Locus of Control, Gambler's Bias, Vicarious Learning and Emotional Self-Regulation: an Emotional Reading of Financial Decision-Making

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Abstract

Our research analyses the emotional trajectory of novice traders in a scalping trading simulation (holding time of less than a quarter of an hour). Using a qualitative approach based on semi-structured interviews, the study highlights a recurring process marked by three phases: initial enthusiasm, growing frustration and final resignation. Four psychological mechanisms appear to be central to this dynamic. The locus of control gradually shifts from internal to external: initially confident in their knowledge, participants come to attribute their failures to chance or market conditions, which undermines their commitment and amplifies a sense of powerlessness. Next, the gambler's bias manifests itself in an irrational persistence in action, due to frustration, boredom and the illusory hope of a turnaround. In addition, vicarious learning, initially a source of reassurance through social comparison, becomes a vector of negative emotional contagion, promoting collective resignation. Finally, it highlights that emotional self-regulation and coping strategies play a central role in how novice traders attempt to deal with the emotional pressure. The analysis shows that these four mechanisms interact in a cumulative and circular dynamic: the shift to an external locus of control weakens confidence, which reinforces the gambler's bias, while emotional contagion accelerates resignation and a lack of emotional regulation. This process, similar to the learned helplessness model, highlights the central role of emotions and social interactions in financial decision-making. On a theoretical level, our study contributes to conclusions drawn from behavioral finance by proposing a dynamic interpretation of four psychological phenomena, which can be considered as emotional and social trajectories. It also highlights the importance of integrating emotion management and reflexivity into technical knowledge in financial education programs.

Keywords: Behavioral Finance, Emotions, Locus of Control, Gambler's Bias, Vicarious Learning, Emotional Regulation.

1. Introduction

Financial markets are environments characterized by high uncertainty, informational complexity and time pressure. In this context, decision-making cannot be reduced to the application of rational models as postulated by efficient market theory (Fama, 1970). Numerous studies have shown that financial behavior is largely influenced by cognitive and emotional biases, which alter the rationality of investors' choices (Kahneman & Tversky, 2013; Barberis & Thaler, 2003). The behavioral finance literature has identified a wide variety of biases but remains focused on quantitative approaches. However, financial decisions are part of evolving trajectories, shaped by experience, emotions and social interactions (Loewenstein et al., 2001).

Short-term trading provides fertile ground for examining these dynamics. Investors are confronted with extreme conditions: high uncertainty, ultra-fast timeframes, partial information and high emotional stakes. These conditions encourage impulsive behavior, recurring errors and emotional reactions (Lo et al., 2005). Novices in particular, lacking experience, appear to be particularly vulnerable to biases and emotional fluctuations.

In this study, we consider four psychological mechanisms:

1. Locus of control (Rotter, 1966), which determines how individuals attribute their successes or failures. An internal locus promotes persistence and learning, while an external locus leads to disengagement.
2. Gambler's fallacy (Tversky & Kahneman, 1974), which generates irrational persistence in the face of losses by feeding the hope of an inevitable reversal.
3. Vicarious learning, which influences coping strategies (Bandura, 1977), is a process by which individuals adjust their behavior by observing the others. In some cases, it can play a protective role, while in others it can amplify collective resignation.
4. Emotional self-regulation and coping. Emotional self-regulation refers to a trader's ability to modulate their emotional states (excitement, frustration, boredom) in order to maintain clear-headed decision-making (Gross, 2015). Coping strategies aim either to transform the situation or to reduce emotional pressure (Folkman & Lazarus, 1988; Carver & Scheier, 1982). However, in the context of recurrent difficulties, they often tend towards defensive responses that limit learning (Loewenstein et al., 2001).

These four mechanisms are rarely studied together or through emotional trajectories. Furthermore, although locus of control, gambler's bias, vicarious learning and emotional self-regulation are widely used in psychology, they are rarely mentioned in behavioral finance studies.

Emotions are the drivers linking these four mechanisms: they weaken locus of control (frustration, discouragement), facilitate gambler's bias (hope, boredom, frustration), spread through vicarious learning in the form of emotional contagion, and condition coping strategies by seeking to reduce emotional distress.

The aim of this article is, firstly, to highlight the typical emotional trajectory of novice traders in simulated scalping trading situations, and to show how it is structured by the four psychological mechanisms considered. Secondly, we will propose a dynamic interpretation of these mechanisms and emphasize the importance of reflective support in financial simulation teaching methods.

Using a qualitative and narrative methodology based on semi-structured interviews, this research provides additional insight into the dominant quantitative approaches in behavioral finance. It contributes to a better understanding of the interactions between emotions, cognition and socialization in stock market decision-making. It also contributes to the development of a pedagogy of finance considering emotional and collective dimensions of learning.

2. Theoretical Framework

2.1. Behavioral Biases and the Role of Emotions

Behavioral finance has shown that individuals regularly deviate from the rational model due to cognitive biases: loss aversion, representativeness heuristic, overconfidence (Kahneman & Tversky, 2013, Barberis & Thaler, 2003). These biases are activated, modulated and amplified by emotions. In this purpose, numerous studies (Loewenstein et al., 2001) have shown that emotions influence risk assessment and decision-making. Fear leads to avoidance and underestimation of opportunities, while excitement promotes impulsive risk-taking (Lerner et al., 2015). In trading, the speed of transactions and exposure to feedback (immediate gains/losses) intensify this emotional resonance, making investors particularly sensitive to their emotional states. The case of boredom is particularly revealing. Long ignored, it appears to be a driver for irrational behavior (Eastwood et al., 2012). In the context of stock market, boredom drives people to act to "occupy the empty space," leading to unnecessary transactions, sometimes referred to as "boredom trades" (Davis & Levine, 2013).

2.2. Locus of Control and Emotions

The concept of locus of control (Rotter, 1966) distinguishes between individuals who attribute their performance to their own knowledge (internal locus) and those who attribute it to external factors (external locus). In a context of financial uncertainty, repeated losses frequently shift the locus of control to the external, which erodes the sense of personal efficacy and can lead to a process of learned helplessness (Seligman, 1975).

From this perspective, an internal locus would tend to reinforce the influence of representativeness, while an external locus would mitigate its effect by attributing results to luck (Ikram, 2016). In addition, a study of 654 respondents shows that an internal locus is associated with more responsible financial management behavior (Prayuda & Purwanto, 2024; Chujan et al., 2022).

In terms of motivation, experimental data show that locus of control increases the preference for retaining control over decisions, without altering optimism or confidence regarding the return on effort. The locus-effort link is strengthened when the return is known but weakened by uncertainty, with gender differences (Caliendo et al., 2024).

In short-term trading, these mechanisms can result in two different trajectories. Firstly, among traders with an internal locus, a persistence in taking positions based on readily available information despite deteriorating financial performance. Secondly, among traders with an external locus, a gradual resignation, deliberate inaction or emotional detachment can be observed.

2.3. Gambler's Bias and Emotional Charges

The gambler's fallacy (Tversky & Kahneman, 1974) illustrates the tendency to believe that after a series of losses, a win should follow. While it can be interpreted as a cognitive bias, it is strongly influenced by emotions. Indeed, the frustration caused by losses encourages traders to "make up for their losses", leading them to follow irrational strategies. Boredom leads to compulsive trading, even without clear market signals. Irrational hope, influenced by greed, reinforces the belief that a reversal is imminent. This link between emotions and biases was highlighted by Lo and Repin (2002), who showed that traders' physiological reactions (stress, excitement) directly influence their decision-making. From this perspective, gambler's bias cannot be understood independently of the emotions that underlie it.

Empirically, numerous lottery data confirm the manifestation of this bias: after a winning number is drawn, players reduce their financial bets on that number, a behavior typical of the gambler's fallacy (Dillon & Lybbert, 2024). In finance, the presence of investors prone to the gambler's fallacy generates correlations between returns and volatility: heterogeneous beliefs (rational or biased) are reflected in prices and amplify reactions to information provided to the markets (Chen, 2022).

At the individual level, this bias can vary: experience tends to reduce it, while professional status does not ensure greater rationality. Gender differences also appear in the propensity to rely on intuition (Hon-Snir et al., 2012). The persistence of this bias can be explained by the fact that agents mistakenly infer negative correlations from truncated samples (He, 2022). Finally, the way in which individuals update their beliefs depends on their perception of the context: when faced with a non-random process, they are more likely to anticipate repetition, while when faced with randomness, a minority adopt predictions consistent with the gambler's fallacy (Rao & Hastie, 2023).

2.4. Vicarious Learning, Social Comparison and Emotional Contagion

The theory of social comparison (Festinger, 1954) and vicarious learning (Bandura, 1977) highlight that observing others influences behavior. In the financial field, Hong, Kubik & Stein (2004) have shown, for example, that investment choices spread within social networks. These mechanisms are strongly influenced by emotions. Observing someone in difficulty can initially reduce anxiety. However, when difficulties become widespread, this observation causes the development of negative emotional contagion (Hatfield et al., 2011), amplifying discouragement and accelerating resignation. Thus, vicarious learning transmits emotional states (positive or negative) that guide the decision-making process.

Recent work shows that vicarious learning can operate even in a context where observers have the same level of knowledge. It works by modifying beliefs and broadening decision-making exploration (Park & Puranam, 2024). In team structures, reciprocal vicarious exchanges (each person learning from the experiences of others) are associated with better collective performance and reinforce the ability to take advantage of external learning (Myers, 2021). In summary, vicarious learning relies on the sharing of experiences between peers that promote in-depth understanding (Roberts, 2010; Mayes, 2015).

2.5. Emotional Self-Regulation and Coping

Emotional self-regulation refers to an individual's ability to modulate their emotional states in order to maintain clear decision-making (Gross, 2015). In an uncertain environment, it plays a decisive role. Psychological research distinguishes between several forms of regulation: cognitive reappraisal, which consists of reconfiguring the interpretation of a situation and promotes learning, and emotional suppression, which aims to inhibit the expression of emotions but tends to increase physiological stress and reduce performance (Gross & Thompson, 2007).

In connection with this process, coping strategies, defined by Folkman and Lazarus (1988) as cognitive and behavioral efforts aimed at managing stressful situations, represent another aspect of adaptation. Two approaches can be distinguished: problem-focused coping, which seeks to transform the situation (adjusting strategy, seeking information), and emotion-focused coping, which aims to reduce the distress felt without acting on the cause (withdrawing from action). While active, problem-focused strategies promote learning, defensive strategies provide immediate relief but may lead to disengagement or learned helplessness (Seligman, 1975; Carver & Scheier, 1982).

2.6. Justifications for the Choice of Mechanisms Studied

There are five main reasons for choosing the four mechanisms studied.

- The experiment we chose focuses on a short-term trading situation in a collective context. These mechanisms highlight on the central dimensions of this experiment: causal attribution of results (locus of control), irrational persistence in the face of losses (gambler's bias), peer influence and social comparison (vicarious learning and coping strategies).
- These mechanisms cover the main dimensions of financial decision-making: cognitive (gambler's fallacy), motivational (locus orientation), social (vicarious learning) and emotional (coping). This complementarity gives us the opportunity to propose a multidimensional analytical framework.

- Unlike more traditional biases, the mechanisms selected have not been widely analyzed in behavioral finance. Their integration aims to complement this field of research by combining concepts from psychology with the challenges of financial decision-making.
- While some biases appear mainly in single decisions (e.g., the disposition effect), the mechanisms selected are part of a longer time frame. They evolve and interact over the course of experience, which corresponds to our focus on emotional and social trajectories rather than isolated choices.
- Emotional self-regulation, in conjunction with coping strategies, allows us to analyze the efforts made to adapt to repeated losses, but also their limitations when regulation takes a defensive form. Its integration complements cognitive, motivational and social analysis with an affective dimension.

3. Methodology and Sampling

3.1. General Methodological Approach

Our research is based on a qualitative and exploratory approach focused on analyzing the processes experienced by individuals in simulated trading situations. We chose this methodology for three main reasons :

- To access the subjective experience of participants**:** behavioral biases are generally studied as statistical "anomalies", identifiable by the gap between a rational norm and observed behaviors (Kahneman, 2011; Barberis & Thaler, 2003). This perspective tends to reduce individuals to "producers of biases", neglecting the way they experience, interpret and feel about their decisions. In our view, understanding emotions requires giving voice to the actors and accessing their experiences.
- Considering the temporal dynamics of decisions: classic behavioral finance models often focus on single decisions. In contrast, our qualitative and experimental approach allows for the integration of temporality, i.e. not only what individuals do, but also how their relationship to the decision evolves over time. Narrative and phenomenological approaches are particularly well suited to this objective (Larkin et al., 2019).
- Integrating the emotional and social dimensions: the aim of this research is to show that decision-making biases are emotionally and socially situated. Quantitative methods fail to consider the nuances of emotional contagion, frustration or boredom. The data collected allows the results to be anchored in an understanding of affective dynamics. This approach is in line with the work of Loewenstein et al. (2001) on the economics of emotions, which calls for a combination of psychology, finance and social sciences to understand decisions in their context.

Epistemologically, the research adopts an interpretative perspective. It considers that the reality under study (the emotional trajectories of novice traders) is a construct coproduced by the participants' lived experience and the researcher's interpretation. This orientation implies a particular focus on reflexivity: the researcher is an actor whose presence, questions and analytical choices contribute to the production of results (Charmaz, 2006).

In summary, our approach aims to generate new understandings of the emotional and social mechanisms of financial decision-making. It is therefore intended to be exploratory (open to unexpected developments), comprehensive (focused on the subjective meaning given by the actors) and interpretative (recognizing the role of the researcher in the construction of knowledge).

3.2. Participants

The study is based on a sample of four management students enrolled in a finance and management programme at the University of Mons (Belgium). The choice of this small sample size was based on a methodological desire to explore individual trajectories in depth. In addition, as the students were paid for the number of hours worked, financial constraints prevented us from increasing the size of our sample.

3.2.1. Selection Process

Calls for applications were sent out in early March 2025 through the usual institutional channels (emails, electronic valves) to the entire student community. The condition was that they had to have passed two subjects in their course programme: Introduction to Financial Reality and Stock Markets, in order to guarantee a certain level of knowledge of stock market mechanisms. Interested individuals were required to submit a letter of motivation explaining why they wanted to participate in the experiment beyond the remuneration offered. We received nine applications (all from men) and the final selection was made by the three authors after reading the letters of motivation. Although the participants presented well-argued motivations, they had no significant prior experience of real or simulated trading. This criterion ensured that their reactions were not influenced by technical knowledge or market habits, thus allowing us to observe "raw" behavior, close to that of someone discovering the markets for the first time. The use of students is methodologically relevant, their homogeneous profile facilitates the comparison of individual trajectories and reduces the influence of external variables related to age, professional background or investment habits, an argument often put forward in experimental research (Harrison & List, 2004).

3.2.2. Sociodemographic Characteristics

The sample consisted of four men, aged 19 to 21, with no previous trading experience. This male homogeneity reflects a more general trend observed in trading, which is dominated by men (Barber & Odean, 2001). Several studies show that men are more prone to risk-taking and over-trading, while women favor more cautious and diversified behavior (Croson & Gneezy, 2009). This male predominance has also emotional implications: it is accompanied by a cultural valorization of competitiveness and persistence, which can amplify gambler's bias or impulsive behavior. In addition, the lack of gender diversity can accentuate negative emotional contagion, promoting collective resignation rather than reflective distancing. Thus, the exclusively male nature of the sample must be considered a methodological limitation and a reflection of the dynamics specific to the intensive trading environment. However, this homogeneity facilitated the comparison of trajectories and allowed for the exploration of variations related to individual sensitivities.

3.2.3. Relevance of the Limited Sample

Although limited in number, this sample has several methodological advantages. It allows for detailed longitudinal analysis (Yin, 2018). In addition, semi-structured interviews were conducted after each day. It also promotes the establishment of a relationship of trust with participants and allows them to express their emotions and difficulties, which are often difficult to approach when working with larger samples. The use of four participants does not allow for statistical representativeness of the behavior of novice traders. However, in a qualitative interpretative approach, the objective is not generalization but transferability (Guba & Lincoln, 1994): by reporting on the profiles studied and the research context, this allows other researchers to assess the relevance of the results in similar situations. Furthermore, this sample size is in line with the standards of in-depth qualitative research. Larkin et al. (2019), for example, recommend samples of 3 to 6 participants for interpretative phenomenological analysis in order to ensure a balance between depth of analysis and comparison.

3.3. Experimental Setup

The experiment was a stock market trading simulation, designed to place participants in a situation of uncertainty and time pressure similar to the financial markets. The aim was to encourage the emergence of the psychological mechanisms under study (impulsivity, frustration, resignation, emotional contagion), while maintaining an educational and ethical framework.

3.3.1. Choice of Context: Short-Term Trading (Scalping Trading)

The experiment focused on scalping trading, a very short-term trading strategy (holding time of less than 15 minutes) consisting of multiplying transactions over very short periods of time in order to try to multiply small gains. There were several reasons for this choice. Firstly, the intensive and fast-paced nature of scalping increases the cognitive and emotional load, as participants are confronted with a rapid succession of gains and losses. Secondly, it allows psychological dynamics to be captured within hours rather than over extended periods in real trading. Thirdly, this practice is particularly conducive to observing behavioral biases as it involves quick decisions.

3.3.2. Timing of the experiment

The experiment took place over three days (28 to 30 April 2025), with three hours of trading (from 9.30am to 12.30pm) each day. This organization allowed sufficient time to observe changes in strategies and to collect comparable data from one day to the next, following the trajectory of each participant.

3.3.3. Technical Setup

Participants were located in a room equipped with individual computers; all connected to a stock market simulation platform (a game on the ABC Bourse platform) reproducing real-time quotes. Bringing participants together in the same room aimed to stimulate spontaneous social interactions and encourage social comparison phenomena. The interface allowed participants to:

- consult prices, graphs and volumes;
- place buy and sell orders;
- real-time monitoring of portfolio performance.

Each participant was allocated the same amount of fictitious capital at the beginning (€100,000) in order to standardize the initial conditions and enable comparison of trajectories. Transactions were limited to shares in companies listed on the CAC40 index.

3.3.4. Instructions Given to Participants

The instructions were deliberately limited: participants were simply asked to manage their portfolios in order to maximize their financial value (no limits on the number or volume of transactions). This choice was made for the following reasons:

- a desire to allow natural behaviors to emerge in the face of uncertainty, without bias induced by an imposed methodology;
- an intention to reproduce the "raw" discovery of scalping trading by novices, faced with an abundance of information without methodological tools;
- an opportunity to observe the variability of individual interpretations of the task (impulsiveness, caution, imitation of peers).

To adhere to the definition of scalping trading, students were asked to close out their positions every quarter of an hour.

3.3.5. Researcher Posture

During the simulation sessions, the researchers adopted the posture of non-participating observers: they did not interact with the participants' trading decisions or provide advice, so as not to influence their behavior. However, their physical presence in the room was noticeable, and it is likely that some behaviors were influenced by the awareness of being observed (Hawthorne effect). To minimize this effect, the researchers prioritized discretion (standing back, refraining from comment, maintaining a neutral body language). At the same time, a certain proximity was necessary in order to collect data. Sharing the simulation space provided access to emotional expressions that would otherwise have been difficult to get. Above all, this immersion helped to build a climate of trust, which was essential for the participants to express themselves sincerely during the interviews.

Studying the participants' emotions inevitably triggered the researchers' emotions. Observing situations of frustration, discouragement and collective resignation generated feelings of empathy. To prevent these emotional resonances from biasing the interpretation, a journal was kept throughout the research. It recorded immediate impressions during observations, analytical insights and personal emotional reactions.

The researchers were also in a position of power asymmetry: as teacher-researchers, they had a higher academic status than the participants. To limit the risk of bias related to social desirability, it was made clear that trading performance had no impact on their academic assessment and that the objective was to understand the processes experienced. Particular attention was also paid to anonymity and confidentiality: all verbatim quotes presented in the results were anonymized and participants were informed of their right to withdraw their comments.

3.4. Data Collection

3.4.1. Stock Market Environment Prevailing During the Experimentation

Over the three days, the market trend was positive. The table below shows the evolution of the benchmark index on the French market as well as the evolution of an American index (Dow Jones 30) and a Japanese index (Topix 225) in order to provide an overview of the general stock market context prevailing at the time of the experiment:

Table : Changes in Stock Market Indexes During the Experimentation

	Close 04.25	**Close 04.28**	**Close 04.29**	**Close 04.30**	**Total**
CAC 40	7537	7574	7556	7594	
Change		0.49	-0.24%	0.5	0.76%
DJ30	40113	40,228	40,528	40,669	1.38%
TOPIX 225	35,706	35,840	Closed	36,045	0.95

Over the course of three days, several CAC40 companies announced their results (turnover) for the first quarter of 2025:

Table: Earnings Announcements (Q1) by CAC40 Companies

04.28	**04.29**	**04.30**
Vivendi	Schneider Electric	Airbus
	Bouygues	ArcelorMittal
	CapGemini	Crédit Agricole
		Société Générale
		TotalEnergies
		Stellantis

ECB suggested (28 April) that further rate cuts remained possible, given the slowdown in inflation. This outlook provided support for the equity markets. Finally, the international context weighed on stock market trends, with investors remaining attentive to developments in the trade war between the United States and China (28 April).

3.4.2. Semi-Structured Post-Simulation Interviews

At the end of each simulation day, semi-structured individual interviews were conducted with each participant (see Table 1). The purpose of these interviews was to explore:

- The emotions felt during the session (enthusiasm, frustration, boredom, resignation).
- The strategies implemented or considered to improve performance (rationalization, imitation of peers, voluntary withdrawal).
- Causal attributions of results (personal responsibility vs. chance or market forces).
- Perceptions of social interactions (influence of other participants).

The interview guide was structured around these themes (see) and allowed space for free expression. All interviews were recorded and transcribed in full, resulting in a text corpus of approximately 36,000 words.

Table 1.

Information about the semi-structured interviews.

Participants	Duration	Number of Pages	Number of Words
	Day 1		
I.1. (210867)	31 minutes 18 seconds	4	2581 words
I.2. (220223)	19 minutes 03 seconds	4	2543 words
I.3. (221399)	20 minutes 55 seconds	5	2527 words
I.4. (190030)	23 minutes 55 seconds	4	2581 words
	Day 2		
I.1. (210867)	22 minutes 29 seconds	6	2982 words
I.2. (220223)	19 minutes 39 seconds	5	2484 words
I.3. (221399)	23 minutes 46 seconds	7	3107 words
I.4. (190030)	24 minutes 55 seconds	6	2,983 words
	Day 3		

I.1. (210867)	31 minutes 18 seconds	10	5047 words
I.2. (220223)	25 minutes 17 seconds	8	3,523 words
I.3. (221399)	23 minutes 29 seconds	9	3743 words
I.4. (190030)	17 minutes 28 seconds	3	1969 words

3.5. Data Analysis

Data analysis followed a thematic and interpretative approach, aiming to highlight the psychological and emotional mechanisms underlying the participants' experiences. The aim was to reconstruct their life trajectories, articulating the cognitive, affective and social dimensions.

3.5.1. Analytical Orientation

Our analysis is based on reflexive thematic analysis (Braun & Clarke, 2006), combined with principles from interpretative phenomenological analysis (Larkin et al., 2019). This choice meets two requirements: the identification of cross-cutting themes and respect for the uniqueness of individual trajectories, considering how each participant experiences and interprets the experience. Thus, the analysis takes a dual perspective: cross-cutting (comparison between cases) and longitudinal (monitoring of developments over three days).

3.5.2. Coding Process

The coding process consisted of three stages (Glaser & Strauss, 1967):

- Open coding: reading interview transcripts line by line to identify relevant segments related to emotions, causal attributions, trading decisions and social interactions. For example, codes such as *"initial excitement"*, *"frustration after losses"*, *"irrational hope"* or *"negative contagion"* emerged at this level.
- Axial coding: grouping open codes into broader categories to structure the data. For example, the codes *"irrational hope"* and *"wanting to win back losses"* were grouped into the category *"gambler's bias"*, while *"attribution to chance"* and *"sense of injustice"* fell under the category *"external locus*".
- Selective coding: integration of categories into an overall model, linking the four mechanisms (locus of control, gambler's bias, vicarious learning and emotional self-regulation) with the emotional trajectory.

3.5.3. Use of Maxqda

All interview transcripts were entered into Maxqda software. This tool facilitated:

- Cross-thematic identification, by enabling rapid comparison of code occurrences between participants.
- Temporal correlation, thanks to coding structured by day, which made it possible to reconstruct emotional trajectories.
- The analysis of co-occurrences between emotional states (boredom, frustration) and biases (gambler's bias, externalization of locus).

3.5.4. Integration of the Emotional Dimension

Particular effort was made to analyze the emotions expressed, which were considered to be drivers and modulators of the mechanisms analyzed. Two levels were distinguished:

- Explicit emotions: verbalized directly by participants ("I was devastated", "I felt powerless").
- Implicit emotions: inferred from the tone of speech (e.g., "it will eventually pick up" conveys a mixture of hope and frustration).

3.5.5. Validation of the Analysis

Several measures were put in place to improve analytical rigor:

- Independent double coding: two researchers separately coded a subsample of the data, then compared their interpretations to ensure consistency across categories.
- Member checking: a summary of the themes was presented to the participants to verify the relevance and accuracy of the interpretations.
- Analytical reflexivity: the principal investigator kept a journal throughout the process, recording his own impressions and questions to limit interpretation bias.

4. Results

4.1. A common Downward Emotional Trajectory

The analysis highlights a trajectory shared by all participants, structured in three stages.

- Day 1: Enthusiasm and Self-Assured Internal Locus:

The beginning of the experiment was marked by curiosity, excitement and the idea that 'everything depends on me'. Participants attributed their initial results to their decisions, reinforcing their motivation.

"I wanted to participate to gain experience and see how it goes." (190030)

"I didn't really have a strategy. I just watched the morning news and gave it a try." (220223)

"I told myself I needed to make more trades, more orders. So I did more." (221399)

- Day 2: Frustration and Efforts at Rationalization:

Faced with repeated losses, participants try to develop more rational strategies: following candlesticks (technical analysis), monitoring volumes, and limiting risks. Disappointment prevails and initial confidence declines.

"I started looking at candlesticks and trading more based on signals... but it didn't make much difference." (190030)

"I was disappointed, dejected... like a child who fails and gives up." (190030)

"At first, I thought I was to blame for my choices on the first day." (220223)

- Day 3: Resignation and External Locus:

The last session reveals two opposing attitudes: desperate hyperactivity ("saving the day") or withdrawal. In both cases, the results are attributed to external factors.

"It was the last day, I thought there was a way to save the day, so I made a lot of trades..." (221399)

"I was detached from the investment. If it went up, great; if it went down, it didn't matter." (221399)

4.2. Locus of Control: from Internal to External

Locus of control serves as the underlying theme across through the trajectory observed.

- Initially, participants expressed the belief that their decisions directly explained the results:

"I felt like I was in control at first." (210867)

- Gradually, repeated losses were attributed to external factors, such as luck or technical constraints:

"Afterwards, I told myself that the market decided anyway." (220223)

"I quickly realized that it wasn't me, but luck or chance." (190030)

- In the end, this externalization led to a marked disengagement:

"In the end, I told myself there was no point in insisting." (221399)

This shift reflects a decline in self-efficacy, leading to discouragement and limiting action.

4.3. Gambler's Bias: Irrational Persistence Due to Frustration and Boredom

Gambler's bias arises repeatedly, particularly during loss sequences.

- Belief in an Inevitable Turnaround:

"I bought several times in a row, telling myself that it would eventually go back up." (221399)

"I knew it wouldn't work, but I wanted to try again to make up for it." (210867)

- Role of Frustration:

"I wanted to make up for it, wipe out the losses... but it only got worse." (190030)

- Inducing Effect of Boredom:

"I made trades just to do something... it was to kill boredom." (210867)

Boredom acts as a catalyst that is rarely highlighted in the literature, prompting irrational behavior even when the chances of success appear limited.

4.4. Vicarious Learning: from Initial Reassurance to Negative Contagion

Peer observation plays an ambivalent role during the experiment.

- Initial phase: reassurance: social comparison normalizes losses and reduces feelings of isolation.

"It reassured me to see that others were losing too, that I wasn't the only one." (190030)

- Final phase: collective discouragement. When losses become widespread, the dynamic is reversed and intensifies a shared state of resignation.

"When I saw that no one was succeeding, I thought to myself that it was pointless." (220223)

"Hearing others say they were giving up, I thought to myself that it was hopeless." (221399)

This emotional contagion illustrates dysfunctional vicarious learning: instead of stimulating adaptation, observing peers reinforces the belief that failure is inevitable.

4.5. Coping Strategies: Predominance of Defensive

Faced with repeated losses, market uncertainty and growing emotional stress, participants implemented various strategies to regulate their emotions and protect their psychological balance. These coping mechanisms (Carver & Scheier, 1982; Folkman & Lazarus, 1988) reveal both efforts at adaptation and the limits of regulation in the trading context.

Participants mainly employ defensive coping strategies focused on stress reduction.

- Voluntary inaction: this appears to be a recurring strategy, adopted when losses accumulate and confidence collapses.

In 221399, we observe the voluntary suspension of trading from the second day ("*I told myself that the best decision, in fact, was to do nothing*"), perceived as the only way to limit losses and regain a minimal state of control.

210867 took a similar approach, choosing not to act in order to avoid the temptation of impulsive trades, especially after identifying his "boredom trades".

This kind of coping is defensive: it reduces the immediate emotional charge, but at the cost of withdrawal from action, which can reinforce resignation in the long term.

- Environmental Withdrawal:

"I forced myself not to look at the screen so I wouldn't do anything stupid." (210867)

- Emotional Detachment: Fatigue and disgust gradually lead to emotional withdrawal:

190030 expresses growing pessimism and ends up approaching sessions without real involvement, considering that losses are inevitable.

220223, after phases of optimism and guilt, shifts to a detached stance where losses no longer have much emotional impact, reflecting a form of protective resignation.

221399 explicitly expresses this detachment on the last day ("if it goes up, great; if it goes down, it doesn't matter"), which is close to a strategy of emotional anesthesia.

This detachment can be interpreted as a response aimed at ensuring psychological comfort in the face of perceived powerlessness, but it also reflects a lack of motivation.

"In the end, I didn't care. If it went up, great; if it went down, too bad." (221399)

Only one participant adopted a strategy of constructive reflexivity, learning lessons for the future:

"I realized that my impulses had caused me to lose. Next time, I'll have to be patient and more rational." (221399)

This participant recognizes his impulsiveness and expresses the need to adopt a more rational, long-term approach. Though less common, this reflexivity suggests that a negative experience can sometimes be turned into a learning opportunity.

4.6. Summary of Results

Analysis of the trajectories of the four participants reveals a common process, structured around a downward emotional dynamic and four central psychological mechanisms.

1. **A Downward Emotional Trajectory**

The experience reveals a relatively uniform sequence:

- Day 1: enthusiasm, curiosity and a sense of control. Participants approach the exercise with high motivation and belief in their abilities. This phase is characterized by an internal locus of control, high transactional activity and a willingness to experiment.
- Day 2: disillusionment and frustration. Accumulated losses prompt participants to rationalize their choices by looking for disciplined strategies (chart analysis, technical indicators). However, these efforts are restricted by the volatility and

constraints of the simulation, generating fatigue and a weakening of the internal locus.

- Day 3: resignation and disengagement. The locus of control shifts to the external, with results attributed to market characteristics. Two attitudes emerge: desperate hyperactivity (multiplying transactions in the hope of "saving the day") or complete withdrawal (voluntary inaction).

2. Locus of Control: a Decisive Shift

The locus of control plays a structuring role in the emotional trajectory. Its shift from internal to external constitutes a psychological turning point: the impression of being in control of the situation is replaced by the feeling that "the market decides". This shift encourages disengagement and lays the foundation for learned helplessness. Thus, locus dynamics appear to be a key driver for understanding the transition from initial engagement to final resignation.

3. The Gambler's Bias: Irrational Persistence and the Role of Emotions

In our experiment, the gambler's fallacy takes on a strong emotional dimension. The frustration associated with losses drives people to "win back" what they have lost, while boredom encourages them to increase the number of transactions without any real conviction. This cognitive bias is activated by specific emotional states. Irrational persistence is an effort to regain control, but it most often leads to increased losses and a heightened state of failure.

4. Vicarious Learning: from Social Support to Negative Contagion

Social influence also plays a role in the experience. Initially, observing peers acts as a protective factor: seeing the difficulties encountered by others reduces feelings of isolation and puts one's own losses into perspective. This dynamic gradually reverses: when failure becomes collective, social comparison turns into negative emotional contagion. Vicarious learning no longer produces coping strategies and results in shared resignation. This shift illustrates the fragility of social mechanisms in the context of repeated loss.

5. Emotional Self-Regulation and Coping: Predominance of Defensiveness

The regulation strategies employed reflect a desire to protect oneself rather than to progress. Voluntary inaction and emotional detachment dominate. These behaviors reduce emotional stress but do not improve performance. Only one participant showed constructive reflexivity, identifying his mistakes and considering new approaches for the future.

6. A Cumulative and Self-Reinforcing Cycle

The results suggest that the four mechanisms identified (locus, gambler's bias, vicarious learning and emotional self-regulation) are interconnected:

- The shift from internal to external locus weakens confidence and results in resignation.
- The frustration and boredom generated by this disengagement reinforce the gambler's bias and lead to irrational behavior.
- The collective failure observed reinforces negative emotional contagion, which accelerates the shift towards an external locus and amplifies resignation.
- The absence of emotional self-regulation is directly linked to the other three mechanisms: it supports the shift from internal to external locus, promotes gambler's bias and increases emotional contagion resulting from vicarious learning.

This cycle leads to learned helplessness, where the individual stops acting not because of a lack of options, but because of a belief that any action is futile. These dynamic highlights the importance of considering behavioral biases as elements of an evolving psychological and social process.

Summary table

Day	Dominant emotional state	Locus of Control	Gambler's Bias	Vicarious Learning	Coping Strategies
Day 1	Enthusiasm, curiosity, confidence	Internal: sense of control	Impulsive activity, multiple orders to test	Reassurance: normalization of losses through social comparison	Impulsive action, willingness to experiment
Day 2	Frustration, disillusionment, weariness	Fragile: initial doubts, mixed internal/external attribution	Irrational persistence due to frustration	Observation of peers: mixed effect, some attempt to imitate	Efforts at rationalization, fragile discipline
Day 3	Resignation, detachment, indifference	External: attribution to chance, the market, loss of control	Desperate hyperactivity or total abandonment	Negative contagion: collective resignation, sense of inevitability	Voluntary inaction, withdrawal, emotional detachment

5. Discussions

5.1. From Initial Impulsiveness to Learned Helplessness

The observed progression – initial enthusiasm, growing frustration, and resignation – illustrates the central role of emotions in financial decision-making. It confirms that economic choices cannot be reduced to rational calculations, as postulated by classical finance (Fama, 1970), but must be placed within an emotional dynamic (Loewenstein et al., 2001).

The shift from internal to external locus of control is a key mechanism in this trajectory. Initially, investors attribute their results to their skills, which reinforce motivation and commitment. Repeated losses lead to an externalization of causes, attributed to the market, which erodes the sense of personal efficacy. This process corresponds to the logic of learned helplessness described by Seligman (1975), where the individual stops acting because they perceive their efforts as ineffective.

These observations extend the recent work of Prayuda & Purwanto (2024), which shows that individuals with an internal locus develop more responsible financial behaviors, as well as Chujan et al. (2022), which establishes a link between internal locus and risk propensity. Conversely, an external locus weakens decision- persistence and leads to inaction. In the case of short-term trading, this dynamic may explain why many novice investors give up after a few negative experiences.

5.2. Gambler's Bias Amplified by Frustration and Boredom

With regard to the gambler's fallacy, our results confirm the prevalence of this bias in the context of high-frequency trading. However, they reveal a less studied aspect: the catalytic role of negative emotions, particularly frustration and boredom. Our data suggests that irrational patterns are activated and sustained by emotional states. Boredom, in particular, drives individuals to increase unnecessary transactions in order to "break the monotony". This phenomenon is consistent with the findings of Eastwood et al. (2012) and finds a new application in behavioral finance. Our results explain the "excessive trading" by individuals described by Odean (1999) and Barber & Odean (2001). Investors trade too much not only because of overconfidence or poor assessment of probabilities, but also because emotions such as boredom stimulate the compulsion to act.

5.3. Vicarious Learning and Emotional Contagion

The third major contribution of this research concerns the role of social interactions. The finance literature has studied the influence of peers on investment choices, particularly through social comparison theory (Festinger, 1954) and information cascades (Bikhchandani, Hirshleifer & Welch, 1992). Hong, Kubik & Stein (2004), for example, show that individuals who interact socially invest more in equities.

Our results extend this perspective by highlighting an ambivalent temporal dynamic. Initially, social comparison plays a reassuring role: seeing that others are experiencing the same difficulties helps to normalize one's losses. Gradually, repeated observation of peers' failures provokes negative emotional contagion and a collective sense of powerlessness spreads. This phenomenon is consistent with the work of Hatfield et al.

(2011) on emotional contagion. Thus, vicarious learning does not improve strategies, as suggested by Bandura (1977), but rather accentuates feelings of failure. This finding refines behavioral economics models, which tend to view social interactions as sources of useful information.

5.4. Defensive Coping and the Limits of Emotional Self-Regulation

The way in which participants attempt to regulate their emotions illustrates the limits of self-regulation. The strategies observed are based on emotion-focused coping (Folkman & Lazarus, 1988), which is mainly defensive: voluntary inaction, withdrawal and emotional detachment. These behaviors reduce emotional tension but do not improve decision-making performance. These observations are consistent with Carver & Scheier's (1982) model on the fragility of self-regulation when a goal seems out of reach. They are also in line with the work of Barber & Odean (2001), who show that many retail investors withdraw from the market after repeated losses, illustrating a process of disengagement rather than adaptation.

5.5. The Paradox between the Positive Stock Market Context and Negative Emotional Feelings

An important element of our results is the paradox between the participants' feelings and the objective stock market context. While the CAC 40 index showed an overall positive trend over the experimental period, the students' emotional trajectories were marked by frustration, discouragement and resignation. This divergence tends to demonstrate that the subjective experience of trading does not depend solely on market trends, but also on how individuals interpret and experience fluctuations in their portfolios. Single losses, experienced as personal failures, dominated the overall upward trend, leading to a shift in locus of control and negative emotional contagion. This finding highlights the importance of the investment time horizon: in scalping trading, micro-variations take precedence over the general trend and generate a perception that is disconnected from reality. In other words, a favorable market can coexist with an unfavorable psychological experience, demonstrating the importance of emotions states and the inability of novices to integrate the overall perspective. This paradox reinforces the idea that emotions are a key determinant of engagement or disengagement, regardless of objective market conditions.

5.6. Theoretical Implications

Theoretically, our results demonstrate that locus of control, gambler's bias, vicarious learning, and emotional self-regulation can be considered interdependent mechanisms, modulated by emotional load and evolving over time. This dynamic approach complements the work of Wu et al. (2022), who emphasize the importance of choice repetition and temporality in the emergence of financial behaviors.

5.6. Educational and Managerial Implications

From an educational perspective, trading simulations offer environments with learning potential, but also a high risk of discouragement. Without reflective guidance, they may produce effects that are contrary to the objectives, reinforcing resignation and the perception that "the market is unpredictable". To make them effective training tools, it is necessary to incorporate emotional regulation (Gross, 2015) and collective feedback mechanisms to face negative contagion.

From a managerial perspective, these results highlight the psychological dynamics faced by novice traders in trading. They clarify the importance of emotional support and continuous training to limit the risk of decision fatigue. They also encourage financial institutions to consider emotion management as an integral part of performance.

Conclusion

This research aimed to understand the emotional and decision-making dynamics of novice traders in a stock market simulation context. Using a qualitative methodology based on semi-structured interviews, it highlighted a recurring trajectory characterized by a transition from initial enthusiasm to frustration, then to a form of resignation.

Our results show that this trajectory is structured around four psychological mechanisms. First, the locus of control, initially internal, gradually shifts to the external under the effect of repeated losses and emotional discouragement, leading to a weakening of commitment and an externalization of the causes of failure. Secondly, the gambler's bias manifests itself as an irrational persistence in action linked to frustration, boredom and irrational hope. Thirdly, vicarious learning has an ambivalent influence. It may initially be perceived as a reassuring factor, but it subsequently becomes a vector of negative emotional contagion leading to collective powerlessness. Fourthly, the absence of emotional self-regulation is an aggravating factor. Unable to effectively modulate their emotions, participants relied on defensive coping strategies (withdrawal, inaction, detachment) that reduce tension and promote resignation. This lack of regulation prevented the transformation of negative emotions into learning, reinforcing the vicious circle intensified by external locus of control, gambler's bias and emotional contagion.

One of the key contributions of this study is to show that these mechanisms are part of a cumulative dynamic. The shift in locus of control weakens persistence, which increases dependence on the gambler's bias; the latter is reinforced by negative emotions; and the emotional contagion resulting from social comparison accelerates collective resignation. This process, which can be likened to the learned helplessness model (Seligman, 1975), highlights the structuring role of emotions in the emergence and amplification of behavioral biases. The absence of emotional regulation accentuates this process, preventing individuals from transforming emotional charge into a catalyst for learning. It contributes to the persistent reinforcement of resignation and limits the possibilities for cognitive and social resilience.

On a theoretical level, this research contributes to behavioral finance by offering a dynamic and situated interpretation of biases. These appear as emotional and social trajectories that are evolutionary and cumulative, based on individual lived experiences. Emotions and social interactions are central determinants that modulate the way individuals attribute, persist and compare themselves.

This research invites us to rethink our understanding of financial decision-making from an approach where cognition, emotion and socialization are strongly linked. It contributes to broadening the conceptual framework of behavioral finance by integrating the affective and collective dimensions into the analysis and their effects on novice investors.

7. Limitations and Avenues for Further Research

This study presents limitations, which require caution in interpreting the results, while also opening avenues for further analysis.

7.1. Limitations of the Study

The first limitation lies in the small size and homogeneity of the sample. With only four students from the same academic background, it is difficult to claim statistical representativeness. This constraint does not weaken the analytical relevance of the study but invites us to consider the results in terms of transferability (Guba & Lincoln, 1994) rather than generalization. The choice of a small sample (four participants) is both a strength, allowing for in-depth analysis, and a limitation. The results should be considered as interpretative proposals that may help understand similar situations (e.g. novice traders, financial education programmes).

A second limitation concerns the artificial nature of the experimental setup. Simulation allows conditions to be controlled and real financial risks to be avoided, but it does not fully replicate the emotional intensity of trading with personal funds. The absence of real monetary stakes probably modulated the intensity and nature of emotional reactions.

A third limitation relates to the duration of the experiment. Three consecutive days allow us to capture a marked emotional trajectory (from enthusiasm to resignation) but are not sufficient to assess long-term dynamics (persistence of biases, delayed learning effects, post-experiment developments). A longitudinal study, following participants over longer periods, would provide a better understanding of the stability or reversibility of these trajectories.

Fifthly, the presence of the researcher in the room and the implicit hierarchical relationship (teacher/students) may have generated biases linked to the Hawthorne effect (behavioral changes due to being observed) and social desirability in the interviews. Despite the precautions taken (neutrality, guaranteed anonymity, emphasis on the absence of academic impact), these biases cannot be completely ruled out and it is possible that some participants may have modified their behavior or comments.

Finally, a significant limitation lies in the complexity of emotional analysis. Emotions are by nature difficult to verbalize and subject to rationalization after the fact. The data from the interviews provide insight but are not sufficient to capture the full richness of the emotional experience.

In our view, these limitations do not diminish the value of the study but rather highlight the need to consider it as an initial exploration and open up avenues for future research: expanding the sample, diversifying profiles, extending the duration, introducing physiological measurements, and comparing simulations with real trading situations.

7.2. Future Avenues of Research

- Expanding and diversifying samples: include participants of various ages, from different educational and cultural backgrounds, or individual investors who already have market experience.
- Real-world studies: observe behavior in environments where real capital is at stake in order to assess the robustness of the dynamics observed.
- Longitudinal approaches: follow participants over several weeks to analyze the lasting evolution of locus of control, the persistence of gambler's bias, the effects of vicarious learning and the development of emotional self-regulation.
- Methodological complementarity: combining qualitative methods with physiological measurements (electrodermal activity, heart rate, automated facial analysis) to complete the analysis of emotions with objective indicators.
- Collective and social dimension: deepen the study of emotional contagion by varying configurations (larger groups, collaborative digital environments, comparison between solitary and collective work).
- Educational applications: experiment with training programmes that incorporate emotion management and reflexivity on biases, in order to assess their effectiveness in preventing resignation and learned helplessness.

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9. Appendix(es)

Appendix 1. Interview Guide

Topic 1. General information

1) What was your main motivation for participating in the experiment?

Topic 2. Strategy employed

1) Did you have a strategy or plan in mind before you started trading?
2) How did you develop your trading strategy?

3) What is your perception of risk?
4) Did you tend to take risks or were you more conservative?
5) How did your trading strategy evolve based on the successes or failures of the first sessions?
6) Have you noticed a difference in the way you manage risk today compared to when you started the experiment?
7) Can you describe a situation where your emotions directly influenced your decision-making, whether in a loss or gain situation?
8) After a session where you made several decisions that did not pay off, how did you react emotionally and how did this influence the next session?
9) Have you noticed any changes in your emotions or behaviour when you have several losses in a row? How did this affect your subsequent decisions?
10) What emotions do you think dominate your trading experience to date? Why?
11) Have you changed your strategy because of your emotions?
12) How do you react when the market moves against you?
13) After a significant gain or loss, did you notice any changes in your behaviour or emotions during the next session? What were they?

Theme 3. Gains and losses

1) How did you react to a loss?
2) Did the losses affect your behaviour or decisions?
3) Did you react more impulsively afterwards?
4) How did you react to a win?
5) Did you react more impulsively afterwards?

Topic 4. Emotions

1) What emotions did you feel before starting a trading session?
2) How did you handle the pressure of making quick decisions?
3) How did your emotions change as the experiment progressed?
4) Did the breaks between each session influence your emotions?
5) What role did emotions play in this experiment?
6) Before placing an order, what emotions did you generally feel?
7) Taking into account the results of this experiment, do you think your emotions influenced your overall performance?

Conclusion

1) Are there any aspects of your experience that we have not covered and that you would like to share?