The impact of cognitive biases on the decision making of strategic alliance managers

A Dissertation Presented

by

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Abstract

Heuristics and cognitive biases have a significant impact on the decision-making process in various spheres of life, including in business.

This research seeks to expand on current research in drawing on behavioural economic principles such as heuristics and cognitive biases to investigate their impact on the decision making of strategic alliance managers.

A sample of 38 strategic alliance managers was surveyed to assess the prevalence of anchoring and overconfidence and its interaction with how successful a partnership is in its first year and the experience of the strategic alliance manager. The survey included up to 49 questions on demographics, general knowledge questions and their sentiment on their confidence in providing answers to surface as performed in their study for analysing biases in management by Jordão et al. (2019).

Utilising statistical analysis, it was found that strategic alliance managers are influenced by overconfidence bias and anchoring bias which corroborates empirical evidence on heuristics and cognitive biases. Moreover, managers with less than 5 years' experience present a higher susceptibility to anchoring, as do the partner managers with a lower percentage of successful partnerships. However, the percentage of partners and the years of experience do not have an effect on how overconfident the strategic alliance manager is in comparison to a more experienced or more successful group of alliance managers.

SAMs should be aware that cognitive biases may influence their initial projections when making the decision to pursue a partnership therefore look to disprove the initial projections rather than seek for information to justify it to counteract the susceptibility to set overconfident expectations and be reluctant to deviate from them, resulting in alliance failure. Agreeing on expected behaviours and then waiting to analyse the results of these behaviours before officially setting a target would allow for projections to be based on data rather than purely based on intuition is likely to produce better decision making.

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Definitions and Terms

Throughout the literature and in practical terms, there are a variety of different definitions for fundamental concepts to the research areas. For the benefit of the reader, the following are the definitions of the key concepts of this paper.

Anchoring: an individual's decisions are influenced by a particular reference point known as an anchor which can be arbitrary.

Cognitive bias: describe the systematic errors of human decision making.

Decision-Making: The term decision-making is used broadly here to include both conscious and unconscious preference, inference, classification, and judgment.

Heuristic: a mental shortcut that allows people to solve problems and make judgments quickly and efficiently but may lead to cognitive biases.

High performing alliances: 50% to 100% of alliances hit Year 1 targets.

Low performing alliances: 0% to 49% of alliances hit Year 1 targets.

Overconfidence: refers to the type of bias when there is the tendency for a person to overestimate their abilities, particularly in the relation to certainty in the accuracy of one's beliefs.

Strategic alliance (SA): a cooperative strategy in which two or more firms combine some of their resources and capabilities to create a competitive advantage. For the purpose of this paper, is a catch all term that was also referred to as "partnership" in this research.

Strategic alliance failure: is a strategic alliance that is consistently not meeting expectations, while there may not be a "break-up" the partnership is deemed doomed.

Strategic alliance manager (SAM): SAM role is the person who makes the majority of the decisions about pursuing and managing strategic alliances for a firm.

Chapter 1 - Introduction

1.1 Background to the Study

The human mind is limited in its ability to make optimal decisions, which has been a topic of interest that crosses many disciplines including economics, business, social sciences and humanities (Alvino and Franco, 2017). In neoclassical economics, homo economicus or an econ refers to the assumption that an agent makes rational decisions (Thaler, 2015). However, Thaler (2015), a Noble prize winner once said, we live in a world of humans rather than a world of econs. Thaler's work along with many other contributors to behavioural economics have focused on uncovering what actually influences the making of decisions. (Simon, 1955; Kahneman and Tversky, 1973; Tversky and Kahneman, 1974; Smith, 1976; Kahneman and Tversky, 1973; Kahneman and Tversky, 1979; Thaler, 1980; Thaler and Sunstein, 2008; Thaler, 2015. Ariely (2008) argues that companies can avoid catastrophic mistakes by adopting principles of behavioural economics.

In their seminal works Tversky and Kahneman in 1974 entitled "judgement under uncertainty: Heuristics and Biases", suggested that business-related and other decisions were based on Heuristics and Cognitive Biases. While these thought processes are extremely common and can be useful, they can lead to suboptimal decision making (Tversky and Kahneman in 1974). The debate continues and is reported in the literature on the impact of heuristics and cognitive biases. (Herz, Schunk and Zehnder, 2014; Zhang, Bij and Song, 2020) While most researchers would agree that heuristics can be positive and negative and cognitive biases are negative by their definition, throughout the literature reviewed in this paper, both positive and negative impacts of heuristics and cognitive biases are referenced (Chao, 2011).

The impact of cognitive biases has been researched in recent times in relation to finance (Costa et al., 2017), entrepreneurship (Zhang, Bij and Song, 2020), management (Nagtegaal et al., 2020) and even sports such as soccer, baseball and basketball (Luiz Octávio Gavião et al., 2020). It is now time to apply the principles to strategic alliances (SA). In a study by Dhaundiyal and Coughlan (2020) which reviews strategic alliance literature over a 30-year period, biases are mentioned briefly as a catch-all term in regard to measuring the performance of an alliance in the latter stages but little reference studies on biases impact on the formation of alliances and are lacking specifics on the types of biases that can impact the success of an alliance.

The importance of strategic SA has substantially increased as a response to globalisation, creating exponential growth opportunities (Cobeña, Gallego and Casanueva, 2017) providing access to knowledge and skills (Drewniak & Karaszewski, 2019), open innovation (Čirjevskis, 2019), and gaining credibility and legitimacy (Hubbard et al., 2018). One of the most common reasons for forming an alliance is to access additional resources, therefore it is imperative that resources are used wisely (Dhaundiyal and Coughlan, 2020). Despite their importance, such alliances have an extremely high failure rate (Russo and Cesarani, 2017; Russo and Vurro, 2018).

One of the key stakeholders influencing whether the SA is a success or failure is the Strategic Alliance Manager (SAM). The work of management begins with the establishment of expectations or aspirations (Ansoff, 1979) which typically relate to a target performance level (Ng, 2020). As identified by Dhaundiyal and Coughlan (2020), a large percentage of alliances fail to achieve their declared goals and therefore, it is imperative that academics and practitioners explore more deeply the cause of SAs falling short of expectations. If the decision made on these targets is suboptimal, it could lead to the failure of the SA and moreover inflated expectations could result in good partners going to waste along with all the investment of resources (Chao, 2011).

While there have been studies related to the topic, these have their limitations. Klossek, Meyer and Nippa, (2014) was one of the few studies of the behavioural aspect of decision making around strategic alliances but the focus on how biases may cause a strategic alliance to persist even though it isn't meeting expectations. While the study does propose a theoretical model there is no empirical evidence to validate the model.

In an article by Jordão et al., (2020) overconfidence and anchoring are diagnosed using biographically based instruments to compare the susceptibility of selected biases of managers in the Portuguese Port Sector and managers in the Brazilian construction industry. Even though the same tools for measuring overconfidence and anchoring are used by the author of this research, the results have limited relevance due to the profile and profession of the sample of participants

Based on these gaps and limitations of previous studies, this author aims to provide guidelines and recommendations via the results of the research that will help SAMs avoid pitfalls when seeking opportunities to form new alliances and thereby improve their job performance.

More specifically, this research aims to explore the question: Do overconfidence and anchoring biases impact the partner manager's decision making in pursuing strategic alliances, which contributes to alliance failure? To answer this question, the research objectives could be broken down and grouped into the following objectives:

1. Determine if SAMs are susceptible to overconfidence bias
2. Determine if SAMs are susceptible to the heuristic of anchoring
3. Analyse the relationship between overconfidence and anchoring bias and a partner meeting target expectations in Year 1.
4. Analyse the relationship between overconfidence and anchoring and SAMs number of years experience.

The initial stage of the research gathering was focused on scoping interviews with 6 strategic alliance managers to ensure that the hypothesis that was going to be tested was relevant and useful for SAMs. Following a scoping interview an in-depth review of the existing literature was conducted based on research aims. This literature focused on exploring the most relevant variants of cognitive biases in relation to Strategic Alliance Managers pursuing strategic alliances; anchoring, and overconfidence. Scholarly articles separated into themes related to certain theories and their impact on various roles relating to business were used as the main source of information.

While mixed methods were used, the primary approach was based on quantitative research and was conducted using Google Forms, an online questionnaire tool, with 38 strategic alliance managers participating to indicate the extent to which cognitive biases exist among strategic alliance managers. The quantitative data was consolidated and analysed using Excel and statistical software SPSS (IBM, v27).

The present study will have implications for SAMs, including companies without a SAM that make decisions on pursuing SA. Uncovering the presence of cognitive biases in SAMS could potentially lead to discovering how they are contributing to the failure of strategic alliances. Academics and business practitioners alike might benefit from research on cognitive biases among partner managers. On the one hand, the researchers might apply the employed technique to previously unexplored fields of management. On the other side, businesses may utilize the questionnaire-based research approach to assess the prevalence of cognitive bias among partner managers

1.2 Scope

Behavioural economics and strategic alliances are two complex and diverse worlds therefore it is important to focus the research on a particular cross section of the two topics. With this in mind, the scope of the work reported in this document is. The theoretical aspects are limited to Prospect Theory and theories concerning heuristics and cognitive biases. While there are a large number of heuristics and biases, the author has chosen to focus on anchoring and overconfidence as they were deemed the most relevant to the topic.

Typically, due to the very nature of alliances, there are a number of key stakeholders involved. For the purpose of this study, the author chose to focus on the Strategic Alliance Manager, as other stakeholders may have crucial roles, it is the Strategic Alliance Manager who is typically responsible for working towards a successful partnership. As reviewed in the literature, strategic decision making is a key task for any manager and therefore, decision making of SAMs was examined. Having uncovered through initial exploratory interviews with SAMS, partners often fall short of expectations which is a common reason for alliance failure therefore the setting of these expectations, which are typically in the form of targets was of particular interest to the author.

The research method is limited to the collection of information and opinions from individuals in structured expressions of views and observations that are subjective in nature. The providers of the data (questionnaire respondents) are a sample of persons that is limited to the extent of the author's professional network. Therefore, a different set or a larger number of respondents may produce different results.

As part of the initial research plan the survey included a risk aversion section which is described in the data collection methods however as the research progressed it was decided to remain focused on cognitive biases to ensure that scope of the data analysis was in line with the research questions.

1.3 Structure of the Document

Chapter 1 – Introduction:

This chapter gives the background to the study, presents the problem that will be addressed and highlights the importance of this research. It provides highlights to the research done to date and identifies research gaps and the research aims and objectives due to these gaps. Finally, the reader is introduced to the key terms, scope and structure of the research paper.

Chapter 2 - Literature Review:

An in-depth review of up-to-date peer-reviewed literature. The literature on prospect theory, heuristics and cognitive biases is critically analysed in the context of strategic decisions making in business, specifically strategic alliances. The concepts of Anchoring and Overconfidence are explored in greater detail as directly related to the research question. Research gaps are identified to contribute to the research aims and discussions.

Chapter 3 – Methodology:

Outlines the research methodology chosen by considering the research's question, objectives as well as the philosophical assumptions. It includes the collection techniques and frameworks chosen, which are mainly pre-existing frameworks. Finally, a detail on how the data was analysed, the research's limitations as well as ethical implications.

Chapter 4 - Results and Findings:

Presents the results of the collection and analysis of the survey responses in line with the research objectives. The survey demographics are summarised, followed by the presentation of the results of the statistical hypothesis testing in two themes, Overconfidence and Anchoring and their comparison in subgroups of experience and target achieving, ultimately answering the hypotheses posed in the research objectives.

Chapter 5 - Discussion:

This chapter critically analyses and interprets the results in the context of the literature base to provide theoretical and practical considerations and recommendations.

Chapter 6 - Conclusion:

The research questions are revisited with an overview of the findings with limitations provided while also suggesting recommendations for future research

Chapter 2 - Literature Review

2.1 Introduction

This chapter reviews literature found to provide information and insights helpful to the enquiries undertaken. It provides the background and motivation of the research report in this document. First, it explores the theoretical considerations on prospect theory, heuristics and cognitive biases. It examines the research about the impact of cognitive biases in decision making in business and strategic alliances. Finally, it explores the potential implications of heuristics and cognitive biases in the decision making of strategic alliances managers.

2.2 Theoretical Considerations

2.2.1 Prospect Theory

Neoclassical economic theory would suggest that all rational behaviour is aimed at maximum utility (Lieder et al., 2017). Expected Utility Theory (EUT) states that when a person is confronted with a decision involving risk or uncertainty one should make their decision based on which choice offers the most significant amount of expected utility (Neumann and Morgenstern, 1944). EUT was widely accepted and is the basis of many economic models and suggested it was the base of decision-making methods. It is one of the pillars of modern economics and finance. However, as Ariely (2008) quotes a Harvard economist saying "in theory, there is no difference between theory and practice but in practice, there is a great deal of difference between them (Ariely, 2008).

Kahneman and Tversky (1979) in their seminal work offered a critique of Expected Utility Theory at explaining decision making under risk and uncertainty as Kahneman and Tversky observed significant violations of standard economic models (Corr and Plagnol, 2019). The theory known as Prospect theory would predict actual choices people would make based on the theory of human behaviour rather than the assumptions neoclassical economists had affirmed.

Prospect Theory stems from Behavioural Economics which is concerned with uncovering the actual processes we execute when making our decision (Mallard, 2017). Keynes was one of

the first influential figures to suggest that human beings didn't make fully rational decisions when he proclaimed that the economy would not just fix itself after the Great Depression because humans based their decisions on psychological factors rather than economic influences (Mallard, 2017). Herbert Simon coined the phrase bounded rationality in the 1950s to refer to human's cognitive limitations in its ability to conform with neoclassical assumptions of rational decision making. Despite Simon winning the Nobel prize in 1978 it was the seminal works of Kahneman and Tversky in the 1970s that has resulted in the interest in Behavioural Economics having astonishing growth and reach (Mallard, 2017).

Prospect Theory is a powerful model that assumes little and explains a lot (Barberis, 2013). The three key elements to Prospect Theory are 1. Choices are made relative to a reference point, 2. Relative to this reference point, people act risk-averse for gains and risk-seeking for losses. 3. People hurt more from a loss of x more than get pleasure from the equivalent gain of x (Kahneman and Tversky, 1979). The theories and research later explored in this paper stem from prospect's theory's findings on decision making can be influenced by reference points rather than the neoclassical assumption that humans will choose the option that maximises utility.

Barberis (2013) in the article "Thirty Years of Prospect Theory in Economics: A Review and Assessment" states that the theory contains many remarkable insights but economists have found it difficult to apply it even today. Whereas Gregoriou et al. (2019) saw its practical application for estimating returns on stock created a seven-factor capital asset pricing model (CAPM), which accurately explains variations in asset returns. Therefore, Prospect Theory proved its relevance for academics and practitioners in finances and further applications of theories stemming from prospect theory have been explored in the following sections of this chapter. The author posits the question if prospect theory contributes to the creation of a model for partnership selection, which would be a good topic for further research but it is out of scope for this research paper.

2.2.2 Heuristics and Cognitive Bias

As Prospect Theory suggests if what maximises the utility is unknown therefore maximising utility is an impossible task (Cartwright, 2018). This lack of knowledge means the person needs to look for more information about what's an acceptable decision and what is not. One

of the ways humans solve this problem is by using cognitive shortcuts known as heuristics that they can draw upon when making decisions (Cartwright, 2018).

In their seminal works on decision making under uncertainty, Tversky and Kahneman (1974) suggested that our decisions were based on Heuristics and Cognitive Biases. Almost all economic decisions are made using these heuristics; otherwise, life would become far too complicated. This highlights the critical nature of understanding how heuristics function and the potential implications of their application (Cartwright, 2018). There seems to me conflicting definitions of Heuristics and Biases, in which some authors use the terms interchangeably (Baddeley, 2012). What is common is that heuristics are useful but when applied incorrectly they can cause cognitive biases, and generally cognitive biases are seen as a deviation in judgement.

Gigerenzer (2015) cites his empirical and experimental research by (Czerlinski, J., Gigerenzer, G., Goldstein, D.G., 1999), highlighting that heuristics may be useful in complex and uncertain situations because they lead the decision-maker to look for information by effectively applying thought processes previously used in a similar context. Tversky and Kahneman (1974) listed a set of heuristics that the human mind relies on including representativeness, availability, and anchoring-adjustment heuristics. While these mental skills are advantageous in times of crisis, they can result in errors, and predicted errors due to the influence of prevalent known biases that are explored later in this chapter (Zhang, Bij and Song, 2020). The research aims to test the hypothesis that heuristics cause problems for strategic alliance managers.

Cognitive biases occur when human cognition consistently creates representations that are systematically skewed in comparison to some element of objective reality." (Haselton et al., 2015). Cognitive biases have a substantial influence on decision-making in a variety of areas of life. They were initially uncovered in the field of psychology but now have also been found in the world of behavioural economics (Alvino and Franco, 2017). Researchers have had a lot of success detecting biases, with over 175 biases discovered so far (Benson 2016). Acciarini et al. (2020), cite Das and Teng (1999, pp.757) affirming that "cognitive biases are an ever-present ingredient of strategic decision-making" (1999, pp. 757).

Tverksy and Kahneman focused on testing hypotheses with experiments (Thaler, 2015), such as their study in 1981 on the presence of a select number of cognitive biases which has been replicated many times (Jullien, 2016). More empirical and experimental tests are explored in the coming sections in this chapter. The fact that the results are repeatable was a great triumph

for behavioural economics but some criticised the tests suggesting that due to their novel approach the results were less relevant to day to day lives (Mishra et al. 2011) and the need for lab experiment conditions reduces their application in the field (Etzioni, 2011).

2.3 Impact of Cognitive Biases on Decision Making in Business

2.3.1 Anchoring

Tversky and Kahneman (1974) identified anchoring as one of three heuristics that could potentially lead to cognitive biases. Anchoring refers to the phenomenon when irrelevant information that we chance to see, hear, or think about at the time might distort our decisions or judgement (Lieder et al., 2017). It has an influence on many parts of our life, including economic decisions, the outcome of salary negotiations, criminal sentencing, and even our capacity to comprehend other people (Lieder et al., 2017).

As mentioned previously, anchoring is a type of heuristic that has a disproportionate influence on It is one of the most important biases for studying since it may impair decisions due to wrong estimates. The anchoring topic is prevalent in academic literature, according to Costa et al. (2017), with 435 out of 923 papers on cognitive bias focusing on it. The effect has a direct impact on decision-making because it forces the decision-maker to gravitate toward one of the previously given values. Anchoring can have a significantly negative influence on strategic decision-making. (Ahmad, Shah and Abbass, 2020)

Research by Nagtegaal et al., (2020) using a survey on 1,221 managers and employees uncovered cognitive biases in the decision making and therefore had practical implications highlighting that the risk of anchoring bias should be taken seriously especially related to goal-setting practices (Nagtegaal et al., 2020).

Additionally, anchoring was found to hinder judgment and caused bias in areas when maximum impartiality is required. Bellé et al. (2017), for example, found that public sector managers and staff who were exposed to a high anchor earned better performance evaluations than those who were exposed to a low anchor. Furthermore, those who were given favourable economic or financial information saw a stronger anchoring effect (Costa et al., 2018). Furthermore, the anchoring effect was widespread, with 96 per cent of the test group demonstrating it to some extent (Costa et al., 2018).

On the other hand, numerous investigations have found that the anchoring effect is advantageous. Unlike the other/another common bias, overconfidence, Parveen and Siddiqui (2018) showed that anchoring enhanced the likelihood of increasing investment returns and making better financial decisions. In certain situations, having a strong or positive anchor might assist you in achieving your objectives. Wu et al. (2018) investigated the demand uncertainty problem from the perspective of anchoring and discovered consistent patterns, a high anchor decreases understocking and enhances profit. As a result, anchoring bias does not always result in poor decision-making.

2.3.2 Overconfidence

Kahneman (2011) described overconfidence and the most prevalent cognitive bias which was echoed with Bazerman and Moore (2013) referring to it as the "father of all biases". Debondt and Thaler (1995) said it was arguably the most robust bias ever studied.

Overconfidence has been described as an overestimate of one's probability of succeeding in a task. Experienced investors evaluated themselves higher in terms of performance than their counterparts, according to Combrink and Lew (2019). As a result, their overconfidence may have an impact on their perception of the causes of errors (Combrink & Lew, 2019). This overconfidence may be the result of the individuals' tendency to overestimate their ability to control events (Souissi, Jarboui and McMillan, 2018).

Overconfidence in relation to business has been described as the tendency to overestimate the probability of one's chosen result occurring as well as the tendency to overestimate one's own expertise (Nouri et al., 2017) whereas Moore and Schatz (2017) describe how overconfidence has three elements including overestimation, over precision and over placement. Overestimation occurs when people think they are better than they truly are. Over placement occurs when people believe they are better than others. Over precision occurs when people have an exaggerated faith that they know the truth (AlKhars et al., 2019). For the purpose of this research, when the author refers to overconfidence it refers to the over precision of what is likely to happen in a partnership and also their overestimation of the ability to succeed at the task when they have little control.

Overconfidence bias, like anchoring, can have beneficial outcomes in some situations. It can encourage innovation via entrepreneurs seeking new opportunities (Dias et al., 2019) According to Bouteska and Regaieg (2020), overconfidence among CEOs has a positive effect on business performance, suggesting that overconfident CEOs may benefit shareholders by

increasing stock returns, increasing profitability, and reducing risk. Overconfident managers, according to Johnson and Fowler (2011), can be brazen and make bold decisions, giving them a competitive advantage (as cited in Moosa and Ramiah, 2017). Overconfidence, on the other hand, is connected to other objectively detrimental situations including self-serving bias (Moosa and Ramiah, 2017). It seems clear that unchecked overconfidence among employees might have disastrous implications for the company.

2.3.3 Impact on Entrepreneurs

An insight into overconfidence bias has been found in the studies of entrepreneurship. A number of academics have tried to figure out what causes entrepreneurial decision-making biases (Nouri et al., 2017). The failure of new firms has been linked to overconfidence bias (Ilieva et al., 2018). In a study of Austrian entrepreneurs, Ilieva et al. (2018) discovered that such people are prone to overconfidence bias. As a result, debiasing strategies for overcoming overconfidence, such as providing criticism, appears to be helpful for entrepreneurs.

Zhang, Bij and Song, (2020) conducted a study to measure overconfidence in entrepreneurs following Forbes (2005) and Brenner et al. (1996), which used general knowledge questions. The findings concluded that due to the high levels of risk and uncertainty, time pressure and emotional intensity of an entrepreneurial setting, entrepreneurs usually apply heuristics in their work to compensate for a lack of general and situational knowledge and to make fast decisions.

2.3.4 Impact on Managers

Herbert Simon, who defined the concept of bounded rationality, while working on decision-making strategies and practices led to many practitioners and academics considering strategic decision making the quintessential managerial task (Luan, Reb and Gigerenzer, 2019). Managers constrained by bounded rationality must achieve their objectives while negotiating various obstacles in a work environment defined by unprecedented complexity, volatility, and uncertainty (Acciarini, Brunetta and Boccardelli, 2020). Furthermore, due to the nature of management, not only do managers have to work with their own cognitive biases, they are constantly working with and on the basis of others' decisions which may also be influenced by cognitive biases (Jordão et al., 2020).

The impairment of judgment caused by the bias could either lead to two types of overconfidence (Baker et al., 2017). Prediction overconfidence: the manager sets a narrow confidence interval around their forecasts, leaving no room for market fluctuations (Baker et al., 2017). Also, certainty overconfidence when the manager believes that their predictions are bound to happen and has too much confidence in their accuracy (Baker et al., 2017). In the end, overconfidence can eventually lead to the formation of concentrated stock portfolios, which can result in large losses if the industry of choice experiences an unforeseen catastrophe. As a result, the process of defining and achieving goals in finance and stock trading is hampered by overconfidence bias. The question for this research is to uncover if overconfidence negatively impacts goal achievement in the strategic alliances' context.

In the world of finance, psychological researchers discovered that at the time of decision-making people sometimes make cognitive errors that can become the reason for bad investment decisions (Zehir et al., 2016). Overconfidence bias may have a detrimental influence on a company's bottom line. Overconfident managers, according to Koo and Yang (2018), tend to overestimate the future payoffs of their investments and feel that they can influence them. Furthermore, overconfident managers instil optimism in their high-risk initiatives (Koo & Yang, 2018). In the end, those managers' overconfidence will expose their firms to further financial dangers, particularly if the high-risk initiatives have quick returns on investment.

Even experienced professionals are susceptible to overconfidence bias, as shown in the above situations. Nonprofessional's, according to Czaja and Röder (2020), are similarly prone to overconfidence. Furthermore, when an overconfident trader displays their bias, it draws larger investment flows from investors. On the other hand, overconfidence has been shown to be detrimental in the long run (Czaja & Röder, 2020). Determining whether overconfidence has more of a positive or negative impact on decision making could be a priority for academics and business practitioners and this research aims to contribute to this exploration.

2.4 Impact of Cognitive Biases on Strategic Alliances

2.4.1 What are Strategic Alliances

The term Strategic Alliances (SA) in the literature is used to describe a wide variety of organisational strategic collaborations (Culpan, 2009 and He et al. 2020), in essence, it refers

to the agreement between businesses to achieve a competitive advantage and strategic edge (Culpan, 2009). The strategic alliances of interest here are defined by Hitt et al. (2000) as a "a cooperative strategy in which two or more firms combine some of their resources and capabilities to create a competitive advantage".

Research on Strategic Alliances (SA) spans 30 years creating an enormous volume of literature to consider. (Dhaundiyal and Coughlan, 2020). The most common areas include theories related to the pre-alliance stage (Gulati, 1995; Hitt et al., 2000), the formation of an SA (Parkhe, 1993; Todeva & Knoke, 2005), how to manage an SA (Doz, 1996) and the performance of the SA (Gulati, 1998; Gulati et al., 2000). One of the most researched and theorised aspects of SA is around the motives to form a strategic alliance. For the purpose of this paper, the author has focused on the decision making related to the **pursuit** of a strategic alliance.

2.4.2 Analysis Under the Influence

From the perspective of the typical absence of full and complete knowledge, also known as information asymmetry, anchoring is seen as a necessary response to uncertainty and a means of simplifying preliminary analysis in strategic partnership choices. According to Malhotra, Morgan, and Zhu (2018), in international experiences, such as entering multinational joint ventures, anchoring frequently replaces time-consuming strategic and financial analysis efforts, allowing decision-makers to rely on similar firms' recent decisions rather than thoroughly analysing their own situation. As a result, the anchoring effect happens more frequently in uncertain environments and in the presence of information deficits (Malhotra et al., 2018).

Negotiation is a key element to strategic alliances and research by Nagtegaal et al., (2020) using meta-analysis, demonstrated the significant impact that anchoring can have on negotiation outcomes and negotiators should both take advantage of anchoring and develop tactics to prevent being manipulated by anchoring in negotiations (Nagtegaal et al., 2020).

Costa et al. (2018) demonstrate that favourable financial results raise anchor prices and values, implying a link between anchoring and overconfidence fuelled by the inclination to accentuate positive facts. One significant feature above is the lack of information on whether

partners' efforts to simplify decision-making by embracing certain principles or strategic goals as reference points impede the financial success or viability of strategic partnerships.

Xiao (2020) examines how anchoring influences international merger and acquisition (M&A) equity decisions and concludes that when a negotiator generates one's own anchor it becomes more influential than if the anchor is externally provided. While the study has important implications for managers, highlighting anchoring as a cognitive mechanism in uncertain and complex decision making, the research does not provide detailed insights into how anchors influence decision-makers.

2.4.3 Collaboration Under the Influence

According to several contemporary authors, the overconfidence bias contributes to the poor consequences of strategic alliances, such as unsuccessful collaboration and a failure to consider all partners' financial and strategic goals. According to Russo and Cesarani (2017), the collaborative spirit is diminished in strategic alliances due to certain parties' lack of knowledge of the dynamic nature of collaborative relationships, which may be compounded by inaccurate self-assessment, among other factors. On the other hand, Chou, Bandera, and Thomas (2017) conclude that when entrepreneurial and innovative businesses form strategic alliances, the latter's lack of overconfidence increases the likelihood of achieving optimal results while remaining true to their competencies.

Overconfidence is also characterized in strategic alliances as a detrimental impact on trust (Kostis and Näsholm, 2018). Interestingly, as was the case with the Etihad Airways equity partnership, the CEO's arrogance contributed to the failure to make successful acquisitions (Jory et al., 2019). Due to the variations in the findings and the fact the study just focuses on just the overconfidence bias, the subject of cooperation failures may require more study focusing on the interaction of overconfidence bias and other variables such as other biases.

2.4.4 Dysfunctional Alliance Persistence

Despite missed performance objectives and rising losses, many alliance relationships are continued (Patzelt and Shepherd, 2008). The phenomena of 'dysfunctional alliance persistence' has frequently been described in terms of 'escalation of commitment,' in which an individual would continue to collaborate despite progressively unfavourable outcomes

(Sleesman et al., 2012). Klossek, Meyer, and Nippa (2014) suggest that the net advantages of a strategic partnership are susceptible to subjective assessment and therefore examine what truly motivates decision-makers to make suboptimal choices via the lens of cognitive biases and strategic alliance research. Nagtegaal et al., (2020) as they are often negotiating, they should both take advantage of anchoring and develop tactics to prevent being manipulated by anchoring in negotiations

Importantly, when assessing the current state of a strategic alliance and forecasting expected revenues and costs, as well as probabilities for outcomes under various future states of the world for which only a 'qualified guess' is available, this may result in an overvaluation of the existing organizational form's net benefits (Klossek, Meyer and Nippa, 2014). Research is needed to examine the initial stages of evaluation of a partnership and how a prediction may be impacted by cognitive bias and its consequences.

2.5 Potential Impact of Cognitive Biases on SAMs

2.5.1 Decision-Making Challenge

There are different levels of decision making, at individual, group and organisational levels and for the purpose of this paper, the author will focus on the individual level, especially at the decision making by the strategic alliance manager. Strategic Alliances are often complex, carried out by multiple teams with a goal of achieving business growth and that are sustainable for years (Klossek, Meyer and Nippa, 2014). Individuals responsible for the alliance formation are not necessarily involved in the execution of all aspects of the alliance and are often allocated to a different project before the ongoing one is completed (Lin and Darnall, 2014). It is essential for managers, and it should be part of their cognitive competence to spot opportunities, detect and solve problems and predict and prevent future threats (Jordão et al., 2020).

Similar to entrepreneurial decisions, many decisions made by SAMs are highly strategic, unique, and mostly taken in situations with limited and imprecise information especially at the start of a relationship. These situations can be characterised by behavioural and informational and uncertainty (Luan, Reb and Gigerenzer, 2019). Behavioural uncertainty refers to uncertainties in inter-organizational interactions caused by challenges accurately interpreting

partners' behaviours or assessing performance using objective, easily available criteria whereas informational uncertainty refers to the challenge of predicting future events due to a significant amount of new information that overwhelms cognitive capabilities due to frequent unanticipated contingencies (Abdi & Aulakh, 2016).

SAs are often pursued due to their strategic flexibility and low long-term resource commitment. However, real alliance decision-making processes are extremely complicated and prone to various biases, implying that strategic alliances are far less flexible in practice than they are in principle (Klossek, Meyer and Nippa, 2014).

Another conceptual paper that is very relevant to this research is by Chao (2011) entitled "Decision-making biases in the alliance life cycle". The research explores three specific decision-making biases including overconfidence and anchoring (Chao, 2011). Like with Klossek, Meyer and Nippa, (2014), the study is beneficial as it proposes a model but it also doesn't present any empirical evidence to validate the model, and as it is ten years old, so it needs to be revisited with more modern examples and data.

2.5.2 Target Setting Under Uncertainty

In the initialization stage, a firm communicates and negotiates with its alliance partner to establish the partnership's first terms. The partners discuss short- and long-term objectives, as well as a timeline for each milestone (Chao, 2011). It is common for firms to have several criteria that have been employed to assess business performance, i.e., a firm's ability to fulfil its objectives. These usually incorporate both financial and non-financial metrics (Baig et al., 2019). Anchoring can have a negative implication for target setting and achievement. According to an empirical study, anchoring can have a significant impact on up to 96 per cent of professionals participating in management decision-making, which might have major consequences for partnerships and defining common goals (Costa et al., 2018).

In a paper by Kieczewski, Matel, and Poskrobko (2016), the authors report a behavioural study of a project's target formulation stage. The purpose was to demonstrate that when developing the project's objectives, it encounters decision-making based on heuristic thinking. (Kiełczewski, Matel and Poskrobko, 2016) The article summarizes the findings of secondary research and concludes that cognitive biases have the potential to impact the process of establishing the project's objective. (Kiełczewski, Matel and Poskrobko, 2016). While this

article is specifically about the area being researched, it lacks empirical testing or robustness, hence its reliability may be questionable.

Timing and planning are critical components of every business endeavour, since success is typically contingent upon the timetable being met. Anchoring may have an effect on the manager's duration estimates, making them excessively optimistic or pessimistic, depending on the anchor. A low anchor would cause the manager to underestimate the amount of time necessary, whereas a high anchor would cause the management to overestimate it (Lorko, Servátka and Zhang, 2019). The study also discovered that the anchoring effect has a continued effect on task length estimate and, more crucially, that this impact endures over time. Furthermore, the bias persists even after the task is estimated and done repeatedly (Lorko, Servátka and Zhang, 2019). As a result, the author will explore the relationship between cognitive biases (anchoring and overconfidence) and target attainment.

2.5.3 Experience Combats or Amplifies?

Another critical area of research for cognitive biases is their probable correlation with professional experience. While numerous research papers have discussed the relationship between a worker's experience level and their vulnerability to anchoring and overconfidence, they have not shown a uniform pattern (Lorko, Servátka and Zhang, 2019).

The places of biases and experience in business and entrepreneurship differ significantly. According to Ilieva et al. (2018), past business experience improves entrepreneurs' confidence, which is a good impact. It was found that Overconfidence in business originated from becoming a sole proprietor rather than from previous experience (Ilieva et al., 2018).

Finally, several researchers dispute the existence of a link between experience and bias susceptibility. The chance of overconfidence among managers does not reduce with experience, according to Huffman et al. (2019). As a result of this apparent absence of a clear link between experience and cognitive biases, the notion that biases are an intrinsic characteristic of human psychology has been proposed. Regardless of their professional expertise, the anchoring effect and overconfidence may be prevalent among strategic alliance managers which has led this author to explore the relationship between cognitives biases (anchoring and overconfidence) and the level of experience of strategic partner managers.

2.6 Conclusion and Limitations

Until now, the issue of risk anchoring and overconfidence bias in partnership managers' decision-making has received relatively little attention. The reviewed literature identifies many research gaps that emphasise the importance of the study on cognitive biases among managers engaged in strategic partnerships. The research in peer-reviewed academic works has largely focused on the implications for entrepreneurs, stock trading, investing, and corporate finance management. As a result, it is critical to address any knowledge gaps in ensuring that the business creates profitable partner collaborations.

Chapter 3 - Methodology

3.1 Introduction

As defined by Saunders (2019), research methodology is the systematic research approach that implies having a clear objective, collecting data purposefully and interpreting results systematically. Ghauri and Gronhaung add that research is "based on logical relationships and not just beliefs" (Saunders, 2019).

This research was developed using Saunders (2019) research onion model, a framework for a research approach in which each layer of the onion represents a stage of researching a way that weights all the possible methodological decisions.

This chapter will outline the methods used to answer the research question. It includes the philosophical assumptions behind selecting the research methods to best answer the research questions from the hypotheses formulated, data collection methods, sample and data analysis methods. Finally, it will state the limitations of the research and the ethical considerations.

3.2 Philosophy

3.2.1. Research Philosophy

This paper aims to develop new knowledge in the area of behavioural economics and strategic alliances. The foundations of this research are based on assumptions and beliefs (Saunders et al., 2018). The assumptions and beliefs of the researcher will inform the research paradigm, which is based on the nature of reality (Ontology), how to examine reality (Epistemology) and the role of values (Axiology) (Saunders et al., 2018). Saunders et al. (2018) reference five paradigms positivism, interpretivism, critical realism, postmodernism and pragmatism. After a thorough analysis of each of these paradigms, there was not a clear choice that would apply to the assumptions and beliefs of this author, so further research on philosophies was needed.

3.2.2 Positivism and Post positivism

Positivism assumes that there is only one single true reality. It can be measured and fully understood. Perfect understanding is achievable through scientific analysis and experimentation. The researcher is detached and separate from the research (Saunders et al., 2018). Truth is embedded in reality and can be discovered *out there*. (Tanlaka, Ewashen and King-Shier, 2019)

Karl Popper, one of the most influential philosophers of science in the 20th century, argued that this view and suggested that scientific knowledge is provisional (Thornton, 2021). According to Ruth (2020), A researcher builds an approximation of the research but never knows fully about it. A theory can have some predictive capabilities. This new paradigm became known as post positivism (Ruth, 2020). It was based on findings in physics such as the Heisenberg Uncertainty Principle, which proved that we could not know what an atom would do, and the atom would change its behaviour based on the researcher's observation, which was proved that the researcher was not detached from the research (Heisenberg, Eckart and Hoyt, 2009). Many post-positivists agree that it is not just flawed in its ontological and epistemological assumptions, but it has caused political and social unrest in the world. (Patomaki and Wight, 2000)

3.2.3 Application to Behavioural Economics

Post positivism is very applicable in the research on behavioural economics. Post positivism critiqued the concept of a human having the ability to be "fully knowing" and suggested as humans we had limitations. This resembles Herbert Simon's, *Bounded Rationality*, one of the underlying principles of behavioural economics, which states that humans do not have the cognitive ability to calculate the expected utility for each option in a decision (Jordão et al., 2020). Post positivism acknowledges that biases and personal experience influence how we research, reflecting behavioural economic theory relating to heuristics and biases as explored in Chapter Two.

While post positivism is a critique of positivism, it should be considered an extension of it. Both positivists and post-positivists believe reality exists and therefore suggest that researchers should employ the scientific method to research, including using experiments and observations to determine whether hypotheses are true or not (Robson, 2005). This is also in

line with the research method of Vernon Smith, who shared the noble prize with Kahneman in 2002 for his contributions to experimental economics (Smith, 2005).

3.3 Research Question

Given the demonstrated effects of cognitive biases in decision making and the weight decision making plays in pursuing alliances and establishing the success metrics of a partnership, this research will aim to answer the following question:

Do overconfidence and anchoring biases impact the partner manager's decision making in pursuing strategic alliances, which contributes to partnership failure?

3.3.1 Research Objectives

The research question can be broken down into four main objectives:

Objective 1: Determine if SAMs are susceptible to overconfidence bias

Objective 2: Determine if SAMs are susceptible to the heuristic of anchoring

Objective 3: Analyse the relationship between overconfidence and anchoring bias and alliances meeting target expectations in Year 1.

Objective 4: Analyse the relationship between overconfidence and anchoring and SAMs number of years experience.

3.4 Research Methods

3.4.1 Approach and Design

The research methods are the different techniques used to gather and analyse the information (Saunders, 2019). The aim of this research is to provide insight for SAMs to improve their decision making regarding Strategic Alliances. As a postpositivist, this author believes there are behavioural factors to be uncovered through scientific analysis and therefore a scientific

approach is necessary. As there is a multitude of potential behavioural factors to choose to uncover, the author first did an exploratory scoping exercise to uncover the most relevant behavioural factors to ensure the hypothesis tested will be beneficial to SAMs and achieve the aim of the research. Therefore, while an explorative interview was conducted, this paper was designed based primarily on a quantitative approach as that is the most appropriate method for testing behavioural economics.

This research uses the data collection methods used in the research conducted by Jordão et al. (2019) in "BOUNDED RATIONALITY IN DECISION MAKING: AN ANALYSIS OF THE DECISION-MAKING BIASES" to analyse the decision-making biases of managers in the Portuguese port sector to analyse the presence of overconfidence bias and anchoring in strategic alliances managers.

3.4.2 Data collection methods

As the approach was mixed methods, two data collection methods were used. The first a preliminary interview to gather information on the problem that needs addressing, following on from that a literature review guided the creation of hypotheses, which were then tested using a quantitative approach to test the hypothesis created from the scoping exercise.

A. Qualitative Data Collection

The initial stage was a scoping exploratory stage to validate an assumption of the presence of cognitive biases. To achieve this semi structured interview. Approach was taken the questions were open-ended and encouraged the participant to share thought-processes in relation to key stages of a partnership including starting a partnership, progressing a partnership, investment decisions in partners and terminating partnerships. See Appendix A.

The interviews took place online using a communication tool known as Zoom. The interview was recorded and is accessible via Zoom through a password secured link. It was suggested that the participants could turn off their camera to make them feel more comfortable and therefore share more deeper insights and create a more free-flowing conversation style. While interesting elements were uncovered, the interviews took a long time with limited output that would contribute to the subject area. Two key findings relating to starting a partnership and terminating a partnership were related to targets. As the researcher gained information on targets from the initial interviews, the following interviews included more specific questions

about targets to uncover the potential cognitive biases. While targets were the most common form of measuring success they were rarely achieved. The question of the quality of the decision making around setting and achieving these elusive targets became the focus on the research.

Using information collected from semi-structured interviews, this research aims to explore review of up-to-date literature and then test the hypothesis uncovered through the initial stages of research with a quantitative method. As noted by Thaler (2015). This use of surveys, as used in this research, is found widely in behavioural economics. According to Thaler (2015), hypothetical surveys are frequent for practical reasons since authorization to conduct studies in which volunteers may lose money would be difficult to get. Furthermore, the author points out that theorists would not have learned the subtleties of behaviour revealed in Prospect Theory if they had refused to depend on hypothetical inquiries. Thaler (2015) also points out that the technique is the easiest way to explore many theoretical problems. To do this a quantitative research study was designed to replicate a research study conducted by Jordão, Costa, Dias et al. (2019) on A pilot of the survey was sent out to two individuals from the sample, to ensure the instructions and questions were clear and logical.

3.5 Sample

Sampling can be defined as the process through which individuals are selected and can be probabilistic and nonprobabilistic Sampling (Martínez-Mesa et al., 2016). For the purpose of this research two types of nonprobabilistic sampling was undertaken, purposive sampling as the opinion of experts in a particular field was needed, in this case strategic alliance managers. As the target sample was very specific, snowball sampling was attempted by using the initial group of strategic alliance managers to encourage other strategic alliance managers to take part in order to increase the number of participants. This didn't result in any further participants.

Participants were targeted using the author's personal network, an online professional network known as Partnership Leaders and LinkedIn. Targeted participants were initially contacted by email or through a specific platform's messaging service. 6 strategic alliance managers were targeted for the exploratory stage of the partnership. Following that a further 34 strategic alliance managers were selected for the main quantitative research. In terms of the size of the

company, typically a company needs to reach a certain size before employing a strategic alliance manager, but the author aimed to target the biggest companies in the world with 3 of the respondents coming from billion-dollar companies. While all 40 targeted participants initially committed to partaking, 38 responded in the timeframe required.

3.6 Survey Design

The survey consisted of four parts. Following the research conducted by Jordão, Costa, Dias et al. (2019) which were based on the following original studies: the overconfidence questionnaire was taken from Baratella (2007) according to the proposals of Gingerezer et al. (1991) and Klayman et al. (1999); and the test for anchoring was based on Luppe (2006) which, in turn, was used from the proposal of Jacowitz and Kahneman (1995), the data was collected from primary sources using an online survey. The first part was designed as a questionnaire of the participants' demographic information, their experience in strategic alliances, and the success of their partnerships. The second part was a questionnaire on SAMs preferences for risk taking and loss aversion.

Part three and four replicated the survey used by Jordão, Costa, Dias et al. (2019). The third part was questions on general knowledge in which participants provide a measure of their confidence in their answers. In the fourth and final part of the survey is a questionnaire that asks participants to estimate a figure after receiving a version of the survey containing either a low anchor, a high anchor or no anchor.

The surveys were composed of either 44 or 49 questions depending on the participants group. The questions included a combination of open-ended and closed- ended response questions created using Google Forms and contained a concise explanation of the research, contact details of the researcher and consent validation. All the survey questions are included in Appendix B.

In the original study three versions of the same questionnaire were distributed to the sample with a minimum of 10 in each group, a Calibration version, a high anchor version and a Low anchor version. In all versions, questions of section one to three were the same, in a way that all participants answered to the same Demographics, Confidence and Loss Aversion questions, while section four had a different variation of the Anchor questions, corresponding to either a calibration group, low anchor group or high anchor group. Each section of the survey will be explained in detail in the following sections.

Survey section 1. Demographics

The first section of the survey elicited information from the participants about their demographics and was designed by the author of this study.

The participants answered eight questions with the purpose to segment the sample by gender, age, partnership experience, indication of target setting and indication on the success of these partnerships in the first year of commercial relationship. This section also included an anonymised unique identifier where participants provided the first letter of their name and company, as well as their validation to participate.

The first two questions asked participants for their consent to take part in the research. Questions three to five asked participants demographic information. In question 3, participants were asked to identify their gender as male; female; rather not to say. The fourth asked to select their years of experience choosing from "≤ 1 year"; "1 to 2 years"; "3 to 5 years"; "5 to 10 years"; "10 to 20 years". The fifth question asked to indicate their age from options "≤ 25"; "26 to 35"; "46 to 55"; "56 to 65" and "≥ 66".

Following the discovery on the preliminary interviews that targets were not a standard practice amongst SAMs, the sixth question in this part was included for the SAMs to disclose their approach to setting targets. The participants answered whether they set targets for their partners and if these targets were based solely on revenue or combined with other metrics selecting one of four options that were then transformed to represent groups (No, targets are not used to measure the success of a partnership ;2-Yes, the targets are based on revenue; Yes, the targets are based on revenue and other non-relevant metrics; 2-Yes, the targets are based on other non-revenue related metrics;).

The seventh question asked the participants to choose the option that best represents the percentage of partners that met such targets in the first year, choosing one of four options ("0 to 24%"; "25% to 49%"; "50% to 74%"; and "75% to 100%"). This information was used to label the SAMs by the success of strategic partnerships in year one their target setting where those that met targets from 0% to 49% were labelled as Low Performing and those with 50% or more were labelled as High Performing The results were then used to analyse the relationship of successful partnerships with overconfidence bias and anchoring as stated in the research questions.

Survey section 2. Loss Aversion

The literature on loss aversion suggests that people are more sensitive to loss than to gains, even when these gains are equal to the loss (Anagol and Jacks Gamble, 2013). The questionnaire used to help determine the susceptibility to loss aversion was replicating the first part of the questionnaire used by Anagol and Jacks Gamble's research on loss aversion in investment, where they examined the effect information had on decision making for retirement investment and used the loss aversion findings to categorise their sample and group their findings (Anagol and Jacks Gamble, 2013).

Following Anagol and Gamble's study, in this second part participants answered six questions to select if they would accept a gamble with an equal chance to win $15; $10; $8; $6; $5 or losing $5 with the options "Yes, I would accept this gamble" or "No, I wouldn't accept this gamble". According to Anagol and Gamble (2013), participants are loss averse when they reject the option to win $8 or lose $5. The participants were labelled as loss-averse or not loss-averse and allowed to determine the susceptibility to loss aversion and the relationship between loss aversion and overconfidence bias.

Survey part 3. Overconfidence

In part three the questionnaire applied was using the questionnaire used by Jordão, Costa, Dias et al. (2019) in their study to analyse decision making biases in managers of the Portuguese port industry. The questions were adapted when considered necessary to ensure the relevance to the sample chosen and feasibility of the research.
As such, the participants answered an overconfidence test in the form of 10 dichotomous questions of general culture in which the participants selected their correct answer, the instructions informed the participants that the correct answer was included as one of the options. Each question was then followed by a confidence scale of seven options ("50%"; "51%–59%"; "60%–69%"; "70%–79%"; "80%–89%"; "90%–99%" and "100%") where "50%" was a random guess and "100%" confidence was certainty to giving the correct answer. The SAMs assessed their estimated level of confidence for the response they believed was correct.

In the literature, Jordão et al. (2019) proposed a measure of overconfidence where the estimation of confidence is higher than the "relative frequencies of correct answers",

comparing the mean of the confidence level (CL) to the accuracy rate (AR), where negative values of this indicator imply the presence of under confidence:

$$Overconfidence\ =\ CL\ -\ AR$$

Same as in their study, the confidence estimation values were transformed into the median of each interval where "50%" = 5, "51%–59%" = 5.5, "60%–69%" = 6.45; "70%–79%" = 7.45, "80%–89%" = 8.45; "90%–99%" = 9.45 and "100%" = 10. The CL was calculated as the average of the transformed answers for confidence estimates and the AR was calculated as the average number of correct answers given by the participants, in which a correct answer equals 1 and incorrect equals 0.

Survey part 4 Anchoring effect survey

The method used to analyse the effects of anchoring was based on the experimental approach taken by Jordão et al. (2019) in their study "Bounded Rationality in Decision Making" as mentioned previously. The authors used an experimental-standard model where the anchoring effect is determined after participants provided estimations to five amounts in two consecutive questions for each, first to make a relative judgement if the amount in question was higher or lower (for example, if they believe length of River Nile is higher or lower than "X" km), then asked for their estimate of the amount in question.

The design of the survey included the introduction of a parameter to which the effects of anchoring would be measured against and, as such, dividing the survey distribution in three groups: the calibration group (CG), the high anchor group (AG) and low anchor group (aG).

The calibration group received a version of the questionnaire with no anchor quantities against which to compare judgement and were only asked to provide their estimations. The high anchor group and low anchor groups received a set of questions including a high and a low anchor, respectively.

For example, question 4.1 for the Calibration group (CG) was: "What is your estimate of the length of the Amazon River (in km)?", while the Low anchored group (aG) received the following two questions: "The Amazon River is greater or fewer than 1,600 km?" followed by "What is your estimate of the length of the Amazon River (in km)?". For the High anchored group (AG) the 4.1 question looked like "The Amazon River is greater or fewer than 7,200

km?" and followed by the question to give their estimate, "What is your estimate of the length of the Amazon River (in km)?".

To determine the presence of anchoring bias an anchoring index (AI) was calculated using Jacowitz & Kahneman (1995) formula, as quoted by Jordão et al. (2009), where results range from 0 (no anchoring) to 1 (the estimate is the same as the anchor). Results higher than 1 are possible as it is possible to provide a value higher than the anchor:

$$AI = \frac{Median_{AG} - Median_{aG}}{High\ Anchor - Low\ Anchor}$$

(AG = High anchored group; aG = Low anchored group)

Following Jordão et al. (2009), in addition to the AI and in order to perform a statistical comparison, the estimates provided for each question by the high anchor group and the low anchor group were transformed into Anchoring Estimates in relation to whether they were the same as the maximum, minimum or median values as the calibration group estimates. Thus, providing a new range from 0 to 100.

For each question's estimates from the high and low group that were equal or above the maximum of the calibration were transformed to 100, while estimates equal to the median of the calibration group were transformed to 50 and, estimates equal or below the minimum were transformed to 0. The remainder estimates were standardised and transformed using a formula depending on their position to the median value of the calibration group.

For values between the maximum and the median of the calibration group the following formula was used:

$$Transformed\ Estimate\ (x) = 50 + \frac{(estimated\ value - Median_{CG})\ x\ 50}{Maximum_{CG} - Median_{CG}}$$

(CG = calibration group)

For values between the median and the minimum value of the GC the following formula was used:

$$Transformed\ Estimate\ (x) = \frac{(estimated\ value - Minimum_{CG})\ x\ 50}{Median_{CG} - Minimum_{CG}}$$

(CG = calibration group)

3.7 Analysis of Quantitative Data

The quantitative data was collected online using Google Forms. Three versions of the same form were collected. In all versions, questions of section one to three were the same, so all participants answered the same Demographics, Confidence and Loss Aversion questions, while section four had a different variation of the Anchor section questions, corresponding to either a calibration group, low anchor group or high anchor group.

For preparation, the data collected from the four sections of the survey was prepared by exporting and consolidating the data in a unique file in Excel. Calculations following the formulas for Overconfidence Level, Anchoring Index and Anchoring Estimate outlined in the previous chapter, were performed in Excel and added columns when needed for the anchoring index and transformed anchoring estimate values. The data was then imported into the statistical software SPSS (IBM, v27). The data transformation needed for scaling and categorising the overconfidence section responses and anchoring section responses was performed in SPSS (IBM, v27) as per the original study (Jordão et al. 2009).

Firstly, graphs and histograms were generated in Excel for all variables, that is the gender, age, experience, target setting, target attainment, anchoring response group, loss averse indicator, confidence level, accuracy rate, overconfidence index, anchoring estimate.

Secondly, a preliminary analysis of the distribution of interval variables was conducted to determine whether the data for the confidence level and anchoring estimates variables were normal, using a Shapiro-Wilk test conducted in SPSS (IBM, v27).

Thirdly, to analyse relationships and differences in the data and achieve the research objectives, statistical tests were performed, where the differences and relationships in the data need to demonstrate statistical significance according to the probability of the result to be considered (Saunders, 2019). Significance testing requires a hypothesis formulation for each test and for data to satisfy assumptions depending on the test to produce reliable results (Saunders, 2019).

The test used should be parametric or nonparametric depending on the assumptions satisfied by the data, if the assumptions for the parametric tests are not satisfied, then a non-parametric test should be used (Saunders, 2019). Such assumptions are:

- The data samples are independent
- The data is normally distributed
- The data shows equal variance
- The data is numerical

As such, in order to achieve the research objectives a null hypothesis was formulated for each of the objectives and test performed in SPSS (IBM, v27). Following the primary study, a mix of parametric and nonparametric tests, as well as index calculations were conducted depending on the variables used for each hypothesis.

The confidence interval for these tests was set at 95% ($\alpha=0.05$) as the results from the survey were self-reported by the sample chosen.

All results from the tests conducted for each hypothesis were summarised in tables in Excel and reported in the Findings chapter, Chapter 4.

Hypothesis 1: The confidence level of SAMs is higher than their accuracy in answers

Following the primary study, where Jordão et al. (2009) measured the Overconfidence as the difference between the confidence level (CL) and the relative frequency of correct answers (AR), the confidence level was defined as a value between 5 and 10 and accuracy ranging from 1 to 10. A positive index indicated overconfidence and a negative index, under confidence (Jordão et al., 2009).

A Wilcoxon test for equality of means was conducted to determine whether there was a significant difference between the means of CL and AR to determine the presence of overconfidence.

Hypothesis 2: Estimates of the High anchor group are significantly higher than estimates from the low-anchor group.

The hypothesis was tested for questions 1 to 5 of the anchoring questionnaire. Two variables were tested, the independent variable being the anchoring group (high anchored or low anchored) defined as an ordinal variable and the dependent variable being the mean of the normalised estimates for each question, defined as an interval variable. Non-normal

distribution of the data was assumed, which is best done when performing statistical testing of ordinal and nominal data (Saunders, 2019) and as such conducted a non-parametric test.

Following the original study, (Jordão et al. 2009), a Mann-Whitney U test was performed to find whether the distribution of the high anchor group was the same as in the low anchored group for each of the five questions, thus proving the presence of anchoring.

Hypothesis 3: The anchoring effects in SAMs with a target attainment of under 50% are higher than SAMs with target attainment of over 50%.

To start, a subset was created to exclude data from participants who indicated they did not set targets (answers equal to "No, targets are not used to measure the success of a partnership"), then labelled the data by groups based on the answers to target success (Group 1 = 49% and under; Group 2 = over 50%).

For this hypothesis the anchoring index (AI) was calculated for two subgroups, the AI of the estimates of SAMs with over 50% achievement and the AI of SAMs with under 50% achievement (n=19), following Jacowitz & Kahneman (1995) formula for Anchoring Index using the median of the estimates for each of the five questions in the questionnaire, resulting in five AI's, one for each question. According to Jacowitz & Kahneman (1995) as cited in the primary study, (Jordão et al., 2009), a result of AI equal to zero represents no anchoring.

It was decided against conducting statistical testing for differences in means, as the subgroup samples would not be sufficient to draw statistically significant results being less than 10 answers for comparison (Count of High anchor and Over 50% = 4, count of Low anchor and Over 50% = 2).

Hypothesis 4: Overconfidence is significantly higher in SAMs with a target attainment of under 50% than SAMs with target attainment of over 50%.

Firstly, a subset was created to exclude data from participants who indicated they did not set targets (answers equal to "No, targets are not used to measure the success of a partnership"). Then created a variable to be used as independent variable, which defined groups depending on the level of target success indicated (Group 1 = 49% and under; Group 2 = over 50%). The dependent variable, the Overconfidence index was defined as interval and tested for normality using a Shapiro-Wilk test.

A t-Test was conducted to determine if there was a significant difference between the means of the Overconfidence Index (OC) of SAMs that indicated 0% to 49% of their partners achieved their year-one targets and those which answered from 50% to 100%.

Hypothesis 5: Overconfidence is lower in SAMs with 5 or more years' experience than SAMs with fewer than 5 years.

Firstly, a variable was created to define groups depending on the experience where Group 1 included all participants with less than 5 years' experience (Group 1 = "≤ 1 year"; "1 to 2 years"; "3 to 5 years"). The Overconfidence variable was previously tested for a normal distribution so the same assumption was followed for this hypothesis.

A t-Test was conducted to determine whether the Overconfidence index (OC) was different in SAMs with less than 5 years' experience. The dependent variable being the OC and independent variable being the experience.

Hypothesis 6: The Anchoring effects are lower in SAMs with 5 or more years' experience than SAMs with fewer than 5 years.

A variable was created to define groups depending on the experience where Group 1 included all participants with less than 5 years' experience and Group 2 with participants of over 5 years' experience.

Same as in Hypothesis 3, the anchoring index (AI) was calculated for two subgroups, the AI of the estimates of SAMs with over 5 years' experience and the AI of SAMs with under 5 years' experience, following Jacowitz & Kahneman (1995) formula for Anchoring Index using the median of the estimates for each of the five questions in the questionnaire, resulting in five AI's, one for each question.

According to Jacowitz & Kahneman (1995) as cited in the primary study, (Jordão et al., 2009), an AI of zero represents no anchoring. The results were summarised and reported in the Findings chapter, Chapter 4.

3.8 Limitations to research

The present methodology used presents a number of limitations that must be considered in reading this present research.

The research sample segment of strategic alliances managers is the same as the current position of the author, which can pose a bias towards personal experiences and empirical interpretation of the results. Therefore, to mitigate this risk, statistical analysis was used to analyse the data provided by the participants.

The size of the sample presented the most significant limitation in being representative of the population on several demographics such as gender, age and experience. The sample selection extended to the author's personal network in the Software industry and therefore is not possible to infer a complete representation of SAMs in this industry.

Similar to this, the sample size forced a change in the method for testing data from the subgroups that would allow for a test result to be considered statistically significant. For the purpose of testing the influence of Anchoring by years of experience and success it was decided that a comparison of the anchoring index would provide a more consistent insight, being the subgroups had equal or less than 10 answers each.

The questions of the survey in the overconfidence and anchoring sections were those of general knowledge and adapted from pre-existing questionnaires for ease of application in the sample chosen. While all efforts were made to ensure the questions retained an equivalence of the Irish counterparts (for example, the size of two known soccer stadiums, distance between two cities in Europe), the questions were not verified or ranked to assess their difficulty.

Finally, the participants were asked for a single assessment of the success of their partnership indicating the percentage of their successful partners, which limits the data to a temporal and subjective recollection of the participants.

3.9. Ethical considerations

The data collection as part of this research forces the author to address ethical considerations in order to conduct the research as it involves human participants (Saunders, 2012). The survey was designed with an introductory statement including the contact details of the research and explaining the purpose of the research and the structure of the survey. This statement also included a disclaimer informing the participant that the responses and results would remain anonymous.

In line with National College of Ireland's governance for ethical considerations, the participants were asked for their consent to use their data in a dichotomous question before starting the survey, where the survey was terminated if the subject declined to participate.

The survey was created using Google Forms and ensured that the configuration for sharing and collecting data was anonymous so no identifying information was collected such as email address or IP. A copy of the survey distributed is included in Appendix B.

Chapter 4 - Findings and Results

4.1 Introduction

The following chapter will detail the results of the statistical testing of the 38 survey responses in line with the research objectives. The survey demographics will be summarised, followed by the presentation of the results of the hypothesis testing for Overconfidence and Anchoring. First for overconfidence, as in the primary study by Jordão et al. (2009) the Overconfidence index will be presented in a table comparing the accuracy rate and the confidence level. The anchoring index will be presented in a table comparing the estimations of the calibration, low and high anchoring groups. Wilcoxon test for equality of means for accuracy and confidence level, t-Test comparing the overconfidence grouped by target attainment level and years of experience.

Second, the results of the analysis of the Anchoring Index and comparison grouped by the level of attainment in targets and years of experience. Finally, a summary of the research objectives, hypotheses and test result outputs will be summarised and presented in a table.

4.2 Demographics

Out of the 38 participants in the survey, 13% identified as female and 87% as male, as mentioned a limitation of the sample was the survey distribution being selective to this author's network reach. 55% were in the age range from 26 to 35 years of age, 22% from 36 to 45 and 16% from 46 to 55 years of age (Table 1).

22.2% responded they do not set targets for their partnerships and 76.3% replied they did with the following split 5.5% targets based on non-revenue related metrics; 13.9% targets based on revenue only and, 58.3% target based on revenue and other metrics (Table 1).

From the participants that did set targets, a total of 64.2% replied that less than half of their partners achieved their targets in their first year and a total of 35.7% replied that more than half of their partners did achieve their targets in year 1 (Table 1).

In years' experience, 58.3% in total replied they had less 5 or less years' experience, with "3 to 5 years" being the most frequent answer represented by 27.8% of the participants (Table 1).

Table 8. Sample Demographics and Overconfidence Level

	N	% of total	CL	AR	OC
Gender					
Female	5	13%	6.5	6.0	0.53
Male	31	82%	7.1	6.0	1.13
Experience					
≤ 1 year	3	8%	7.55	5.67	1.89
≥ 20 years	1	3%	6.72	6.00	0.72
1 to 2 years	8	21%	7.21	6.63	0.58
10 to 20 years	5	13%	7.07	6.80	0.27
3 to 5 years	10	26%	6.79	6.00	0.79
5 to 10 year	9	24%	7.04	5.11	1.93
Target Setting					
No, targets are not used to measure the success of a partnership	8	21%	6.88	6.25	0.63
Yes, the targets are based on other non-revenue related metrics	2	5%	6.82	6.50	0.32
Yes, the targets are based on revenue	5	13%	6.79	5.40	1.39
Yes, the targets are based on revenue and other non-revenue metrics	21	55%	7.19	6.00	1.19

4.3 Overconfidence

To determine the presence of overconfidence in the surveyed SAMs and by subgroups according to research objectives. the following hypothesis 1, 4 and 5 were formulated:

Hypothesis 1: The confidence level of SAMs is higher than their accuracy

The result of a Wilcoxon Test for the equality of two means rejected the null hypothesis ($Z = -4.721$ and $Sig<0.05$). Therefore, there is a statistically significant difference in the means of CL and AR (Table 2). CL presented 31 positive ranks over AR which allows to determine that Confidence levels are higher than the accuracy frequency. Moreover, 23 out of 38 of the participants presented positive OC coefficients.

Table 2*. Descriptive statistics of Overconfidence Index*

N=38	Minimum	Maximum	Mean	Std. Deviation
Confidence Level (CL)	5.30	9.23	7.083	1.093
Accuracy Rate (AR)	3.00	8.00	5.684	1.296
Overconfidence Index (OC)	-0.73	4.57	1.399	1.261

Hypothesis 4: Overconfidence is higher in SAMs with a target attainment of under 50% than SAMs with target attainment of over 50%

A Mann Whitney-U test for equality of distribution between Over 50% target and Under 50% target resulted in failing to reject the null hypothesis (Z=79, Sig= .484, p=.05). The Overconfidence index does not differ according to the SAMs success in targets.

According to the primary study (Jordão et al. 2009), the Overconfidence index suggest the presence of overconfidence when the coefficient is positive, both groups presented positive OC coefficients, the average OC for SAMs with under 50% target attainment was 30% lower than SAMS with under 50% attainment ($OC_{<50\%}$ = 1.51 vs $OC_{>50\%}$ = 1.16) (Table 3).

Hypothesis 5: Overconfidence is lower in SAMs with 5 or more years' experience than SAMs with fewer than 5 years.

A Mann Whitney-U test for equality of distribution between Over 5 years' experience and under 5 years' experience resulted in failure to reject the null hypothesis (Z=103, Sig= .839, p=.05). There is no significant difference in the overconfidence of more experienced SAMs.

The OC index of more experienced SAMs was positive and 27% lower than the OC of SAMs with under 5 years' experience (table 3).

				N	AR	CL	OC
What percentage of your partners hit their Year 1 target?	Over 50%			11	5.55	7.20	1.65
	Under 50%			27	5.74	7.04	1.30
How many years have you worked in a role relating to managing partners?	Over 5 years			16	5.56	7.09	1.53
	Under 5 years			21	5.81	7.11	1.30
What percentage of your partners hit their Year 1 target?	Over 50%	Do you set targets for new partners?	No	1	4.00	7.07	3.07
			Yes	10	5.70	7.21	1.51
	Under 50%	Do you set targets for new partners?	No	8	5.38	6.99	1.62
			Yes	19	5.89	7.06	1.16

4.4 Anchoring effect

To address the research objectives related to anchoring stated in chapter 3 and determine if the SAMs are susceptible to overconfidence bias as stated in Objective 1 and the relationship between experience and target reaching with anchoring bias, the following hypotheses and results were obtained:

Hypothesis 2: Estimates of the High anchor group are significantly higher than estimates from the low-anchor group.

The anchoring index (AI) was calculated, where 0 represents no anchoring, and a value above 0 indicates anchoring (Jordão et al., 2009). The AI for the whole group resulted in AI=0.71 indicating the presence of anchoring (Table 5). This could also be observed as the median estimates of the high anchored group have an average difference of 49% higher to the median of the estimates of the group exposed to a low anchor (table 5).

	Anchor		Calibration Group				High Anchored				Low Anchored				AI
	High	Low	Mean	Median	Min	Max	Mean	Median	Min	Max	Mean	Median	Min	Max	
Q1	7200	1600	2079	1250	300	5500	7041	6400	3200	10000	3586	2350	1700	12000	**0.72**
Q2	8377	3380	5440	4500	3000	15000	7353	6700	4000	12000	4255	4500	2300	6000	**0.44**
Q3	1880	500	2280	1500	800	10000	1544	1500	800	4000	998	900	180	3500	**0.43**
Q4	8.4	4.6	14.8	11	6	28	10.8	11	6	20	7.7	7	5	12	**1.05**
Q5	3140	560	1757	325	16	10000	2838	2800	0	5000	768	500	300	2000	**0.89**

Mean: 0.**71**

In line with the distribution of the data, the results of a Mann-Whitney U test for questions 2 and 5 confirmed that there was a statistically significant difference between the means of the high and low anchored group (question 2: Z=-3.813 and Sig <0.001; and question 5: Z= -3.661 and Sig < 0.001; p =0.05) (Table 4).

The distribution of questions 1, 3 and 4 allowed to compare the means with a t-Test and confirmed also that there was a significant difference between the high and low estimates at 5% significance (question 1: t = 4.325, Sig =<0.001; question 3: t = 3.136 and Sig = <0.001:and question 4: t= 2.606 and Sig = <0.001; p =0.05). A detailed representation of the means for each question can be seen in table 4.

	Mean		Std. Deviation	
	High	**Low**	**High**	**Low**
Q1	95.966	70.535	11.501	17.171
Q2	62.745	34.848	12.621	23.673
Q3	38.307	14.057	18.933	21.568
Q4	40.464	18.449	22.409	20.877
Q5	60.143	51.578	16.594	3.829
Mean	59.525	37.893		

Hypothesis 3: The anchoring index is higher in SAMs with a target attainment of under 50% than SAMs with target attainment of over 50%

Table 6 presents a summary of the Anchoring indexes calculated for the subgroup of SAMs divided by target attainment. The average AI of SAMs with under 50% target achievement show a difference of 60% higher than the AI of SAMs with a higher attainment (0.53 vs 0.33). However, for individual questions 3, 4 and 5 the AI is higher in the group of over 50% target.

Hypothesis 6: Anchoring is lower in SAMs with 5 or more years' experience than SAMs with fewer than 5 years.

The AI observed for SAMs with higher experience was 60% higher than the AI of SAMs with less than 5 years of experience (AI = 1.25 vs AI = 0.78) suggesting SAMs are more susceptible to anchoring when they are less experienced. Similar as in the previous hypothesis, not all questions showed a higher susceptibility, questions 3 and 4 had a lower effect in the estimates being anchored (Table 6).

The group of under 5 years' experience resulted in the highest AI coefficient of the subgroups observed with an AI of 1.25 (Table 6).

Table 6. Summary Anchoring indexes per subgroup

	AI				
	All groups **N=38**	**Over 50% hit target** **N=10**	**Under 50% hit target** **N=19**	**Over 5 years' experience** *N=16*	**Under 5 years' experience** **N=22**
Q1	0.72	0.04	0.71	-0.36	0.89
Q2	0.44	0.20	0.50	1.20	1.40
Q3	0.43	0.54	0.43	1.09	0.36
Q4	1.05	1.18	1.05	0.79	2.11
Q5	0.89	-0.33	-0.06	1.16	1.47
Mean	**0.71**	**0.33**	**0.53**	**0.78**	**1.25**

Table 7. Synthesis of Statistical Test Outputs

Objectives	Hypotheses	Results
Objective 1: Determine if SAMs are susceptible to overconfidence bias	Hypothesis 1: The confidence level of SAM's is higher than their accuracy	Wilcoxon test Z = -4.721 and Sig < 0.001, p = 0.05
Objective 2: Determine if SAMs are susceptible to the heuristic of anchoring	Hypothesis 2: Estimates of the High anchor group are significantly higher than estimates from the low-anchor group.	t-Test for questions 1 (t = 4.325 and Sig =<0.001), question 3 (t = 3.136 and Sig = <0.001) and question 4 (t= 2.606 and Sig = <0.001) *p* =0.05. Mann Whitney-U Whitney test for question 2 (Z=-3.813 and Sig <0.001) and question 5 (Z= -3.661 and Sig < 0.001) *p* =0.05
Objective 3: Analyse the relationship between overconfidence and anchoring bias and a partner meeting target expectations in Year 1.	Hypothesis 3: The anchoring index is higher in SAMs with a target attainment of under 50% than SAMs with target attainment of over 50%	The average AI observed for Under 50% target is higher at 0.53 than average AI for Over 50% target at 0.33.
	Hypothesis 4: Overconfidence is higher in SAMs with a target attainment of under 50% than SAMs with target attainment of over 50%	Mann Whitney-U Z=79, Sig= .484, *p* =.05.
Objective 4: Analyse the relationship between overconfidence and anchoring and SAMs number of years' experience.	Hypothesis 5: Overconfidence is lower in SAMs with 5 or more years' experience than SAMs with fewer than 5 years.	Mann Whitney-U Z=103, Sig= .839, *p* =.05.
	Hypothesis 6: Anchoring is lower in SAMs with 5 or more years' experience than SAM's with fewer than 5 years.	The observed average *AI* for SAMs with under 5 years' experience (*AI* = 1.25) is 160% higher than the AI of SAMs with more than 5 years' experience (*AI* = 0.78).

Chapter 5 - Discussion

5.1. Introduction

In this section the researcher returns to the research objectives and hypothesis with a presentation of the insights and issues raised from the robust data gathering and data analysis. It will discuss the practical applications of the findings along with placing them in relation to existing research.

5.2. Discussion

5.2.1 Consequences of Key Decisions of SAMs

With the causes of high failure rates of strategic alliances relatively unexplored, it was important to ensure that the research would contribute in the most effective way. In the initial stages of this research, it was found that partners failing to meet expectations is very common and is the most common reason for a partnership to be considered a failure. Expectations are often expressed using targets, which are often related to revenue. Following on from the initial interviews with SAMs, the author decided to focus on the decision making around setting these expectations, and the potential influences/practices that could lead to suboptimal decisions.

SAMs interviewed referred to targets being too high and unrealistic (Appendix A), and considered meeting such targets was an elusive goal. While some SAMs have partners that are consistently falling short of targets others refrain from setting any targets for this very reason. One may conclude that it is best not to set targets but as one SAM mentioned, it is important to aim for some metric. Therefore, the author decided to focus on the impact of overconfidence in regard to setting too high a target and anchoring in regard to sticking to this target even though it was based on a significant amount of uncertainty and lack of information at the start of an alliance. These findings confirmed the relevance to the study of the work of Klossek, Meyer and Nippa (2014), who suggested that when forecasting, managers are more inclined to focus on possibilities than on potential costs and dangers when evaluating collaborations that were successful in the past, regardless of how they are currently performing.

5.2.2 Susceptibility and Impact of Overconfidence on SAMs

In relation to the first research objective to determine if SAMs are susceptible to overconfidence bias, the research has found that SAMs are susceptible to overconfidence, with 60% of the participants in the sample scoring a positive overconfidence index (M=1.39, n=38). Therefore, it is justified to conclude that SAMs have a tendency to overestimate their knowledge and abilities, particularly their perspective regarding the accuracy of their knowledge. This confirms previous research that states that overconfidence is the most common type of cognitive bias (DeBondt and Thaler, 1995; Kahneman 2011; Bazerman and Moore, 2013).

These findings were the same as other empirical studies mentioned in the literature such as Chuang and Lee, (2006) in the case of managers of finance Dias et al., (2019) when comparing entrepreneurs and managers, found that both had the same bias. Ilieva, Brudermann and Drakulevski, (2018) which used similar general knowledge questions to test for overconfidence as used in this research also concluded that entrepreneurs are indeed prone to over precision, a type of overconfidence when people have an exaggerated faith that they know the truth mentioned in the literature. Whereas Huffman, Raymond and J. Shvets, (2019) reported that only 33% of the managers who participated in their study were considered by the results as overconfident.

As covered in Chapter 2, overconfidence commonly has a negative influence on decision making such as reported in the empirical evidence provided by Ahmad, Shah and Abbass, (2020). The implications of this are that overconfidence can contribute in a negative way to the success of an alliance, therefore it is imperative that they are aware of such biases. For example, as Koo Yang (2018) found, that often managers overestimate future payoffs on investments. As there is a lot of uncertainty at the beginning of an alliance the initial projections may be prone to be inflated, therefore setting targets based on these projections should be reviewed with an awareness of the likelihood of overconfidence.

The results found that the level of experience did not make a significant difference to the susceptibility to overconfidence (M=1.51 vs M= 1.16). SAMs should be aware of this, and not naively think that being experienced equals higher quality of decision making. This is in line with Ilieva, Brudermann and Drakulevski, (2018) and Nouri's et al. (2017) conclusions, who

both found that experience didn't have a significant impact on overconfidence levels. However, Szerb and Vörös, (2019) concluded that overconfidence fades with experience.

The research conducted also found that the level of overconfidence did not have a significant impact on the alliance partners of the SAM reaching their Year 1 targets. This was really interesting. SAMs level of overconfidence isn't correlated with target attainment. The question remains, did overconfidence have a positive impact on target attainment when in the case of high performing alliances there was the same level of overconfidence as the low performing alliance group. Therefore, the debate in the literature on the benefits of overconfidence should be considered (Johnson and Fowler 2011; Herz, Schunk and Zehnder, 2014; Zhang, Bij and Song, 2020).

As overconfidence is present in 60% of the SAMs studied, awareness is the first step and it is unlikely to decrease with experience. This may mean that initial targets are reduced until proved otherwise. A suggestion would be to explore alternatives to measuring performance based on the traditional revenue targets should be considered, such as agreeing on expected behaviours and then waiting to analyse the results of these behaviours before officially setting a target. Therefore, the target will be based on actual data rather than purely based on intuition should result in better decision making.

5.2.3 Susceptibility and Impact of Anchoring in SAMs

To address the second objective of determining if SAMs are susceptible to the heuristic of anchoring, according to the analysis of the results of the research on SAMs, it can be concluded that SAMs are susceptible to anchoring (AI=0.71). This is consistent with the findings of (Jordão et al., 2020; Ahmad, Shah and Abbass, 2020; Lorko, Servátka and Zhang, 2019).

Like overconfidence, anchoring often results in suboptimal decision making (Lieder et al., 2017); Costa et al., 2017; Nagtegaal et al., 2020). Anchors can influence SAMs to make irrational decisions. SAMs may look to confirm the anchor rather than disprove it, even when the number is irrelevant. Whether the initial target is consciously or unconsciously too high the SAM should be aware of the implications of setting a target. The target becomes an anchor that has a strong influence on decisions relating to it. The implications of this are that initial

estimates when dealing with informational and behavioural uncertainty should be treated as *best guesses* and therefore SAMs should try to look for falsifying insights or data to counteract our natural predisposition to search for confirming data (Moore and Schatz, 2017).

Regarding the third objective, Analyse the relationship between overconfidence and anchoring bias and alliances meeting target expectations in Year 1, in contrast to overconfidence, anchoring did have a significant difference with SAMs target attainment. The group of SAMs with high performing alliances are less susceptible to anchoring than the group of SAMs with low performing alliances (AI=0.33, AI=0.53, respectively). This suggests that anchoring has potentially more of a negative impact on target attainment than overconfidence. This would make sense because if an overconfident target can be adjusted based on real data feedback, the likelihood of falling short of a target may be lessened. Certainly, the continuation of missing targets should also be reduced as if the target was not anchored, it could be adjusted according to the actual data to avoid the alliance being considered a failure.

Consistently not meeting expectations is cited in this research as a common reason for partnership failure and as this has been referred to in the literature and through initial research. Therefore, we conclude in regard to the sample of this study that anchoring has a negative impact on year 1 target attainment of partners, it is justified to say that anchoring contributes to partnership failure.

Attending the fourth research objective to analyse the relationship between overconfidence and anchoring and SAMs number of years experience, in relation to analysing the relationship between experience and anchoring, there was also a significant result that suggested that the more experienced the SAM is, the less they are influenced by anchoring (AI = 1.25 vs AI = 0.78). This correlates to some of the more experienced participants not setting targets which was also mentioned in the initial scoping stage of this research. They highlighted that targets are often unrealistic and cause more harm than good as they become the measurement of success.

If the SAM or other stakeholders are anchored to an initial target it is important that the target is a realistic and accurate prediction of the potential of the alliance. Otherwise, alliances fail to meet these high expectations and due to the continued influence of the initial target, the alliance may consistently fall short of expectations and ultimately be considered a failure. Overall, the anchoring effect remains an issue for decision-making, and its benefits are rare and highly situational.

Chapter Six - Conclusion

6.1 Conclusion

Looking at the research question the paper aimed to answer: Do overconfidence and anchoring biases impact the partner manager's decision making in pursuing strategic alliances, which contributes to partnership failure? Key findings in relation to this research question are laid out as two parts, first addressing the presence of overconfidence and anchoring and second, addressing if these contributed to strategic alliance failures.

First of all, the results of the statistical analysis presented in chapter three show that SAMs do not follow the assumptions that neoclassical economists suggest in relation to rational decision making. The results are in line with the findings in the literature of Tversky and Kahneman and other behavioural economic contributors (Simon, 1955; Kahneman and Tversky, 1973; Tversky and Kahneman, 1974; Smith, 1976; Kahneman and Tversky, 1973; Kahneman and Tversky, 1979; Thaler, 1980; Thaler and Sunstein, 2008; Thaler, 2015. Ariely 2008) as explored in chapter two.

It was found in the quantitative analysis in chapter four that SAMs are susceptible to both anchoring and overconfidence. These tendencies have been identified as leading to suboptimal strategic decisions and, therefore, are likely to contribute to the failure of a strategic alliance.

Given the confirmation of the presence of overconfidence and anchoring biases discussed in the findings of this study and the existing literature linking cognitive biases to decision making, SAMs should be aware of the potential negative impact of these biases and try to create processes that avoid intuitive decision making as much as possible. SAMs and senior leadership in companies should create counter bias measures, one of which using behavioural economics principles known as "nudging", a method of suggestion and positive reinforcement to influence the behaviour and decision-making (Thaler, 2008).

Businesses may utilize the questionnaire-based research approach to assess the prevalence of cognitive bias among partner managers. Additionally, a suggestion for further research would be to get an understanding of the most frequent forms of biases. Doing so is likely to

be beneficial for developing ways to counter the biases and improve decision making by partner managers.

SAMs should be aware that cognitive biases may influence their initial projections when making the decision to pursue a partnership. They ought to seek to disprove the initial projections rather than seek for information to justify them. Thereby, they would counteract the susceptibility to set overconfident expectations and be reluctant to deviate from them. Agreeing on expected behaviours and then waiting to analyse the results of these behaviours before officially setting a target would allow for projections to be based on data rather than purely based on intuition. Such an approach would be likely to produce better decision making.

Finally, the author had an ambition to provide actual evidence for *how* the identified biases impact the decision-making of partner managers in relation to setting and achieving targets. The research was inconclusive in relation to the impact overconfidence had on the missing of targets but uncovered that the high performing partners were correlated with lower levels of anchoring in the SAMs. However, due to the limitations on the size of the sample, the author would be reluctant to suggest it was conclusive evidence for the industry to say that higher levels of anchoring are strongly correlated with Year 1 target attainment but it does indicate potential for further research.

6.2 Limitations and Future Research

It is recommended that future research uses a randomised sample from multiple types of industries to improve reliability, as well as distribution of a pilot survey with the purpose of identifying trends in the data and validating the questionnaire design. It is also recommended to expand the study of the factors influencing the success of partnerships in order to have a more comprehensive view of the reasons leading to alliances failure.

Research on the success of SAMs over a number of years with a group of participants who are made aware that they should be conscious of their susceptibility to cognitive biases and another group of participants that simply report on their success. This would determine our ability to combat against the biases through awareness as the first step.

As this research just looks at just two cognitive biases as dependent variables, future studies should also expand into other cognitive biases and look at the ways they interact with each other. Are there any unexpectedly beneficial consequences of cognitive biases for strategic alliance managers?

Even the most analytical thinkers are predictably irrational; the really smart ones acknowledge and address their irrationalities.

Dan Ariely

References

Abdi, M. and Aulakh, P.S. (2016). Locus of Uncertainty and the Relationship Between Contractual and Relational Governance in Cross-Border Interfirm Relationships. *Journal of Management*, 43(3), pp.771–803.

Acciarini, C., Brunetta, F. and Boccardelli, P. (2020). Cognitive biases and decision-making strategies in times of change: a systematic literature review. *Management Decision*, 59(3), pp.638–652.

Ahmad, M., Shah, S.Z.A. and Abbass, Y. (2020). The role of heuristic-driven biases in entrepreneurial strategic decision-making: evidence from an emerging economy. *Management Decision*, 59(3), pp.669–691.

AlKhars, M., Evangelopoulos, N., Pavur, R. and Kulkarni, S. (2019). Cognitive biases resulting from the representativeness heuristic in operations management: an experimental investigation. *Psychology Research and Behavior Management*, Volume 12, pp.263–276.

Alvino, L. and Franco, M. (2017). The decision-making process between rationality and emotions. *International Journal of Scientific Research and Management*, 5(9).

Ansoff, I.H. (1979), *Strategic Management*, Macmillan, London.

Ariely, D. (2008). *Predictably irrational : the hidden forces that shape our decisions*. New York: Harper Perennial.

Baddeley, M. (2012). Behavioural Economics and Finance. 1st ed. Hoboken:Taylor and Francis.

Baig, S., Zia-Ur-Rehman, M., Jamil, K., Hashim, M. and Iqbal, N. (2019). Impact of Behavioral Biases on firm performance: Mediating Role of Entrepreneurial Innovations. *Journal of Managerial Sciences*, 13(2).

Baratella, F.
(2007) Excesso de confiança: estudantes versus gerentes.Dissertação de Mestrado Apresentad a no Programa de Pós-Graduação em Administração daUniversidade Federal de Santa Catarina, Florianópolis.

Barberis, N.C. (2013). Thirty Years of Prospect Theory in Economics: A Review and Assessment. *Journal of Economic Perspectives*, 27(1), pp.173–196.

Belle, N., Cantarelli, P. and Belardinelli, P. (2017). Cognitive Biases in Performance Appraisal: Experimental Evidence on Anchoring and Halo Effects With Public Sector Managers and Employees. *Review of Public Personnel Administration*, [online] 37(3), pp.275–294. Available at: https://journals.sagepub.com/doi/abs/10.1177/0734371X17704891.

Bingham, C.B. and Eisenhardt, K.M. (2011). Rational heuristics: the "simple rules" that strategists learn from process experience. *Strategic Management Journal*, [online] 32(13), pp.1437–1464. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1002/smj.965.

Bouteska, A. and Regaieg, B. (2020). Loss aversion, overconfidence of investors and their impact on market performance evidence from the US stock markets. *Journal of Economics, Finance and Administrative Science*, 25(50), pp.451–478.

Cartwright, E. (2018). *Behavioral Economics*. 3rd ed. London ; New York: Routledge Taylor & Francis Group.

Chao, Y.-C. (2011). Decision-making biases in the alliance life cycle: Implications for alliance failure. Emerald Insight. *Management Decision*, [online] 49(3). Available at: https://www.emerald.com/insight/content/doi/10.1108/00251741111120743/

Chick, C.F., Pardo, S.T., Reyna, V.F. and Goldman, D.A. (2017). Decision Making (Individuals)☆. In: *Reference Module in Neuroscience and Biobehavioral Psychology*. [online] Elsevier. Available at: https://www.sciencedirect.com/science/article/pii/B9780128093245063938.

Chou, P.B., Bandera, C. and Thomas, E. (2017). A behavioural game theory perspective on the collaboration between innovative and entrepreneurial firms. *International Journal of Work Innovation*, 2(1), p.6.

Chuang, W.-I. and Lee, B.-S. (2006). An empirical evaluation of the overconfidence hypothesis. *Journal of Banking & Finance*, [online] 30(9), pp.2489–2515. Available at: https://www.sciencedirect.com/science/article/pii/S0378426606000227 [Accessed 29 Oct. 2020].

Cobeña, M., Gallego, Á. and Casanueva, C. (2017). Heterogeneity, diversity and complementarity in alliance portfolios. *European Management Journal*, [online] 35(4), pp.464–476. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0263237316301347?via%3Dihub.

Combrink, S. and Lew, C. (2019). Potential Underdog Bias, Overconfidence and Risk Propensity in Investor Decision-Making Behavior. *Journal of Behavioral Finance*, 21(4), pp.1–15.

Corr, P.J. and Plagnol, A.C. (2019). *Behavioral Economics : The Basics*. Abingdon, Oxon ; New York, Ny: Routledge.

Costa, D.F., de Melo Carvalho, F., de Melo Moreira, B.C. and do Prado, J.W. (2017). Bibliometric analysis on the association between behavioral finance and decision making with cognitive biases such as overconfidence, anchoring effect and confirmation bias. *Scientometrics*, 111(3), pp.1775–1799.

Costa, D., Moreira, B.C., Carvalho, F. and Silva, W. (2018). ANCHORING EFFECT IN MANAGERIAL DECISIONMAKING IN ACCOUNTANTS AND MANAGERS: AN EXPERIMENTAL STUDY. pp.425–445.

Czaja, D. and Röder, F. (2020). Self-attribution bias and overconfidence among nonprofessional traders. *The Quarterly Review of Economics and Finance*, 78.

Czerlinski, J., Gigerenzer, G., Goldstein, D.G., (1999). How good are simple heuristics?In: Gigerenzer, G., Todd, P.M., the ABC Research Group, Simple

Heuristics thatMake Us Smart. Oxford University Press, New York, pp. 97–118.*(1) (PDF) Decision Making: Nonrational Theories*. Available from: https://www.researchgate.net/publication/323839337_Decision_Making_Nonrational_Theori es

Das, T.K. (2016). *Decision Making in Behavioral Strategy*. Charlotte, Nc: Iap, Information Age Publishing.

Dhaundiyal, M. and Coughlan, J. (2020). UNDERSTANDING STRATEGIC ALLIANCE LIFE CYCLE: A 30 YEAR LITERATURE REVIEW OF LEADING MANAGEMENT JOURNALS. *Business: Theory and Practice*, 21(2), pp.519–530.

Dias, N., Avila, M., Campani, C.H. and Maranho, F. (2019). The Heuristic of Representativeness and Overconfidence Bias in Entrepreneurs. *Latin American Business Review*, 20(4), pp.317–340.

Drewniak, R. and Karaszewski, R. (2019). Diffusion of knowledge in strategic alliance: empirical evidence. *International Entrepreneurship and Management Journal*.

Etzioni, A. (2011). Behavioral Economics: Towards a New Paradigm.American Behavioral Scientist, 55(8), pp.1099-1119

Everett, C.R. and Fairchild, R.J. (2014). A Theory of Entrepreneurial Overconfidence, Effort, and Firm Outcomes. *SSRN Electronic Journal*, 17(1), pp.1–26.

Fabricius, G. and Büttgen, M. (2015). Project managers' overconfidence: how is risk reflected in anticipated project success? *Business Research*, 8(2), pp.239–263.

Furnham, A. and Boo, H.C. (2011). A literature review of the anchoring effect. *The Journal of Socio-Economics*, [online] 40(1), pp.35–42. Available at: https://www.sciencedirect.com/science/article/pii/S1053535710001411.

Gebrekidan, D.A. and Mukhtar, S.M. (2017). Determinants of the international strategic alliance process and alliance failure: learning from the Volvo-Renault break-up. *International Journal of Strategic Business Alliances*, 6(1/2), p.86.

Gigerenzer, G. and Gaissmaier, W. (2011). Heuristic Decision Making. *Annual Review of Psychology*, 62(1), pp.451–482.

Gigerenzer, G. and Gaissmaier, W. (2015). Decision Making: Nonrational Theories. *International Encyclopedia of the Social & Behavioral Sciences*, 5, pp.911–916.

Gregoriou, A., Healy, J.V. and Le, H. (2019). Prospect theory and stock returns: A seven factor pricing model. *Journal of Business Research*, 101, pp.315–322.

Heisenberg, W., Eckart, C. and Hoyt, F.C. (2009). *The physical principles of the quantum theory*. Mineola, Ny: Dover Publ.

Herz, H., Schunk, D. and Zehnder, C. (2014). How do judgmental overconfidence and overoptimism shape innovative activity? *Games and Economic Behavior*, 83, pp.1–23.

Hubbard, T.D., Pollock, T.G., Pfarrer, M.D. and Rindova, V.P. (2018). Safe Bets or Hot Hands? How Status and Celebrity Influence Strategic Alliance Formations by Newly Public Firms. *Academy of Management Journal*, 61(5), pp.1976–1999.

Huffman, D., Raymond, C. and J. Shvets (2019). Persistent overconfidence and biased memory: Evidence from managers*. *Pittsburgh: University of Pittsburgh.*

Ilieva, V., Brudermann, T. and Drakulevski, L. (2018). "Yes, we know!" (Over)confidence in general knowledge among Austrian entrepreneurs. *PLOS ONE*, 13(5), p.e0197085.

Jacowitz, K.E. and Kahneman, D. (1995). Measures of Anchoring in Estimation Tasks. *Personality and Social Psychology Bulletin*, 21(11), pp.1161–1166.

John Von Neumann and Oskar Morgenstern (1944). *Theory Of Games And Economic Behavior.* Princeton University Press, Princeton, New York 1953.

Jordão, A.R., Costa, R., Dias, Á.L., Pereira, L. and Santos, J.P. (2020). BOUNDED RATIONALITY IN DECISION MAKING: AN ANALYSIS OF THE DECISION-MAKING BIASES. *Business: Theory and Practice*, 21(2), pp.654–665.

Jory, S., Benamraoui, A., Tunahan, H. and Cedilitçi, U.S. (2019). A Critical Examination of Etihad Airways Equity Alliance Strategy using a Case Study Approach. *SSRN Electronic Journal*, pp.1–38.

Jullien, D. (2016). All Frames Created Equal Are Not Identical:
On theStructure of Kahneman and Tversky's Framing Effects. OEconomia, (6-2),pp.265-291

Kahneman, D. (1992). Reference points, anchors, norms, and mixed feelings. *Organizational Behavior and Human Decision Processes*, 51(2), pp.296–312.

Kahneman, D. (2011). *Thinking, fast and slow*. New York: Farrar, Straus And Giroux.

Kahneman, D. and Tversky, A. (1973). On the psychology of prediction. *Psychological Review*, 80(4), pp.237–251.

Kahneman, D. and Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, [online] 47(2), pp.263–292. Available at: .

Kahneman, D., Knetsch, J.L. and Thaler, R.H. (1990). Experimental Tests of the Endowment Effect and the Coase Theorem. *Journal of Political Economy*, 98(6), pp.1325–1348.

Kalinowski, S. (2020). From Expected Utility Theory To Prospect Theory: Tracking Down The Experimental Path After Forty Years. *Operations Research and Decisions*, 30(4).

Kent Baker, H., Ricciardi, V. and Filbeck, G. (2017). How Behavioural Biases Affect Finance Professionals. *The European Financial Review*.

Kiełczewski, D., Matel, A. and Poskrobko, T. (2016). Project Management
in Behavioural Perspective – Cognitive Biases in the Formulation of the Aim of the Project. *Ekonomia i Zarzadzanie*, 8(3), pp.70–78.

Klayman, J., Soll, J.B., González-Vallejo, C. and Barlas, S. (1999). Overconfidence: It Depends on How, What, and Whom You Ask. *Organizational Behavior and Human Decision Processes*, [online] 79(3), pp.216–247. Available at: https://www.sciencedirect.com/science/article/pii/S0749597899928479 [Accessed 26 Mar. 2020].

Klossek, A., Meyer, K.E. and Nippa, M. (2014). Why Do Strategic Alliances Persist? A Behavioral Decision Model. *Managerial and Decision Economics*, 36(7), pp.470–486.

Koo, J.-H. and Yang, D. (2017). Managerial Overconfidence, Self-Attribution Bias, and Downwardly Sticky Investment: Evidence from Korea. *Emerging Markets Finance and Trade*, 54(1), pp.144–161.

Kostis, A. and Näsholm, H.M. (2018). Balancing trust and distrust in strategic alliances. In: *Managing trust in strategic alliances*. Charlotte, Nc: Information Age Publishing - Iap, Inc, pp.103–127.

Lai, J.-H. (2020). Does Difference in CEO Overconfidence Propensity Create Value in Strategic Alliances? *Academy of Management Proceedings*, 2020(1), p.19458.

Lai, J.-H., Lin, W.-C. and Chen, L.-Y. (2017). The influence of CEO overconfidence on ownership choice in foreign market entry decisions. *International Business Review*, 26(4), pp.774–785.

Lee, J. (2020). Estimating the benefits and costs of forming business partnerships. *The RAND Journal of Economics*, 51(2), pp.531–562.

Leković, M. (2020). Cognitive Biases as an Integral Part of Behavioral Finance. *Economic Themes*, 58(1), pp.75–96.

Levy, M.R. and Tasoff, J. (2017). Exponential-growth bias and overconfidence. *Journal of Economic Psychology*, 58, pp.1–14.

Lieder, F., Griffiths, T.L., M. Huys, Q.J. and Goodman, N.D. (2017). The anchoring bias reflects rational use of cognitive resources. *Psychonomic Bulletin & Review*, 25(1), pp.322–349.

Li, L., Feifei Jiang, Pei, Y. and Nengqian Jiang (2017). Entrepreneurial orientation and strategic alliance success: The contingency role of relational factors. *Journal of Business Research*, [online] 72, pp.46–56. Available at: https://www.sciencedirect.com/science/article/pii/S0148296316306361.

Lin, H. and Darnall, N. (2014). Strategic Alliance Formation and Structural Configuration. *Journal of Business Ethics*, 127(3), pp.549–564.

Liu, H., Song, Y. and Yang, G. (2019). Cross-efficiency evaluation in data envelopment analysis based on prospect theory. *European Journal of Operational Research*, 273(1), pp.364–375.

Li, W.S. (2018). Creating value through strategic alliances. In: *Strategic management accounting: a practical guidebook with case studies*. Singapore: Springer, pp.193–216.

Lorko, M., Servátka, M. and Zhang, L. (2019). Anchoring in Project Duration Estimation. *SSRN Electronic Journal*, 162, pp.49–65.

Luan, S., Reb, J. and Gigerenzer, G. (2019). Ecological Rationality: Fast-and-Frugal Heuristics for Managerial Decision Making under Uncertainty. *Academy of Management Journal*, 62(6).

Lucena, E.R., Tibúrcio Silva, C. and Paiva Azevedo, Y. (2021). The Influence of Cognitive Ability on Cognitive Biases Generated by the Representativeness Heuristic. *Review of Business Management*, 23(1), pp.180–205.

Luiz Octávio Gavião, Annibal Parracho Sant'Anna, Gilson Brito Alves Lima and Pauli Adriano de Almada Garcia (2020). Evaluation of soccer players under the Moneyball concept. *Journal of Sports Sciences*, [online] 38, pp.1221–1247. Available at: https://doi.org/10.1080/02640414.2019.1702280.

Malhotra, S., Morgan, H.M. and Zhu, P. (2016). Sticky Decisions: Anchoring and Equity Stakes in International Acquisitions. *Journal of Management*, 44(8), pp.3200–3230.

Mallard, G. (2017). *Behavioural Economics*. [online] Newcastle upon Tyne: EBSCOhost. Available at: https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,cookie,shib&db=e020mww&AN=2143922&site=edslive&scope=site&custid=ncirlib.

Martínez-Mesa, J., González-Chica, D.A., Duquia, R.P., Bonamigo, R.R. and Bastos, J.L. (2016). Sampling: how to select participants in my research study? *Anais Brasileiros de Dermatologia*, 91(3), pp.326–330.

Mishra, S., Gregson, M. and Lalumière, M. (2011). Framing effects and risksensitive decision making. British Journal of Psychology, 103(1), pp.83-97.

Moore, D.A. and Healy, P.J. (2008). The trouble with overconfidence. *Psychological Review*, [online] 115(2), pp.502–517. Available at: http://healy.econ.ohio-state.edu/papers/Moore_Healy-TroubleWithOverconfidence.pdf [Accessed 10 Apr. 2019].

Moore, D.A. and Schatz, D. (2017). The three faces of overconfidence. *Social and Personality Psychology Compass*, 11(8), p.e12331.

Moosa, I. and Ramiah, V. (2017). Overconfidence and self-serving bias. In: *The Financial Consequences of Behavioural Biases*. Palgrave Macmillan, pp.83–95.

Nagtegaal, R., Tummers, L., Noordegraaf, M. and Bekkers, V. (2020). Designing to Debias: Measuring and Reducing Public Managers' Anchoring Bias. *Public Administration Review*, 80(4), pp.565–576.

Ng, D. (2020). Looking forward instead of backward. *Journal of Strategy and Management*, 13(3), pp.377–392.

Nouri, P., Talebi, K., Imanipour, N. and Zali, M. (2017). HEURISTICS AND BIASES IN ENTREPRENEURIAL MARKETING: SOME NEW INSIGHTS. *International Journal of Entrepreneurship*, 21(3).

Opper, S., Nee, V. and Holm, H.J. (2017). Risk Aversion and Guanxi Activities: A Behavioral Analysis of CEOs in China. *Academy of Management Journal*, 60(4), pp.1504–1530.

Parkhe, A. (1993). Strategic Alliance Structuring: A Game Theoretic and Transaction Cost Examination of Interfirm Cooperation. *Academy of Management Journal*, 36(4), pp.794–829.

Parveen, S. and Siddiqui, M. (2018). Anchoring Heuristic, Disposition Effect and Overconfidence Bias in Investors: A Case of Pakistan Stock Exchange. *Abasyn Journal of Social Sciences*, 11(2).

Patomaki, H. and Wight, C. (2000). After Postpositivism? The Promises of Critical Realism. *International Studies Quarterly*, 44(2), pp.213–237.

Robson, C. (2005). *Real world research : a resource for social scientists and practitioner-researchers*. Oxford: Blackwell.

Robson, M.J., Skarmeas, D. and Spyropoulou, S. (2006). Behavioral attributes and performance in international strategic alliances. *International Marketing Review*, 23(6), pp.585–609.

Russo, A. and Vurro, C. (2018). Alliance management knowledge and alliance performance: unveiling the moderating role of the dedicated alliance function. *Industrial and Corporate Change*, 28(4), pp.725–752.

Russo, M. and Cesarani, M. (2017). Strategic Alliance Success Factors: A Literature Review on Alliance Lifecycle. *International Journal of Business Administration*, [online] 8(3), p.1. Available at: http://www.sciedu.ca/journal/index.php/ijba/article/viewFile/11490/7069.

Ruth, M. (2020). Postpositivism. In: *Salem Press Encyclopedia*. [online] EBSCOhost. Available at: https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,cookie,shib&db=ers&AN=129815395&site=edslive&scope=site&custid=ncirlib.

Shepherd, D.A., Williams, T.A. and Patzelt, H. (2014). "Thinking About Entrepreneurial Decision Making: Review, Integration, and Research Agenda." *Academy of Management Proceedings*, 2014(1), p.10205.

Simon, H.A. (1955). A behavioral model of rational choice. *The Quarterly Journal of Economics*, [online] 69, pp.99–118. Available at: https://doi.org/10.2307/1884852.

Singh, R.P. (2020). Overconfidence. *New England Journal of Entrepreneurship*, 23(1), pp.25–39.

Smith, V.L., (1976). Experimental economics: Induced value theory. *The American Economic Review*, *66*(2), pp.274-279.

Smith, V.L. (2005). Behavioral economics research and the foundations of economics. *The Journal of Socio-Economics*, 34(2), pp.135–150.

Souissi, Y., Jarboui, A. and McMillan, D. (2018). Does CEO emotional bias affect performance? *Cogent Economics & Finance*, 6(1), p.1453452.

Szerb, L. and Vörös, Z. (2019). The changing form of overconfidence and its effect on growth expectations at the early stages of startups. *Small Business Economics*, 57(1), pp.151–165.

Tanlaka, E.F., Ewashen, C. and King-Shier, K. (2019). Postpositivist critical multiplism: Its value for nursing research. *Nursing Open*.

Thaler, R.H. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior & Organization*, [online] 1(1), pp.39–60. Available at: https://www.sciencedirect.com/science/article/pii/0167268180900517.

Thaler, R.H. (2000). From Homo Economicus to Homo Sapiens. *Journal of Economic Perspectives*, 14(1), pp.133–141.

Thaler, R.H. (2015). *Misbehaving : the making of behavioral economics*. New York: W.W. Norton & Company.

Thaler, R.H. and Sunstein, C.R. (2008). *Nudge: Improving decisions about health, wealth, and happiness*. New York. N.Y.: Penguin Books.

Thornton, S. (2021). *Karl Popper (Stanford Encyclopedia of Philosophy)*. [online] Stanford.edu. Available at: https://plato.stanford.edu/entries/popper/.

Tversky, A. and Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases. *Science*, [online] 185(4157), pp.1124–1131. Available at: https://science.sciencemag.org/content/185/4157/1124.

Tversky, A. and Kahneman, D. (1981). The framing of decisions and thepsychology of choice. Science, 211, pp.453-458

Čirjevskis, A. (2019). What Dynamic Managerial Capabilities Are Needed for Greater Strategic Alliance Performance? *Journal of Open Innovation: Technology, Market, and Complexity*, 5(2), p.36.

Ullah, I., Awais, M., Jebran, K. and Abidy, M. (2017). Overconfidence behavior and managerial decisions: Evidence from pakistan. *Research Journal of Finance and Accounting*, 8, pp.28–35.

Weber, L. and Mayer, K. (2014). Transaction Cost Economics and the Cognitive Perspective: Investigating the Sources and Governance of Interpretive Uncertainty. *Academy of Management Review*, 39(3), pp.344–363.

Westphal, J. (2008). The Resource Characteristics of Strategic Alliances, by James Westphal, University of Michigan, Ann ArborThe Resource Characteristics of Strategic Alliances, by WestphalJames, University of Michigan, Ann Arbor. *Academy of Management Review*, 33(2), pp.553–557.

Wu, M., Bai, T. and Zhu, S.X. (2018). A loss averse competitive newsvendor problem with anchoring. *Omega*, [online] 81, pp.99–111. Available at: https://www.sciencedirect.com/science/article/pii/S0305048317303560.

Xiao, H. (2020). Anchoring in international merger and acquisition equity decisions: evidence from Chinese firms. *Baltic Journal of Management*, 15(3), pp.395–410.

Zehir, C., Gurol, Y., Karaboga, T. and Kole, M. (2016). Strategic Human Resource Management and Firm Performance: The Mediating Role of Entrepreneurial Orientation. *Procedia - Social and Behavioral Sciences*, [online] 235(2), pp.372–381. Available at: https://www.sciencedirect.com/science/article/pii/S1877042816315798

Zhang, H., Bij, H. van der and Song, M. (2020). Can cognitive biases be good for entrepreneurs? *International Journal of Entrepreneurial Behavior & Research*, 26(4), pp.793–813.

Appendix A - Scoping Interview

Six Interviews were conducted via Zoom as part of an initial scoping stage of the research between the dates of July 6th and July 14th 2021 as described in Section 3.4.2.

The participants were members of the Sample as described in Section 3.5.

The questions were as follows:

1. How many years' experience do you have in partnerships?

2. What size company do you work for now and in the past

3. What is your thought process around starting a partnership?

4. What is your thought process around progressing a partnership?

5. Do you ever have partners that go on longer than they should? Why is that?

6. What is your thought process around terminating a partnership?

Following on from the initial interviews interesting conversations came up on targets, measuring performance and meeting expectations, so the following questions were added to the final three interviews:

1. Do you set targets?

2. Where do you get these targets from?

3. Do partners generally hit their targets?

Appendix B - Survey questionnaire

Title: Simon Turner MBA research survey

The purpose of this survey is to analyse the decision making process of partner managers.

The survey is voluntary and you can withdraw your participation at any time.

All responses and results will be kept anonymous and confidential.

The survey consists of the following sections:

Section 1: 7 Questions - Estimated Time to Complete - 1 minute

Section 2: 7 Closed Questions - Estimated Time to Complete - 2 minutes

Section 3: 10 Closed Questions with two parts in each - Estimated Time to Complete - 3 minutes

Section 4: 5 Questions with three parts in each - Estimated Time to Complete - 4 minutes

The quality of this work depends on the sincerity of your answers.

If you have any questions or doubts about this research, please contact me via e-mail: simontturner@gmail.com

Demographic Section

1.1, The results of this questionnaire will be anonymous but to help me track completions please write down your initials and the first letter of the company you work for.
1.2. By choosing Yes, I confirm that I would like to partake in this study.
Yes
No
1.3. What is your gender?
Male
Female
Prefer not to say
1.4. Please select your age range
≤ 25
26 to 35
36 to 45
46 to 55
56 to 65
≥ 66
1.5. How many years have you worked in a role relating to managing partners?
≤ 1 year
1 to 2 years
3 to 5 years
5 to 10 years
10 to 20 years
≥ 20 years
1.6. Do you set metric based targets for new partners?

Yes, the targets are based on revenue
Yes, the targets are based on revenue and other non-revenue metrics
Yes, the targets are based on other non-revenue related metrics
No, targets are not used to measure the success of a partnership
1.7. If yes, what percentage of your partners hit their Year 1 target? (Once again, the quality of this work depends on the sincerity of your answers)
0% to 24%
25% to 49%
50% to 74%
75% to 100%

Risk Aversion section

2.1 Please choose the one sentence below that best characterizes your risk preferences:
I am very willing to bear high risk in exchange for high expected returns.
I am willing to bear high risk in exchange for high expected returns.
I am unwilling to bear high risk in exchange for high expected returns.
I am not at all willing to bear high risk in exchange for high expected returns.
2.2. Would you accept a gamble with an equal chance of winning $15 or losing $5?
Yes, I would accept this gamble.
No, I would not accept this gamble.
2.3. Would you accept a gamble with an equal chance of winning $10 or losing $5?
Yes, I would accept this gamble.
No, I would not accept this gamble.
2.4. Would you accept a gamble with an equal chance of winning $8 or losing $5?
Yes, I would accept this gamble.
No, I would not accept this gamble.
2.5. Would you accept a gamble with an equal chance of winning $6 or losing $5?
Yes, I would accept this gamble.
No, I would not accept this gamble.
2.6. Would you accept a gamble with an equal chance of winning $5 or losing $5?
Yes, I would accept this gamble.
No, I would not accept this gamble.
2.7. Would you accept a gamble with an equal chance of winning $4 or losing $5?
Yes, I would accept this gamble.
No, I would not accept this gamble.

Overconfidence Section

3.1. What is the Armenian mountain are where the legendary Noah's Ark came to rest?
Mount Sinai
Mount Arat
3.1. How confident are you that your answer is correct? [Select one]
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%
3.2. Who was born first?
Sigmund Freud
Albert Einstein
3.2. How confident are you that your answer is correct? [Select one]

50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%
3.3. When was the airplane invented?
Before 1900
After 1900
3.3. How confident are you that your answer is correct? [Select one]
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%
3.4. What is the largest construction in the world, that can be visible from space?
The Great Wall of China
The Pyramids of Egypt
3.4. How confident are you that your answer is correct? [Select one]
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%
3.5. Which city is furthest north?
Dublin, Ireland
Montreal, Canada
3.5. How confident are you that your answer is correct? [Select one]
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%
3.6. Which of these stadiums has the largest capacity?
Azteca, Mexico
Wembely, United Kingdom
3.6. How confident are you that your answer is correct? [Select one]
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%
3.7. Which car brand is older?
Ford, American
Lanchester, English
3.7. How confident are you that your answer is correct? [Select one]
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%
3.8. Where was Paper invented, over 2000 years ago?
China
Egypt
3.8. How confident are you that your answer is correct? [Select one]
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%
3.9. Who is the patron saint of Italy?
St. Francis of Assisi
St. Anthony de Padua
3.9. How confident are you that your answer is correct? [Select one]
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%
3.10. Who founded the Bank of New York?
George Washington
Alexander Hamilton
3.10. How confident are you that your answer is correct? [Select one]
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

Anchoring section – Calibration group

Anchoring Section - Calibration Group
4.1a What is your estimate of the length of the Amazon river (in km)?
4.1b How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%
4.2a What is your estimate of the height of Mount Kilimanjaro (in metres)?

4.2b How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.3a What is your estimate of the distance between London and Munich (in km)?

4.3b How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.4a What is your estimate of the population of Rio de Janeiro (in millions)?

4.4b How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.5a What is your estimate of the number of babies who are born daily in Spain?

4.5b How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

Anchoring Section – High Anchoring Group

4.1a The Amazon River is greater or fewer than 7,200 km?
Greater Fewer

4.1b What is your estimate of the length of the Amazon river (in km)?

4.1c How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.2a The height of Mount Kilimanjaro is greater than or less than 8377 meters?
Greater Fewer

4.2b What is your estimate of the height of Mount Kilimanjaro (in metres)?

4.2c How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.3a The distance between London and Munich is greater or less than 1880 km?
Greater Fewer

4.3b What is your estimate of the distance between London and Munich (in km)?

4.3c How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.4a The population of Rio de Janeiro is greater or less than 8.4 million?
Greater Fewer

4.4b What is your estimate of the population of Rio de Janeiro (in millions)?

4.4c How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.5a The average number of babies born daily in Spain is greater than or fewer than 3140 babies?
Greater Fewer

4.5b What is your estimate of the number of babies who are born daily in Spain?

4.5c How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

Anchoring Section – Low Anchoring Group

4.1a The Amazon River is greater or fewer than 1,600 km?
Greater Fewer

4.1b What is your estimate of the length of the Amazon river (in km)?

4.1c How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.2a The height of Mount Kilimanjaro is greater than or less than 3380 meters?
Greater Fewer

4.2b What is your estimate of the height of Mount Kilimanjaro (in metres)?

4.2c How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.3a The distance between London and Munich is greater or less than 500 km?
Greater Fewer

4.3b What is your estimate of the distance between London and Munich (in km)?

4.3c How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.4a The population of Rio de Janeiro is greater or less than 4.6 million?
Greater Fewer

4.4b What is your estimate of the population of Rio de Janeiro (in millions)?

4.4c How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

4.5a The average number of babies born daily in Spain is greater than or fewer than 560 babies?
Greater Fewer

4.5b What is your estimate of the number of babies who are born daily in Spain?

4.5c How confident are you in the estimate made?
50% | 51% - 59% | 60% - 69% | 70% - 79% | 80% - 89% | 90% - 99% | 100%

Appendix C – Statistical Test Results

Test results

Overconfidence frequency

Overconfidence Index	
Bin	Frequency
-2.0	2
-1.5	3
-1.0	4
-0.1	4
0.5	6
1.0	0
1.5	6
2.0	1
More	10

Descriptive Statistics Overconfidence

	N	% of total	CL	AR	OC
Overconfidence					
Gender					
Female	5	13%	6.5	6.0	0.53
Male	31	82%	7.1	6.0	1.13
Experience					
≤ 1 year	3	8%	7.55	5.67	1.89
≥ 20 years	1	3%	6.72	6.00	0.72
1 to 2 years	8	21%	7.21	6.63	0.58
10 to 20 years	5	13%	7.07	6.80	0.27
3 to 5 years	10	26%	6.79	6.00	0.79
5 to 10 year	9	24%	7.04	5.11	1.93
Target Setting					
No, targets are not used to me	8	21%	6.88	6.25	0.63
Yes, the targets are based on	2	5%	6.82	6.50	0.32
Yes, the targets are based on	5	13%	6.79	5.40	1.39
Yes, the targets are based on	21	55%	7.19	6.00	1.19
Target Attainment					
<u>No, targets are not used to measure the success of a partners</u>			6.88	6.25	0.63
0% to 24%	7	18%	6.91	6.29	0.62
50% to 74%	1	3%	6.72	6.00	0.72
<u>Yes, the targets are based on other non-revenue related metr</u>			6.82	6.50	0.32
0% to 24%	1	3%	6.72	6.00	0.72
25% to 49%	1	3%	6.92	7.00	-0.09
<u>Yes, the targets are based on revenue</u>			6.79	5.40	1.39
25% to 49%	3	8%	6.56	6.00	0.56
50% to 74%	2	5%	7.14	4.50	2.64
<u>Yes, the targets are based on revenue and other non-revenue</u>			7.19	6.00	1.19
0% to 24%	7	18%	6.68	5.71	0.97
25% to 49%	6	16%	7.47	5.67	1.81
50% to 74%	7	18%	7.59	6.43	1.16
75% to 100	1	3%	6.23	7.00	-0.77
Over 50%			7.20	5.55	1.65
Under 50%			7.04	5.74	1.30
Over 50%	1.6. Do you set metric	No	7.07	4.00	3.07
		Yes	7.21	5.70	1.51
Under 50%	1.6. Do you set metric	No	6.99	5.38	1.62
		Yes	7.06	5.89	1.16

Anchoring indexes

	Anchor		Callibration Group (CG) n = 10				High Anchored (AG) n = 17				Low Anchored (aG) n = 11				AI
	High	Low	Mean	Median	Min	Max	Mean	Median	Min	Max	Mean	Median	Min	Max	
Q1	7200	1600	2079	1250	300	5500	7041	6400	3200	10000	3586	2350	1700	12000	0.72
Q2	8377	3380	5440	4500	3000	15000	7353	6700	4000	12000	4255	4500	2300	6000	0.44
Q3	1880	500	2280	1500	800	10000	1544	1500	800	4000	998	900	180	3500	0.43
Q4	8.4	4.6	14.8	11.0	6	28	10.8	11.0	6	20	7.7	7.0	5	12	1.05
Q5	3140	560	1757	325	16	10000	2838	2800	0	5000	768	500	300	2000	0.89
														Mean:	0.71

Over 50% *(n = 10)*

	Anchor		Callibration				High				Low				AI
	High	Low	Mean	Median	Min	Max	Mean	Median	Min	Max	Mean	Median	Min	Max	
Q1	7200	1600	2570	1000	5500	350	7750	7500	10000	6000	7250	7250	12000	2500	0.04
Q2	8377	3380	7000	5000	15000	3000	5875	6000	7500	4000	5000	5000	6000	4000	0.20
Q3	1880	500	3200	1500	10000	1000	1500	1250	2500	1000	500	500	700	300	0.54
Q4	8.4	4.6	13.60	12.00	25.00	6.00	9.75	10.50	12.00	6.00	6.00	6.00	7.00	5.00	1.18
Q5	3140	560	300	300	300	300	300	300	300	300	1150	1150	1500	800	-0.33
														Mean:	0.33

Under 50% *(n = 19)*

	Anchor		Callibration				High				Low				AI
	High	Low	Mean	Median	Min	Max	Mean	Median	Min	Max	Mean	Median	Min	Max	
Q1	7200	1600	1588	1500	2870	300	6823	6000	10000	3200	2772	2000	5000	1700	0.71
Q2	8377	3380	3880	3200	5000	3000	7808	7000	12000	5000	4089	4500	5000	2300	0.50
Q3	1880	500	1360	1500	1500	800	1558	1500	4000	800	1109	900	3500	180	0.43
Q4	8.4	4.6	16.00	10.00	28.00	6.00	11.17	12.00	20.00	6.00	8.06	8.00	12.00	5.00	1.05
Q5	3140	560	300	300	300	300	300	300	300	300	650	450	2000	300	-0.06
														Mean:	0.53

Over 5 Years Experience *(n = 16)*

	Anchor		Callibration				High				Low				AI
	High	Low	Mean	Median	Min	Max	Mean	Median	Min	Max	Mean	Median	Min	Max	
Q1	7200	1600	1000	5000	350	2117	8000	10000	4800	7400	2425	12000	2000	4308	-0.36
Q2	8377	3380	8000	15000	3000	8667	7500	12000	4000	7729	5000	6000	4000	4917	1.20
Q3	1880	500	2500	10000	1500	4667	1500	2500	1000	1529	650	1000	300	650	1.09
Q4	8.4	4.6	15.0	25.0	12.0	17.3	11.0	13.0	7.0	10.9	7.5	10.0	5.0	7.7	0.79
Q5	3140	560	2500	3000	400	1967	2500	5000	0	2443	650	2000	400	942	1.16
														Mean:	0.78

Less than 5 Years Experience *(n = 22)*

	Anchor		Callibration				High				Low				AI
	High	Low	Mean	Median	Min	Max	Mean	Median	Min	Max	Mean	Median	Min	Max	
Q1	7200	1600	1500	5500	300	2063	6200	10000	3200	6790	1900	5000	1700	2720	0.89
Q2	8377	3380	4000	5000	3000	4057	6400	12000	5000	7090	3000	5000	2300	3460	1.40
Q3	1880	500	1500	1500	800	1257	1400	4000	800	1555	1000	3500	180	1416	0.36
Q4	8.4	4.6	10.0	28.0	6.0	13.7	11.0	20.0	6.0	10.8	6.0	12.0	5.0	7.7	2.11
Q5	3140	560	250	10000	16	1667	3200	5000	1000	3114	500	1200	300	560	1.47

Statistical testing outputs

Tests of Normality[a,c,e,f,g]		Kolmogorov-Smirnov[b]			Shapiro-Wilk		
Anchor Group		Statistic	df	Sig.	Statistic	df	Sig.
4.1b	High	0.519	17	0.000	0.399	17	0.000
	Low	0.269	11	0.025	0.788	11	0.006
4.2b	High	0.158	17	.200[*]	0.921	17	0.153
	Low	0.284	11	0.013	0.760	11	0.003
4.3b	High	0.320	17	0.000	0.859	17	0.015
	Low	0.314	11	0.003	0.697	11	0.000
4.4b	High	0.253	17	0.005	0.859	17	0.015
	Low	0.266	11	0.028	0.801	11	0.010
4.5b	High	0.347	17	0.000	0.597	17	0.000
	Low	0.206	11	.200[*]	0.927	11	0.385
*. This is a lower bound of the true significance.							

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
4.1b	Equal variances assumed	4.728	0.039	4.709	26	0.000	25.432	5.401	14.330	36.533
	Equal variances not assumed			4.325	15.815	0.001	25.432	5.881	12.953	37.910
4.3b	Equal variances assumed	0.068	0.796	3.136	26	0.004	24.250	7.734	8.353	40.148
	Equal variances not assumed			3.046	19.438	0.007	24.250	7.961	7.614	40.887
4.4b	Equal variances assumed	0.014	0.907	2.606	26	0.015	22.014	8.448	4.649	39.380
	Equal variances not assumed			2.647	22.613	0.015	22.014	8.316	4.794	39.235

Anchoring Effect - Test Statistics[a]

	Q2	Q5
Mann-Whitney U	13.000	16.000
Wilcoxon W	79.000	82.000
Z	-3.813	-3.661
Asymp. Sig. (2-tailed)	0.000	0.000
Exact Sig. [2*(1-tailed Sig.)]	.000[b]	.000[b]
a. Grouping Variable: Anchor Group		
b. Not corrected for ties.		

Ranks				
Group		N	Mean Rank	Sum of Ranks
Q1	High	11	7.59	83.50
	Low	17	18.97	322.50
	Total	28		
Q2	High	11	7.18	79.00
	Low	17	19.24	327.00
	Total	28		
Q3	High	11	9.23	101.50
	Low	17	17.91	304.50
	Total	28		
Q4	High	11	9.77	107.50
	Low	17	17.56	298.50
	Total	28		
Q5	High	11	7.45	82.00
	Low	17	19.06	324.00
	Total	28		
b. 1 = High Anchored, 2 = Low Anchored				

Overconfidence statistical tests outputs

Test Statistics[a]	
	CLmean - ARmean
Z	-4.721[b]
Asymp. Sig. (2-tailed)	0.000
a. Wilcoxon Signed Ranks	
b. Based on negative	

Ranks				
		N	Mean Rank	Sum of Ranks
CLmean - ARmean	Negative Ranks	7[a]	6.43	45.00
	Positive Ranks	31[b]	22.45	696.00
	Ties	0[c]		
	Total	38		
a. CLmean < ARmean				
b. CLmean > ARmean				
c. CLmean = ARmean				

Over 50%

Ranks[a]

		N	Mean Rank	Sum of Ranks
CLmean - ARmean	Negative Ranks	1[b]	1.00	1.00
	Positive Ranks	9[c]	6.00	54.00
	Ties	0[d]		
	Total	10		

a. 1.7. If yes, what percentage of your partners hit their Year

b. CLmean < ARmean

c. CLmean > ARmean

d. CLmean = ARmean

Test Statistics[a,b]

	CLmean - ARmean
Z	-2.701[c]
Asymp. Sig. (2-tailed)	0.007

a. 1.7. If yes, what

b. Wilcoxon Signed

c. Based on negative

Under 50%

Ranks[a]

		N	Mean Rank	Sum of Ranks
CLmean - ARmean	Negative Ranks	4[b]	4.50	18.00
	Positive Ranks	15[c]	11.47	172.00
	Ties	0[d]		
	Total	19		

a. 1.7. If yes, what percentage of your partners hit their Year

b. CLmean < ARmean

c. CLmean > ARmean

d. CLmean = ARmean

Test Statistics[a,b]

	CLmean - ARmean
Z	-3.099[c]
Asymp. Sig. (2-tailed)	0.002

a. 1.7. If yes, what

b. Wilcoxon Signed

c. Based on negative

Comparing means of target attainment

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of OC is the same across categories of "What percentage of your partners hit their Year 1 target?"	Independent-Samples Mann-Whitney U Test	.484[c]	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

c. Exact significance is displayed for this test.

Comparing means of Experience

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of OC is the same across categories of "Years experience"	Independent-Samples Mann-Whitney U Test	.839[c]	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

c. Exact significance is displayed for this test.