (Study 1 and Study 2). This relationship between one's rankings and pay request is moderated by the pay amount that similarly-ranked persons receive (Study 3). More precisely, as the pay amount decreases, the difference in pay requests of high and low-ranking individuals attenuates. Additionally, without ranking information, individuals tend to behave like those with low ranks, such that they demand similar pay as low-ranking individuals, and lower pay than high-ranking individuals (Study 3 and Study 4). The effect of rankings on pay requests remains robust across both comparison directions: with a higher- or lower-ranked colleague (Study 1), and the roles of both candidate and recruiter (Study 4).

The findings contribute to the literature on the influence of rankings on judgment and behaviour by showing how individuals use them to justify and negotiate their pay. The findings also contribute to the literature on pay entitlement, which has suggested that pay entitlement hinges predominantly on social comparison and focused mainly on gender, rather than performance feedback, as a determinant of entitlement. However, since pay is often a reflection of performance (Prendergast, 1999) and unfulfilled pay entitlement can lead to counterproductive behaviour (Paul et al., 2000), it is necessary to understand how performance feedback influences pay entitlement. The findings in this chapter shows how performance feedback, and ranking in particular, can be used as a determinant of legitimacy and pay entitlement, and is given priority over social comparisons.

From a practical point of view, the findings help organisations learn about the pay entitlement of employees, and reduce the chance of unfulfilled entitlement, which could negatively influence employees' behaviour and attitude. The findings suggest that individuals

use ranking information to infer competence and justify pay. Without ranking information, individuals tend to demand pay at a similar level to those with a low-ranking condition, and lower pay than those with a high-ranking condition. This implies that ranking feedback specifically helps high-ranking individuals justify their pay and demand pay which is as equally high as their colleagues'. Even though both high-ranking candidates and recruiters agree on the pay as shown in Study 4, the finding suggests that organisations may be at a disadvantage since they may need to pay (albeit voluntarily) high-ranking candidates more compared to when ranking feedback is not available.

However, by abandoning performance feedback that differentiates poor, average, and high performers, or ranking feedback in particular, and adopting a flat pay plan, organisations may find that their employees lack the motivation to perform. Additionally, employees' sense of entitlement may even be heightened (Fisk, 2010). Specifically, employees may expect to receive the same rewards as others without performing adequately, and such expectation can increase their feelings of entitlement (Fisk, 2010). Although Studies 3 and 4 show that employees without ranking information request lower pay than comparable others, suggesting that they feel less entitled to the same pay, in the longer term this unequal pay may create doubt and ambiguity as to which factors contribute to pay (Fisk, 2010). As a result, employees may turn to irrelevant performance factors such as age or gender and place too much value in these factors (Fisk, 2010). This behaviour may eventually boost their sense of entitlement (Naumann et al., 2002). Consequently, even though ranking helps high-ranking individuals justify their pay, which may put organisations at a disadvantage, it may lead to better overall results than overly-lenient performance feedback.

The findings also help organisations make appropriate and attractive offers to potential candidates, based on their expectations. More precisely, the moderating role of comparative pay suggests that if organisations want a high-ranking candidate to accept their

offer, they will need to offer the candidate at least the same as his colleagues' pay regardless of its level. For low-ranking individuals, however, the amount offered depends on whether or not the low-ranking individuals perceive their colleagues' pay to be justified. If low-ranking individuals cannot justify their colleagues' pay, they will not feel entitled to the same pay. In this case, organisations can make an offer lower than the comparative pay. On the other hand, if they perceive their colleagues' pay to be justified, organisations will need to offer low-ranking candidates similar pay. Hence, it may be beneficial for recruiters to find out about the rank of their potential candidates and the pay of their candidates' colleagues.

Future work can extend the present findings in several important ways. First, the present studies only consider entitlement as cash compensation. It would be interesting and important to see whether the ranking effect on entitlement extends to fringe benefits such as holidays or health insurance. Since fringe benefits are often undervalued (Wilson et al., 1985) and their perceived values varied markedly from one employee to another (Chiu et al., 2002), the ranking effect on benefits entitlement may not be as strong as on pay entitlement. Second, the present studies consider only one-way requests/offers of candidates/recruiters. It would be interesting to investigate the behaviour of the two parties in a negotiation. Since occupying high ranks implies high competence, high-ranking individuals may exert more confidence, and perhaps be more competitive, when negotiating their pay. Future work can also investigate whether or not the present findings can also be *further* explained by the law of demand and supply. Specifically, there are fewer candidates (supply) at the top than at the bottom. The limited supply may make recruiters be more willing to pay higher for those near the top than for those near the bottom. Similarly, it may make candidates feel more entitled and in turn request more pay when they are in higher ranks than lower ranks, as demonstrated in the present research. Finally, since high-ranking individuals request higher pay than low-ranking individuals, and higher expectations are more likely to lead to disappointment (Bell,

1985), it may be worthwhile to explore whether high-ranking individuals are more likely than low-ranking individuals to experience disappointment and dissatisfaction.

Chapter 6

The Effect of Rankings on Cooperation Decision

6.1 Hypotheses

When making social decisions, individuals need to not only consider their own outcomes but also the outcomes of others. These decisions can be influenced by the situational context since individuals tend to make different decisions when they are in a loss situation as compared to a gain situation. In a loss situation, individuals tend to be more individualistic: they maximise only their own outcomes (Poppe and Valkenberg, 2003) and are less concerned about relative outcome differences (de Dreu et al., 1994b).

Individuals' social decisions are also influenced by rank. Rankings create two meaningful standards: the top standard motivates high-ranking individuals as a goal whereas the bottom standard acts as an incentive for low-ranking individuals to desperately avoid. In a gain situation, these motivations lead individuals near the top and the bottom to try hard not to fall in rank. As a consequence, high- and low-ranking individuals tend to feel more competitive towards their rivals and are thus more concerned about relative outcomes than those far away from the standards. This means they are likely not to cooperate with their commensurate rivals if their rivals benefit more from the cooperation than they do (Garcia and Tor, 2007; Garcia et al., 2006). In other words, concern about others being surpassed in rank is more intense than the perceived benefits from cooperation.

However, when facing a loss situation, the cooperation decisions of high and low-ranking individuals are likely to differ. Generally speaking, due to loss aversion (Tversky and Kahneman, 1991), both groups of individuals are likely to perceive the same increase in cooperation outcomes as being more beneficial when facing losses than gains. However, since having a high ranking communicates success and creates pride (Sloman et al., 2003), when such individuals are in a loss situation they tend to be concerned about maintaining their reputation as a strong performer, and are likely to shift their focus from relative outcome differences to perceived benefit increases. Specifically, they are likely to focus less on relative outcomes difference from cooperation, and therefore feel less competitive towards their rivals. As a consequence, they tend to decide to cooperate when cooperation leads to superior performance. On the other hand, because low-ranking individuals are not reputed to be strong performers, it is not as necessary for them to maintain their good performance in a loss situation. Thus, even though they perceive higher benefits from cooperation in a loss situation, they are still concerned about relative outcome differences. As a result, low-ranking individuals should feel equally competitive towards their rivals and choose not to cooperate when they are facing a loss as well as a gain. This discussion thus suggests the following:

H1: (a) High-ranking individuals are more likely to cooperate with a commensurate rival in loss as opposed to gain situations. (b) In both situations there is no difference in the cooperation decision of low-ranking individuals.

H2: (a) High-ranking individuals feel less competitive towards a commensurate rival in loss as opposed to gain situations. (b) In both situations there is no difference in competitive feelings of low-ranking individuals.

The cooperation behaviour of high- and low-ranking individuals should not be manifested only in real gain and loss situations. The literature on framing effects suggests

that individuals are also influenced by frames, tending to make different decisions when choices that are essentially the same are described differently (Kuhberger, 1998; Tversky and Kahneman, 1981). Individuals presented with a negative (positive) frame are likely to perceive outcomes as losses (gains), and make decisions as if they are presented with real losses (gains). Given that higher-ranked individuals are more likely to cooperate with a commensurate rival in a loss rather than a gain situation while lower-ranked individuals are more consistent in their cooperation decisions regardless of the situational context (Hypothesis 1), I predict the following:

H3: (a) High-ranking individuals are more likely to cooperate with a commensurate rival in negatively-framed situations rather than positively-framed situations. (b) There is no difference in the cooperation decision of low-ranking individuals in both situations.

The Present Studies

All three hypotheses were tested across three studies. Study 1 explored the cooperation decisions of high- and low-ranking individuals under gain and loss situations. Study 2 investigated how rankings and situational contexts influence individuals' competitive feelings towards their rivals. Study 3 examined the cooperation decisions of high and low-ranking individuals under two situations which have the same payoffs, but which were positively and negatively framed.

6.2 Study 1

Participants

A total of 160 participants, recruited from Amazon Mechanical Turk, participated in a questionnaire study online in exchange for $0.15.

Design and Procedure

Participants were randomly assigned to one of the two between-subjects ranking conditions (high vs. low). In each ranking condition, participants were asked to assume the role of CEO and decide whether or not to cooperate with their rival in the counter-balanced loss and gain situations. The first group of participants started with loss then gain situations. The second group started with gain then loss situations.

The exact scenario in the loss condition read:

Imagine that you are the CEO of a company that is ranked #3 (#500) on the prestigious *Fortune* 500. **This is the recession period, and it is likely that your company will be facing losses this year.** To limit losses, you are thinking about a possible alliance with a rival company ranked #4 (#501, just off the list). The return will depend on whether or not you form an alliance.

Strategy A: With an alliance, your company's return will be -5% and your rival's
        return will be -1%.
Strategy B: Without an alliance, your company's return will be -6% and your rival's
        return will be -6%.

Participants then responded to the question, "Which strategy would you choose?" A: Form an alliance, B: Not form an alliance.

The exact scenario in the gain condition read:

Imagine that you are the CEO of a company that is ranked #3 (#500) on the prestigious *Fortune* 500. **This is the normal period, and it is likely that your company will have profits this year.** To gain higher profits, you are thinking about a possible alliance with a rival company rank #4 (#501, just off the list). The returns will depend on whether or not you form an alliance.

Strategy A: With an alliance, your company's return will be 7% and your rival's
        return will be 11%.
Strategy B: Without an alliance, your company's return will be 6% and your rival's
   return will be 6%.

Participants then responded to the question, "Which strategy would you choose?" A: Form an alliance. B: Not form an alliance.

Finally, participants responded to the attention and manipulation check question, "What is your imaginary company's rank?"

Results

Participants who did not answer the attention check question correctly were discarded from the analysis, which resulted in a total of 142 valid responses. There was no significant order effect of situational context (*gain/loss* vs. *loss/gain*) on the dependent measure (High-ranking condition – gain situation: b=0.452, p=0.186; loss situation: b=-0.571, p=0.100; Low-ranking condition – gain situation: b=0.571, p=0.100; loss situation: b=0.336, p=0.320). Therefore, the data was combined for the subsequent analyses. As predicted, the results of the Generalised Estimating Equations (GEE), with cooperation decision as the dependent variable and situational context (gain vs loss) as the independent variable, showed that high-ranking participants decided to cooperate significantly more frequently when their company was facing a loss rather than a gain ($\chi^2(1)$ = 6.304, p = 0.012). However, the decisions of low-ranking participants did not significantly change when they were facing a loss rather than a gain ($\chi^2(1)$ = 1.081, p = 0.299). Figure 6.1 shows the percentage of participants who chose to cooperate by rank and situational context.

Figure 6.1: Percentage of Participants Choosing to Cooperate

by Rank and Situational Context
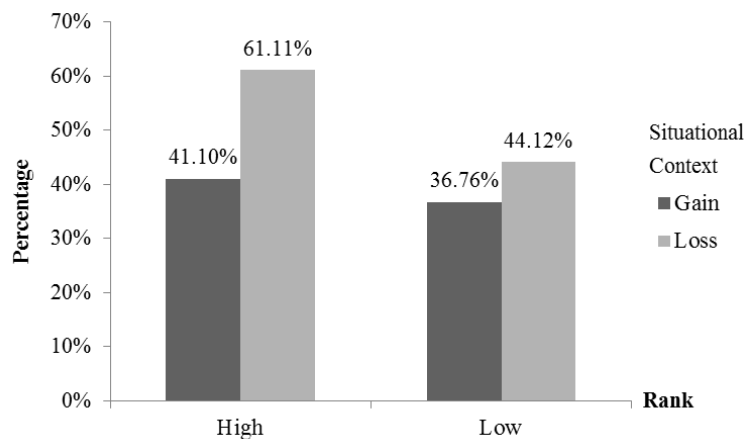
Discussion

The results suggest that high-ranking individuals tended to maximise their return by cooperating with their rival more frequently when facing a loss rather than a gain. However, the decisions of low-ranking individuals were similar in both situations. Study 1, however, did not reveal what was motivating and driving the cooperation decisions. To decide whether or not to cooperate with commensurate rivals, individuals need to weigh their own benefits against the competitive feelings which arise when their rivals receive a higher payoff than them. It is possible that the cooperation decision of high-ranking individuals depends on a situational context whereas that of low-ranking individuals does not because 1) the difference in *perceived benefits* from cooperation between a gain or loss situation is lower in low-ranking individuals than high-ranking individuals, or 2) the difference in *competitive feelings* between gain and loss situations of low-ranking individuals is lower than high-ranking individuals, or potentially both. Study 2 aims to investigate this.

6.3 Study 2

Participants

A total of 380 participants, recruited from Amazon Mechanical Turk, participated in a questionnaire study online in exchange for $0.30.

Design and Procedure

As in Study 1, participants were randomly assigned to one of two between-subjects ranking conditions (high vs. low). In each ranking condition, each participant was asked to assume the role of a CEO, and to rate the perceived benefits from cooperation as well as their competitive feelings towards their rival in counter-balanced loss and gain situations. The first group of participants started with a loss, followed by a gain situation. The second group started with a gain, then followed with a loss situation.

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The exact scenario in the loss condition read:

Imagine that you are the CEO of a company that is ranked #4 (#495) on the prestigious *Fortune* 500. **This is the recession period, and it is likely that your company will be facing losses this year.** To limit losses, you are thinking about a possible alliance with a rival company ranked #5 (#496). The return will depend on whether or not you form an alliance.

Strategy A: With an alliance, your company's return will be -5% and your rival's
return will be -1%.

Strategy B: Without an alliance, your company's return will be -6% and your rival's
return will be -6%.

Participants then responded to two sets of questions. The first set gathered their opinions about the benefits from cooperation (their perception about the payoff increase). The three questions in this set asked "How big is the difference in return between forming an alliance (-5%) and not forming an alliance (-6%)?" (1=not at all big, 9=very big), "How important is it for your company to face a loss as little as possible during the recession?" (1=not at all important, 9=very important), and "How much would you benefit from forming an alliance?" (1=not at all, 9=very much).

The second set of questions analysed the participants' competitive feelings toward their rivals. The three questions were, "To what extent would you be inclined to compare your return to your rival's return?" (1=not at all, 9=very much), "How important is it that your rival's return must not be higher than your return?" (1=not at all important, 9=very important), and "How competitive would you feel toward your rival during the recession?" (1=not at all competitive, 9=very competitive).

The exact scenario in the gain condition read:

Imagine that you are the CEO of a company that is ranked #4 (#495) on the prestigious *Fortune* 500. **This is the normal period, and it is likely that your company will have profits this year.** To gain higher profits, you are thinking about a possible alliance with a rival company rank #5 (#496). The returns will depend on whether or not you form an alliance.

Strategy A: With an alliance, your company's return will be 7% and your rival's

   return will be 11%.

Strategy B: Without an alliance, your company's return will be 6% and your rival's

   return will be 6%.

Similar to the questions in the loss condition, participants responded to the questions regarding the benefits from cooperation, which were "How big is the difference in return between forming an alliance (7%) and not forming an alliance (6%)?" (1=not at all big, 9=very big), "How important is it for your company to have a profit as much as possible during the normal period?" (1=not at all important, 9=very important), and "How much would you benefit from forming an alliance?" (1=not at all, 9=very much). They also responded to the questions regarding competitive feelings towards their rivals, which are "To what extent would you be inclined to compare your return to your rival's return?" (1=not at all, 9=very much), "How important is it that your rival's return must not be higher than your return?" (1=not at all important, 9=very important), and "How competitive would you feel toward your rival during the normal period?" (1=not at all competitive, 9=very competitive).

Finally, participants responded to the attention and manipulation check question, "What is your imaginary company's rank?"

Results

Participants who did not answer the attention check question correctly were discarded from the analysis, which resulted in a total of 279 valid responses. The ratings of the three questions regarding perceived benefits were average, as were the ratings of the three questions regarding the competitive feelings. The Cronbach's alphas of benefit rating in the gain and loss conditions were, respectively, 0.645 and 0.659. The Cronbach's alphas of competitive feelings rating in the gain and loss conditions were, respectively, 0.841 and 0.863. There was no order effect of situational context (*gain/loss* vs. *loss/gain*) on dependent measures except for the benefit rating of high-ranking individuals in a gain situation (Benefit

rating – high rank, gain situation: $F(1, 132)=4.229$, $p=0.042$, $\eta^2=0.031$; high rank, loss situation: $F(1, 132)=1.090$, $p=0.298$, $\eta^2=0.008$; low rank, gain situation: $F(1, 143)=0.003$, $p=0.956$, $\eta^2=0.000$; low rank, loss situation: $F(1, 143)=2.413$, $p=0.123$, $\eta^2=0.017$; Competitive feeling rating – high rank, gain situation: $F(1, 132)=0.138$, $p=0.710$, $\eta^2=0.001$, high rank, loss situation: $F(1, 132)=0.065$, $p=0.799$, $\eta^2=0.000$; low rank, gain situation: $F(1, 143)=0.380$, $p=0.539$, $\eta^2=0.003$, low rank, loss situation: $F(1, 143)=0.187$, $p=0.666$, $\eta^2=0.001$). Order was included as a covariate in the subsequent analyses.

The results of a two-way ANOVA with benefit ratings as the dependent variable, situational context (gain vs. loss) as the within-subjects factor, rank (high vs. low) as the between-subjects factor, and order as a covariate showed that there were no significant interaction effect for rank x situational context ($F(1, 276)=0.043$, $p=0.837$, $\eta^2=0.000$), and no significant main ranking effect ($F(1, 276)=0.041$, $p=0.839$, $\eta^2=0.000$). However, both high- and low-ranking participants rated higher perceived benefits for their own companies when facing losses rather than gains ($F(1, 276)=15.305$, $p=0.000$, $\eta^2=0.053$), as shown in Figure 6.2.

The results of a two-way ANOVA with competitive feeling ratings as the dependent variable, situational context (gain vs. loss) as the within-subjects factor, rank (high vs. low) as the between-subjects factor, and order as a covariate showed that there was a significant interaction effect for rank x situational context ($F(1, 276)=6.992$, $p=0.009$, $\eta^2=0.025$). Specifically, high-ranking participants felt more competitive in gain rather than loss situations ($F(1, 132)=18.067$, $p=0.000$, $\eta^2=0.120$); however, low-ranking participants felt equally competitive towards their rivals in both situations ($F(1, 143)=1.305$, $p=0.255$, $\eta^2=0.009$), as shown in Figure 6.3. There was no significant main effect of situational context ($F(1, 276)=1.224$, $p=0.269$, $\eta^2=0.004$), and no significant main ranking effect ($F(1,$

276)=0.005, p=0.944, η^2=0.000). Table 6.1 shows the means and standard deviations of benefit rating and competitive feeling rating by rank and situational context.

Table 6.1: Means and Standard Deviations of Dependent Variables

by Rank and Situational Context

Rank	Situational Context		Rank	Situational Context	
	Gain	Loss		Gain	Loss
Benefit Rating			Competitive Feeling Rating		
High (#4 out of 500)	5.58 (1.60)	5.91 (1.59)	High (#4 out of 500)	6.75 (1.89)	6.00 (2.01)
Low (#495 out of 500)	5.58 (1.35)	5.85 (1.48)	Low (#495 out of 500)	6.47 (1.86)	6.31 (1.85)

Note: Standard deviations are in parentheses.

Figure 6.2: Mean Benefit Rating

by Rank and Situational Context
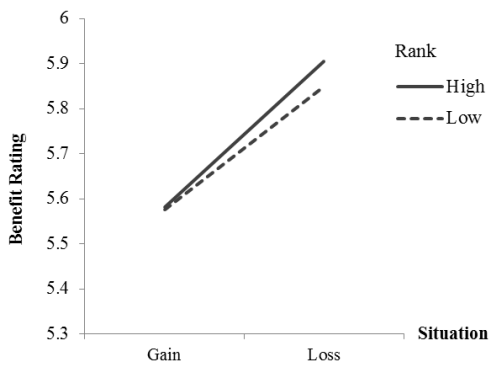
Figure 6.3: Mean Competitiveness Rating

by Rank and Situational Context
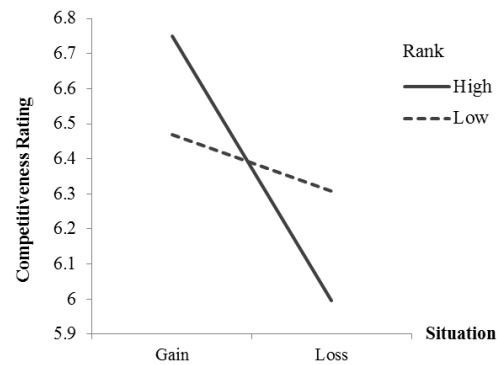
Discussion

The results show that the difference in cooperation decisions of high-ranking individuals between gain and loss situations is unlikely to be explained by the difference in perceived benefits. Both high- and low-ranking individuals perceived higher benefits from cooperation when they were presented with losses rather than gains. However, as shown in

Study 1, only high-ranking individuals decided to cooperate more in loss as opposed to gain situations. The difference is more likely to be influenced by competitive feelings. Specifically, high-ranking individuals felt less competitive towards their rivals when they were presented with losses rather than gains, whereas the competitive feelings of low-ranking individuals remained relatively the same in the two situations. This could possibly influence the decision to cooperate, i.e. whereas high-ranking individuals decided to cooperate more in loss rather than gain situations, the cooperation decisions of low-ranking individuals did not change significantly.

In Studies 1 and 2, participants were asked to imagine facing real losses and gains. Study 3 aims to test whether the effects in Studies 1 and 2 still hold true when participants are manipulated by framing a payoff in positive and negative terms.

6.4 Study 3

Participants

A total of 240 participants, recruited from Amazon Mechanical Turk, participated in a between-subjects questionnaire study online in exchange for $0.20.

Design and Procedure

Participants were randomly assigned to one of the four conditions with the between-subjects factor *rank* (high vs. low) and the between-subjects factor *situational frame* (positive vs. negative).

Participants in the negatively-framed situation were given the following scenario:

Imagine that you are the owner of a car dealer. Your company is ranked #2 (#98) among 100 car dealers in term of sales. You aim to sell 100 cars in the next quarter. Your rival, ranked #3 (#99), also aim to sell 100 cars. To reduce the chance of failure in achieving your target, you are thinking about a possible alliance with the rival ranked #3 (#99).

Strategy A: With an alliance, your chance of failure will be 20%, and your rival's

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chance of failure will be 5%.

Strategy B: Without an alliance, your chance of failure will be 30%, and your rival's
chance of failure will be 30%.

Participants in the positively-framed condition were given the following scenario:

Imagine that you are the owner of a car dealer. Your company is ranked #2 (#98) among
100 car dealers in term of sales. You aim to sell 100 cars in the next quarter. Your rival,
ranked #3 (#99), also aim to sell 100 cars. To increase the chance of success in achieving
your target, you are thinking about a possible alliance with the rival ranked #3 (#99).

Strategy A: With an alliance, your chance of success will be 80%, and your rival's
chance of success will be 95%.

Strategy B: Without an alliance, your chance of success will be 70% and your rival's
chance of success will be 70%.

Participants in all conditions responded to the question, "Which strategy would you
choose? A: Form an alliance, B: Not form an alliance." The attention and manipulation check
was assessed by the question, "What is your imaginary company's rank?"

Results

Participants who did not answer the attention check question correctly were discarded
from the analysis, which resulted in a total of 167 valid responses. The results of a binary
logistic regression, with cooperation decision as the dependent variable and situational frame
(gain vs. loss) as the independent variable, showed that frame was a significant predictor of
the cooperation decisions of high-ranking participants ($b = 1.217$, *Wald* $= 7.054$, $p = 0.008$)
but not low-ranking participants ($b = 0.448$, *Wald* $= 0.943$, $p = 0.332$). Figure 6.4 shows the
percentage of participants who chose to cooperate by rank and frame.

Discussion

The results suggest that the cooperation decisions of high-ranking individuals were
influenced by how the situations were framed, unlike the decisions of low-ranking
individuals. These findings are consistent with the findings in Study 1.

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Figure 6.4: Percentage of Participants Choosing to Cooperate by Rank and Frame.
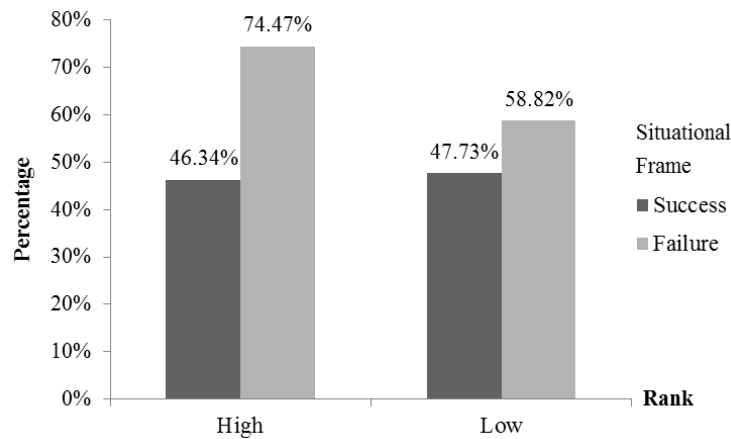
6.5 General Discussion

Across three studies I showed that situational contexts (gain/loss) and situational frames (positive/negative) have different effects on high- and low-ranking individuals. High-ranking individuals chose to cooperate more when they were facing a loss or negatively-framed situation rather than a gain or positively-framed situation, whereas the cooperation decisions of low-ranking individuals remained the same in both situations (Study 1 and 3). The difference in cooperation decisions of high- and low-ranking individuals in gain and loss situations was not the result of the difference in the perceived benefit from cooperation but rather the result of the difference in competitive feelings: high-ranking individuals feel less competitive towards their rivals when they are facing losses rather than gains. However, the competitive feeling of low-ranking individuals remains approximately the same (Study 2).

These findings contribute to the literature of how rankings influence competitive and cooperative behaviour. Even though the previous literature has suggested that individuals in high and low ranks are similarly competitive (Garcia and Tor, 2007; Garcia et al., 2006), the findings suggest that this may be the case only in gain or positively-framed situations. However, in loss or negatively-framed situations, high-ranking individuals tend to be less

competitive than low-ranking individuals. The findings also contribute generally to the literature of social decisions and prospect theory. The previous literature has shown that individuals make different decisions in gain and loss domains (Tversky and Kahneman, 1981; Kahneman and Tversky, 1979). The findings in this chapter suggest that the effect of the situational context may influence particular type of individuals more than others. High-ranking individuals tend to be sensitive to situational contexts, and therefore are inconsistent in their decisions compared to low-ranking individuals.

From a practical point of view, the findings suggest that ranking feedback may not be suitable in a situation where cooperation or teamwork is encouraged. The findings also suggest that the use of rankings leads to less negative impacts in loss as opposed to gain situations: in a loss situation, high-ranking individuals are less concerned about the higher payoff of their rivals, and in turn choose to cooperate more often than in a gain situation. However, since individuals are also influenced by situational frames, high-ranking individuals in a gain situation can increase the cooperation behaviour of their prospective partners by framing, if possible, the payoffs negatively rather than positively. The findings also suggest that organisation may need to promote particularly low-ranking individuals to increase their cooperation behaviour by, for example, letting them focus on improving themselves rather than competing with rivals (Poortvliet et al., 2009).

Future research could extend the current studies in several ways. Firstly, the present analysis investigates only the scenario where individuals decide to cooperate with a lower-ranked rival. Future work could investigate whether or not the results can be extended to the decision to cooperate with a higher-ranked rival. Note, however, that Garcia et al. (2006) has shown, in a gain situation, that individuals tend to be equally competitive and are consistent in their decisions regardless of the ranking positions of their rivals (one above/one below). Secondly, the present analysis did not include the control condition in which ranking

feedback is not provided. Future research could explore how individuals without ranking information behave compared to those with high and low ranks in both gain and loss situations. Third, the findings in this chapter are based on hypothetical situations. Even though the hypothetical decisions can serve as a starting point to study the ranking effect on cooperation behaviour, it is still important to further investigate whether or not the effect extends to a real life scenario. Fourth, the present analysis focuses mainly on the effect of ranking on cooperation decisions in a passive context, i.e. where individuals decide whether to cooperate or not based on predetermined payoffs. Nevertheless, in some circumstances there may be an opportunity for individuals to initiate actions to sabotage their rivals. Sabotage could help individuals protect their rank by reducing the payoff of their rivals. It would be interesting to see whether the ranking effect also influences this kind of behaviour. On the one hand, since individuals generally perceive action to be worse than inaction, given the same outcomes (Spranca et al., 1991), sabotage may be seen as something worse than simply deciding not to cooperate. As a result, the ranking effect may be less likely to influence sabotage behaviour. On the other hand, feelings of competitiveness may be so strong that it can lead individuals to sabotage their rivals. For instance, Charness et al. (2010) demonstrated that individuals are willing to sacrifice part of their pay just to reduce the performance of others. Hence, in this case, the ranking effect may also provoke sabotage. This remains a potential avenue for future research.

Chapter 7

Discussion and Implications

7.1 Overview

Rankings facilitate comparison, and have become an increasingly popular form of performance feedback in many different fields, ranging from Premier League rankings in sport, box office rankings in entertainment, Fortune 500 company rankings and Forbes billionaire rankings in business to MasterCard destination city rankings in tourism. These rankings not only help us make decisions, but also influence the judgment and behaviour of those being ranked. For example, previous research has suggested that rankings affect life satisfaction (Boyce et al., 2010; Clark et al., 2009), interactions with others (Keltner et al., 2003; Gilbert and Miles, 2000), and competitive behaviour (Poortvliet et al., 2009; Garcia and Tor, 2007; Garcia et al., 2006). However, despite this research, our understanding of the effect of rankings on our judgments and decisions is still limited. Given the ubiquitous use of rankings, such a lack of understanding could potentially lead to undesirable and unintended consequences.

This research investigated how rankings influence four important areas of judgment and decision, namely individuals' aspiration levels, predicted winning probabilities, pay entitlements, and cooperation decisions. Individuals' aspiration levels and predicted winning probabilities are central judgments in the area of competition. The aspiration level influences future performance by motivating individuals to work harder (Heath et al., 1999) whereas

predicted winning probability is fundamental to many decisions, such as applying for a job and betting on a contest. Pay entitlement and cooperation decisions play a crucial role in organisations. Unfulfilled entitlement can lead to dissatisfaction and the counterproductive behaviour of employees. The lack of cooperation in the workplace potentially reduces productivity, which might eventually lead to business failure.

Through a variety in scenarios, samples, and the originality of designs, this thesis revealed four main findings. First, rankings determine the potential to improve, which in turn influences individuals' aspiration levels (Chapter 3). Higher-ranked individuals are associated with less potential to improve and lower aspiration levels (Study 1). This ranking effect is more pronounced for individuals with high self-efficacy than those with low self-efficacy (Study 4). Without ranking information, individuals tend to see low potential for improvement and as a consequence set relatively low aspiration levels (Study 2). Second, individuals use rankings to infer their relative capability compared to their competitors' and predict winning probabilities based on these differential capabilities (Chapter 4). Higher-ranked individuals believe their capabilities are similar to those of commensurate competitors and predict relatively low winning probabilities, whereas low-ranking individuals believe their capabilities are superior, resulting in relatively high predicted winning probabilities. Third, rankings influence pay requests of individuals through feelings of entitlement (Chapter 5). Given the same pay of similarly-ranked others, individuals in high ranks, as compared to low ranks, perceived others' pay to be more legitimate and thus felt more entitled to the same pay as others. Consequently, the first group requested higher pay (Study 1). However, as the pay of others in a similar position becomes lower, the differential feelings of legitimacy and entitlement between high- and low-ranking individuals diminish, and the ranking effect on pay requests attenuates (Study 3). Fourth, the cooperation decisions of individuals depend on rankings and situational contexts and frames (Chapter 6). Individuals in high ranks feel less

competitive towards their rivals and are more likely to cooperate in a loss or negatively-framed situation than in a gain or positively-framed situation. However, low-ranking individuals feel equally competitive towards their rivals and do not change their cooperation decisions regardless of situational contexts or frames.

7.2 Theoretical Contributions

The findings provide a deeper understanding of how rankings can influence judgment and behaviour. Researchers have long recognised that individuals are concerned for status or ranks within a society, and this concern affects well-being (Boyce et al., 2010; Clark et al., 2009) as well as various kinds of behaviour (e.g. Keltner et al., 2003; Fournier et al., 2002; Gilbert and Miles, 2000). However, it was only recently that research began to study the effects of rankings as a performance feedback device. This line of research argues that ranking feedback influences productivity (e.g. Kuhnen and Tymula, 2012; Tran and Zeckhauser, 2012; Blanes i Vidal and Nossol, 2011) and that the different positions within rankings activate different social comparison concerns, leading to unequal competitive feelings towards commensurate rivals (e.g. Poortvliet et al., 2009; Garcia & Tor, 2007; Garcia et al., 2006). In this thesis I extend this line of literature by showing how ranking feedback can be used as a tool to infer one's potential to improve, relative capabilities, feelings of entitlement, and competitiveness. In turn, this influences, respectively, aspiration levels, predicted winning probabilities, pay requests, and cooperation decisions.

By studying the influences of ranking feedback on these four factors, this research also contributes to other related fields. First, most prior work on aspiration levels has shown that individuals use performance feedback to determine aspiration levels by comparing their current performance with a reference point, which can be past performance, current aspiration level, or average performance (Lant, 1992; Vance and Colella, 1990; Cyert and March, 1963;

Festinger, 1942; Gould and Lewis, 1940). The discrepancy between the performance and the reference point then affects individuals' aspiration levels. This thesis demonstrates how ranking feedback changes the way an individual uses their performance feedback to form an aspiration level, i.e. they infer how much they can improve from the feedback. This approach may be regarded as superior to the previous approach in terms of motivating individuals to perform better. By comparing one's performance with a reference point, there may be a case where individuals set their aspiration levels below their current performance (e.g. Festinger, 1942; Hilgard et al., 1940). For instance, individuals tend to lower their aspiration level when their performance is above average (Festinger, 1942; Hilgard et al., 1940). As a consequence, since individuals tend to adjust their effort in accordance with their aspiration level (Bryan and Locke, 1967), a lower aspiration level could lead to lower performance. However, rankings direct individuals' attention to the rank difference between their ranks and the top, leading individuals to perceive their potential to improve. By seeing how much they can improve, they are likely to set their aspiration level higher than their current performance, leading to an improvement of future performance.

Second, this thesis helps develop a better understanding of the way individuals view competitions. Previous work on comparative judgment has focused primarily on the role of non-motivational factors, namely people's egocentric focus and differential information, when studying determinants of competition outcome prediction. However, considerable evidence has suggested that a motivational factor – self-enhancement – plays a key role when individuals estimate their relative skills (Brown, 1986; Alicke, 1985; Messick et al., 1985). This thesis contributes to this line of literature by demonstrating how this motivational factor influences the prediction of winning probabilities: individuals with different ranks vary in their self-enhancement and as a consequence predict different winning probabilities.

Third, this research contributes to the understanding of the factors determining employees' pay entitlement. Previous work in this field has focused predominantly on how gender, rather than performance feedback, influences feelings of entitlement and pay allocation (e.g. Desmarais and Curtis, 1997). However, as pay is often tied to performance (e.g. Prendergast, 1999), and employees' perception of pay entitlement influences the psychological contract, in turn influencing employees' behaviour and work attitude (Naumann et al., 2002), it is important to learn how relative performance (i.e. rankings) helps to determine the legitimacy of outcomes and pay entitlement. This research fills this gap by demonstrating how individuals with differential ranks perceive different outcome legitimacy and pay entitlement.

Finally, the previous literature on rankings and competitive behaviour has suggested that high- and low-ranking individuals tend to be equally competitive, and are less likely to cooperate with their commensurate rivals (Garcia and Tor, 2007; Garcia et al., 2006). My findings reveal that this is not always the case, with the cooperation decisions also depending on situational contexts (loss vs. gain) and frames (negative vs. positive).

7.3 Practical Implications

The findings offer several important insights for practitioners into how rankings influence judgment and behaviour. Organisations aiming to use ranking as a way to enhance employees' performance, as well to reward and maintain high-performing employees so as to compete with their rivals, should consider the effects of ranking on the factors addressed in this thesis. This will help organisations fully exploit the use of ranking feedback, as well as to avoid the adverse effects of ranking, which may conflict with an organisation's main objectives.

First, the findings in Chapter 3 suggest that rankings could help motivate low performers. Since low performers often lack the metacognitive ability to acknowledge their limitations (Kruger and Dunning, 1999), they may often believe that they are performing well, in a relative sense, and are less likely to perceive their potential to improve. These findings demonstrate how rankings could address this shortcoming of low performers, i.e. by enabling them to perceive their potential to improve and set relatively high aspiration levels. The findings also suggest that low self-efficacy individuals with low performance should be particularly encouraged to set higher aspiration levels or encouraged to increase their self-efficacy through, for example, training and motivating (Gist and Mitchell, 1992). Additionally, in circumstances where organisations need to set goals for their employees, these findings could also help them estimate the appropriate goal levels that their employees are likely to accept. This would increase the likelihood of goal acceptance, subsequently increasing the effectiveness of goals in influencing performance (e.g. Erez and Zidon, 1984).

Secondly, the findings in Chapter 4 suggest that even though rankings may be useful in signalling capabilities, they may have an unintended consequence on the perceived relative capabilities of individuals from different ranks. Lower-ranked individuals view themselves as more capable than their commensurate rivals, whereas higher-ranked individuals believe they are as capable as their competitors. As a result, the two groups of individuals perceive competition differently. Those in low-ranking positions believe they have a higher chance of winning than those in high-ranking positions.

Third, the findings in Chapter 5 suggest that individuals rely more on their own rank, rather than the pay of similarly-ranked persons, to determine their pay entitlement. These findings help organisations reduce the chance of unfulfilled entitlements, which could lead to counterproductive behaviour of employees. In determining pay raises or bonuses, for instance, these findings show that it is important for organisations to pay high-performing

individuals at a similar level to those with similar performance. However, for low-ranking individuals, the amount of pay can vary, depending on whether low-ranking individuals perceive their colleagues' pay to be justified. It is therefore recommended that the pay of highly-ranked individuals should be competitive and less variable than that of low-ranking individuals. Additionally, in determining a salary for a new employee, the findings suggest that it may be useful for recruiters to find out about the rank of potential candidates and the pay of the colleagues. In doing this, recruiters can make an attractive offer and increase the chance of a new employee accepting the offer.

Fourth, the implementation of a ranking system may need to be implemented concomitant with the promotion of cooperative behaviour. The findings in Chapter 6 suggest how organisations could reduce the deleterious effect of rankings, namely the inhibition of cooperation intentions. The findings show that cooperation intentions of high-ranking individuals can be encouraged by framing payoffs negatively rather than positively.

This thesis also provides several insights for those being ranked. First, the findings of Chapter 3 help low-ranking individuals to become aware that their similarly-ranked competitors tend to set relatively high aspiration levels. This implies that setting low aspiration levels may lead them to perform less well than their similarly-ranked colleagues, which may eventually lead to an even lower rank. The findings also suggest that high-ranking individuals may overestimate their capability to improve by setting unrealistically high aspirations. As a result, higher-ranked individuals may be more likely to experience disappointment. Secondly, the findings of Chapter 4 suggest that rank positions may lead to bias in predicting the outcome of a competition. The findings show that despite the same difference in ranks, low-ranking individuals overestimate their capability to outperform their rivals than high-ranking individuals do. This larger difference in perceived capabilities of lower-ranked individuals leads them to predict higher probabilities of winning. Third, the

findings of Chapter 5 help individuals learn how to allocate outcomes or rewards to group members when working as a team. Lower performing individuals are less likely than higher performing individuals to demand equal outcomes. Finally, the findings of Chapter 6 propose how high-ranking individuals can convince their similarly-ranked competitors to cooperate, i.e. by framing payoffs negatively rather than positively.

7.4 Limitations and Future Research Directions

Even though this research offers various novel findings, there are certain limitations, which represent potentially interesting avenues for future research.

Limitations and future research directions for each chapter

Chapter 3 considers only the positive effect of the comparison between one's rank and the top rank, i.e. to help low-ranking individuals see their potential to improve. However, since low-ranking individuals see that they are still a long way from the top, they may feel demotivated, thereby leading to lower self-worth (Crocker et al., 2003). Future research could examine this negative effect. It could also examine whether rankings influence individuals' effort and preparation levels. On the one hand, since individuals tend to adjust their effort based on their aspiration level (Bryan and Locke, 1967), with all else being equal, high-ranking individuals may put in less effort than low-ranking individuals because the aspiration level of the first group is lower. On the other hand, lower-ranked individuals may set higher aspiration levels because they assume that their performance will, by default, increase; consequently, they may not try as hard.

In Chapter 4, the analysis on the predicted winning probability is limited to individual decision-making. However, in some competitions and sports, individuals work as a team. Since group and individual decision-making varies in many different ways (e.g. Charness and Sutter, 2012), future research could investigate how rankings influence the predicted winning

probability of group decision-making. In addition, the current analysis focuses only on self-judgment and self-prediction, but in many circumstances, such as hiring decisions, individuals may need to compare and evaluate the skills of others. Future research could also explore how the rankings of the persons being evaluated influence the judgment of these independent individuals.

In Chapter 5, my findings related to the ranking effect on entitlement are limited to cash compensation. In many instances, rewards or compensation packages consist of non-cash benefits such as holidays, insurance, or childcare. Unlike cash, these benefits are perceived differently from one individual to another (Chiu et al., 2002), and are sometimes undervalued (Wilson et al., 1985). Future research could, for instance, explore whether or not the ranking effect extends to the entitlement of these benefits. Additionally, the current research has focused mainly on the entitlement feelings of requesters (e.g. employees). In fact, how responders (e.g. employers) feel as to whether requesters warrant a particular pay request is equally important because the unfulfilled request could lead to counterproductive employee behaviour (Paul et al., 2000) and sabotage in the workplace (Ambrose et al., 2002). Even though this research has shown that requesters and responders tend to agree on proposed pay (Chapter 5, Study 4), it has yet to explore the effect using monetary incentives, and in an interactive context. These remain an open avenue for future research.

In Chapter 6, the analysis of the ranking effect on cooperation decisions focuses only on decision making in a passive context, where individuals only decide whether or not to cooperate. However, individuals may sometimes have an opportunity to initiate an action which sabotages their rivals, thereby reducing the rivals' payoff and protecting their rank. On the one hand, since actions are often judged to be worse than inactions given the same outcomes (Spranca et al., 1991), one may feel uncomfortable sabotaging one's rivals just to protect rank. Thus, the ranking effect may attenuate. On the other hand, the effects of ranking

may be so strong that it increases the chances of this behaviour. For instance, Charness et al. (2010) showed that when performance feedback was available, individuals were willing to give up part of their income in order to reduce the performance of others. Hence, the ranking effect may still manifest itself in sabotage. This could be a potential avenue for future research.

One may argue that self-efficacy can be used as a moderator of every relationship between rank and main dependent variables of this thesis, in addition to the aspiration level. However, as self-efficacy is defined as the perception of "how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982, p.122), it relates most directly to the ability to see their potential to improve, and subsequently the aspiration level. Specifically, one needs to judge his own ability to perform the task in order to set his aspiration level. Self-efficacy is less relevant to the other three factors (winning probability, pay entitlement, and cooperation decisions). To determine the winning probability, individuals need to estimate the relative capability, rather than just their own ability. To determine how much one should receive, he normally relies on his performance or the pay that similar others receive. The perception of his ability to do the task (self-efficacy) may influence pay entitlement when the information regarding his performance or others' pay is not available. Finally, to determine whether or not to cooperate with rivals, individuals focus mainly on the benefits gain from cooperation and their competitive feelings, rather than their perceived ability to do the task. Hence, self-efficacy was not use as a moderator for the other three factors, but only for the aspiration level.

Limitations and future research directions overall

Almost all studies in the thesis compare the judgments or behaviours of individuals with absolute extreme ranks i.e. very close to the top and the bottom (e.g. #3 or #97 out of 100), future work could explore whether or not the ranking effect extends to the judgments of

those in relatively high and low-ranking positions (e.g. #15 out of 100, which is still considered to be high rank but not extreme). For instance, future work can compare the difference in pay entitlement between individuals ranked #15 out of 100 and #86 out of 100.

Additionally, the last three chapters explore the ranking effect on high- and low-ranking individuals by making them compare themselves with a *specific* and *commensurate* rival. This study design serves as a starting point to investigate the ranking effect. By making individuals compare themselves to a *specific* person, we can direct and narrow individuals' attention to just one rival, making it easier to observe the effect of that particular person on individuals' judgments. In addition, by making individuals compare themselves to a *commensurate* rival, we can control for, or at least minimise, the variation in capabilities, enabling us to attribute the observed effects to the difference in rank. Based on the current design, future work could extend it in two different ways. First, future work could investigate whether or not the judgments of high and low-ranking individuals are still different when comparing themselves to a specific non-commensurate rival. Second, future work could also explore the ranking effect when individuals compare themselves to a group of rivals within rankings, rather than just a specific rival.

Most of the studies in this thesis investigate the ranking effect based on a one-off event. As a result, individuals' judgments could also be influenced by regression toward the mean. To minimise this side effect, future work could explore the ranking effect in a repeated scenario. Note, however, that by doing so, individuals' judgments may also be affected by the sequence of their ranks. For instance, even though their latest ranks are the same, individuals initially ranked #5, #6, and then #7 in a repeated competition may feel more entitled than those initially ranked #9, #8, and then #7 because the former come from a higher rank. Additionally, as most studies in this thesis (except for Chapter 6) focus on judgments on an

individual level, future work could explore whether or not the ranking effect extends to an organisation level, i.e. when individuals made a decision for their organisations.

Finally, a large number of participants in this thesis were recruited from Amazon Mechanical Turk (MTurk). Even though MTurk participants produce results that are reliable and similar to students, the usual participants in decision-making research, in many different areas such as risk-taking behaviour and certainty effect, the first group tends to pay less attention to study materials, potentially reducing the statistical power (Goodman et al., 2012). In this thesis, this problem is carefully managed by including manipulation and attention check questions, and discarding all the responses that did not correctly answer these questions in the analyses. However, future research could also explore whether the findings in this thesis can be extended to other groups of participants, such as specialists or experts in related fields.

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