Research article

Cognitive Biases and Firm Performance among Entrepreneurs in Bangladesh SMEs: Unwrapping the Mediating Role of Strategic Decision-Making

[a]Tania Afroze and [b]Md. Abdur Rashid Sarker

[a]*Institute of Bangladesh Studies, University of Rajshahi, Rajshahi-6205, Bangladesh*
[a]*Business Administration Discipline, Khulna University, Khulna-9208, Bangladesh*
[b]*Department of Economics, University of Rajshahi, Rajshahi-6205, Bangladesh*

A B S T R A C T

This study investigates how strategic decision-making mediates the relationship between cognitive biases and firm performance among Bangladeshi entrepreneurs. We use data from 354 SME (Small and Medium Enterprise) entrepreneurs located in four major cities: Dhaka, Rajshahi, Khulna, and Jashore to investigate both direct and mediated effects using Partial Least Squares Structural Equation Modeling (PLS-SEM). A structured questionnaire with five-point Likert scale statements was administered through face-to-face interviews with SME owners to assess cognitive biases, strategic decision-making processes, and firm performance. The results indicate that overconfidence and the illusion of control adversely influence strategic decision-making, and strategic decision-making positively impacts firm performance. However, no significant relationship was found between overoptimism and strategic decision-making. The mediating effect of strategic decision-making on overconfidence and firm performance is significant, whereas the mediation effect of strategic decision-making on overoptimism and firm performance, as well as on the illusion of control and firm performance, is insignificant. These findings highlight the complex role of cognitive biases in shaping entrepreneurial decision-making and business outcomes. By integrating strategic decision-making as a mediating variable, this study enhances the understanding of how cognitive biases affect SMEs within Bangladesh, an emerging market economy. Additionally, it extends the application of Upper Echelons Theory by demonstrating the influence of cognitive biases on strategic choices and firm performance. The insights from this study provide valuable implications for entrepreneurs, policymakers, and business advisors seeking to lessen biases and improve decision-making effectiveness in the SME sector.

Introduction

An essential inquiry in the arena of entrepreneurship literature is: What factors contribute to the varying levels of performance among entrepreneurs (Benevolo *et al.*, 2021)? Existing studies have looked into how the traits of entrepreneurs and their entrepreneurial environmental factors (e.g., risk, uncertainty, time constraints, and emotional intensity) affect their decision-making and performance (Shepherd *et al.*, 2015; Zhang *et al.*, 2020). In such contexts, they opt for any "satisfying" as opposed to an "optimal" solution. Cognitive biases are mental shortcuts or simplifications that make it easier to integrate information, detect opportunities, and manage obstacles

when starting and growing a business (Gudmundsson and Lechner, 2013). However, because of the complexity of unpredictable situations, their cognitions may be faulty (Busenitz and Barney, 1997), which can distort perceptions and impair their decision quality (Ahmad *et al.*, 2021). The consequences of those biases may be unpleasant or favorable (Schade and Koellinger, 2007). Thus, researchers have shifted their focus toward examining the cognitive mechanisms of entrepreneurs and the influence of cognition on their decision-making (Shepherd and Patzelt, 2018).

In strategic decision-making (SDM), cognitive biases are an inevitable component (Das and Teng, 1999) that

falls within the entrepreneurial cognition research domain. It shapes their attention, framing, interpretation, and information processing, which in turn influence decisions and outcomes (Eggers and Kaplan, 2013). Entrepreneurs base their decisions on how they think and perceive the world, which affects how they identify opportunities, allocate resources, and run their businesses (De Carolis and Saparito, 2006). Entrepreneurs face strategic choices that require substantial resources and long-term effort to attain organizational objectives. Due to the unpredictable nature of their business environment, business opportunities would be lost by the time more comprehensive data became accessible. Consequently, they depart from classical economic models to behavioral models.

In an entrepreneurial setting, cognitive research is limited to a few biases, particularly in areas like risk perception, starting a venture or entry decision, and entrepreneurial exit decision (Thomas, 2018; Zhang and Cueto, 2017). Prior research has examined cognitive biases in decision-making (Busenitz and Barney, 1997; Gudmundsson and Lechner, 2013), yet findings remain inconsistent. Some studies suggest biases drive opportunity recognition (Hmieleski and Baron, 2009), whereas others argue they contribute to financial mismanagement (Chen et al., 2013). Some empirical research has also focused on performance, especially on new ventures or startup ventures. Overoptimism (OP), overconfidence (OC), and the illusion of control (IC) affect entrepreneurial decision-making and business performance by shaping risk perception and strategic choices. Though these biases can drive entrepreneurial motivation, they may also impair judgment and decision quality, leading to inconsistent performance outcomes. OP and OC bias have been researched on risk-taking, decision-making, and performance issues; the results of these studies are still inconclusive; some research results are not representative of entrepreneurial decisions and need to be reinvestigated. For example, Kannadhasan et al. (2014) did not see a direct effect of OP on creating new ventures. Similarly, OC has unclear results in predicting performance, and IC's role remains largely unexplored. A deeper understanding of how these biases operate can provide entrepreneurs with strategies to diminish decision-making errors. Additionally, policymakers and business advisors could develop training programs or interventions to help entrepreneurs make more balanced and rational decisions in critical environments.

Previous research has explored risk perception as a mediator variable between cognitive bias and entrepreneurial decision-making (Kannadhasan et al., 2014; Riasudeen et al., 2022; Simon et al., 2000). However, it may be challenging to assign entrepreneurial firm performance (FP) to cognitive biases because literature revealed cognitive bias affects SDM (Acciarini et al., 2021; Das and Teng, 1999) and SDM affects FP (Baum and Wally, 2003; Sinnaiah et al., 2023). Cognitive bias is distantly situated from the actual performance outcomes. As a result, its capacity to forecast FP might be substantially limited. The considerable gap between cognitive biases and behavioral outcomes suggests the possibility of mediating variables that could substantially impact the relationship between cognitive biases and FP.

Given that SDM serves as the foundation of entrepreneurial actions, it is reasonable to examine its role as a mediator between cognitive biases and FP. SDM determines how entrepreneurs allocate resources, evaluate risks, and implement growth strategies; these factors directly influence business success. Prior research has linked biases to risk-taking and risk perception, but few studies have explored how SDM mediates this relationship, particularly in the SME sector. This study seeks to bridge this gap by investigating the influence of cognitive biases on SDM and FP through SDM. We empirically study three research objectives: 1) to explore the relationship between SDM and FP, 2) To explain the link between cognitive biases and SDM, and 3) to analyze the mediating effect of SDM upon the relationship between cognitive biases and FP. As an emerging market economy, Bangladesh is strategically important to the world. The business environment in Bangladesh is facing problems like restricted information, limited markets, inadequate capital and technologies, and an unfavorable legislative and regulatory environment. Research on cognitive biases in the Bangladeshi entrepreneurial ecosystem is scarce, making this study particularly relevant.

The remainder of this paper is structured as follows: The theoretical foundation is presented first, focusing on Upper Echelons Theory (UET) and hypothesis development. This is followed by an outline of the methods, an interpretation of the results, and a discussion, including theoretical and practical implications. The paper concludes with a summary of key insights and future directions.

Theoretical Background and Hypothesis Development
The Upper Echelons Theory (UET) proposed by Hambrick and Mason (1984) provides new understandings for this research. It is based on the idea that the traits and cognitive base of top executives can be used to partially predict the outcomes of the organization, including strategic decisions and performance levels. In the UET, top managers, here entrepreneurs, are identified as the primary determinant of firm development. Bounded rationality and cognitive bias significantly influence SDM (Acciarini et al., 2021). Cognitive bias refers to systematic deviation from rationality that occurs frequently during periods of uncertainty (Cossette, 2014). It is more frequent among entrepreneurs than individuals who are not entrepreneurs (Busenitz and Barney, 1997). This study investigates the associations between cognitive bias and FP, with SDM as a mediator using the UET for two specific purposes. First, entrepreneurs have an important position as strategic decision-makers for their businesses, and their cognitive biases substantially impact the strategic direction of those businesses (Dölarslan et al., 2017). Second, SME owners rely on a more centralized decision-making process, which implies that the entrepreneur's traits and biases have a direct and significant effect on the firm's overall performance and strategic direction. Consequently, entrepreneurs' cognitive biases—like OC, OP, and IC—can significantly impact how they make decisions.

Cognitive biases influence how entrepreneurs perceive opportunities, evaluate risks, and allocate resources, directly affecting their SDM processes.

According to UET, decision-makers interpret strategic situations through their cognitive frameworks (Hambrick, 2007). In SMEs, entrepreneurs face high uncertainty, resource constraints, and dynamic market conditions, increasing their reliance on cognitive heuristics and biases when making strategic choices (Acciarini et al., 2021). Bounded rationality, complementing UET, suggests that decision-makers operate under limited information and cognitive constraints, leading them to rely on mental shortcuts (heuristics) rather than fully rational decision-making (Simon, 1993). Consequently, cognitive biases emerge as systematic deviations from rational judgment, shaping how entrepreneurs navigate SDM processes (Cossette, 2014).

For example, OP leads entrepreneurs to underestimate risks and overestimate their likelihood of success, causing them to engage in overexpansion or resource misallocation (Hmieleski and Baron, 2009). Similarly, OC results in distorted risk assessment, where entrepreneurs perceive their strategic decisions as inherently superior. This perception leads to insufficient contingency planning and poor adaptation to market feedback (Keh et al., 2002). IC further reinforces biased SDM if entrepreneurs believe they can control external market forces beyond their actual influence. The result is persistence in failing strategies and delayed corrective actions (Simon et al., 2000).

Since SDM is the mechanism through which business strategies are formulated, biased decision-making can produce positive and negative FP outcomes. On the one hand, highly confident and optimistic entrepreneurs may exhibit strong persistence, innovation, and risk-taking, leading to growth opportunities. On the other hand, cognitive distortions can result in overcommitment to flawed strategies, financial mismanagement, and resistance to feedback, ultimately reducing firm adaptability and success.

Thus, UET provides a strong theoretical foundation for linking cognitive biases to SDM, demonstrating that entrepreneurs' personal traits and cognitive distortions directly shape their decision-making processes, influencing FP. The next section explores these biases and their impact on strategic choices in theory and empirical settings.

Strategic decision-making and firm performance
Simon (1993) defines SDM as a complicated and comprehensive social process normally lasting an extended duration. SDM is one segment of strategic management that has different consequences, especially for FP. Both at the individual level (Bazerman, 1990) and the group level (Guzzo, 1986) decision-making process, decision-making outcomes are related to cognitive processes. When people apply cognitive anchors or justify past decisions, their decision-making worsens (Tversky and Kahneman, 1974). Different decisions yield different results, and not all decisions are equally good (Dean and Sharfman, 1996).

Firm effectiveness (performance) is increased by solving problems quickly despite limited resources or information (Sinnaiah et al., 2023). On the other hand, Bourgeois and Eisenhardt (1988) revealed that successful businesses employed rational approaches more often than failing businesses. Understanding constraints and having

reasonably complete information are probable mechanisms of rational decision-making. Managers who gather a lot of data prior to making decisions will perceive the environment more accurately (Bourgeois, 1985). They structure the decision criterion through the identification and evaluation of each alternative independently (Fitzgerald *et al.*, 2017), which can affect the performance of their business. Similarly, Jones *et al.* (1992) found organizational effectiveness and decision-making comprehensiveness are positively connected. As a whole, the empirical findings in this field are contradictory. This could be because of the model under specification that characterizes most of the research or the moderating impact of other omitted factors, such as the environment (Rajagopalan *et al.*, 1993). Following the above critical discussion, the first hypothesis emerges as follows:

H_1: Rationality in SDM is positively and significantly related to firm performance.

Cognitive bias and strategic decision-making
Cognitive biases originate from mental shortcuts for reducing efforts in performing a task (Shah and Oppenheimer, 2008) and are used to make judgments in uncertain and ambiguous situations (Cossette, 2014). They happen because of systematic breaks from rational decision-making (Tversky and Kahneman, 1974) and limited individual capacity to evaluate information and assess probability (Baron, 1998). Entrepreneurs often make strategic decisions when introducing new products or entering new markets, as well as in information collection, resource allocation, risk measurement, and financial or investment-related decisions (Thomas, 2018). Empirical research has been conducted on how cognitive biases affect entrepreneurial decision-making, and their short review is discussed here.

Overoptimism and strategic decision-making
The belief that better things will be forthcoming and outweigh bad things is known as OP (Hmieleski and Baron, 2009; Scheier and Carver, 1985). OP is seen as a narrow individual characteristic that is generally steady throughout time and over numerous contexts (Trevelyan, 2008). The main components of an entrepreneurial setting, where OP does matter, include (1) evaluating and exploiting opportunities (Cassar, 2009), (2) venture creation or entry decisions (Kannadhasan *et al.*, 2014), (3) exit decisions (Shepherd *et al.*, 2015), and (4) growth and development decisions (Trevelyan, 2008).

Researchers have two perspectives on the impact of entrepreneurial OP. Research suggests that a "rose picture" of the world motivates entrepreneurs to start innovative ventures and persevere when losses occur (Crane and Crane, 2007; Trevelyan, 2008). OP positively influences foreign market equity mode preferences (Adomako *et al.*, 2021) and improves new venture performance (Chen *et al.*, 2013). However, optimistic entrepreneurs may negatively impact venture performance, decision-making, and judgment (Hmieleski and Baron, 2009). Entrepreneurs have a high OP bias score (Fraser and Greene, 2006). They emphasize strengths and opportunities and downplay weaknesses and risks (Cassar, 2009). OP can cause overextension and incorrect estimates (Frese and Gielnik, 2014), leading to less risk perception (Keh *et al.*, 2002) and

increased motivation to start a new venture. Previous research indicates an inconclusive link between OP and the strategic decision of entrepreneurs, with certain studies identifying a negative correlation while others demonstrate a positive one. The proposed hypothesis is:

H₂. OP has a significant and negative influence on the SDM of SME entrepreneurs.

Overconfidence and strategic decision-making
OC is a relatively stable psychological trait (Gu, 2023). According to Camerer and Lovallo (1999), OC occurs when entrepreneurs believe they can be successful in the future regardless of their lack of knowledge about the business. This means that they overestimate their abilities. Theoretical views and empirical findings regarding the contribution of OC to entrepreneurial decision-making are still inconsistent. For example, OC can be useful in decision-making in uncertain and complex environments, particularly for entrepreneurs, due to risks and a lack of information about customer and competitor reactions (Busenitz and Barney, 1997). OC has a significant favorable association with innovative products (Simon and Shrader, 2012), patents (Amore *et al.*, 2021), and R&D investments. Similarly, venture creation is positively impacted by OC, as it gives them the desire and eagerness to grasp possibilities even during times of adversity (Robinson and Marino, 2015). In contrast, it can lead to inaccurate and less comprehensive decision-making, possibly leading entrepreneurs to start ventures with inadequate funding. Overconfident entrepreneurs, as they are incorrect in predicting the success or failure of a business, decrease their effort in gathering information, fund unprofitable ventures, or reject more promising investment opportunities (Zacharakis and Shepherd, 2001). Moreover, OC has been linked to a higher chance of non-survival for entrepreneurial initiatives because they underestimate risks and overestimate their accuracy and control over various circumstances (Camerer and Lovallo, 1999; Gudmundsson and Lechner, 2013). In their study, Nouri *et al.* (2017) concluded that OC bias has a detrimental impact on the process of making strategic decisions in entrepreneurship and impedes their overall performance (Ahmad *et al.*, 2021). Based on the findings of empirical data on the above-mentioned relationships, we offer the following hypothesis:

H₃. OC has a significant and negative influence on the SDM of SME entrepreneurs.

Illusion of control and strategic decision-making
IC arises when a person overestimates the degree to which their competence can raise the likelihood of success. In reality, chance plays a more significant role in success than competence (Langer, 1975). IC has been identified as one of the key biases influencing the decision to launch new businesses in entrepreneurship (Keh *et al.*, 2002; Simon *et al.*, 2000). These studies find a positive association between IC and the decision to start a business or venture and opportunity evaluation. People who believe they can manage the odds of launching a new product will feel less pressure to deviate from their planned schedule. Additionally, they were more likely to possess IC over their ability to market a problematic product (Keil *et al.*, 2007). Carr and Blettner (2010) found illusions of control

to lower decision quality and time stress, and prior industry expertise strengthened this link. This supports Kahneman and Tversky's (1996) theory that biases have undesirable effects. Following these arguments, the proposed hypothesis is

H₄: IC has a significant and negative influence on the SDM of SME entrepreneurs.

Strategic decision-making: Mediator between cognitive bias and firm performance
In performing mediation analysis, a third variable (here, SDM) shows how the independent variable(s), like cognitive biases, affect the dependent variable, like FP (Baron and Kenny, 1986). There are two conditions for mediation analysis: first, the independent variable(s) must be significantly related to the mediator variable, and second, the mediator variable must be significantly related to the dependent variable (Hayes, 2009). The previously discussed literature has supported these two conditions. Hypotheses 1 to 4 were developed for the negative relationship between OP, OC, IC, and SDM, as well as the positive relationship between SDM and FP. Accordingly, using the logic developed for hypotheses 1 to 4, this study proposes that:

H₅ₐ: SDM mediates the relationship between overoptimism and firm performance.

H₅ᵦ: SDM mediates the relationship between overconfidence and firm performance.

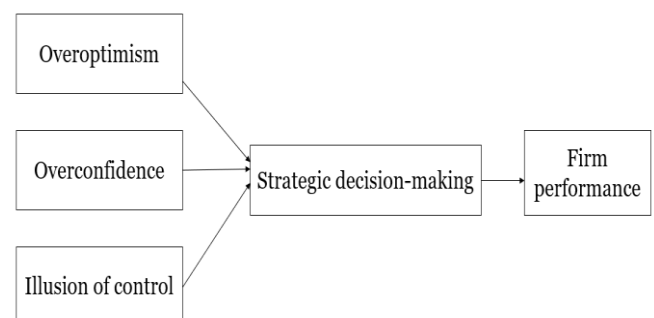H₅꜀: SDM mediates the relationship between the illusion of control and firm performance.

Figure 1: Conceptual Framework

Materials and Methods
Data collection and sampling
This study treats the owners of SMEs as its population. We purposefully selected the study areas based on the concentration of SMEs in Bangladesh and used the convenience sampling technique to select respondents. We selected the entrepreneurs in the sample based on specific selection criteria, including employment in the formal economy, ownership of their businesses, and involvement in the agriculture and/or manufacturing sectors. A pilot survey was carried out to finalize the questionnaire. A face-to-face interview was conducted with the 363 SME owners as respondents from four cities: Dhaka, Rajshahi, Khulna, and Jashore of Bangladesh, where the majority of the SMEs are concentrated. A priori sample size determination using Soper's (2022) online power analysis calculator was used to calculate the required number of samples. The priori sample size calculator is well-suited

for research employing both probability and non-probability sampling methods suggests that a minimum sample size of 341 is required for this study. This calculation is based on an anticipated effect size of 0.25, a desired statistical power level of 0.95, and a significance level of 0.05, considering a research model with five latent variables and 30 observed indicators. Due to huge missing values and being incorrectly filled up, nine questionnaires become unusable. In the end, 354 questionnaires were finally used for analysis, with an actual response rate of 97.5%.

Measures

All measures for the operationalization of variables used in this study were either adopted or modified from current research and translated into Bangla, the local language of the country. The FP measure used in this study was taken from Simarasl et al. (2022), and Maltz et al. (2003), and entrepreneurs assessed their firm's performance compared to their rivals with three dimensions, including six indicators, namely financial, customer, and employee. Each item was assessed subjectively using the following sample statement: 'Your firm's sales growth compared to competitors'. Answers ranged from 1 to 5, where 1 indicates 'much worse,' and 5 represents 'much better.' Entrepreneurs' business performance can be tracked by using non-financial and subjective measurements. The reason for using subjective measurement is that strong relations exist between objective and subjective FP measures (Dess and Robinson, 1984). Moreover, the subjective method was used since objective measures of performance data are often tough to collect (Love, Priem, and Lumpkin, 2002), and there are strong associations between objective and subjective FP measures (Dess and Robinson, 1984). In Bangladesh, many SMEs do not provide publicly available statements, and most do not disclose their financial performance. Therefore, we relied on subjective assessments, which are widely used and validated in entrepreneurial research (e.g., Wiklund and Shepherd, 2003; Dess and Robinson, 1984)

A five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) was used for independent construct measurements. We used three items from Wally and Baum (1994) and Simon et al. (2000) to assess OP. One sample item was 'you feel your performance will improve next year.' High scores indicate OP, and low scores indicate pessimism. For IC, measures were taken from Houghton *et al.* (2000). The respondents' IC was measured using the five items. For example, 'you believe you can succeed at making this firm a success, even though many other businesses like yours will fail.' Five statements were adopted to measure OC from Ahmad *et al.* (2021) and Mouna and Jarboui (2015). SDM indicators are adopted from Dean and Sharfman (1996) and Wally and Baum (1994). A list containing ten 5-point Likert-type scale items includes sample statements like 'Your firm follows a formal plan.'

Data analysis procedure

Structural equation modeling (SEM) can be conducted using the commonly used covariance-based SEM and partial least squares (PLS). When the sample size is small, the theory is few, the predictive theory is significant, and

the precise model specifications are not obvious, PLS-SEM is a useful alternative to CB-SEM (Wong, 2013). The study employed Smart PLS 4.1.0 software for data analysis, which is widely used in the social sciences and management (Nitzl *et al.*, 2016).

Results

Demographic characteristics

Table 1 provides an overview of the demographic characteristics of SME entrepreneurs and their firm profiles. It highlights key attributes such as age, education, business ownership, and firm-specific details like sector, employee size, and business longevity. This information helps contextualize the study by offering insights into the background of the surveyed entrepreneurs and their enterprises.

Table 1: Demographic and firm characteristics

Entrepreneurs' profile	Category	Percentage
Age	21-35 Years	20.6
	36-50 Years	52.5
	51 and above	26.8
Source of Ownership	Founder	72.9
	Inherited	18.4
	Bought from others	8.8
Education	Secondary	42.9
	Bachelor	29.9
	Master's & above	27.1
Firm Profile	**Category**	**Percentage**
Business Sector	Manufacturing	79.4
	Agriculture	20.6
Number of Employees	1-30	63.8
	31-60	23.2
	61 and above	13.0
Age of Firm	1-10 Years	40.1
	11-20 Years	33.3
	21 Years and above	26.6

Source: Survey result 2023

Common method bias

During data collection, secrecy was confirmed to limit possible common method bias (CMB), and entrepreneurs were requested to respond truly. They were told that there were no accurate or inaccurate replies (Podsakoff *et al.*, 2003). Harman's single-factor test was conducted to detect CMB. After data collection, this test was done, and the result explained 23.318% of the total variance. This result is markedly lower than the threshold limit of 50%. So, CMB is not problematic for this study.

Measurement model

The research model in this study involved reflectively measured constructs. In measurement model specification (Table 2), examining the indicator's reliability is considered the first step. Here, no items had a loading of less than 60. To eliminate indicators, we consider the effects of the deleted item on its reliability, content, and convergent validity. Usually, items having outer loadings from 0.40 to 0.70 shall be taken for deletion only when such deletion results in higher reliability or convergent validity over the suggested value (Hair *et al.*, 2019). Six items were deleted to reach the preferred reliability level and average variance extracted (AVE). Here, reliability is

assessed by using composite reliability, which was greater than 0.70. Convergent validity was satisfactory because AVE was above 0.50, as recommended by Fornell and Larcker (1981). Discriminant validity was also confirmed by the Fornell and Larcker criterion and the Heterotrait-Monotrait Method (HTMT) with values below the (conservative) threshold of 0.85. Hence, discriminant validity is ensured, as presented in Tables 3 and 4. All the variables of this study seem to be valid and reliable.

Table 2: Outer loadings, reliability, and convergent validity

Variable Name	Items	Loadings	CR	AVE
Illusion of Control (IC)	IC1 <- IC	0.741	0.815	0.524
	IC2 <- IC	0.697		
	IC3 <- IC	0.755		
	IC4 <- IC	0.700		
overconfidence (OC)	OC1 <- OC	0.699	0.791	0.559
	OC4 <- OC	0.772		
	OC5 <- OC	0.768		
Overoptimism (OP)	OP1 <- OP	0.701	0.795	0.566
	OP2 <- OP	0.853		
	OP3 <- OP	0.691		
Firm performance (FP)	FP2 <- FP	0.807	0.891	0.577
	FP3 <- FP	0.818		
	FP4 <- FP	0.784		
	FP5 <- FP	0.751		
	FP6 <- FP	0.701		
	FP7 <- FP	0.688		
Strategic Decision-Making (SDM)	SDMC1 <- SDM	0.751	0.876	0.502
	SDMC2 <- SDM	0.756		
	SDMC3 <- SDM	0.711		
	SDMC4 <- SDM	0.664		
	SDMF1 <- SDM	0.693		
	SDMF3 <- SDM	0.669		
	SDMF5 <- SDM	0.711		

Table 3: Fornell and Larcker Criterion

	IC	OC	OP	FP	SDM
IC	0.724				
OC	0.546	0.747			
OP	0.356	0.311	0.752		
FP	-0.132	-0.102	-0.359	0.760	
SDM	-0.377	-0.484	-0.236	0.170	0.709

Table 4: HTMT ratio

	IC	OC	OP	FP	SDM
IC					
OC	0.832				
OP	0.520	0.504			
FP	0.184	0.144	0.466		
SDM	0.481	0.667	0.323	0.207	

Structural model

The first step in the structural model assessment is to detect multicollinearity through VIF, which was found to be less than the recommended threshold level of 5 (Hair et al., 2021). This indicates that multicollinearity is not a serious problem.

A partial least squares structural equation estimation model with 5000 sub-samples was used to analyze our data. Our hypothesis results are presented in Table 5. Our results support H₁, showing the positive and significant relationship between SDM and FP (B = 0.118, p = 0.029). H2 was not supported, which postulates that OP has a significant negative effect on the SDM of SME entrepreneurs. (B = -0.065, p = 0.134). Whereas H₃ was supported as OC has a significant negative influence on the SDM of SME entrepreneurs (B = -0.386, p < 0.001). We get a significant result for H₄, which states that the IC has a significant negative influence on the SDM of SME entrepreneurs (B = -0.143, P = 0.024).

In mediation analysis, H₅ₐ, H₅ᵦ, and H₅ᵪ postulate that SDM mediates the relationship between cognitive biases (OP, OC, and IC) and FP, where H₅ᵦ was confirmed but not H₅ₐ and H₅ᵪ. As shown in Table 6, the results revealed that H₅ₐ has no mediating role in SDM between OP and FP (B = -0.008, p = 0.19). Whereas H₅ᵦ states that SDM mediates the relationship between OC and FP (B = -0.046, P = 0.04). In H₅ᵪ, the mediating role of SDM between the

IC and FP was not confirmed (B = -0.017, P = 0.08). Using Zhao *et al.*'s (2010) typology (2010), we found that SDM has an indirect-only mediation, also known as full mediation, on the relationship between OC and FP. Detailed estimates are presented in Table 6.

Table 5 displays the explanatory power; the value of R^2 is 0.256 for SDM and 0.139 for FP. Acceptable and reasonable R^2 values are based on the domain and context, and in some disciplines, even an R^2 value of 0.10 is considered satisfactory, for instance, when forecasting stock returns (Raithel *et al.*, 2012). The relatively low R^2 value is shaped by multiple contextual, economic, and psychological factors (Hair et al., 2019) and reflects the complexity of entrepreneurial decision-making and FP. So, fully capturing these relationships in a statistical model is challenging. Additionally, these findings align with prior research, where entrepreneurial decision-making models often yield moderate-to-low R^2 values (Rauch and Frese, 2007). Similarly, Lyver and Lu (2018) found moderate R^2 values in their study on SME innovation performance and strategic entrepreneurship. Thus, the R^2 values may not be high, but they still provide valuable insights into the relationships examined. The model's Q^2 is 0.103 and 0.225 for FP and SDM, respectively. As a guideline in a structural model, if Q^2 values are greater than zero for a specific endogenous construct, it confirms predictive accuracy for that construct.

Table 5: Direct relationships

Hypothesis	Beta	Standard Error	t Statistics	P -value	Decision
IC -> SDM	-0.143*	0.072	1.986	0.024	Accepted
OC -> SDM	-0.386***	0.059	6.573	0.000	Accepted
OP -> SDM	0.065	0.059	1.109	0.134	Rejected
SDM -> FP	0.118*	0.063	1.891	0.029	Accepted

*Note *Relationships are significant at P < 0.05, ***Relationships are significant at P <0.001*

	R-squared	Adjusted R-squared	Q²predict
FP	0.139	0.130	0.103
SDM	0.256	0.250	0.225

Table 6: Mediation analysis

Total Effect

	Beta	Standard Error	t Statistics	P -value
IC -> FP	-0.013	0.075	0.179	0.429
OC -> FP	0.017	0.069	0.242	0.404

Direct Effect

	Beta	Standard Error	t Statistics	P -value
IC -> FP	0.004	0.074	0.047	0.481
OC -> FP	0.062	0.075	0.829	0.204

Specific Indirect Effect

	Beta Coefficient	Standard Error	t Statistics	P -value
OP -> SDM -> FP	-0.008	0.009	0.879	0.190
IC -> SDM -> FP	-0.017	0.012	1.381	0.084
OC -> SDM -> FP	-0.046*	0.027	1.681	0.046

*Note *Relationships are significant at P < 0.05*

Discussion

This research explores the relationship between cognitive biases, strategic decision-making (SDM), and firm performance (FP) among SME entrepreneurs in Bangladesh. Here, we take overoptimism (OP), overconfidence (OC), and the illusion of control (IC) as cognitive bias. The results reveal that entrepreneurial SDM has a significant positive effect on FP (H_1). This finding infers that the more comprehensive and formal the decision-making process, the more rational the decision is. This results in quality decisions leading to better FP. These results align with the earlier literature, which shows a positive relationship between SDM and performance (Dean and Sharfman, 1996; Feng *et al.*, 2022). In addition, our findings align with Sinnaiah *et al.* (2023), which suggests that rationality in SDM positively impacts financial performance. In Bangladesh, entrepreneurs operate their ventures in a regulatory complex environment and have limited financial resources; they also face supply chain disruptions. If entrepreneurs use analytical procedures and collect reasonable information when making strategic decisions, particularly in SMEs where they have flexibility, they can better structure their decision-making criteria to find and assess each alternative. Thus, entrepreneurs who adopt rational and structured decisions can minimize risk and adjust to uncertainty, building confidence during decision-making. They are better positioned to face institutional challenges, leading to higher FP.

In this study, our observed relationship between OP bias and the SDM of SME entrepreneurs (H_2) is not statistically significant and rejected. Despite the insignificant p-value, the coefficient sign was negative, as expected. This insignificant result might be due to the post-COVID recovery phase, which is accompanied by growing inflation, political turmoil, and the upcoming national election in the country (Bangladesh) during the data collection stage. This may diminish the OP and SDM relationship of entrepreneurs in Bangladesh. Economic volatility and political instability make them more cautious and practical, even if they are optimistic. Previous research (Trevelyan, 2008) established this relationship in contexts in developed countries, which are economically and politically stable compared to developing countries like Bangladesh. However, the trend in the data implies that optimistic entrepreneurs influence SDM negatively.

We find that OC is negatively associated with the SDM of SME entrepreneurs (H_3), which agrees with the literature (Ahmad *et al.*, 2021). OC may result in risky or unsafe decisions. Therefore, it impedes the capability of entrepreneurs to draw sound strategic decisions (Nouri *et al.*, 2017). A simple but probable explanation for this direct negative link is that OC can lead to fewer information-gathering efforts (Zacharakis and Shepherd, 2001) and less perceived risk (Camerer and Lovallo, 1999). Entrepreneurs who have experienced success in the past are more inclined to stick to their initial plan of action. They feel that their investment will turn out well, and they definitely have the ability to manage it. In Bangladesh, most SMEs operate informally or semi-formally. They do not disclose detailed financial or relevant data. Due to limited access to competitor and industry performance data, entrepreneurs often rely on personal experience and intuition to make strategic decisions. They assume they have superior market knowledge, even when they lack objective data. This can also lead to overinvestment in risky projects or failure to recognize probable threats in the market.

This study revealed that IC bias has a negative effect on the SDM of SME (H_4) entrepreneurs, which is in line with the findings by Carr and Blettner (2010) and Kahneman and Tversky (1996). This bias makes entrepreneurs perceive lower risk and inspires them to undertake new ventures (Simon *et al.*, 2000). In Bangladesh, entrepreneurs face regulatory barriers and corruption when operating their businesses. They overestimate their ability to handle such situations (e.g., bureaucratic hurdles, regulatory formalities), which results in IC. Moreover, since market information is not readily available, entrepreneurs depend on their personal and social networks to collect information. For example, an SME owner might assume that their political connections will secure a loan, even if their business lacks financial viability. Thus, IC bias could be reinforced since they over-rely on word of mouth; they only take into account a small number of options when making decisions. They become less thorough and less comprehensive, resulting in inferior decision quality.

The examination of the mediating effect of SDM on OP, OC, IC, and FP has been stated in H_{5a}, H_{5b}, and H_{5c} (Table 6). The mediating effect of SDM on OC and FP (H_{5b}) is significant. Previous research has revealed that SDM is directly associated with OC (e.g., Ahmad *et al.*, 2021) and FP (e.g., Singh, 2020). We did not observe a direct correlation between OC and FP, which makes this result intriguing as well. In other words, this study highlights that the relationship between OC and FP is complex and needs consideration of mediating factors such as SDM. In Bangladesh, where financial and institutional restrictions impede fast corrective measures, inadequate SDM exacerbates the riskiness of business for overconfident entrepreneurs. This implies that improving SDM structures might help reduce OC-driven business failures. The mediation effect of SDM on OP and FP (H_{5a}) and the mediation effect of SDM on IC on FP (H_{5c}) are insignificant; this could be due to a distinct contextual factor. The non-significant mediation of SDM in the OP–FP relationship suggests that OP alone is not a strong enough driver of SDM in the Bangladeshi SME sector. In Bangladesh, entrepreneurs face imperative financial constraints, economic volatility in the post-COVID age, and ongoing political instability. These challenges induce them to adopt cautious, risk-averse decision-making strategies. As a result, OP has a slight effect on SDM and fails to serve as an effective mediator for FP. This financial limitation further diminishes the impact of OP, as entrepreneurs cannot make decisions solely based on optimistic expectations but must carefully deal with funding constraints. We found non-significant mediation of SDM in the IC–FP. Entrepreneurs with high IC often substitute structured SDM with informal networks. They think that they can face market challenges through personal influence. As a result, social capital may be a more effective mediator than SDM in connecting IC to FP. Furthermore, adaptive crisis management could be another alternative mediator in the IC–FP relationship.

Entrepreneurs with high IC can influence their intuition to respond quickly to external shocks, make real-time adjustments, and adapt judiciously to evolving market conditions.

As far as we know, this is the first research effort that shows how SDM mediates the link between FP, OC, IC, and OP in an entrepreneurial setting. To summarize, we contend that investigating relevant mediating variables is a suitable research approach to further our knowledge of the relationship between cognitive biases and FP in entrepreneurs.

Theoretical and Policy Implication

This study could potentially make some useful contributions to the existing literature. First, the study adds to our understanding of cognitive biases and business performance and advances theory. This is achieved by examining the mediating effect of SDM. Entrepreneurs often perceive many situations differently, and their decision-making can be affected by several cognitive biases, such as overoptimistic bias, OC, and IC. Second, entrepreneurs have behavioral biases that negatively impact their SDM and, as a result, FP. While several studies have revealed a causal link between cognitive biases and decision-making or a relation between cognitive biases and performance, efforts should have been made to know the fundamental reason behind FP through the SDM process. The literature on cognitive bias and SDM is not voluminous. As per our knowledge, taking SDM as a mediator between biases and performance, in this sense, this work represents pioneering research. Third, the research took place in the context of Bangladesh SMEs. According to research on cognitive bias, they often vary depending on the situation (for example, stage in the business, activity area, country's developmental stage, etc.). This difference is particularly apparent when considering how the setting of emerging economies differs from that of developed nations due to differences in the contextual paradigm.

Our findings imply that policymakers might find it useful to enhance the performance of entrepreneurial firms by devising appropriate policies. First, they could find initiatives that assist entrepreneurs in suitably assessing their abilities, skills to run businesses, and capacity to predict their success. As such, training and education modules for controlling the impact of cognitive bias or debiasing can be developed and enhanced through knowledge of these kinds of empirical findings. Second, experiential learning initiatives, such as mentorship and guidance from experienced entrepreneurs, could be used. Such initiatives would encourage entrepreneurs to consider more objective information and to take into account relevant sources of factual knowledge. Third, entrepreneurs and recruiting agencies can develop tests to figure out the psychological decision-making patterns of employees and candidates for employee selection and their training as a counterbalance.

Conclusion

This study aimed to find out the relationship between cognitive bias, SDM, and FP. This study examined SDM and its role as a mediator in explaining the OP, OC, and IC relationship with FP. The findings indicate that SDM has a positive association with FP. OC and IC have a significant negative association with SDM; as such, it reduces rationality in decision-making, and this reduction has led to reduced FP. Findings also reveal that SDM mediates the relationship between OC and FP.

A careful analysis of the strategic decision may allow entrepreneurs to improve the firm's performance. The research encourages entrepreneurs to make strategic decisions relying on their competence and experience level and refrain from depending on intuition or short-cut decision-making processes. The entrepreneurs are capable of handling the decision process consciously by balancing their biases and improving their FP. By doing this, they can become aware of their psychological characteristics and cognition processes and adopt balancing self-control mechanisms (Hmieleski and Baron, 2008). The entrepreneurs can use these findings to determine their level of cognitive biases and take constructive measures to control their biased behavior through training, counseling, or other mechanisms. They would understand that inadequate comprehension of the decision-making process lowers the venture's performance.

Though the present study made an initial effort to comprehend the connection between cognitive biases, SDM, and FP, readers need to recognize the necessity of further expanding upon these findings. First, the present research addressed the three biases likely to affect SDM. Future researchers can explore other biases (e.g., self-serving attribution, planning fallacy) about SDM and FP. Second, this study trusted on self-reported performance data, which may introduce bias as entrepreneurs could exaggerate their success or provide responses impacted by social desirability effects (Podsakoff et al., 2003). However, in an emerging economy like Bangladesh, where financial data is often unavailable or unreliable, self-reported measures appear to be a valuable instrument for evaluating FP. Third, future research could highlight the model by incorporating control variables such as firm size, industry type, or entrepreneurial experience. This would help isolate the effect of cognitive biases on SDM and FP, strengthening the robustness of the findings and providing a more precise understanding of how biases operate beyond other influencing factors. Fourth, the sample originates from Bangladesh, and it might be posited that the unique attributes of Bangladeshi society, its culture, people's lifestyle, and regulatory framework may explain the findings of this study. Further studies might give new insights into how the environment in Bangladesh or social relationships might affect entrepreneurs' OP, OC, IC, SDM, and FP. Moreover, although spatial is special and findings of different studies vary depending on the contexts, the results and policy implications of this study can be replicated in other areas with similar characteristics of Bangladesh SMEs.

Competing Interest
The authors report that there are no competing interests to declare.

Credit Author Statement
TA did the main research as part of her ongoing Doctoral degree requirement under the supervision of ARS. TA was accountable for the conceptualization, data collection, analysis, interpretation, and manuscript writing. ARS, her supervisor, assisted in comprehending the idea of the research, helped in the analysis, and reviewed the manuscript. All authors read and approved the final manuscript.

References

Acciarini, C., Brunetta, F., & Boccardelli, P. (2021). Cognitive biases and decision-making strategies in times of change: A systematic literature review. *Management Decision*, *59*(3), 638–652.

Adomako, S., Frimpong, K., Mohammed, R. A., Opoku, R. A., & Hussain, R. (2021). Chief executive officers' dispositional optimism, host country's rule of law, and foreign market equity mode choice of Ghanaian small and medium-sized enterprises. *Thunderbird International Business Review*, *63*(1), 63–75.

Ahmad, M., Shah, S. Z. A., & Abbass, Y. (2021). The role of heuristic-driven biases in entrepreneurial strategic decision-making: Evidence from an emerging economy. *Management Decision*, *59*(3), 669–691.

Amore, M. D., Garofalo, O., & Martin-Sanchez, V. (2021). Failing to Learn from Failure: How Optimism Impedes Entrepreneurial Innovation. *Organization Science*, *32*(4), 940–964.

Baron, R. A. (1998). Cognitive Mechanisms in Entrepreneurship: Why and When Entrepreneurs Think Differently Than Other People. *Journal of Business Venturing*, *13*(4), 275–294.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182.

Baum, R. J., & Wally, S. (2003). Strategic decision speed and firm performance. *Strategic Management Journal*, *24*(11), 1107–1129.

Bazerman, M. H. (1990). *Judgment in Managerial Decision Making*. Free Press.

Benevolo, C., Penco, L., & Torre, T. (2021). Entrepreneurial decision-making for global strategies: A "heart–head" approach. *Management Decision*, *59*(5), 1132–1157.

Bourgeois, L. J. (1985). Strategic Goals, Perceived Uncertainty, and Economic Performance in Volatile Environments. *Academy of Management Journal*, *28*(3), 548–573.

Bourgeois, L. J., & Eisenhardt, K. M. (1988). Strategic Decision Processes in High Velocity Environments: Four Cases in the Microcomputer Industry. *Management Science*, *34*(7), 816–835.

Busenitz, L. W., & Barney, J. B. (1997). Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *Journal of Business Venturing*, *12*(1), 9–30.

Camerer, C., & Lovallo, D. (1999). Overconfidence and Excess Entry: An Experimental Approach. *The American Economic Review*, *89*(1), 306–318.

Carr, J. C., & Blettner, D. P. (2010). Cognitive Control Bias and Decision-Making in Context: Implications for Entrepreneurial Founders of Small Firms. *Frontiers of Entrepreneurship Research*, *30*(6).

Cassar, G. (2009). Are individuals entering self-employment overly optimistic? An empirical test of plans and projections on nascent entrepreneur expectations. *Strategic Management Journal*, n/a-n/a.

Chen, S., Liao, Z., Redd, T., & Wu, S. (2013). Laotian entrepreneurs' optimism and new venture performance. *Social Behavior and Personality: An International Journal*, *41*(8), 1267–1278.

Cossette, P. (2014). Heuristics and cognitive biases in entrepreneurs: A review of the research. *Journal of Small Business & Entrepreneurship*, *27*(5), 471–496.

Crane, F. G., & Crane, E. C. (2007). Dispositional optimism and entrepreneurial success. *The Psychologist-Manager Journal*, *10*(1), 13–25.

Das, T. K., & Teng, B. (1999). Cognitive Biases and Strategic Decision Processes: An Integrative Perspective. *Journal of Management Studies*, *36*(6), 757–778.

De Carolis, D. M., & Saparito, P. (2006). Social Capital, Cognition, and Entrepreneurial Opportunities: A Theoretical Framework. *Entrepreneurship Theory and Practice*, *30*(1), 41–56.

Dean, J. W., & Sharfman, M. P. (1996). Does decision process matter? A study of strategic decision-making effectiveness. *Academy of Management Journal*, *39*(2), 368–392.

Dess, G. G., & Robinson, R. B. (1984). Measuring organizational performance in the absence of objective measures: The case of the privately-held firm and conglomerate business unit. *Strategic Management Journal*, *5*(3), 265–273.

Dölarslan, E. Ş., Koçak, A., & Özer, A. (2017). "Bats are blind?" Cognitive biases in risk perception of entrepreneurs. *Journal of Developmental Entrepreneurship*, *22*(03), 1750021.

Eggers, J. P., & Kaplan, S. (2013). Cognition and Capabilities: A Multi-Level Perspective. *Academy of Management Annals*, *7*(1), 295–340.

Feng, J., Han, P., Zheng, W., & Kamran, A. (2022). Identifying the factors affecting strategic decision-making ability to boost the entrepreneurial performance: A hybrid structural equation modeling – artificial neural network approach. *Frontiers in Psychology*, *13*.

Fitzgerald, D. R., Mohammed, S., & Kremer, G. O. (2017). Differences in the way we decide: The effect of decision style diversity on process conflict in design teams. *Personality and Individual Differences*, *104*, 339–344.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39–50.

Francioni, B., & Clark, K. D. (2020). The mediating role of speed in the global sourcing decision process. *Journal of Purchasing and Supply Management*, *26*(2).

Fraser, S., & Greene, F. J. (2006). The Effects of Experience on Entrepreneurial Optimism and Uncertainty. *Economica*, *73*(290), 169–192.

Frese, M., & Gielnik, M. M. (2014). The Psychology of Entrepreneurship. *Annual Review of Organizational Psychology and Organizational Behavior*, *1*(1), 413–438.

Gu, W. (2023). Impact of Managers' overconfidence upon listed Firms' entrepreneurial behavior in an emerging market. *Journal of Business Research*, *155*, 113453.

Gudmundsson, S. V., & Lechner, C. (2013). Cognitive biases, organization, and entrepreneurial firm survival. *European Management Journal*, *31*(3), 278–294.

Guzzo, R. A. (1986). Group decision making and group effectiveness in organizations. *Designing Effective Work Groups*, *34*, 71.

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook*. Springer.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24.

Hambrick, D. C. (2007). Upper Echelons Theory: An Update. *Academy of Management Review*, *32*(2), 334–343. https://doi.org/10.5465/amr.2007.24345254

Hambrick, D. C., & Mason, P. A. (1984). Upper Echelons: The Organization as a Reflection of Its Top Managers. *The Academy of Management Review*, *9*(2), 193.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical Mediation Analysis in the New Millennium. *Communication Monographs*, *76*(4), 408–420.

Hmieleski, K. M., & Baron, R. A. (2008). When does entrepreneurial self-efficacy enhance versus reduce firm performance? *Strategic Entrepreneurship Journal*, *2*(1), 57–72.

Hmieleski, K. M., & Baron, R. A. (2009). Entrepreneurs' Optimism And New Venture Performance: A Social Cognitive Perspective. *Academy of Management Journal*, *52*(3), 473–488.

Houghton, S. M., Simon, M., Aquino, K., & Goldberg, C. B. (2000). No Safety in Numbers: Persistence of Biases and Their Effects on Team Risk Perception and Team Decision Making. *Group & Organization Management*, *25*(4), 325–353.

Jones, R. E., Jacobs, L. W., & van't Spijker, W. (1992). Strategic Decision Processes in International Firms. *MIR: Management International Review*, *32*(3), 219–236.

Kahneman, D., & Tversky, A. (1996). On the reality of cognitive illusions. *Psychological Review*, *103*(3), 582–591.

Kannadhasan, M., Aramvalarthan, S., & Pavan Kumar, B. (2014). Relationship among cognitive biases, risk perceptions and individual's decision to start a venture. *DECISION*, *41*(1), 87–98.

Keh, H. T., Der Foo, M., & Lim, B. C. (2002). Opportunity Evaluation under Risky Conditions: The Cognitive Processes of Entrepreneurs. *Entrepreneurship Theory and Practice*, *27*(2), 125–148.

Keil, M., Depledge, G., & Rai, A. (2007). Escalation: The Role of Problem Recognition and Cognitive Bias. *Decision Sciences*, *38*(3), 391–421.

Langer, E. J. (1975). The illusion of control. *Journal of Personality and Social Psychology*, *32*(2), 311–328.

Love, L. G., Priem, R. L., & Lumpkin, G. T. (2002). Explicitly Articulated Strategy and Firm Performance Under Alternative Levels of Centralization. *Journal of Management*, *28*(5), 611–627.

Lyver, M., & Lu, T.-J. (2018). Sustaining Innovation Performance in SMEs: Exploring the Roles of Strategic Entrepreneurship and IT Capabilities. *Sustainability*, *10*(2), 442.

Maltz, A. C., Shenhar, A. J., & Reilly, R. R. (2003). Beyond the Balanced Scorecard: *Long Range Planning*, *36*(2), 187–204.

Mouna, A., & Jarboui, A. (2015). Financial literacy and portfolio diversification: An observation from the Tunisian stock market. *International Journal of Bank Marketing*, *33*(6), 808–822.

Nitzl, C., Roldan, J. L., & Cepeda, G. (2016). Mediation analysis in partial least squares path modeling: Helping researchers discuss more sophisticated models. *Industrial Management & Data Systems*, *116*(9), 1849–1864.

Nouri, P., Imanipour, N., Talebi, K., & Zali, M. (2017). Heuristics and Biases in Entrepreneurial Marketing: Some New Insights. *International Journal of Entrepreneurship*, *21*(3), 1–9.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903.

Raithel, S., Sarstedt, M., Scharf, S., & Schwaiger, M. (2012). On the value relevance of customer satisfaction. Multiple drivers and multiple markets. *Journal of the Academy of Marketing Science*, *40*(4), 509–525.

Rajagopalan, N., Rasheed, A. M. A., & Datta, D. K. (1993). Strategic Decision Processes: Critical Review and Future Directions. *Journal of Management*, *19*(2), 349–384.

Rauch, A., & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *European Journal of Work and Organizational Psychology*, *16*(4), 353–385.

Riasudeen, S., Ratnoo, H. S., Kannadhasan, M., & Singh, P. (2022). Risk Perception as a Mediator in Explaining the Relationship of Cognitive Biases and New Venture Creation. *The Journal of Entrepreneurship*, *31*(2), 274–297.

Robinson, A. T., & Marino, L. D. (2015). Overconfidence and risk perceptions: Do they really matter for venture creation decisions? *International Entrepreneurship and Management Journal*, *11*(1), 149–168.

Schade, C. D., & Koellinger, P. (2007). Heuristics, biases, and the behavior of entrepreneurs. In Minniti M (Ed.), *Entrepreneurship: The engine of growth* (Vol. 1, pp. 41–64). Praeger.

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology*, *4*(3), 219–247.

Shah, A. K., & Oppenheimer, D. M. (2008). Heuristics made easy: An effort-reduction framework. *Psychological Bulletin*, *134*(2), 207–222.

Shepherd, D. A., & Patzelt, H. (2018). *Entrepreneurial cognition: Exploring the mindset of entrepreneurs*. Springer Nature.

Shepherd, D. A., Williams, T. A., & Parzelt, H. (2015). Thinking About Entrepreneurial Decision Making: Review and Research Agenda. *Journal of Management*, *41*(1), 11–46.

Simarasl, N., Tabesh, P., Munyon, T. P., & Marzban, Z. (2022). Unveiled confidence: Exploring how institutional support enhances the entrepreneurial self-efficacy and performance of female entrepreneurs in constrained contexts. *European Management Journal*.

Simon, H. A. (1993). Strategy and organizational evolution. *Strategic Management Journal*, *14*(S2), 131–142.

Simon, M., Houghton, S. M., & Aquino, K. (2000). Cognitive biases, risk perception, and venture formation. *Journal of Business Venturing*, *15*(2), 113–134.

Simon, M., & Shrader, R. C. (2012). Entrepreneurial actions and optimistic overconfidence: The role of motivated reasoning in new product introductions. *Journal of Business Venturing*, *27*(3), 291–309.

Singh, R. P. (2020). Overconfidence: A common psychological attribute of entrepreneurs which leads to firm failure. *New England Journal of Entrepreneurship*, *23*(1), 25–39.

Sinnaiah, T., Adam, S., & Mahadi, B. (2023). A strategic management process: The role of decision-making style and organisational performance. *Journal of Work-Applied Management*, *15*(1), 37–50.

Soper, D. (n.d.). *A-priori sample size calculator for structural equation models*. Retrieved July 30, 2023, from https://www.danielsoper.com/statcalc/calculator.aspx?id=89

Thomas, O. (2018). Two decades of cognitive bias research in entrepreneurship: What do we know and where do we go from here? *Management Review Quarterly*, *68*(2), 107–143. https://doi.org/10.1007/s11301-018-0135-9

Trevelyan, R. (2008). Optimism, overconfidence and entrepreneurial activity. *Management Decision*, *46*(7), 986–1001.

Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *Science*, *185*(4157), 1124–1131.

Wally, S., & Baum, J. R. (1994). Personal and Structural Determinants of the Pace of Strategic Decision Making. *The Academy of Management Journal*, *37*(4), 932–956.

Wiklund, J., & Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic Management Journal*, *24*(13), 1307–1314.

Wong, K. K.-K. (2013). Partial least squares structural equation modeling (PLS-SEM) techniques using SmartPLS. *Marketing Bulletin*, *24*(1), 1–32.

Zacharakis, A. L., & Shepherd, D. A. (2001). The nature of information and overconfidence on venture capitalists' decision making. *Journal of Business Venturing*, *16*(4), 311–332.

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

Zhang, S. X., & Cueto, J. (2017). The Study of Bias in Entrepreneurship. *Entrepreneurship Theory and Practice*, *41*(3), 419–454.

Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis. *Journal of Consumer Research*, *37*(2), 197–206.