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Framing the Decision: An Experimental Study of Managerial Judgments after Leadership Training

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Abstract

The present study aims to contribute to the interdisciplinary discourse within behavioural economics and managerial psychology by examining the role of cognitive biases in managerial decision-making. Specifically, it investigates the framing effect - an established cognitive heuristic - by exploring how identical market information presented in either a gain-oriented (positive) or loss-oriented (negative) frame influences managerial investment decisions differently. A fundamental objective of the present study is to examine the moderating effect of transformational leadership training in diminishing vulnerability to framing-induced distortions. A total of 45 managers employed by the university participated in the research study. All participants initially underwent a standardised four-hour training session focusing on the principles of transformational leadership. Participants were then randomly allocated to one of two experimental conditions. Each group was provided with investment scenarios of an identical nature, but with different informational framing: one emphasised potential gains (positive framing), while the other foregrounded potential risks and uncertainties (negative framing). Participants were then invited to respond to the following question: 'Should the company enter the market under these conditions?', and to provide a concise written rationale to support their response. The present study employs a mixed-methods experimental design, integrating quantitative and qualitative analytical approaches. Quantitative analysis revealed no

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statistically significant differences in decision outcomes between framing conditions ($\chi^2 \approx 0.045$, $p > 0.05$). However, a subsequent qualitative content analysis of the open-ended justifications revealed that participants' cognitive reasoning was markedly sensitive to the framing manipulation. The respondents who were exposed to positive framing predominantly employed opportunity-centric rationales, whereas those exposed to negative framing articulated risk-averse arguments. These findings are consistent with the theoretical propositions of prospect theory (Tversky & Kahneman, 1981) and the risk-as-feelings hypothesis (Loewenstein et al., 2001), both of which emphasise the interaction between cognitive heuristics and emotional responses in decision-making contexts. It is noteworthy that the absence of significant outcome variation may imply that transformational leadership training has mitigated the behavioural impact of framing. Thematic analysis suggests that there are nuanced shifts in cognitive processing and increased resilience to framing effects among trained participants. The study under discussion highlights the importance of cognitive framing in shaping managerial judgements and the potential of leadership-oriented cognitive interventions to mitigate such biases. The present study makes a novel contribution to the extant literature on behavioural decision-making, executive cognition and leadership development within organisational contexts.

Keywords: Framing effect, decision-making, leadership training, behavioral biases, experimental research, managerial psychology

Introduction

Theoretical Framework

The framing effect constitutes a robust cognitive bias that systematically alters individual judgment. This alteration is not merely a consequence of the informational content, but also of the manner in which it is presented (Tversky & Kahneman, 1981). This phenomenon, termed the "loss aversion effect," postulates that individuals' choices undergo a shift in preference when presented with outcomes that are depicted in terms of gains or losses. Prospect theory (Kahneman & Tversky, 1979), which serves as the foundational theoretical framework, elucidates how individuals typically exhibit risk aversion when confronted with positively framed (gain) scenarios, yet become more risk-seeking under negatively framed (loss) contexts, particularly under uncertainty (Levin, Schneider, & Gaeth, 1998; Jin et al., 2023). Levin et al.'s (1998) typology categorizes framing effects into three primary forms: risky framing, attribute framing, and goal framing. Risky framing is defined as a shift in preference when equivalent outcomes are expressed differently (Tversky & Kahneman, 1981; Gong et al., 2013). To illustrate, consider the contrast between the phrases "200 people will be saved"

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and "400 people will die". Attribute framing pertains to differential evaluations elicited by opposing descriptions of identical products, such as "75% fat-free" versus "25% fat" (Levin & Gaeth, 1988; Petrescu et al., 2023). Goal framing is a concept that has been utilised to address the differing persuasive effectiveness of positively versus negatively framed behavioural messages (Piñon & Gambara, 2005; Tao et al., 2022). The framing effect transcends purely cognitive processes by significantly implicating emotional dimensions. Loewenstein et al.'s (2001) risk-as-feelings hypothesis underscores the role of affective reactions - rather than deliberate rationality - in decision-making under risk. Emotions such as anxiety, uncertainty, and perceived threat become potent heuristic guides in judgments. Recent studies, including Stark et al. (2017) and Tao et al. (2022), have consistently highlighted that emotional responses notably mediate framing effects, with positively framed messages generating more favorable affective outcomes. The magnitude and direction of framing effects are further moderated by various individual and contextual factors. Individuals with elevated social anxiety are notably susceptible to framing biases, exhibiting increased risk aversion under uncertainty (Lincă, 2016; Maner et al., 2007). Similarly, ambiguity aversion - discomfort in the face of informational uncertainty - amplifies negative framing effects, leading individuals towards safer, more certain outcomes (Osmont et al., 2014).

Cognitive capacity and educational attainment are critical moderators of susceptibility to framing biases. Neuroimaging studies (Gonzalez, Dana, & Koshino, 2005; Jin et al., 2023) indicate that individuals with higher education levels exhibit enhanced activation of prefrontal brain regions associated with executive control, enabling more rational, frame-independent decision-making. Fan (2017) similarly demonstrated reduced framing susceptibility among individuals with advanced analytical reasoning abilities. Beyond individual decisions, framing effects significantly influence organizational, institutional, and policy contexts. For instance, Diacon and Hasseldine (2007) reported significant framing impacts on investment decisions based on the presentation format of financial data. Recent research by Ventre et al. (2023) utilizing multi-criteria decision-making frameworks has shown systematic variability in product evaluations linked explicitly to framing. Comparable impacts have been documented in healthcare communications (Gong et al., 2013), judgments of social discrimination (Hsee & Li, 2022), sustainability initiatives (Ibrahim & Saeed, 2025), and digital media environments (Li & Ling, 2015; Jin et al., 2023). Meta-analytic evidence robustly validates the framing effect across various domains. Piñon and Gambara (2005) reported substantial average effect sizes: risky framing ($d = 0.437$), attribute framing ($d = 0.260$), and goal framing ($d = 0.444$), confirming framing's reliable influence on diverse decision-making contexts. More recently, Petrescu et al. (2023) and

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Paladino (2024) reinforced these findings, highlighting the nuanced interaction of framing with cognitive effort and question structure.

Overall, framing effects profoundly alter not only behavioral outcomes but also the cognitive, emotional, and discursive processes underpinning decision-making. The quality and rationale of individuals' justifications are significantly contingent upon framing, prompting critical questions about managerial judgment objectivity. Scholars recommend interventions such as debiasing techniques, analytical reasoning training, and cultivating metacognitive awareness to mitigate such biases (Kahneman, 2011; Milkman et al., 2009; Jin et al., 2023).

In managerial contexts - where decision stakes are notably high - the framing effect's relevance intensifies. Recent research emphasizes the potential of cognitive training and domain-specific expertise to reduce framing bias susceptibility (Kuhn, 1997; Levin et al., 1998; Paladino, 2024). Transformational leadership, defined by Bass (1985) as encompassing vision articulation, inspirational motivation, and individualized consideration, is theorized to enhance cognitive processing and facilitate higher-order decision-making. Nevertheless, empirical studies directly linking transformational leadership training to diminished framing effects remain limited. Addressing this gap, this study investigates whether transformational leadership principles can effectively modulate framing sensitivity among mid-level managers, incorporating contemporary perspectives and modern empirical insights (Ibrahim & Saeed, 2025; Tao et al., 2022; Jin et al., 2023).

Methodology

The data collection phase was meticulously designed to empirically investigate the influence of framing on managerial decision-making. The procedure involved the systematic exposure of participants to framing manipulations and the evaluation of their responses based on two complementary data types: binary investment choices and written justifications. The employment of a mixed-method approach facilitated a comprehensive quantitative and qualitative analysis.

a. Participants were randomly assigned to either the gain-frame group (n = 22) or the loss-frame group (n = 23).
b. Participants received an informational brief detailing an investment scenario. Content was consistent across conditions, with only framing varied. Gain-frame: Information presented positively ("70% chance of success"). Loss-frame: Information presented negatively ("30% risk of failure").
c. Participants answered the question: "Given these conditions, should the company enter the market?" Responses recorded in binary form (1

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= Yes, 0 = No). Each participant provided a brief, open-ended written justification for their decision.

d. Open-ended responses were subjected to thematic content analysis employing an inductive qualitative coding strategy:
    - **Data Immersion:** Comprehensive reading of justifications.
    - **Line-by-Line Coding:** Identification of meaning units focusing on evaluative dimensions (e.g., risk aversion, strategic foresight).
    - **Theme Development:** Categorization into themes such as "risk minimization," "strategic opportunity," "emotional intuition," and "long-term orientation."
    - **Inter-Coder Reliability:** Two independent coders conducted initial coding, resolving discrepancies through discussion to ensure reliability.
    - **Matrix Classification:** Responses categorized into a 2×2 matrix by framing condition (Gain vs. Loss) and decision outcome (Yes vs. No) for systematic comparative analysis.
e. Binary decision data analyzed using the chi-square (χ^2) test of independence to examine associations between framing type and investment decision outcomes.
f. Experimental materials reviewed and pre-tested by subject matter experts to ensure semantic neutrality, structural coherence, and consistent cognitive load.

Framing manipulation isolated as the sole variable differing between experimental conditions.

Research Methodology

This study empirically investigates the framing effect - a cognitive bias influencing decision-making through differences in wording rather than informational content - among mid-level managers who completed identical leadership training sessions. Employing a single-factor, between-subjects design based on prospect theory (Tversky & Kahneman, 1981), we examined whether uniformly trained university managers would make divergent investment decisions when presented with information framed positively versus negatively.

Experimental Variables

Independent Variable (Framing Condition):

- Gain Frame: Emphasizes a 70% probability of success.
- Loss Frame: Highlights a 30% probability of failure.

This framing manipulation aligns with Levin, Schneider, and Gaeth's (1998) risky-choice framing taxonomy, designed to evoke distinct cognitive

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and emotional responses as supported by the risk-as-feelings hypothesis (Loewenstein et al., 2001; Stark et al., 2017).

Dependent Variable:

- Binary investment decision (1 = Invest, 0 = Do not invest) concerning a hypothetical mobile-phone market entry.
- Participants provided brief written justifications explaining their choices. Quantitative investment decisions were analyzed using chi-square (χ^2) tests, and qualitative responses were subjected to thematic analysis based on Hsee and Li (2022).

The study sample consisted of 45 mid-level academic managers aged 30–65 from a single public university in Turkey, including department chairs and program coordinators. Prior to the experimental manipulation, participants voluntarily engaged in a structured 4-hour leadership training session covering cognitive biases, decision heuristics, and transformational leadership principles (Milkman et al., 2009; Fan, 2017).

Table 1. Participant Demographics and Group Allocation

Participant Group	Sample Size	Age Range	Occupation	Training Received
Group A (Gain Frame)	23	30–65	University academic managers	4-hour leadership training
Group B (Loss Frame)	22	30–65	University academic managers	4-hour leadership training

Procedure

Immediately after completing the training, participants were randomly assigned to either the gain or loss framing condition. Each participant received an identical investment scenario related to entering the mobile-phone manufacturing sector, differing solely in linguistic framing (gain vs. loss). Participants then responded to the following decision prompt:

"Should the university invest in this mobile-phone venture under the presented conditions?"

Additionally, they provided concise written rationales for their decisions.

Table 2. Experimental Procedure and Data Collection Summary

Stage	Description
Pre-training	4-hour leadership session for all participants
Experimental Stimulus	Investment scenario framed in terms of gain vs. loss
Decision Task	Binary choice: invest or do not invest
Justification Task	Brief written rationale (qualitative data)
Analytical Methods	χ^2 test for binary decisions; thematic coding
Post-training Assessment	Not applicable (single training and decision phase)

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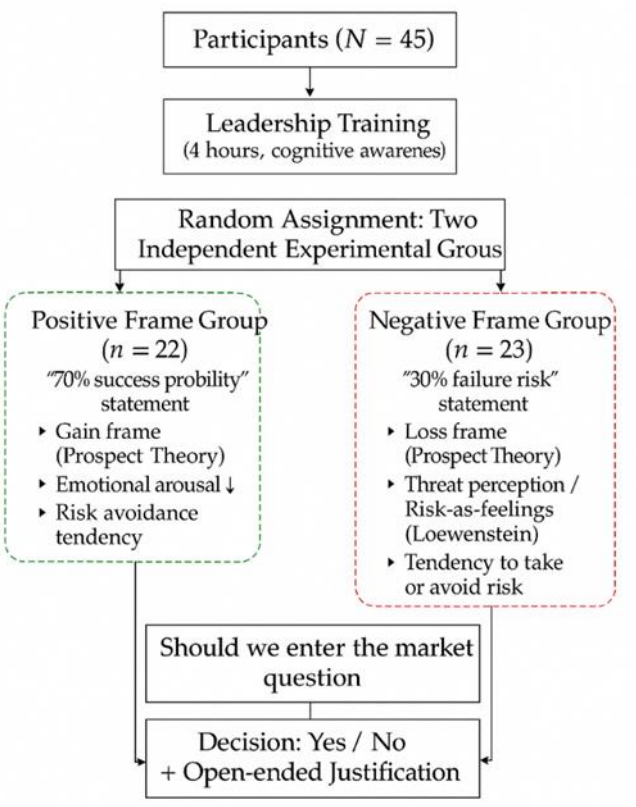

Figure 1: Created By Authors

This design provided a multidimensional decision analysis model, extending beyond statistical comparison to include the discursive and cognitive strategies used by participants. As such, the study aimed to make an original contribution to the decision-making literature by capturing both behavioral and narrative dimensions of the framing effect within a managerial decision-making context.

Data Collection

This study investigated how linguistic framing influences managerial decision-making post-leadership training using a structured experimental design that integrated quantitative and qualitative methodologies. The sample consisted of 45 mid-level academic managers from a public university in Turkey, all of whom occupied dual roles involving teaching and administration (e.g. department chairs and directors). Prior to participating in the experiment, all individuals voluntarily undertook a standardised four-hour leadership training session designed to enhance awareness of cognitive biases and strategic decision-making.

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Immediately after completing the training, participants were randomly divided into two groups:

- •Gain Frame Group (n = 23): Participants received an investment scenario framed positively, emphasizing opportunities ("70% probability of success").
- Loss Frame Group (n = 22): Participants received the identical scenario framed negatively, highlighting risks ("30% probability of failure").

The experimental manipulation adhered to Levin, Schneider, and Gaeth's (1998) risky-choice framing paradigm, designed explicitly to evaluate whether identically trained managers make different investment decisions based solely on linguistic framing, consistent with prospect theory (Tversky & Kahneman, 1981).

Following scenario exposure, participants answered the binary decision question:

"Given these conditions, should the university invest in this mobile phone venture?"

Their decisions (1 = Yes, 0 = No) were recorded quantitatively. Additionally, each participant provided a brief written justification for their decision, generating qualitative data for thematic analysis.

For enhanced clarity, the experimental procedure is summarized below:

Table 3: Experimental Procedure and Data Collection Summary

Stage	**Description**
Pre-training	4-hour standardized leadership training for all participants
Experimental stimulus	Investment scenario framed as either gain or loss
Decision task	Binary choice: "Should the university invest?"
Justification task	Brief open-ended rationale provided by each participant
Analysis methods	x^2 test for quantitative decisions; thematic coding for qualitative justifications
Instrument	Materials reviewed by subject experts for semantic equivalence, validation neutrality, and cognitive load

Quantitative decisions were coded nominally, and chi-square (χ^2) tests of independence were conducted to assess the influence of framing conditions on decision outcomes. This statistical approach was appropriate for analyzing categorical data distributions across independent groups. Thematic analysis of the written justifications revealed distinct cognitive and emotional reasoning patterns related to framing. Themes such as "questioning assumptions," "evaluating long-term impacts," and "assessing probability versus

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consequence" appeared consistently in both groups. These findings indicate the leadership training encouraged reflective and deliberative reasoning.

Aligned with recent findings by Jin et al. (2023), these observed patterns suggest a shift toward more deliberate cognitive processing, revealing partial resistance to framing effects due to enhanced cognitive engagement fostered by training. Nonetheless, framing continued to subtly influence justification logic, confirming the persistent impact of linguistic presentation even among trained decision-makers.

All experimental materials were rigorously pre-tested by subject-matter experts prior to implementation to ensure:

- Semantic equivalence across framing conditions
- Neutrality of tone
- Consistency in cognitive difficulty

This validation step confirmed framing as the exclusive manipulated factor, thereby minimizing potential confounding variables and enhancing the study's internal validity (Gonzalez, Dana, & Koshino, 2005).

Data Analysis

The data collection phase was meticulously designed to empirically investigate the influence of framing on managerial decision-making. Data were collected from participants who were systematically exposed to a framing manipulation and assessed based on both their binary investment choices and the underlying reasoning articulated in their written justifications. This dual-data approach enabled a robust mixed-method analysis, incorporating both quantitative outcomes and qualitative insights to evaluate the cognitive and emotional impact of framing. During the experimental procedure, each participant received an informational brief describing an investment scenario. While the substantive content remained constant, the framing varied linguistically in accordance with Levin, Schneider, and Gaeth's (1998) risky-choice framing typology. The gain-frame group (n = 22) received positively framed information (e.g., “70% chance of success”), while the loss-frame group (n = 23) received a negatively framed counterpart (e.g., “30% risk of failure”). This design allowed for a direct test of prospect theory predictions (Tversky & Kahneman, 1981) regarding the influence of presentation format on perceived risk and decision orientation. Participants were then prompted with a scenario-based decision question: “Given these conditions, should the company enter the market?” Responses were recorded in binary format (1 = Yes; 0 = No), and participants were asked to provide a brief open-ended justification. These qualitative justifications were thematically analyzed to identify variation in cognitive and emotional processing across framing conditions (Stark et al., 2017; Hsee & Li, 2022). Thematic analysis revealed a pattern of increased cognitive elaboration and metacognitive reflection among

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participants. Recurring themes included "challenging assumptions," "considering long-term impacts," and "weighing risk-benefit trade-offs."

These findings align with Jin et al. (2023), suggesting that leadership training may have fostered a shift from intuitive to deliberative cognition, thereby reducing reliance on heuristic shortcuts while not entirely eliminating the influence of framing. Quantitative responses were coded as nominal variables and analyzed using a chi-square (χ^2) test of independence to determine whether the framing condition significantly affected decision patterns. This statistical test was appropriate for assessing associations between categorical variables - namely, framing type and investment decision. To ensure the internal validity of the study, all experimental materials were reviewed and pre-tested by subject matter experts. The content was evaluated for semantic neutrality, structural coherence, and consistency in cognitive load across conditions. The framing variable was carefully isolated as the sole experimental manipulation, with equivalent text length, complexity, and informational content. These validation measures enhanced the reliability and internal consistency of the data collection instruments (Gonzalez, Dana, & Koshino, 2005). In conclusion, the study's data collection protocol facilitated a comprehensive examination of the framing effect by integrating behavioral metrics with interpretive analyses of decision rationales. This approach enabled a more nuanced understanding of how framing operates in managerial contexts and the extent to which leadership training can modulate its influence.

Preliminary Analysis of Open-Ended Responses

In addition to recording participants' binary investment decisions (i.e. 'Yes' or 'No'), the study also elicited the cognitive rationales that underpinned these decisions. Each participant was asked to provide a brief explanation of the reasoning behind their choice. This qualitative component was purposefully integrated to examine how linguistic framing influenced both decision outcomes and the narratives used to justify them, rather than just observing surface-level behaviour. By capturing participants' interpretive frameworks, the study aimed to establish whether the valence of the information - framed positively or negatively - shaped the structure and content of their rationalisations. This approach enabled framing-induced discursive patterns to be identified, offering a deeper understanding of how managerial cognition is constructed in context. It provided insight into whether identically trained decision-makers internalised and expressed framing manipulations not only behaviourally, but rhetorically too, thereby contributing to the broader literature on framing and managerial decision-making processes.

The open-ended responses of the 45 participants were systematically analyzed using thematic content analysis, applying an open coding strategy

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consistent with inductive qualitative research practices. The analysis was conducted in a multi-phase process designed to ensure methodological transparency, analytical depth, and interpretive reliability:

Initial Data Immersion: Each written justification was read holistically to develop a comprehensive understanding of the participants' reasoning strategies, tone, and narrative flow.

Line-by-Line Coding: Responses were deconstructed at the sentence and clause levels. Units of meaning were extracted and coded as semantic tokens that captured evaluative dimensions such as risk aversion, opportunity recognition, ethical sensitivity, and strategic foresight.

Theme Development: Coded segments were clustered into higher-order thematic categories based on conceptual congruence. Emergent themes included "risk minimization," "strategic opportunity," "emotional intuition," and "long-term orientation," reflecting diverse cognitive and emotional evaluative schemas.

Inter-Coder Reliability: To enhance the credibility of the analysis, two independent coders performed the initial coding phase. Coding agreement was assessed, and any discrepancies were resolved through collaborative dialogue and consensus, thereby ensuring analytical rigor and enhancing the confirmability of findings.

Matrix Classification: After finalizing the thematic coding, each participant's response was mapped onto a 2×2 matrix structured by two independent variables:

Framing Condition: Gain vs. Loss

Decision Outcome: Yes vs. No

This classification allowed for systematic cross-group comparisons to determine how framing influenced not only the valence of investment decisions but also the structure and content of justificatory reasoning.

By integrating quantitative decision data with qualitative thematic insights, this layered analytical framework enabled a more comprehensive exploration of the framing effect. Capturing both "what" participants decided and "why" they chose as they did, the study provides a nuanced and context-sensitive account of managerial cognition under conditions of uncertainty and cognitive bias. This approach advances the literature by illustrating how even well-trained decision-makers may exhibit framing-contingent reasoning patterns, reinforcing the need for deeper cognitive awareness in leadership contexts.

Positive Frame Group (n = 22)

Among participants exposed to the positively framed scenario, those who endorsed entering the market predominantly articulated opportunity-driven rationales. Their justifications frequently referenced broader market-

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level considerations, including anticipated industry growth, emerging technological trends, and strategic advantages associated with early market entry. Illustrative responses included:

- "Early movers gain competitive advantage."
- "Becoming a pioneer in AI and 5G strengthens our brand."

These statements reflect a future-oriented strategic cognition, wherein positively framed probabilities of success activated schemas centered on innovation, leadership positioning, and long-term differentiation. The framing appeared to amplify attention to external opportunities and competitive positioning.

In contrast, participants within the same framing condition who declined to invest emphasized internal limitations and constraints. Their decision-making was not characterized by skepticism toward the market opportunity but rather by assessments of organizational readiness and strategic fit. Example responses included:

- "Due to lack of preparation, this opportunity is premature."
- "There is potential, but our strategic plan is not yet ready."

These narratives suggest that while positive framing can enhance the salience of external opportunities, it does not override managerial evaluations of internal capacity and strategic alignment. This highlights the complex interplay between cognitive framing and organizational situational awareness in shaping managerial choices. The findings underscore that decision-making under positively framed conditions involves an integration of opportunity perception and internal feasibility assessment.

Table 4: Distribution of Investment Decisions by Framing Condition

Decision	Positive Frame (n=22)	Negative Frame (n=23)
Yes	11	11
No	11	12

Negative Frame Group (n = 23)

Participants exposed to the negatively framed condition predominantly exhibited discursive patterns characterized by heightened risk sensitivity and environmental caution. Those who rejected market entry frequently cited concerns related to financial volatility, market saturation, and technological immaturity. Representative justifications included:

- "This investment could be too costly."
- "The market is saturated; profit margins will shrink."
- "The technology is not mature; risk is high."

These responses align closely with prospect theory's predictions, which posit that loss-framed scenarios are more likely to activate conservative cognitive heuristics and amplify perceived risk (Tversky & Kahneman, 1981).

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The language employed in these justifications reflects a defensive evaluative stance, where the perceived potential for loss constrains strategic openness.

However, a notable subset of participants within the same loss-framed group nonetheless endorsed market entry. Their justifications demonstrated elements of strategic foresight, competitive alertness, and cognitive reframing of uncertainty into opportunity. Illustrative responses included:

- "Competitors are moving ahead; we cannot afford to be late."
- "Uncertainty creates opportunity; those who take risks win."

These counter-narratives underscore that while loss framing exerts a measurable influence, it does not exert uniform control over decision-making. Rather, its effects are mediated by individual-level variables such as risk tolerance, cognitive flexibility, and strategic mindset. Participants who resisted the dominant framing orientation exhibited adaptive reasoning capabilities, reframing potential threats as opportunities for strategic differentiation. These findings emphasize the nuanced and non-deterministic nature of framing effects in real-world managerial contexts.

Table 5. Thematic Patterns in Negative Frame Group

Decision	**Thematic Emphasis**
No	Risk aversion and uncertainty (e.g., "This investment could be too risky.")
Yes	Strategic foresight (e.g., "Uncertainty creates opportunity.")

The qualitative analysis revealed that the framing manipulation had a multidimensional impact, influencing not only participants' observable decisions but also the cognitive architecture and discursive construction of their justifications. This suggests that framing operates at both behavioral and interpretive levels, shaping how individuals reason through uncertainty. Three dominant patterns emerged from the thematic evaluation:

Frame-Congruent Reasoning:

Most participants provided rationales that closely mirrored the valence of the frame they received. In the gain-framed condition, justifications emphasized opportunity, innovation, and strategic leverage. In contrast, responses in the loss-framed condition concentrated on risk mitigation, environmental uncertainty, and avoidance of negative outcomes. This pattern indicates a deeper cognitive assimilation of the framing logic, wherein participants' evaluative frameworks were semantically aligned with the initial stimulus. The framing effect, therefore, extended beyond surface-level behavioral bias to influence the internal logic and structure of decision reasoning.

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Decision–Theme Coherence:

There was a high degree of consistency between participants' decisions and the dominant themes in their justifications. Affirmative ("Yes") decisions were often supported by narratives focused on growth potential, competitive positioning, and visionary planning. Negative ("No") decisions were predominantly justified through themes such as financial risk, technological immaturity, or lack of organizational readiness. This thematic coherence illustrates how participants integrated cognitive and affective components in a manner congruent with both their decision and the framing condition, suggesting the presence of emotionally and semantically reinforced reasoning processes.

Organizational Context Sensitivity:

Across both gain and loss framing conditions, a subset of negative decisions referenced internal organizational limitations - such as resource constraints, insufficient preparation, or misalignment with current strategies - as decisive factors. These responses were independent of the external framing manipulation and instead reflected grounded assessments of institutional readiness. This indicates that context-sensitive factors may act as moderating variables in framing effects, attenuating or overriding externally induced cognitive biases. Such findings underscore the importance of incorporating organizational and structural awareness into models of managerial decision-making.

Collectively, these insights affirm that the framing effect influences not only what decisions are made but also how those decisions are reasoned through and justified. The presence of frame-congruent and context-sensitive reasoning patterns highlights the value of including qualitative components in experimental decision research. By examining justificatory discourse, scholars can gain a more nuanced and ecologically valid understanding of how cognitive biases function in real-world managerial environments. This approach enriches behavioral decision theory by revealing the interplay between framing, cognition, and organizational awareness.

Discussion

The primary objective of this study was to examine the influence of information that is presented in a positive or negative manner on investment decisions made by managers who had previously undergone structured leadership training. While quantitative analyses revealed no statistically significant differences between groups, thematic content analysis of open-ended justifications provided compelling evidence that framing exerts influence at the cognitive-discursive level. The findings of this study indicate that, while leadership training may serve to mitigate overt behavioural

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susceptibility, cognitive framing continues to exert a significant influence on the reasoning and articulation of decisions.

In accordance with the seminal work of Tversky and Kahneman (1981), the present study lends further support to the notion that individuals exhibit risk-averse behaviour in gain-framed conditions and become more risk-tolerant in loss-framed conditions. This directional influence has been robustly confirmed in prior research (Kühberger, 1998; Levin, Schneider, & Gaeth, 1998). In the present study, subjects in the gain-frame condition predominantly employed opportunity-focused, technology-driven rationales, while subjects in the loss-frame group emphasised risk avoidance, cost concerns, and uncertainty. These findings are in alignment with the assertions put forward by Stark et al. (2017), who argued that the manner in which information is presented can influence the allocation of attention and the activation of reasoning schemas that are congruent with one's emotional state. Research has repeatedly demonstrated that framing effects are not limited to lay populations; even professionals and experts are susceptible (Druckman, 2001). Research in domains such as healthcare, law and finance has demonstrated that the manner in which information is presented can influence expert assessments, even when the information is said to be equivalent. For instance, Gong, Zhang, and Sun's (2013) study revealed that physicians' treatment preferences were found to be significantly influenced by gain versus loss frames. In addition, the present study demonstrated that, when confronted with an ambiguous investment scenario, managers employed rationales that were consistent with their existing frameworks. This finding lends support to the affect heuristic proposed by Slovic et al. (2002), which posits that emotional cues influence risk perception.

The relatively balanced distribution of decision outcomes across both framing conditions may be indicative of a moderating influence from the leadership training intervention. As indicated in the extant literature, individuals who have undergone more extensive cognitive and analytical training have been shown to exhibit a greater aptitude for the detection of framing manipulations and the resistance to heuristic-driven reasoning (Lincă, 2016; Smith & Levin, 1996). The hypothesis that the standardised 4-hour leadership training programme administered prior to the experiment may have facilitated metacognitive awareness is postulated, with the ensuing potential to enable participants to engage in more deliberate and rational decision-making processes. While the training did not entirely eliminate framing effects, it may have reduced their behavioural impact.

The subsequent analysis of the written justifications provided by the participants revealed frame-congruent reasoning patterns that extended beyond the final decisions. In the case of participants who adopted a 'gain-framed' perspective, the predominant themes that emerged were 'first-mover

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advantage', 'strategic positioning' and 'technological transformation'. Conversely, those who adopted a 'loss-framed' perspective placed greater emphasis on 'market saturation', 'financial burden' and 'technological uncertainty'. These patterns are consistent with the findings of Hsee and Li (2022), who argue that framing effects are frequently attributable to attentional redirection rather than informational discrepancy. This finding serves to reinforce the conclusion that framing operates through shifts in cognitive salience rather than through content variation. It is imperative to acknowledge the limitations of the present study. The findings are limited in their generalisability by three factors. Firstly, the sample size was modest. Secondly, the experimenter relied on a hypothetical scenario. Thirdly, the experimental design was single-session. Furthermore, real-world organisational dynamics, including collaborative decision-making, stakeholder accountability, and long-term strategic goals, could not be fully incorporated.

In order to address the aforementioned limitations, it is recommended that future research should take the following approaches:

- It is imperative that the study be replicated with larger, more heterogeneous samples in order to test the generalisability of the results (Levin et al., 1998).
- An investigation into individual-level moderators is required, with particular reference to leadership style, cognitive reflection, and trait risk aversion (Stanovich & West, 2000).
- The employment of neuroscientific methodologies (e.g., electroencephalography (EEG), functional magnetic resonance imaging (fMRI)) is imperative for the exploration of the neural correlates of framing-induced decision-making processes (Gonzalez, Dana, & Koshino, 2005).

Such interdisciplinary approaches would yield a more comprehensive understanding of how framing influences managerial cognition, both behaviourally and neurologically, and how targeted interventions – such as leadership development – might mitigate these effects.

Conclusion

The present study sought to examine the framing effect, a phenomenon that has been extensively documented within the domain of decision-making research, by utilising an experimental design involving mid-level managers who had previously completed a standardised leadership training programme. Specifically, the research examined how the valence of information presentation (i.e., positive versus negative framing) influences managerial decision-making when the underlying content remains constant.

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While the quantitative analysis did not reveal statistically significant differences in decision outcomes between the positively and negatively framed groups, a deeper qualitative content analysis of the open-ended justifications revealed that framing exerted a significant influence on the reasoning process. These findings indicate that the framing effect operates not only at the behavioural level but also through underlying cognitive-emotional mechanisms and discursive justifications, confirming its multidimensional nature (Tao, Liu, & Wang, 2022).

The results obtained are consistent with the fundamental propositions of prospect theory (Tversky & Kahneman, 1981), which posits that individuals tend to exhibit risk-averse behaviour in gain-framed scenarios and risk-seeking behaviour in loss-framed ones. The justificatory narratives of the participants exhibited consistent variation in tone and structure based on the frame, despite the utilisation of identical data. This finding is consistent with the "risk-as-feelings" hypothesis proposed by Loewenstein et al. (2001), which posits that emotionally salient framing cues, such as perceived threat or opportunity, interact with cognitive assessments to influence decision outcomes.

It is important to note that the absence of statistically significant behavioural divergence between the groups may be indicative of the mitigating role of prior leadership training. Research suggests that cognitive interventions and metacognitive awareness can reduce reliance on heuristic thinking and increase resistance to framing-induced biases (Lincă, 2016; Petrescu, Tudor, & Popescu, 2023). This assertion is corroborated by neuroimaging studies, which have demonstrated that individuals with elevated cognitive engagement - frequently induced through training or educational interventions - exhibit activation in brain regions implicated in executive control and deliberation, consequently diminishing their vulnerability to superficial cues (Gonzalez, Dana, & Koshino, 2005; Jin, Wu, & Zhang, 2023).

A further noteworthy finding is that participants' decisions were influenced to a comparable extent by the presentation format and the content itself. This pattern is indicative of recent empirical work suggesting that framing functions as a cognitive filter, redirecting attentional resources and shaping the thematic salience of information (Hsee & Li, 2022; Paladino, 2024). Participants exposed to gain frames emphasised strategic opportunities and innovation, whereas those in the loss frame group were more likely to highlight financial risk and market uncertainty. Notwithstanding the informational equivalence of the decision prompt, these differences in interpretation occurred.

In conclusion, this study demonstrates that the framing effect in managerial decision-making extends beyond binary behaviour into the discursive and cognitive domains. However, the moderating effect of

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leadership training indicates the potential of targeted cognitive education in reducing susceptibility to framing-based distortions. These results support the growing body of evidence suggesting that education for decision-making should not merely involve the transmission of information but should also include explicit training in identifying and counteracting cognitive biases (Ibrahim & Saeed, 2025). Consequently, leadership development programs would benefit from integrating framing-awareness modules to foster more reflective and evidence-based decision-making under uncertainty.

Suggestions for Future Research

In order to build on the findings of this study and respond to contemporary academic concerns regarding framing and decision-making, future research should consider the following directions:

- The replication process is to be conducted using larger samples and a greater variety of samples:
  In order to enhance the generalizability and external validity of the findings, it is recommended that the experiment be reproduced with a broader range of participants from various sectors, hierarchical levels and cultural backgrounds. The impact of framing effects may be amplified or attenuated by diverse industry contexts, as evidenced by research conducted by Levin et al. (1998) and Ibrahim & Saeed (2025).
- Investigation of Group-Level Decision Dynamics:
  It is recommended that future studies extend the framing paradigm to group decision-making contexts, such as those encountered by executive teams or in boardroom discussions. Group-level dynamics, such as conformity pressure, leadership dominance, and shared cognition, may interact with framing cues in unique ways, thereby altering collective risk perception and consensus strategies (Paladino, 2024).
- Inclusion of Moderating Variables:
  The integration of moderating factors, such as time pressure, information ambiguity, emotional valence, or perceived accountability, may facilitate the identification of boundary conditions for the framing effect. These variables have the capacity to expose situational triggers that either serve to amplify or diminish frame susceptibility (Tao, Liu, & Wang, 2022; Jin, Wu, & Zhang, 2023).
- Modeling Post-Decisional Variables:
  The expansion of the analysis to encompass post-decision variables, including anticipated regret, confidence levels, and perceived uncertainty, has the potential to yield valuable insights into the emotional and metacognitive consequences of frame-induced decisions (De Martino et al., 2006; Slovic et al., 2002). This would also

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facilitate a deeper understanding of how individuals evaluate the quality of their decisions in retrospect.

The pursuit of these research directions has the potential to contribute to a more nuanced and ecologically valid understanding of the framing effect. Integration of the behavioural, contextual and neurocognitive dimensions is imperative for the advancement of theory and practice, particularly within high-stakes managerial and policy-making environments.

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