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Administrative Sciences

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Suggested Citation: Nuijten, Arno; Benschop, Nick; Rijsenbilt, Antoinette; Wilmink, Kristinka (2020) : Cognitive biases in critical decisions facing SME entrepreneurs: An external accountants' perspective, Administrative Sciences, ISSN 2076-3387, MDPI, Basel, Vol. 10, Iss. 4, pp. 1-23,
<https://doi.org/10.3390/admsci10040089>

This Version is available at:

<https://hdl.handle.net/10419/240079>

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Article

Cognitive Biases in Critical Decisions Facing SME Entrepreneurs: An External Accountants' Perspective

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Received: 18 September 2020; Accepted: 1 November 2020; Published: 5 November 2020



Abstract: Decisions by small and medium enterprise (SME) entrepreneurs are plagued by a variety of cognitive biases. Extant literature has mainly focused on a limited number of important biases (e.g., overconfidence) in a handful of important entrepreneurial decisions (e.g., start-up, market entry or exit). However, putting the spotlight on a few important biases and entrepreneurial decisions could leave other important biases and decisions underexposed. SME accountants are in a unique position to shed a broader light on this issue. SME entrepreneurs often seek advice of their accountants when they struggle with decisions that involve uncertainty and business risks in the domains of strategy, regulatory compliance, human resources, IT, and succession. In this study, we explore 12 different biases and analyze whether their importance can change across these decision domains. Interviews were performed with 14 SME accountants who provide an independent third-party view on decision making by over 3000 entrepreneurs. Our findings suggest that the importance of most of these biases varies from one decision domain to the other. We also identified four approaches (warn, inform, intervene, and coach) that accountants can take when entrepreneurs may fall victim to biases. We discuss the implications for research and practice of SME entrepreneurs and their accountants.

Keywords: SME entrepreneurs; accountants; cognitive biases; decision making; debiasing

1. Introduction

Entrepreneurial decision making is a challenging task. The context in which entrepreneurs make decisions is extreme in various ways: high uncertainties and ambiguities, high consequences, time pressures, emotional anticipation, and reactions (Shepherd et al. 2015). Theory on bounded rationality (Simon 1947) suggests that in these types of decision environments, rational decision-making processes (referred to as system 2 by Stanovich and West 2000) are often pushed beyond their capabilities. When system 2 gets overwhelmed, decisions are dominated by the experiential and intuitive decision-making processes (referred to as system 1). Unfortunately, these system 1 decisions are prone to cognitive biases that can cause irrational decision making. As one solution to cope with the limitations of bounded rationality in organizational decision making, Simon (1947) introduced the idea of the so-called 'administrative man'. The administrative man, or woman, is someone who helps to provide organizations with objective and unbiased information to support decision making.

In line with this, Kahneman et al. (2011) recommend that for critical decisions, such as the introduction of new products, organizational decision makers should seek advice from an external party. Such a third party could contribute to more rational decision making by challenging assumptions and by uncovering potential biases in the decision-making process. A third-party role could therefore be of pivotal value to identify cognitive biases in entrepreneurial decision making (Abatecola et al. 2018, p. 412). External accountants fulfil this role for many small and medium enterprise (SME) entrepreneurs. They

are frequently sought for advice—and invited to challenge the entrepreneur—when entrepreneurs face critical decisions (Bennett and Robson 1999; Berry et al. 2006; Blackburn and Jarvis 2010; Suddaby et al. 2002). Therefore, SME accountants are in a unique position to provide insight in the way SME entrepreneurs make decisions across a variety of domains for which they seek the advice of their accountant.

To the best of our knowledge, our study is the first to examine biases in entrepreneurial decision making from the perspective of SME accountants. Following a similar approach, in the business research domain of managing complex IT projects, insights from practitioners in a third-party role (i.e., information systems auditors) were used to shed light on cognitive biases (Keil and Robey 1999; Keil et al. 2000; Nuijten et al. 2019). In this study, we propose that this third-party view offered by seasoned SME accountants could similarly provide a contribution to extant literature on entrepreneurial decision making.

Results from interviews with 14 Dutch SME accountants, seasoned in this role and who combined have serviced over 3000 SME entrepreneurs over the years, provide a view from a third-party perspective on how these entrepreneurs make decisions. Following a deductive thematic analysis approach, we examine how 12 documented cognitive biases compare to each other in how important they appear to be in SME entrepreneurs' decisions. This comparative view across multiple cognitive biases contributes to the existing body of knowledge since many studies in this domain focus on one or two individual biases in isolation. While extant literature on cognitive biases in entrepreneurial decision making has predominantly focused attention on entrepreneurs' overconfidence, our results suggest that other biases could warrant more research attention as well.

Furthermore, the findings from our study suggest that the importance of many of those cognitive biases on entrepreneurial decisions varies across five decision domains for which entrepreneurs seek advice of their external accountants. These results contribute to the discourse since most of the extant studies depict entrepreneurial decisions as strategic investment decisions (start-up, market entry) or exit decisions. Our results however suggest that entrepreneurs might struggle with cognitive biases across a wider range of critical decisions that involve business risks (other than strictly financial).

Finally, our interviews showed four different approaches (warn, inform, intervene, and coach) that SME accountants take when they encounter cognitive biases in entrepreneurial decision making.

The remainder of our paper is organized as follows: In Section 2, we describe the theoretical background of our study. In Section 3, we discuss how the data for our study were collected and analyzed. Section 4 provides an overview of our research results. Finally, we conclude with a discussion of the implications of our study for both research and practice in Section 5.

2. Theoretical Background

2.1. Research on Cognitive Biases in Entrepreneurship

Research on cognitive biases in entrepreneurship has increased rapidly since its inception in the early nineties and in two decades it has become an important research area for entrepreneurship (Zhang and Cueto 2017). From their structured literature review of research on entrepreneurial biases, Zhang and Cueto (2017) also portray the research domain (in our words) as fragmented: a lack of consistent use of definitions, showing overlap and redundancy in biases (like *overconfidence* and *overoptimism*). The figures in their review, as well as their analysis, also indicate a very high representation of in-depth studies that put the spotlight on individual 'popular' cognitive biases (like *overconfidence*)¹. Furthermore, after they defined a typology of cognitive biases to structure their assessment, Zhang and Cueto (2017) identified a need for research on relatively underexposed

¹ The literature review by Zhang and Cueto (2017) shows that 33 out of 41 papers focused on one single cognitive bias, 5 papers examined two biases and no papers investigated more than four biases in one study. More than half of all papers examined *overconfidence* or *overoptimism*.

biases related to emotions (for example on *affect heuristic*) or biases related to the social context of the entrepreneur (environmental pressure). Since the literature review by Zhang and Cueto (2017), we are aware of only one paper (Abatecola et al. 2018), who examined a combination of multiple cognitive biases, (including one associated with *affect heuristic*), and how they are related.

The tables in the review by Zhang and Cueto (2017), show that a large portion of the research on entrepreneurial biases examined specific biases in the context of strategic investment decisions (start-up, market entry) or exit decisions (disinvestments). While there is no doubt that those financial decisions have been proven to be very good candidates to examine cognitive biases in entrepreneurial decision making, this spotlight approach could raise the issue whether other entrepreneurial decisions involving business risks and uncertainties might be underexposed. Furthermore, it could raise the issue whether the importance of specific biases in strategic investment decisions carries to other domains of entrepreneurial decisions as well.

In our attempt to supplement the many valuable spotlight studies in this domain, we aim to shed broader light on these issues. Therefore, we explore the importance of a series of (12) cognitive biases across a broader range of entrepreneurial decisions that involve business risks and uncertainties and for which decisions entrepreneurs seek external advice from their accountants. From their third-party role, accountants are in the position to have an overview of various types of decisions that entrepreneurs struggle with and seek advice for, as well as the cognitive biases that entrepreneurs may fall victim to in those decisions. Interestingly, a very recent conceptual study by Liebrechts et al. (2020) confirms that people in the social context of entrepreneurs (like the accountants in our study) and who can observe entrepreneurs in their decision making processes, are in a unique position to examine cognitive biases and Liebrechts et al. (2020) find this a promising avenue to advance our understanding of entrepreneurial decision making.

Before we further elaborate the literature background of the decisions and the cognitive biases that we included in our study, we first define the two concepts—biases and heuristics—that we put central. *Bias* refers to the systematic deviation from rational choice theory when people choose actions and estimate probabilities (Tversky and Kahneman 1974). *Heuristics* refer to simplifying shortcuts or principles that people use for problem solving and information processing (Baron 2007). Heuristics are fast and frugal, freeing people from making complete and systematic and effortful processing of information. As heuristics simplify information processing, they are associated with biases. Both biases and heuristics are part of what Stanovich and West (2000) referred to as experiential and intuitive decision-making processes (labeled as system 1). Although biases are portrayed as deviations from rationality, we do not take the position that biases are always bad. Moreover, while it has been documented that biases influence risk perceptions as well as decisions that involve risk, the desirability of biases should be considered in the context of the risk appetite (or desired risk-taking behavior) of the organization (Croce et al. 2020). We think this warrants the value of our study to explore whether cognitive biases are equally important across different domains of entrepreneurial decisions that involve business risk and uncertainties.

In the remainder of this section, we use the third-party stance of the SME accountant to develop our theoretical background. First, we describe for what kind of decisions entrepreneurs seek the advice from their accountants and we clustered those decisions to domains. Next, we determine a list of cognitive biases from literature that we can use for the purpose of our study and that allows us to exploit the unique position that accountants have to observe cognitive biases in entrepreneurial decision making in real-life situations.

2.2. Domains of Decisions for Which SME Entrepreneurs Seek Advice from Accountants

Table 1 provides an overview of literature and shows the various decisions for which SME entrepreneurs seek advice from accountants. Based on this overview of the existing literature, we have identified five decision domains that accountants are involved in as advisors. Table 1 shows how

each of the various types of decisions from prior literature have been mapped to the following five decision domains:

- i. Strategy (e.g., advice on finances, business structuring, business transfers etc.)
- ii. Regulatory compliance (e.g., taxes, (ISO) compliance, health and safety etc.)
- iii. Human Resources (e.g., payroll, training and development, recruitment etc.)
- iv. Information Technology (e.g., information system implementation, security, IT system support)
- v. Succession planning (e.g., inheritance, ownership transfer etc.).

Table 1. Types of decisions in which entrepreneurs seek advice of accountants

Study:	Types of Decisions:
Gooderham et al. (2004)	(i). * business structure (company set-up), budgeting, marketing/sales, strategic planning, valuation of firms/mergers/demergers, (iii). pension schemes, management, organization, HRM, training and skills development, remuneration schemes, salary, (iv). implementation administrative routines, IT, (v). inheritance, generation transfer, owner transference
Berry et al. (2006)	(i). business advice, emergency advice, financial management, (ii). statutory services
Blackburn et al. (2006)	(ii). regulations and compliance, (iii). advice on employment and payroll
Van Teeffelen (2006)	(v). business transfers
Leung et al. (2008)	(ii). regulatory compliance, health and safety, environment
Doving and Gooderham (2008)	(i). closure of firms, (ii). tax/tax planning, type of company entity, (iii). recruitment
Devi and Samujh (2010)	(i). business formation, business plans, business valuation, due diligence, financing arrangement, liquidation/corporate recovery, mergers/ acquisitions, strategic planning, (ii). compliance, filing of tax returns, ISO standards internal control systems, forensic accounting, internal audit, statutory audit, (iii). loan application, payroll, recruitment, secretarial services, (iv). IT system implementation
Hasle et al. (2010)	(ii). health and safety, employment
Blackburn and Jarvis (2010)	(i). acquisition and new business advice, financial modeling, business structuring, purchase and sale of business, planning and forecasting, business strategy, financial advice, due diligence, investment strategy, (ii). forensic accounting, asset protection (iii). HR, payroll, company secretary, (iv). IT, (v). retirement planning, succession planning
Jarvis and Rigby (2012)	(iii). HR and employment issues
Ismail and King (2014)	(iv). IT system advice and support

* Roman numerals indicate to which of the five decision domains, described in the text above, each specific decision type has been assigned.

2.3. Cognitive Biases That Can Affect SME Entrepreneurs

To serve the purpose of our study, we selected a set of appropriate cognitive biases following an approach that is similar to the one that was followed by Cristofaro (2017). Since our research design required in-depth interviews with SME accountants, we decided that 60 topics would be our maximum (12 biases across 5 decision domains). Therefore, we limited ourselves to 12 biases so that it would remain possible to interview respondents in one interview.

Given the design of our study, biases should show in practice and must be recognized and easily distinguished by accountants from a third-party stance. We derived our set of biases from an initial literature review on SME entrepreneurial biases and we tested and refined the set of biases in our pilot with SME accountants. We also asked them whether important biases were missing.

At the time we set up our study, we were not familiar with the list of important biases that Zhang and Cueto (2017) derived from SME literature. Nevertheless, we have 8 out of 12 biases in common with their list. Four biases from their list are not in ours, and we think for good reason, since they appeared to be conceptually confusing for our respondents (too proximate with other biases we did include). From their list we did not have in ours: *law of small numbers* (could be confused with *representativeness bias*), *self-serving attribution* (is more hindsight to the decision, and could be confused

with *confirmation bias* and *illusion of control*), *similarity* (could be confused with *confirmation bias* and *affect heuristic*), and *over-optimism* (could be confused with *overconfidence*).

Furthermore, we included four biases that were not in Zhang and Cueto's list. First, we included the more generic *confirmation bias*, that covered the more situated bias *similarity* in Zhang and Cueto's list. Next, we included *groupthink* which blends well with Zhang and Cueto's call to examine biases related to the entrepreneurs' social context. The accountants in our pilot mentioned that many entrepreneurs participate in entrepreneurial network events from Rotary, Lions and alike. There they discuss and exchange business decisions to larger extent and get influenced by other entrepreneurs as well as some entrepreneurs get influenced by family members who are or have been involved in the SME. We also included two biases that were not in Zhang and Cueto's list but which blend well with their call to do further research on biases that are associated with SME entrepreneurs' emotions. We added *affect heuristic* that taps into the happiness emotion (proposed by accountants who told of entrepreneurs who felt in love with their products and company). And finally, our fourth added bias is *regret* that taps into the fear emotion of 'missing the boat', which was also mentioned by the accountants in our pilot. Following this approach, we arrived at the set of 12 cognitive biases and heuristics that we will briefly introduce.

2.3.1. Bias #1: Anchoring

Anchoring is a heuristic that influences one's intuitive judgment. Individuals subconsciously base their decisions on a reference point, the so-called anchor, and subsequently make adjustments to this initial anchor to come to their estimation or judgment. However, these adjustments are often insufficient causing the ultimate outcome to be biased towards the initial anchor, thereby limiting rational decision making (Tversky and Kahneman 1974). For example, in negotiations, the first offer made forms the anchor, causing the outcome of the negotiations to be strongly influenced by the first offer (Galinsky and Mussweiler 2001). Similarly, the entrepreneurial decision of whether to start a new venture has also been found to be subject to the anchoring bias (Barbosa and Fayolle 2007).

2.3.2. Bias #2: Availability Heuristic

The availability heuristic is a mental shortcut where prior examples that easily come to mind can receive disproportionate weight in decision making (Tversky and Kahneman 1973; Palich and Bagby 1995). As such, strongly positive or negative experiences, which come to mind easily, can strongly bias the decision-making process. Recent experiences have also been shown to come to mind more easily than experiences from a long time ago. In this context, entrepreneurs have been found susceptible to the availability heuristic in a study which showed that the decision of whether to found a new venture was strongly biased based on recent experiences (Barbosa and Fayolle 2007).

2.3.3. Bias #3: Confirmation Bias

The confirmation bias causes individuals to look for information that supports their opinion or decision, while disregarding information that is contradicting (Baron 2004). Entrepreneurs have been found to be prone to the confirmation bias, particularly when they have not experienced failure before. These entrepreneurs tend to overestimate their own previous successes, focusing on positive information and thereby rejecting disconfirming evidence (Carr and Blettner 2010).

2.3.4. Bias #4: Regret and Counterfactual Thinking

Counterfactual thoughts are thoughts that form an alternative to past events or situations, whereby one thinks about "what could have happened if . . . ". This can lead to forming alternative strategies for the future, which in turn can influence decision making processes (Baron 2013). Related to counterfactual thinking is the concept of regret, a counterfactual emotion, which is also strongly associated with decision making. Mullins and Forlani (2005) and Zeelenberg (1999) documented the regret effect in the field of new venture decisions and SME as the 'fear of missing the boat'. Family firms are more prone to regret in

terms of family-based circumstances as well as business-related regret. The experienced regret in a family firm has been found to bias decision making (Hirigoyen and Labaki 2012).

2.3.5. Bias #5: Escalation of Commitment

Escalation of commitment occurs when decision makers overcommit to a previously chosen course of action, despite negative feedback indicating that this will not lead to success (Staw 1976). The longer people continue along the same path, the more difficult it generally becomes for them to change direction (Drummond 2004). Escalation of commitment in the context of SME's is primarily caused by a shortsighted vision as well as by the mixing of economic and personal interests (Drummond 2004). Furthermore, entrepreneurs are often highly dedicated to making their firm a success, which can hamper their ability or willingness to recognize that they, or their firm, are currently on a failing course of action. As long as this is not recognized, entrepreneurs are prone to escalation of commitment (Baron 1998).

2.3.6. Bias #6: Illusion of Control

The illusion of control bias occurs when people overestimate the amount of control that they have over a situation. It specifically constitutes an 'illusion' of control in the case where someone believes to have control even over those outcomes which are objectively outside of their control (Langer 1975). Entrepreneurs have been shown to be more inclined to overestimate the amount of control that they have. Due to this illusion of control they tend to underestimate risks, since they believe their own skills can prevent potential negative outcomes (Keh et al. 2002; Le Roux et al. 2006).

2.3.7. Bias #7: Overconfidence

In the context of our study, overconfidence comes in the form of the tendency to overestimate the correctness of an initial assessment in relation to complex situations (Busenitz and Barney 1997). Whereas the illusion of control relates to the false belief of having control over situations outside one's control, overconfidence relates to overestimating one's personal chances of success in any situation. Entrepreneurs have been found to show more overconfidence than managers in large organizations (Busenitz and Barney 1997; Forbes 2005). This has been related to differences in individual characteristics and the complexity and uncertainty that many entrepreneurs face, amongst others (Forbes 2005).

2.3.8. Bias #8: Planning Fallacy

The planning fallacy is associated with overoptimism in estimations about the amount of work that can be completed within a certain time period (Baron 1998; Kahneman and Lovallo 1993). This is often the result of assuming ideal circumstances or of underestimating or not accounting for events or risks that can add to the workload. The planning fallacy is more likely to occur in environments which are characterized by new and unique situations including a lot of uncertainty. These are also the types of environments that entrepreneurs operate in. Similarly, entrepreneurs have a more difficult time basing their estimations on prior experiences, an approach which has shown to reduce the planning fallacy (Kahneman and Lovallo 1993), due to the typically smaller size and younger age of the firm (Baron 1998).

2.3.9. Bias #9: Representativeness Bias

The representativeness bias can make decision makers falsely assume that limited experiences can be generalized and apply in all instances. Recognizing elements of past experiences in new situations can lead decision makers to incorrectly draw analogies and assume the same result will be achieved once more (Schwenk 1984). Busenitz and Barney (1997) conclude that entrepreneurs are more subject to the representativeness bias than managers in large organizations. Simon et al. (2000) argue that entrepreneurs are prone to the representativeness bias because they lack past examples on which to

base estimations, forcing them to rely on the limited amount of data that they do have, which can lead to oversimplified analogies of complex situations. In line with this, [Mehrabi and Kolabi \(2012\)](#) show that representativeness negatively influences the quality of strategic decisions by entrepreneurs.

2.3.10. Bias #10: Status Quo Bias

The status quo bias is a tendency to stick to previously made choices and decisions, thereby sticking with and being unwilling to deviate from past decisions either made by yourself or by someone else, even if this is no longer rational ([Burmeister and Schade 2007](#)). [Burmeister and Schade \(2007\)](#) argue that entrepreneurs are not necessarily more prone to the status quo bias than other decision makers. However, they do argue that the status quo bias is more likely to occur in decisions or situation that the decision maker has a lot of experience with. Previous experience leads to a reduction in flexibility and a less varied range of potential choices ([Burmeister and Schade 2007](#)). In line with this, [Gibbons and O'Connor \(2005\)](#) found that the experience of SME CEO's was positively related to their commitment to the status quo.

2.3.11. Bias #11: The Affect Heuristic

Often, decisions are not made mostly based on the objective weighting of pros and cons but rather on how "good" or "bad" something feels, i.e., we buy the products, or hire that people, that we "like". This is referred to as the affect heuristic. Such affective reactions have been found to be important in decision making by entrepreneurs ([Baron 2008](#)) and entrepreneurs are often passionate people who follow their emotions ([Cardon et al. 2009](#)). In line with this, [Nouri et al. \(2017\)](#) describe that entrepreneurs may be particularly susceptible to the affect heuristic. For example, affect has been shown to have an influence on entrepreneurial opportunity evaluation ([Foo 2011](#)) and the pursuit of entrepreneurial ideas and even the decision to become an entrepreneur and start a business ([Hayton and Cholakova 2012](#)).

2.3.12. Bias #12: Groupthink

Whereas the previous biases are all focused on decision making by the individual, groupthink is a bias which can occur when people make decisions in a group. Groupthink originates from the human tendency to not want to go against the group. Groupthink occurs when "*the members' strivings for unanimity override their motivation to realistically appraise alternative courses of action*" ([Janis 1972](#), p. 9). Groupthink tendencies in entrepreneurial teams can threaten entrepreneurial adaptation and renewal of the firm ([Kor et al. 2007](#)). In high-velocity environments ([Bourgeois and Eisenhardt 1988](#)), a free exchange of views among entrepreneurs is preferred to conformist thinking ([Hambrick 1995](#)).

3. Method

3.1. Research Design

In order to explore the importance of the 12 identified biases in each of the 5 decision domains, we performed in-depth interviews with 14 accountants who have experienced biases in SME decision making firsthand. In these structured interviews we collected both qualitative and quantitative data regarding the importance of each bias in the various decision domains. Following a deductive thematic analysis approach, we collected and analyzed these data as we will describe further in Section 3.3. Repeated Measures ANOVAs were performed to assess whether the importance of each bias differed across decision domains.

3.2. Interviewees

Fourteen experienced accountants were recruited to participate in the interviews. These SME accountants were recommended to us, by the Dutch association of Public Accountants, for their extensive experience with SME entrepreneurs. Prior to starting the interview, we first asked each

accountant to what extent they had experience with the type of decisions involved in our study. Table 2 provides relevant characteristics of the interviewees, which they provided upon request. The Table lists the amount of years the respondents have been acting in this role, the sectors in which their customers are active, and the number of SME entrepreneurs that have sought their advice. Our interviewees had an average of 20 years of experience and they advised 200 entrepreneurs on average. The combined experience of all 14 interviewees together reflects decisions made by more than 3000 SME entrepreneurs cumulated.

Table 2. Characteristics of our interviewees.

Accountant	Years of Working Experience with SME Entrepreneurs	Estimated Number of SME Entrepreneurs	Sectors in which the SMEs Were Active (Predominantly)
#1	21	>100	Trade, manufacturing, services
#2	18	>100	Hotel, catering, manufacturing, services
#3	11	>100	Building, transportation, manufacturing, wholesale
#4	22	300	Mostly flowers and food
#5	32	>300	Manufacturing, wholesale, retail, transportation, agriculture
#6	34	300	Construction, manufacturing, services, wholesale, retail, hotels
#7	20	100	Retail, manufacturing, construction, hotels and restaurants
#8	29	200	Services, manufacturing, wholesale, retail, restaurants
#9	15	>100	Construction, manufacturing, automotive, retail
#10	17	>300	Construction, agriculture, retail, manufacturing
#11	31	>300	Retail, manufacturing, automotive, wholesale
#12	34	250	Retail, wholesale, manufacturing, hotels and restaurants
#13	22	>300	All types of SMEs except agriculture
#14	37	>300	Retail, manufacturing, services, food

3.3. Materials Development and Pilot Testing

Interview materials were prepared to facilitate the collection of the intended qualitative and quantitative data. Since interviewees were asked to provide us with input on 12 different biases, we prepared plasticized cards with information on each of the biases. These cards contained the name of the bias, a brief description of the bias and an illustration associated with the bias. In this way, the interviewees could refer to the biases and their descriptions at any time during the interview. A pilot test with 3 accountants (who were excluded from our sample for the main study) was used to assess whether the descriptions and illustrations on these cards were clear and understandable to our target sample. Based on the pilot a few minor changes were made to the wording on the cards and to two of the illustrations.

In a similar way, we prepared 5 plasticized cards that represent the decision domains discussed in Section 2, i.e., strategy, regulatory compliance, human resources, information technology and succession planning. Each of these cards provided a brief description of the domain, as well as a few examples of decisions within this domain. These cards were also pilot tested with 3 accountants. The accountants recognized and validated the decision domains included in our study. Input obtained from the pilot test allowed us to make a few minor refinements to the wording on the cards prior to the subsequent 14 interviews.

3.4. Data Collection and Analysis

Our interview data were structured and analyzed using thematic analysis. Specifically, we performed a deductive, or theory-driven, thematic analysis approach (Boyatzis 1998; Braun and Clarke 2012). In doing so, we followed an approach similar to that of Cristofaro (2017), who also applied a

theory-driven thematic analysis approach based on structured interviews in which the role of multiple cognitive biases in decision making on an organizational context was explored.

Prior to performing the interviews, a theoretical framework was developed. This framework consisted of descriptions of the 12 cognitive biases that can play a role in decisions for which entrepreneurs ask for advice from SME accountant. The biases that formed the framework were identified in our analysis of the literature and subsequently validated via a set of pilot interviews.

As part of the thematic analysis, themes have to be identified which constitute “a pattern of meaning . . . across a dataset” (Braun and Clarke 2012, p. 57) and “a pattern in the information that at minimum describes and organises the possible observations” (Boyatzis 1998, p. 161). Given the deductive approach, the themes for our thematic analysis constituted the 12 predefined biases, and their corresponding descriptions.

Individual codes are associated with each theme, and each theme can contain a variety of codes (Braun and Clarke 2012). In deductive thematic analysis, these codes, like the themes, are typically predefined and theory-driven (Braun and Clarke 2012). The codes for our thematic analysis were developed with the intent to capture the importance of the biases in each of the 5 decision domains described in Section 2. As such, coding was performed using a predefined set of 60 codes, one for each unique combination of bias (12) and decision domain (5). These codes were applied to the input provided by the interviewees on the corresponding bias/domain combination. This input included the interviewees discussion of the importance of said bias in that specific domain: the score of the importance on the 5-point Likert scale, the supporting explanation, arguments, examples, and anecdotes.

Descriptions of the 12 themes, i.e., the biases, were provided during each interview. Each interviewee was asked to read this description aloud and to indicate whether this description was clear to them. A similar procedure was followed for each of the 5 decision domains. As such, we were able to clearly convey the meaning of each of the biases and decision domains and to verify whether interviewees understood these correctly. Based on this understanding, interviewees were able to accurately provide information in relation to each of the 60 codes included in our study.

The interviews were conducted in private and lasted between 90 and 120 min, in which each bias/domain combination was discussed. All interviews were recorded to accurately and completely capture interviewees' responses. Our data were stored in an electronic research database that contained: (1) the materials, i.e., cards and interview protocol, (2) audio files that captured our interviews, (3) a spreadsheet that contains for each respondent the validity test results and the input related to each of our 60 codes (including scores and brief explanations or anecdotes, completed with a time stamp that allowed a drill down to the corresponding text fragment in the audio file).

The data generated from the interviews were subsequently coded. Specifically, answers provided by interviewees were analyzed and assigned the corresponding code, where appropriate. The coded segments were gathered, analyzed, and compared across interviews. Findings related to individual codes were also grouped in the corresponding themes which formed the basis for the qualitative analysis of whether, or how, the importance of a specific bias differed across decision domains.

3.5. Data Quality Assessment

Before we further analyzed the results from our data collection, we assessed whether the quality of our data was sufficient to serve the purpose of our exploratory study. More specifically, we examined whether the data collected from these 14 interviewees formed a sufficient basis to draw conclusions. Therefore, we considered both the qualitative and the quantitative aspect of our data.

With regard to the question of whether 14 interviewees would be sufficient to draw conclusions from our qualitative data, we examined whether our data provides evidence of saturation. For that purpose, we assessed the rankings of each bias across the 5 decision domains. Specifically, we assessed whether the overall ranking of individual biases (from highest to lowest) changed when the number of interviews increased. Our data shows that after 12 interviews, no biases from the 7 (out of 12)

highest ranked biases changed position when we moved to the 13th and 14th interviews. In those 2 last interviews, only very minor changes were found in the lower ranked biases which flipped places between 8th, 9th, and 10th position in the ranking. The lowest ranked biases (11th and 12th) no longer changed positions after the 12th interview. We think this analysis provides evidence that we had reached saturation when we stopped collecting data after 14 interviews.

With regard to the question of whether 14 interviewees would be sufficient to draw conclusions from our quantitative data, we examined whether our data would allow hypothesis testing that biases vary (means are significantly different) across the 5 decision domains that we identified. With a Repeated Measures ANOVA, we tested whether the means of 5 cells with 14 observations are equal. Assuming that our $N = 14$ would be too low and would suggest that a type II error could exist in our data. In that case we would not find any significant effects from our hypothesis testing due to a lack of N . No such problem showed from the results, which we will present later in Table 3 and include the results of hypothesis testing, significance, and effect sizes.

Next to the number of interviewees, we also examined whether our data contained any indications that could question its reliability. More specifically, we questioned whether the interviewees themselves were biased in their observations of entrepreneurial decisions. From literature, we already knew that this would likely not be the case in observations from a third-party position. From the background and experience of our interviewees (as described in Section 3.2), the large number of SMEs that our interviewees discussed, the many anecdotes that were provided in our interviews, as well as the coherence of findings across the interviews, we have no reason to doubt the reliability of the data that we obtained from the 14 interviews.

Taken this together, we found that the data from the 14 interviews provided a sufficient basis to draw the conclusions that we did in the context of this exploratory paper. With our study we do not attempt to generalize to a population, like many survey studies in this domain do. Our contribution with this explorative study is to obtain a more rich and coherent insight on cognitive biases in entrepreneurial decision-making across 5 different decision domains in which SME entrepreneurs seek advice from their external SME accountant. We assessed that the quality of our data serves that purpose. The results of our analyses are discussed extensively in Section 4.

4. Analysis & Results

4.1. Overview of the Importance of Each Bias across Decision Domains

Table 3 provides an overview of the overall scores of the biases across decision domains. The rows of the table represent the biases and the column represents the decision domains. Each cell provides information of the mean score from the fourteen interviewees on the importance of a specific bias in a certain decision domain. Furthermore, each cell also provides a relative ranking (from highest to lowest) of the mean score of that bias compared to the mean scores of the other biases in that domain.

As can be seen from looking at the individual rows of Table 3, the mean scores and the relative rankings of a bias can vary strongly across the five decision domains. For example, the *affect heuristic*, which is rated by the interviewees to be the second most important bias in the HR decision domain with a mean score of 3.86, is actually rated as the least important bias in the law decision domain, with a mean score of just 2.14. The *affect heuristic* is, however, not the only bias for which scores differ across domains. For nine of the biases, the difference between the highest ranking and the lowest ranking across the five domains is at least six places (e.g., highest ranking as 1st and lowest ranking as 7th).

Table 3. Rankings and mean scores of each bias across decision domains.

Bias	Strategic Decision Domain	Regulatory Compliance Decision Domain	HR Decision Domain	IT Decision Domain	Succession Planning Decision Domain	Bias Mean Score (Scale 1–5)
<i>Planning fallacy</i>	2nd * 4.14 ^	5th 3.07	9th 3.14	1st 4.00	3rd 4.11	3.69
<i>Escalation of commitment</i>	4th 3.89	9th 2.46	3rd 3.71	2nd 3.82	4th 3.86	3.55
<i>Status quo bias</i>	3rd 4.00	8th 2.50	5th 3.57	4th 3.50	1st 4.18	3.55
<i>Overconfidence</i>	1st 4.32	6th 2.79	4th 3.64	3rd 3.64	7th 3.18	3.51
<i>Availability heuristic</i>	8th 3.50	3rd 3.32	1st 3.96	5th 3.46	6th 3.21	3.49
<i>Affect heuristic</i>	6th 3.75	12th 2.14	2nd 3.86	7th 3.32	2nd 4.14	3.44
<i>Regret</i>	7th 3.64	11th 2.32	9th 3.14	9th 3.14	5th 3.71	3.19
<i>Confirmation bias</i>	4th 3.89	10th 2.39	6th 3.50	11th 3.00	9th 2.93	3.14
<i>Groupthink</i>	12th 2.71	1st 3.43	11th 3.07	6th 3.43	8th 3.07	3.14
<i>Illusion of control</i>	9th 3.46	2nd 3.36	12th 3.04	12th 2.93	10th 2.79	3.11
<i>Representativeness bias</i>	11th 3.14	3rd 3.32	6th 3.50	9th 3.14	12th 2.07	3.04
<i>Anchoring</i>	10th 3.43	7th 2.64	8th 3.21	8th 3.29	11th 2.54	3.02
<i>Domain mean score</i>	3.66	2.81	3.45	3.39	3.32	3.32

* Rankings of scores of the 12 biases within a specific decision domain (column), from highest to lowest. ^ Mean of the scores provided by the 14 interviewees on a 5-point Likert scale ranging from 'not at all important' (1) to 'very important' (5).

4.2. Testing for Significant Differences in Bias Scores across Decision Domains

To test whether the differences, depicted in Table 3, are significant and in order to determine empirically whether the importance of these biases differs across decision domains, Repeated Measures ANOVAs were performed. In this test, the score assigned by each of the respondents to the bias across conditions (i.e., the five decision domains) is compared and is tested against a null hypothesis that this score does not differ across conditions. An outcome of $p < 0.05$ indicates that the null hypothesis is rejected and that the scores assigned to the bias differ significantly across conditions.

One advantage of this method is that it compares scores assigned to a bias in one domain with scores of the same bias in other domains assigned by the same interviewee. Comparing scores by the same interviewee allows the analysis to account for, and filter out, individual characteristics and differences between respondents. Furthermore, this method of analysis enabled us to test each bias individually, rather than the set of 12 biases as a whole and allowed us to test whether scores differed significantly across conditions for each bias separately.

Prior to interpreting the results, the assumptions for performing a Repeated Measures ANOVA were tested for each of the 12 biases across decision domains. First, boxplots were generated for each bias for each decision domain to detect possible outliers. A small subsample of observations was flagged as potential outliers. Note, however, that all observations constitute scores on a 5-point Likert scale and, as such, it would be unusual to classify any score on such a scale as being an outlier which can significantly disturb our research findings. Nevertheless, robustness checks were performed by running the same set of the Repeated Measures ANOVAs a second time with these potential outliers

removed from the dataset. The observed effects were almost identical, and in fact slightly stronger, with the outliers removed.

Second, tests of normality of the distribution of the dependent variable were performed via Shapiro-Wilk's tests and inspection of Q-Q plots for each bias in each decision domain. For some specific combinations of bias and decision domain the Shapiro-Wilk's test was significant, indicating a potential violation of normal distribution. Note, however, that Likert scale data typically is not perfectly normally distributed. In addition, Repeated Measures ANOVAs are quite robust to violations of normal distribution. Further investigation of the Q-Q plots revealed no sign of patterns deviating from normality.

Third, the data sample for each of the 12 biases was tested for sphericity using Mauchly's tests. *Regret* was the only bias for which Mauchly's test was significant. As a result, the p -value related to the Repeated Measures ANOVA for the bias *regret* was corrected to account for this using a Greenhouse-Geisser correction. Both the uncorrected and the corrected results were significant at the $p < 0.05$ level. After performing the testing of the assumptions, the Repeated Measures ANOVAs were performed.

Table 4 shows the results from the Repeated Measures ANOVAs. For most of the biases, the mean scores differ significantly across decision domains, indicating that these biases, and their importance, is indeed dependent on the decision domain. The rightmost column depicts the relative effect sizes for each of the biases. While there were differences in mean scores across decision domains for the *anchoring* effect, the *availability heuristic*, *groupthink* and the *illusion of control*, as shown in Table 4, these differences were not statistically significant. This suggests that for these biases, unlike the other eight, the importance is more or less the same across decision domains. For example, the anchoring effect was generally rated as a relatively unimportant bias across decision domains and never ranked in the top 5. Similarly, the illusion of control ranked between 9th and 12th place for all but one decision domain.

Table 4. Results of Repeated Measures ANOVAs.

Bias	Does the Importance of the Bias Differ Significantly across Decision Domains?	Significance	Effect Size (Partial Eta-Squared)
<i>Planning fallacy</i>	Yes	$p = 0.012$ *	0.215
<i>Escalation of commitment</i>	Yes	$p = 0.001$ **	0.302
<i>Status quo bias</i>	Yes	$p = 0.000$ ***	0.359
<i>Overconfidence</i>	Yes	$p = 0.006$ **	0.241
<i>Availability heuristic</i>	No	$p > 0.2$	0.069
<i>Affect heuristic</i>	Yes	$p = 0.000$ **	0.424
<i>Regret</i>	Yes	$p = 0.028$ *	0.220
<i>Confirmation bias</i>	Yes	$p = 0.009$ **	0.227
<i>Groupthink</i>	No	$p > 0.2$	0.098
<i>Illusion of control</i>	No	$p > 0.2$	0.084
<i>Representativeness bias</i>	Yes	$p = 0.008$ **	0.230
<i>Anchoring</i>	No	$p = 0.109$	0.129

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, two-tailed.

4.3. Which of These Biases Are Considered to Be the Most Important in Each Decision Domain?

Our findings not only imply that the importance of individual biases can differ across decision domains, but also that, for each decision domain, different biases are important. When comparing the columns of Table 3, one can see that the top three, or the top five, most important biases out of the set of 12 biases included in our study, differ greatly across decision domains. For example, none of the biases appear in the top 3 for more than two decision domains, with the sole exception of the *planning fallacy*,

which appears in 3. Indeed, the top 3's for the different decision domains contain 8 out of 12, different biases. Furthermore, the bottom row of the table shows that, overall, biases are considered to be more important in some decision domains than in others. In this subsection of the paper, we provide further insight into the most important biases for each decision domain, based on the qualitative findings from the interviews.

4.3.1. The Importance of Biases in the Strategic Decision Domain

According to the interviewees, biases are most important in the strategic decision domain, as illustrated by the domain mean score across all biases of 3.66/5 that is higher compared to the other domains. The respondents indicated that strategic decisions can have a big impact on the SME but are simultaneously subject to much uncertainty. These factors could fuel biases.

Out of all biases, *overconfidence* was considered to be the most important, with a mean score of 4.34 out of 5. The consensus amongst interviewees was that SME entrepreneurs are prone to overoptimism about their capabilities and chances of success. Multiple interviewees argued that *overconfidence* is typical for entrepreneurs, e.g., "*otherwise they would not have become entrepreneurs*". Our respondents shared several anecdotes of entrepreneurs who exhibited overconfidence in their capabilities and started risky adventures far beyond their domain of expertise.

The second highest rated bias is the *planning fallacy* (mean: 4.14/5). According to the interviewees, SME entrepreneurs often underestimate the time needed for the implementation of the strategic decisions. As a result, strategic plans are often unrealistic since they don't sufficiently account for potential setbacks and delays.

The status quo bias was rated as the third most important bias (mean: 4.00/5) As one interviewee explains: "SME entrepreneurs discuss with me about strategic changes and they visualize new products. Nevertheless, they often find it difficult to take a distance from and end the old products. It sometimes seems as if they visualize a happy future with a new girlfriend, but that they are happily married to the old products as well."

4.3.2. The Importance of Biases in the Regulatory Compliance Decision Domain

In stark contrast to the strategic decision domain, the importance of biases is considered to be the lowest overall in the regulatory compliance decision domain (mean: 2.81/5), as can be seen in Table 3. Multiple interviewees argued that this decision domain leaves less room for interpretation, as you either comply or you do not. There is less room for uncertainty or subjective views, thus limiting the overall importance of biases. However, even in this decision domain, there are individual biases which are considered to be important.

While *Groupthink* was considered to be the least important bias in strategy decisions, it is ranked as the most important bias in the regulatory compliance decision domain (mean: 3.43/5). It was argued that, for these decisions, entrepreneurs are easily influenced by their peers. As one interviewee describes: "*When I discuss these topics with my clients, they often refer to what their peers from Rotary or Lions clubs say or do. It is clear to me that for law and regulation decisions, entrepreneurs compare themselves to others: they don't want to be best in class, but they don't want to be discordant to their peers either.*"

The second most important bias, according to the respondents, is the *illusion of control* (mean: 3.36/5). SME entrepreneurs are believed to sometimes overestimate their chances of "*not getting caught*" if they were to violate law and regulation requirements. This is closely related to *availability heuristic*, which was also considered to be important (mean: 3.32/5). During our interviews this was illustrated as follows: "*When I discuss law or regulatory decisions with my customers, it makes a huge difference whether or not they have previously experienced a visit by inspectors or have received a penalty for noncompliance. They always immediately mention such an experience that they had themselves, or one of their closely related family members or peers. Other customers, who do not have such an experience, are quicker to think that this won't happen to them and that they may not get caught if they don't comply with regulations.*"

4.3.3. The Importance of Biases in the Human Resources Decision Domain

Table 3 shows that biases are considered to be fairly important in the HR decision domain (mean: 3.45/5). According to the respondents, HR decisions involve many subjective aspects such as assessing peoples' competencies, personal preferences, and relationships. This leaves much room for subjective interpretations and biases. These biases may be especially important in family-owned SME's since personal relations and experiences may promote biases there.

The *availability heuristic* is ranked as the most important bias in this decision domain (mean: 3.96/5). SME entrepreneurs are heavily influenced by preconceptions and former experiences that they had with people or with other people that they deem to be similar (in age, background, etc.). For example, one interviewee described that: *"When I discuss HR decisions with my customers, such as hiring new staff, they often bring easily to the table any former experiences, such as problematic dismissal procedures, and other problems they had with people from a certain age or background."*

The second most important bias for HR decisions, is the *affect heuristic* (mean: 3.86/5). A positive or negative first impression of a person can strongly influence SME entrepreneurs' assessments of the qualities of that person. Prior affective reactions to a person, e.g., due to them being a family member, can similarly lead SME entrepreneurs' to (falsely) assume that the person also will do well in the family business.

Escalation of commitment was ranked as the third most important bias (mean: 3.71/5). The following quote is illustrative for the importance of this bias: *"I often see that my customers stick to their choices regarding people and sometimes stay loyal to specific employees far beyond what I would find reasonable. This often applies to certain family-members who don't function properly, but who are hardly criticized and even get protected by the SME entrepreneur."*

4.3.4. The Importance of Biases in the IT Decision Domain

Cognitive biases were also considered to be fairly important in the IT decision domain (mean: 3.39/5). Our respondents argued that IT decisions involve complexity and that SME entrepreneurs, often due to a lack of personal expertise on the subject, can be prone to make their decisions based on 'beautiful pictures' presented by IT-suppliers and consultants who may not always act in the SME's best interests.

For IT decisions, the planning fallacy is ranked as the most important bias (mean: 4.00/5). From the accountants' experiences, SME entrepreneurs especially tend to heavily underestimate the time and effort needed to implement or replace an IT system, such as ERP systems, or computer hardware. The following quote is exemplary of the kind of comments made with regards to this bias: *"My customers often do not see nor understand what it takes to implement a new IT-system. SME entrepreneurs sometime use phrases like 'How difficult can it be? In my home, I can get software up and running in a few minutes. So why would it take so much time to implement a system at the office?', that illustrate how much they underestimate time and complexity of IT implementations in the business environment."*

The second most important bias is escalation of commitment (mean: 3.82/5). Amongst others, it appears to be difficult for SME entrepreneurs to admit that a challenged or failing implementation of a system should be redirected or stopped. This seems to be especially difficult if the entrepreneurs themselves previously tried to convince their employees of the value of the system, because they may not want to lose face in front of their employees and would rather continue with the (troubled or failing) chosen course of action.

Surprisingly, our respondents ranked *overconfidence* as the third most important bias (mean: 3.64/5). Although SME entrepreneurs are typically aware that they have limited knowledge of IT, they often do think they are very capable to select and find the right person or organization to provide IT services to them, as one interviewee explains: *"Some of my customers tell me that they 'sense' which IT person or organization they should hire or not. I sometimes find it curious that they make such claim without having the IT knowledge necessary to make such decisions."*

4.3.5. The Importance of Biases in the Succession Planning Decision Domain

Biases were considered to be fairly important in the succession planning decision domain, as shown in Table 3 (mean: 3.32/5). Respondents indicated that the succession decisions have such large consequences (i.e., pensions, stakeholders) that dedicated accountants are often involved, who can help the SME entrepreneur to make well-informed, rather than biased, decisions. At the same time, these decisions involve many of the same subjective considerations that play a role in the HR decision domain, as well as the high level of uncertainty and impact that is present in the strategic decision domain. In addition, these decisions have a big impact on the SME entrepreneur personally. These factors may all increase the likelihood of biases occurring, for example, in relation to the assessment of one's own capabilities and those of the potential successor(s). This may especially hold true for family-owned SME's since family relations are often intertwined with positions in these firms.

The *status quo bias* was ranked as the most important bias (mean: 4.18/5). Our respondents provided many examples of SME entrepreneurs who found it very difficult to detach from the company that had been part of their lives for so many years and who often postponed the difficult decision to make such drastic changes in a situation that existed for so long. As such, they often stayed at the helm for longer than was desirable, or rational.

The *affect heuristic*, the second most important bias in this decision domain (mean: 4.14/5), played a similar role. The interviewees argued that their customers are often emotionally attached to their organization, citing SME entrepreneurs who talk about 'this beautiful company', 'these wonderful people', and 'our unique products'. This too, can be a barrier to leaving the company, even if this is the best course of action. The *affect heuristic* can also bias the assessment of who would make the best example—for example one of the children.

Our respondents ranked *planning fallacy* as the third most important bias (mean: 4.11/5). Entrepreneurs often underestimate the time and effort that is needed to prepare for and implement the succession. Additionally, since they may have postponed the succession decision for too long, due to the aforementioned biases, there is often not enough time left to make proper arrangements.

4.4. Actions That SME Accountants Could Take When Faced with These Biases

In addition to information about the importance of these biases across the five decision domains, our interviewees also provided us with insights about actions that SME accountants could take when faced with these biases by SME entrepreneurs. In this subsection, we will discuss and categorize these proposed actions.

The accountant is in a unique position to guard SME entrepreneurs from the harm to the enterprise that may result from irrational and biased decision making. The information provided in our paper can help SME accountants to recognize the most prominent biases in each of the decision domains. However, while awareness and recognition of such biases is a necessary precondition for dealing with them, recognition alone does nothing to stop the harmful effects of biases. Prior research has shown that external advice, i.e., from someone outside the organization, can be valuable. Such external advice has been found effective in reducing the *illusion of control* bias, for example. Internal advice was shown to be less effective and in fact even increased the bias (Meissner and Wulf 2016). Similarly, the seeking of outside advice has shown to reduce *escalation of commitment* (Hammond et al. 2006).

Reducing the effects of biases is also called *debiasing* (Fischhoff 1982). Debiasing by an outsider—such as the accountant—can be achieved in several ways, such as by giving warnings, information, by intervening, or by providing coaching or mentoring. The debiasing approaches emerged from the question to our interviewees what actions they would recommend to their peer accountants when they deal with an SME entrepreneur who falls victim to biases. The four approaches are discussed in more detail in the following paragraphs and we briefly reflect on them from debiasing literature. Which debiasing approach is most appropriate and successful according to our interviewees, depends, in part, on the specific relationship that the SME accountant has with the SME entrepreneur.

4.4.1. Debiasing by Giving Warnings

Our interviewees suggested that the accountant can warn SME entrepreneurs of important biases in a specific decision domain, prior to them occurring. While a warning in advance may prevent the entrepreneur to fall victim to a bias, it is important that the warning is given by the right person, in the right way and at the right time. Another bias, the deaf effect, where receivers of messages irrationally do not hear, or listen to, warnings, can manifest itself otherwise. In some cases, such warnings may even be counterproductive (Keil and Robey 1999; Nuijten et al. 2016). The accountant could be the right person to give such a warning, but only if the specific relationship that the accountant and the SME entrepreneur have is suitable for it. Prior literature has shown that such warnings are effective if the messenger is perceived to be a partner, who is giving the message with the intention to help, but less effective otherwise (Nuijten et al. 2016). Thus, this approach is suitable specifically when the SME entrepreneur perceives the SME accountant in such a way and if their relationship allows for the giving of such well-intended advance warnings. The findings from our study may be valuable to accountants in this role since they provide insight into which biases are most important in a specific decision domain. As such, the accountant could focus on providing warnings for those biases which are most important for the decision at hand.

4.4.2. Debiasing by Giving Information to Help Recognize or Reduce the Impact of Biases

This approach focuses on reducing the effects of a bias by providing information that can help reduce the bias, and promote rational decision making, at the right time. This can be effective at the time when an SME entrepreneur is considering his decision and the accountant suspects that a bias might play a role. Some interviewees suggested that, to aid in the decision-making process, the accountant could provide information about the most relevant biases that apply to these types of decisions as well as information on the impact of these biases or how to recognize them (i.e., symptoms of the bias). With this information, the SME entrepreneur may realize that they have fallen victim to this bias, or, they may recognize symptoms of these biases if they risk falling victim to them in the future. On multiple occasions, this was referred to during the interviews as ‘holding up a mirror’. Similarly, several interviewees mentioned that it was important for accountants to inform the SME entrepreneurs of the risks and impact associated with a specific decision, if it seemed that the entrepreneur was not fully aware of them. The information provided in our study can aid accountants by identifying which specific biases they should look out for and should discuss with the SME entrepreneur.

Furthermore, the accountant and entrepreneur could agree on the usage of checks for these biases, specific critical questions that an accountant can routinely ask prior to making the final decision aimed at detecting potential biases in the decision-making process. They can also discuss potential actions that are advisable of signs of a bias are detected. One interviewee indicated that the use of such protocols by accountants can be helpful and several interviewees also discussed the importance of the accountant providing the right information but also of asking the right questions.

This suggestion aligns with what is known about reducing biases from literature. For example, prior research has established that the *status quo bias* can be reduced by explicitly thinking about, and taking into consideration, alternative courses of action and by critically considering whether the status quo will actually help achieve them (Hammond et al. 2006). Other studies have shown that drafting a checklist of information relevant to the decision, prior to making the decision, can help ensure that decisions are based on the right information and are not biased by the *availability heuristic* (Kahneman et al. 2011). The accountant could advise the entrepreneur to consider such aspects in their decision.

As stated, the effectiveness of this approach depends on the nature of the relationship that the SME entrepreneur and accountant have. This approach seems to fit especially when the entrepreneur needs an accountant who is mainly focused on business support of the entrepreneur with interpretation of figures and provides insight into the impact of choices.

4.4.3. Debiasing by Intervening when an SME Entrepreneur Falls Victim to a Bias

This is a reactionary approach, where the accountant responds when they have strong suspicions that an SME entrepreneur has fallen victim to a bias. This response could take the form of trying to make the entrepreneur aware of the bias that they have fallen victim to, warning them of the potential negative consequences of the bias, and advising them on actions that could be taken to reduce the impact of the bias. For example, prior research suggests that the effects of *anchoring* can be reduced by challenging the decision maker to consider an alternative point-of-view. This can reduce the effect that an anchor has on the decision (Mussweiler et al. 2000; Galinsky and Mussweiler 2001). Such a perspective taking has been shown to be an effective strategy in reducing biases in general (Kahneman et al. 2011).

This situation is of course precarious because the accountant should not want to be perceived as sitting in the entrepreneur's chair. As such, the relationship that the accountant and SME entrepreneur have should be suitable for performing such interventions. As such, this approach is likely most appropriate for an entrepreneur who values an accountant who is sometimes willing to take on the additional role of a 'strict friend'.

4.4.4. Debiasing by Coaching and Mentoring

The approach of coaching implies a more extensive program of feedback to combat biases in practice (Fischhoff 1982). This constitutes a more holistic approach which utilizes elements from the previously described approaches, where and when appropriate, depending on the specific context and the relationship with the SME entrepreneur. As with the first approach, the accountant can share knowledge about the most important biases in specific decision domains with clients from the SME practice, illustrated with anonymized examples from practice, prior to biases occurring. This could not only help prevent entrepreneurs falling victim to these biases later, but it can also create a basis for future discussion about the subject of biases with these clients. Thus, making it easier to give warnings (approach #2) or intervene (approach #3) at a later time, if the accountant is concerned about the entrepreneur falling victim to a specific bias. Furthermore, prior research has shown that such group discussions or group decision making can reduce the effects of biases (Hammond et al. 2006). Of course, not every SME entrepreneur will desire or appreciate their accountant taking on the role of a coach or mentor. Additionally, even if they do desire it, this cannot be forced—such a relationship must develop over time.

5. Discussion & Implications

5.1. Implications for Research

While SMEs have been a subject of investigation of cognitive biases for decades, our exploratory study has three main contributions. To our knowledge this study is the first to examine cognitive biases in entrepreneurial decision making from the perspective of SME accountants. SME entrepreneurs often seek the advice of their accountants when they struggle with critical decisions that involve uncertainty and business risks (Bennett and Robson 1999; Berry et al. 2006; Blackburn and Jarvis 2010; Suddaby et al. 2002). This can involve a large variety of decisions regarding strategy, regulatory compliance, human resources, IT, and succession. It is acknowledged that involving a third party could contribute to more rational decisions, since someone in that position can challenge assumptions and uncover potential biases in the decision-making process (Kahneman et al. 2011). A third-party role therefore could be of pivotal value to identify cognitive biases in entrepreneurial decision making (Abatecola et al. 2018, p. 412). External accountants fulfil this role for many small and medium enterprise (SME) entrepreneurs. Therefore, SME accountants are not only in the position to help SME entrepreneurs make more rational decisions, but they could also serve as a valuable source of information for research in the domain of entrepreneurial decision making. They are in the position to directly observe how entrepreneurs make decisions in real-life situations and they could identify

cognitive biases when they occur. Direct observation of entrepreneurial decision making could be a fruitful way to study cognitive biases (Liebregts et al. 2020). SME accountants who are external to the SME and advise hundreds of entrepreneurs over a long period of time, therefore could offer valuable insights of how cognitive biases affect SME entrepreneurial decision making. Although our study is exploratory by nature, we think it confirms the value of using SME accountants as a source of information.

The second contribution of our study exploits the use of SME accountants who are consulted by entrepreneurs for a variety of decisions. This allowed us to shed a broader light on an issue that is related to how the research stream on cognitive biases in entrepreneurial decision making has unfolded. A literature review by Zhang and Cueto (2017) shows that research in the domain of entrepreneurial decision making has emphasized a number of important biases (e.g., overconfidence) in a handful of specific and important entrepreneurial decisions (e.g., start-up, market-entry or exit). However, putting the spotlight on a few specific biases and entrepreneurial decisions could leave other important biases and decisions underexposed. Since the SME accountants in our study advised in total over 3000 entrepreneurs on a variety of decisions, they allowed us to compare the importance of 12 different cognitive biases and analyze whether their importance can change across five decision domains for which entrepreneurs seek advice of accountants: strategy, regulatory compliance, human resources, IT, and succession. Results from our analysis showed that for most of these biases, the importance differs significantly across decision domains. This indicates that considering the decision domain is important when studying these biases. In addition, our analysis allowed us to compare the 12 different biases to each other. In doing so, we provide some insight into which of these 12 biases are most important, both in general, as well as for each of the individual decision domains. In line with our other findings, this analysis showed that the biases that were considered to be the most important differed greatly across decision domains. We think this offers a small but valuable contribution, since it sheds a broader light on the issue whether some cognitive biases and decisions might be over-emphasized or under-emphasized and thus might be of help to researchers to determine which biases and decisions to focus on.

A third contribution of our study comes from the willingness of our interviewees to share with us and with other accountants what approach they follow in situations that SME entrepreneurs fall victim to cognitive biases. We identified four debiasing approaches (warn, inform, intervene, and coach) SME accountants take to help SME entrepreneurs avoid or reduce biases.

5.2. Implications for Practice

As more and more SME accountants extend their services from traditional bookkeeping towards advisory services and coaching, they are faced with both a great opportunity and a great challenge of adding value to SME entrepreneurs who struggle with their decisions. Those external accountants are in a unique position to provide added value by aiding the identification and prevention of cognitive biases. However, there are several challenges in doing so. Prior literature has identified many different cognitive biases, and these have often been studied in isolation. This makes it difficult for SME accountants to be informed of all these biases. Furthermore, it was unclear how important these biases are in these decision domains. Our study provides insights from various experienced SME accountants who have encountered these biases with SME entrepreneurs in practice. As such, our study provides other accountants with insight into how important these biases are across five decision domains.

Furthermore, based on our analysis, we were able to identify which of these biases were considered to be the most important in each of the five domains. We consider such information to be valuable to practitioners since it allows them to focus on those biases, amongst the ones studied, that are most important given the decision at hand, and it allows them to better recognize them from the role that they can play in that decision domain. As such, accountants need not have to look out for 12 different cognitive biases in each decision, without knowing how important each of these may be.

Knowledge of which of these biases is the most important in the specific decision domain at hand can also provide an effective means to leverage the influence of the accountant and have a positive impact on the quality of the decisions that SME entrepreneurs make. The SME accountant can do so either by helping prevent these biases before they occur, or by counteracting them if an SME entrepreneur has fallen victim to them already. The insights generated from our interviews with SME accountants experienced in this role yielded suggestions for four different approaches that an SME accountant could adopt to achieve this result: by giving pre-emptive warnings, by giving the right information and asking the right questions, by challenging the SME entrepreneur when a bias occurs, or by mentoring and coaching the SME entrepreneur.

5.3. Limitations

As is the case with all research studies, our work is subject to limitations. One limitation is that we restricted our study to five decision domains for which SME entrepreneurs seek the advice of their accountants. So, SME decisions that would not lend themselves for any involvement of the accountants, were excluded from our scope. We are not aware of relevant SME decisions that could be prone to biases and which are not included in our scope, other than the decision of choosing an accountant. At the same time, we cannot rule out that there may be other such decisions in which biases could play a role.

Another limitation is that our study was not longitudinal and therefore we relied on the accountants' recollection of biases in order to reconstruct how SME entrepreneurs made their decisions. We did not independently measure or verify the consequences of such biases, beyond the information that was provided by the interviewees. Therefore, we could not entirely eliminate the existence of cognitive biases from the end of the accountant in our data collection. However, the unique third-party position (Kahneman et al. 2011) that accountants have, offers them a very good stance to observe biases in the decisions that entrepreneurs make. On a related note, from the way we measure the importance of biases to entrepreneurial decisions, our results cannot distinguish between (1) how frequently a bias occurs as a percentage of the decisions that are taken, and (2) how strongly the bias affects the decisions. Both contribute to the importance that cognitive biases have in entrepreneurial decision making and serve the purpose of our study.

A final limitation is that our study was restricted to 14 Dutch SME accountants who had advised in decisions by over 3000 entrepreneurs in the Netherlands over a period of two or three decades in total. Of course, some of our findings may have been influenced by the particularities of Dutch culture. Therefore, we are cautious to generalize our exploratory findings to a larger population nor can we make any claims for similarities with other countries. However, we do know that our list of decision domains for which SME entrepreneurs seek advice of the external accountant as well as our list of biases are derived from international literature and were confirmed by our Dutch interviewees. So, at least there is a certain level of similarity of the Dutch context to other countries.

5.4. Directions for Future Research

Our study suggests several avenues for future research. First, it would be useful to conduct longitudinal studies and interpret the effects of cognitive biases over time for the various types of decisions that we identified. Some types of decisions (e.g., HR decisions) are taken more frequently than others (e.g., succession planning) and such differences could shape the pattern of chance and impact of biased decisions.

Next, the results of our exploratory study could warrant further use of accountants as a source of information to examine entrepreneurial cognitive biases. Future research on this avenue could address the limitations of our study and expand to other countries, to a larger number of participants, and adopt a further refined instrument to measure and compare the importance of a series of cognitive biases on entrepreneurial decision making (in line with Keil et al. 2000).

In addition, there is a need to conduct research to test and verify the effectiveness of the actions that were suggested by the SME accountants to cope with these biases. Prior literature on the deaf effect, for example, suggests that the approach of giving warnings may only be successful under certain circumstances (Nuijten et al. 2016). Even though several of the approaches mentioned by the interviewees may have been successful for them, and are in line with literature on debiasing strategies, we believe it to be important to investigate such potential negative side-effects of the approaches that are described in this study.

Finally, while extant research has focused on entrepreneurs and accountants separately and considered individual biases, we believe that more work is needed that takes a holistic approach on these biases, the entrepreneurs, their accountants, and their relationships. We encourage other scholars to further develop our understanding of this important field.

Author Contributions: Conceptualization, A.R. and A.N.; methodology, K.W., A.R., A.N. and N.B.; software, K.W. and A.N.; validation, N.B. and A.N.; formal analysis, A.N. and N.B.; investigation, K.W. and A.N.; resources, A.R.; data curation, K.W. and A.N.; writing—original draft preparation, A.N. and N.B.; writing—review and editing, A.R. and K.W.; visualization, A.R.; supervision, A.R. and A.N.; project administration, A.R. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

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