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From Bias to Brain:

A Critical - Narrative Literature Review on Crowdfunding From a Psychological and Neuroscientific Perspective

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ABSTRACT

This thesis develops a critical-narrative review of the literature on crowdfunding decision-making, integrating behavioral, cognitive, and neuroscientific perspectives. While prior research has documented systematic regularities in backers' behavior, such as herding, local bias, emotional framing, and social influence, the underlying mechanisms remain fragmented across disciplinary domains.

To address this gap, this review analyzes 23 peer-reviewed studies published between 2004 and 2025, classifying them according to theoretical pillars, crowdfunding types, and methodological approaches. Purely behavioral and archival studies have been analyzed alongside neuroscientific and mixed-method designs, including fMRI, EEG, and fNIRS experiments.

Building on this synthesis, the thesis proposes an integrated Behavioral - Cognitive - Neuroscientific framework in which crowdfunding decisions emerge from the interaction between attentional selection processes, neural valuation mechanisms, and observable behavioral outcomes. The framework emphasizes how neural valuation systems and affective circuitry interact with cognitive constraints and social information to shape crowdfunding decisions under uncertainty.

By bridging traditionally separated levels of analysis, this work contributes to a more unified and mechanistic understanding of crowdfunding decision-making and offers directions for future interdisciplinary research.

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1 INTRODUCTION

Over the past decade, crowdfunding has emerged as a prominent and increasingly institutionalized mechanism for financing entrepreneurial, cultural, and social initiatives. Broadly defined, crowdfunding refers to the process through which individuals or organizations raise capital by soliciting relatively small contributions from a large number of people, typically via online platforms and without relying on traditional financial intermediaries such as banks or venture capital firms. By enabling direct interaction between project creators and dispersed backers, crowdfunding has lowered entry barriers to funding and reshaped access to capital across a wide range of domains (Bruton et al., 2015).

1.1 The Four Types of Crowdfunding

One of the defining characteristics of crowdfunding is the heterogeneity of its models, which differ according to the nature of the exchange between founders and contributors. The literature commonly distinguishes four main types. Donation-based crowdfunding involves contributions made without material or financial returns and is typically motivated by altruism, moral values, or identification with a social cause (Rijanto, 2018). Reward-based crowdfunding offers non-financial rewards such as early access to products, symbolic recognition, or experiential benefits, and is the most widely studied model, particularly on platforms such as Kickstarter (Hohen et al., 2025). Lending-based crowdfunding, also referred to as peer-to-peer lending, allows individuals to lend money with the expectation of repayment, often with interest (Kusumawati et al., 2024). Finally, equity-based crowdfunding enables contributors to obtain an ownership stake or a share of future profits, positioning crowdfunding as a direct alternative to traditional entrepreneurial finance (Ahlers et al., 2015).

1.2 The Role of Uncertainty, Information Asymmetry, and Social Visibility

Despite these structural differences, all forms of crowdfunding share a common decision-making environment characterized by high uncertainty, information asymmetry, and strong social visibility (Courtney et al., 2017; Mollick, 2014). Backers are required to evaluate project quality, founder credibility, and potential outcomes without the formal safeguards, due diligence procedures, or contractual protections that characterize traditional financial markets. As a result, crowdfunding decisions rely heavily on subjective evaluations, social cues, and interpretative processes rather than on standardized financial metrics.

1.3 Traditional Research on Crowdfunding

Early academic research on crowdfunding focused on documenting its basic dynamics and distinguishing it from other forms of entrepreneurial finance. A seminal contribution in this regard is Mollick (2014), who provided one of the first large-scale empirical analyses of crowdfunding using Kickstarter data. This work demonstrated that crowdfunding success is systematically associated with signals of project quality, social networks, and geographic factors, while also highlighting substantial uncertainty and frequent delays in project delivery. Subsequent research expanded these insights by identifying a wide range of correlates of success, including narrative quality, visual presentation, update frequency, social proof, and creator reputation.

More recently, systematic reviews such as Deng et al.(2022) have synthesized this growing body of literature by categorizing success determinants, platforms, and methodological approaches. These reviews provide a comprehensive descriptive overview of the field and document the diversity of empirical strategies employed across crowdfunding models. Taken together, existing studies offer a detailed map of *what* tends to be associated with crowdfunding success.

1.4 Considering the Why and How

However, while the literature has become increasingly rich at a descriptive level, it remains comparatively limited in explaining *why* and *how* these determinants influence backers' decisions. Crowdfunding research has largely been conducted within frameworks derived from traditional finance, entrepreneurship, and information systems, implicitly relying on assumptions of rational evaluation and information processing (Vismara, 2016). Yet the crowdfunding environment poses fundamental challenges to these assumptions. Backers must make decisions under severe informational asymmetry, time pressure, and cognitive constraints, often relying on narratives, images, and social signals rather than on objective performance indicators. In such conditions, the classical model of the fully rational investor becomes difficult to sustain.

1.5 Behavioral Science in Crowdfunding Literature

Behavioral research has provided important progress in addressing these limitations by documenting systematic deviations from rational choice. Studies have identified the role of heuristics and biases such as herding effects, anchoring, availability, and goal-gradient dynamics in shaping both individual contributions and aggregate funding trajectories (Shao et al., 2023). These findings suggest that crowdfunding outcomes are not merely the result of project fundamentals, but emerge from psychological processes that govern how individuals interpret uncertainty and social information. Nevertheless, behavioral explanations often remain at the level of surface regularities: they describe which biases are present, but rarely clarify the underlying cognitive processes that generate them or the mechanisms through which they interact.

1.6 Crowdfunding: An Attention Market

Beyond behavioral considerations, crowdfunding also operates as an attention-intensive digital environment (Burtch et al., 2013). On online platforms, users are exposed to many competing campaigns and must process information rapidly. Under such conditions, attention becomes a scarce resource and a central bottleneck in decision-making. Visual salience, narrative coherence, emotional cues, and perceptual fluency play a critical role in determining which projects are noticed, remembered, and evaluated (Parhankangas & Renko, 2017). Cognitive constraints therefore shape not only individual choices but also the aggregate dynamics of crowdfunding markets.

1.7 Neuroeconomics and Modern Decision-making

Yet even cognitive-attentional explanations have their limits. While they account for selective information processing and interpretative efficiency, they do not fully explain how subjective value, trust, risk perception, and emotional resonance are formed and stabilized under uncertainty (Frydman & Camerer, 2016). Addressing these questions requires a deeper level of analysis: the neurobiological mechanisms underlying valuation, affective responses, and social cognition in economic decision-making.

Recent advances in neuroscience and neuroeconomics have shown that economic choices are supported by distributed neural systems involved in reward anticipation, risk processing, emotional evaluation, and mentalizing. Importantly, neural signals related to valuation and affect have been shown to predict individual choices and, in some contexts, aggregate market-level outcomes more accurately than self-reported preferences (Genevsky & Knutson, 2015). Despite their relevance, these insights have rarely been systematically integrated into the crowdfunding literature. As a result, behavioral, cognitive, and neuroscientific approaches to crowdfunding have largely evolved in parallel, leaving the field fragmented across disciplinary boundaries.

1.8 The Need for a Critical and Integrative Review

This fragmentation motivates the need for a critical and integrative review. Rather than providing an additional descriptive synthesis of success determinants, this review seeks to clarify the conceptual foundations of crowdfunding research by examining how decision-making processes unfold across three interconnected levels: behavioral regularities, cognitive-attentional constraints, and underlying neural valuation mechanisms. By linking these levels, the review aims to move from surface-level correlates toward a more coherent explanation of how crowdfunding decisions emerge from the interaction between mind and brain.

1.9 Research Purpose and Research Questions

The primary purpose of this review is to critically assess how crowdfunding research has conceptualized decision-making to date and to identify the limitations of existing approaches in explaining the mechanisms underlying backer behavior. Building on foundational empirical studies and prior systematic reviews, the thesis seeks to highlight the absence of an integrated framework that connects observable crowdfunding outcomes to cognitive and neural processes.

Accordingly, this review addresses the following research questions:

RQ1: How have behavioral, cognitive, and neuroscientific approaches independently explained backer decision-making in crowdfunding, and what are the fundamental limitations of each isolated perspective?

RQ2: How can key findings on backer decision-making be reconceptualized through an integrated framework that connects behavioral outcomes, cognitive-attentional processes, and underlying neurobiological valuation mechanisms?

RQ3: What are the theoretical, methodological, and practical implications of adopting such an integrated neuro-cognitive-behavioral framework for practitioners and future research?

To address these questions, the thesis adopts an integrative set of theoretical lenses. From behavioral economics and social psychology, it draws on theories such as heuristics, social influence, and identity-based choice. From cognitive psychology, it employs attentional bottleneck and expectancy-based frameworks to account for selective information processing. From neuroscience and neuroeconomics, it relies on models of valuation, affective forecasting, and social cognition to explain how reward anticipation, risk processing, and mentalizing mechanisms contribute to economic decisions under uncertainty. By combining these perspectives, the review aims to position crowdfunding as a fertile domain for studying decision-making at the intersection of finance, psychology, and neuroscience, and to provide a clearer foundation for future interdisciplinary research.

1.10 Structure of the Thesis

This thesis is organized as a critical, narrative, and integrative literature review and is structured to progressively move from descriptive evidence to deeper explanatory mechanisms of crowdfunding decision-making.

Following the present introduction, **Chapter 2** outlines the methodological approach adopted for the review. This chapter describes the literature search strategy, the databases consulted, the selection criteria, and the analytical framework used to classify and interpret the reviewed studies.

The aim of this chapter is to ensure transparency and methodological rigor, while clarifying the scope and limitations of the review.

Chapter 3 examines crowdfunding through a behavioral perspective. It reviews empirical findings on behavioral regularities and biases observed in crowdfunding contexts, including herding effects, social proof, identity-based support, and goal-gradient dynamics. This chapter highlights how behavioral economics and social psychology have contributed to explaining deviations from rational choice, while also discussing the limits of purely behavioral interpretations.

Chapter 4 shifts the focus to the cognitive-attentional layer of decision-making. Drawing on cognitive psychology, this chapter conceptualizes crowdfunding as an attention-driven environment and analyzes how cognitive constraints, selective attention, and interpretative fluency shape backers' evaluations of campaigns. By doing so, it positions attention as a central mechanism linking observable campaign features to individual decisions.

Before introducing neuroscientific evidence, **Chapter 5** provides a conceptual and methodological primer on neuroscience and neuroeconomics. This chapter introduces the main neuroscientific methods, key brain regions involved in valuation, risk, affect, and social cognition, and explains their relevance for the study of economic decision-making. Its purpose is to equip the reader with the necessary foundations to interpret neuroscientific findings discussed in subsequent chapters.

Chapter 6 reviews and critically assesses neuroscientific and neuroeconomic studies relevant to crowdfunding and closely related domains. It examines how neural measures of reward anticipation, affective processing, and social cognition have been linked to individual choices and aggregate outcomes, and discusses the extent to which these findings can explain behavioral patterns observed in crowdfunding.

Building on the insights of the previous chapters, **Chapter 7** proposes an integrated framework that connects behavioral regularities, cognitive-attentional constraints, and neural valuation mechanisms. This chapter synthesizes the reviewed evidence into a unified interpretative model, highlighting causal pathways, complementarities, and remaining gaps in the literature.

Chapter 8 outlines directions for future research at the intersection of crowdfunding, psychology, and neuroscience.

Chapter 9 presents the managerial implications of this review, which can be useful when designing a real-life crowdfunding campaign.

Finally, **Chapter 10** concludes the thesis by summarizing the main contributions of the review.

2 METHODOLOGY

2.1 Paper Selection Process

The literature review was conducted between August and December 2025. A structured and iterative search strategy was adopted in order to identify and synthesize academic contributions at the intersection of crowdfunding, behavioral decision-making, and neuroscience.

The primary database used for the literature search was Scopus, chosen for its selectivity, controlled indexing, and strong reputation for peer-reviewed academic content. Google Scholar was employed as a complementary source to enrich the corpus with relevant interdisciplinary contributions and to account for potential database coverage limitations, particularly with respect to emerging research areas and grey literature.

The initial phase of the search focused on identifying review articles related to crowdfunding. Queries combining the keywords *"crowdfunding"* AND *"review"* were conducted on Scopus, yielding 572 documents. This step served to map the existing structure of the crowdfunding literature and to assess the extent to which prior reviews had incorporated behavioral or neuroscientific perspectives.

In a subsequent phase, the search strategy was expanded to explicitly integrate neuroscientific dimensions. Queries combining *"crowdfunding"*, *"review"*, and *"neuroscience"* returned no results, thereby highlighting the absence of systematic reviews directly bridging crowdfunding and neuroscience. To further explore this gap, additional searches were conducted using the keywords *"crowdfunding"* AND *"brain"*, which resulted in 26 documents. Among these, the study *When Brain Beats Behavior* by Alexander Genevsky and Brian Knutson (2017) emerged as a foundational contribution after relevance-based sorting. This article was subsequently treated as a seminal reference for the neuroscientific pillar of the present review.

Building on this work, author-based searches were conducted by querying publications authored by Genevsky and Knutson. These searches yielded five papers included in the final corpus, making them the most recurrent contributors within the neuroscientific stream of the analyzed literature. No other authors exhibited a comparable concentration of relevant publications within the selected sample.

To further capture behavioral and psychological perspectives on crowdfunding, additional queries were conducted using the keywords *"crowdfunding"* AND *"bias"*, which produced 136 results, and *"crowdfunding"* AND *"psychology"*, which yielded additional relevant studies. These searches

contributed to broadening the analytical scope of the review beyond purely economic interpretations of crowdfunding behavior.

Given that crowdfunding, neuroforecasting, and the application of neuroscience to financial decision-making represent relatively recent and rapidly evolving research domains, no temporal restrictions were imposed as inclusion criteria. For similar reasons, the adoption of a minimum citation threshold was deliberately avoided. In emerging and interdisciplinary fields, citation-based metrics may reflect cumulative advantage dynamics, commonly referred to as the Matthew Effect, rather than intrinsic theoretical or methodological quality. To mitigate this risk and avoid excluding potentially valuable insights, documents were selected through a manual screening process based on their relevance to the research scope, methodological rigor, and conceptual contribution.

2.2 Overview of the Selected Papers for Review

The final corpus consists of twenty-three reviewed papers, encompassing the four main types of crowdfunding and spanning multiple countries and continents. This diversity was intentionally preserved in order to support a comprehensive and balanced synthesis of behavioral and neuroscientific approaches to crowdfunding research.

Table 1. summarizes the methodological distribution of the reviewed studies, distinguishing between archival/secondary data analyses, controlled behavioral experiments, neuroimaging designs (fMRI, fNIRS, EEG), and mixed-method approaches. This methodological heterogeneity reflects the multi-level structure of the review, spanning large-scale observational data, laboratory-based experiments, and neuroscientific investigations of valuation processes.

A subset of contributions is classified as *Attention & Simulated Markets*. These studies examine decision-making within digitally mediated environments that replicate key features of online attention markets, such as visibility rankings, social information cues, and platform-driven exposure dynamics. For example, experimental designs using YouTube-like interfaces analyze how algorithmic visibility, prior engagement signals, and attention allocation shape user valuation and behavioral responses. In this sense, crowdfunding is treated not only as a financing mechanism, but as an attention-based digital market in which salience and exposure critically influence decision outcomes. Table 2. reports the full list of selected papers for this review.

Table 1. Descriptive Statistics of the Reviewed Papers

Dimension	Category	Number of Papers	%
Theoretical Pillar	Behavioral	9	39.1%
	Cognitive	3	13.0%
	Neuroscientific	11	47.8%
Crowdfunding Context	Reward-based	7	30.4%
	Donation-based	6	26.1%
	Equity-based	4	17.4%
	Lending-based	1	4.3%
	Attention & Simulated Markets	5	21.7%
Methodology	Archival/Secondary Data	6	26.1%
	Behavioral Experiment	3	13.0%
	Neuroimaging (fMRI/fNIRS/EEG)	8	34.8%
	Mixed Methods	6	26.1%

Table 2. List of the Reviewed Papers

Authors	Year	Paper Title	Journal
Bak S., Yeu M., Min D., Lee J., Jeong J., and Rau H.	2024	Charitable crowdfunding donation-intention estimation depending on emotional project images using fNIRS-based functional connectivity	Plos One
Butticè V., Collewaert V., Stroe S., Vanacker T., Vismara S., and Walthoff-Borm X.	2022	Equity Crowdfunders' Human Capital and Signal Set Formation: Evidence From Eye Tracking	Entrepreneurship Theory and Practice
Camerer C., Loewenstein G., and Prelec D.	2004	Neuroeconomics: Why Economics Needs Brains	The Scandinavian Journal of Economics
Comeig I., Mesa-Vázquez E., Sendra-Pons P., and Urbano A.	2020	Rational Herding in Reward-Based Crowdfunding: An MTurk Experiment	Sustainability
Costello F. and Lee K.	2022	Exploring investors' expectancies and its impact on project funding success likelihood in crowdfunding by using text analytics and Bayesian networks	Decision Support Systems
Du Z., Li M., and Wang K.	2019	The more options, the better? Investigating the impact of the number of options on backers' decisions in reward-based crowdfunding projects	Information & Management
Genevsky A., and Knutson B.	2015	Neural Affective Mechanisms Predict Market-Level Microlending	Psychological Science
Genevsky A., Tong L., Knutson B., and Yortsos Y.	2025	Neuroforecasting reveals generalizable components of choice	PNAS Nexus
Genevsky A., Yoon C., and Knutson B.	2017	When Brain Beats Behavior: Neuroforecasting Crowdfunding Outcomes	The Journal of Neuroscience
Genevsky, Västfjäll D., Slovic P., and Knutson B.	2013	Neural Underpinnings of the Identifiable Victim Effect: Affect Shifts Preferences for Giving	The Journal of Neuroscience

Authors	Year	Paper Title	Journal
Greenberg J., and Mollick E.	2017	Activist Choice Homophily and the Crowdfunding of Female Founders	Administrative Science Quarterly
Guo L., Guo D., Wang W., Wang H., and Wu Y.	2018	Distance Diffusion of Home Bias for Crowdfunding Campaigns between Categories: Insights from Data Analytics	Sustainability
Guo R., Wang G., Wu D., and Wu Z.	2025	Keep Bright in the Dark: Multimodal Emotional Effects on Donation-Based Crowdfunding Performance and Their Empathic Mechanisms	British Journal of Psychology
Hornuf L., Schmitt M., and Stenzhorn E.	2022	The local bias in equity crowdfunding: Behavioral anomaly or rational preference?	Journal of Economics & Management Strategy
Letwin C., Ciuchta M., Johnson M., Stevenson R., and Ford C.	2024	Passion and attractiveness on display: an examination of gender bias in crowdfunding	Small Business Economics
Peterson R.	2005	The Neuroscience of Investing: fMRI of the Reward System	Brain Research Bulletin
Sendra-Pons P., Mas-Tur A., and Garzon D.	2024	Anchor Investors and Equity Crowdfunding for Entrepreneurs	European Journal of Management and Business Economics
Theerthaana P., and Lysander Manohar H.	2021	How a Doer Persuades a Donor? Investigating the Moderating Effects of Behavioral Biases in Donor Acceptance of Donation Crowdfunding	Journal of Research in Interactive Marketing
Tong, Acikalin M., Genevsky A., Shiv B., and Knutson B.	2020	Brain activity forecasts video engagement in an internet attention market	Proceedings of the National Academy of Sciences
Trzebinski A., and Kołodziejczyk L.	2025	Beauty Contest in Equity-Based Crowdfunding Campaigns	Journal of Alternative Finance
Wang L., Li L., Shen Q., Zheng J., and Ebstein R.	2019	To run with the herd or not: Electrophysiological dynamics are associated with preference change in crowdfunding	Neuropsychologia
Ye Y., Jiang P., and Zhang W.	2022	The Neural and Psychological Processes of Peer-Influenced Online Donation Decision: An Event-Related Potential Study	Frontiers in Psychology
Zheng J., Hu L., Li L., Shen Q., and Wang L.	2021	Confidence Modulates the Conformity Behavior of the Investors and Neural Responses of Social Influence in Crowdfunding	Frontiers in Human Neuroscience

3 BEHAVIORAL SECTION

3.1 Behavioral Drivers of Crowdfunding Decisions

Understanding crowdfunding through a behavioral lens requires departing from the premise that backers are neither fully rational nor fully informed. Instead, they operate under conditions of severe uncertainty, limited attention, asymmetric information, social interdependence, and systematic cognitive distortions. Behavioral influences do not merely add noise to crowdfunding markets. They constitute the underlying structure that shapes who gets funded, when, and why. This section examines the behavioral mechanisms that drive decision-making in reward-based, donation-based, and equity crowdfunding, synthesizing the contributions of nine core studies and offering a critical evaluation of their methodological robustness and theoretical coherence. Despite the heterogeneity of domains and methods, the literature converges on a central idea: backers construct their decisions through a mixture of heuristic interpretation, social learning, biased perception of identity cues, and contextual sensitivity to platform design. Yet this convergence masks major internal contradictions. By comparing findings across papers, it becomes evident that many behavioral explanations lack external validity, suffer from confounds in causal inference, or rely on overly stylized experimental paradigms. A critical review is therefore essential to separate robust insights from fragile claims.

3.2 Rational Herding and Anchor Investors

A starting point for analyzing behavioral dynamics in crowdfunding lies in understanding how early signals shape backer perceptions of project quality. Mollick's foundational work (2014) established that early support acts as a powerful heuristic for perceived quality. This intuition has been rigorously tested in controlled experiments such as the Amazon Mechanical Turk study on rational herding by Comeig et al. (2020), where participants were exposed to manipulated displays of early contributors and peer versus expert opinions. The authors demonstrate that early contributions reliably shift beliefs about the probability of campaign success, increasing the likelihood of subsequent pledges. Importantly, they argue that such behavior is *rational*, because observational learners update their priors in a Bayesian-consistent manner. This claim is theoretically elegant, yet the study's external validity is limited by the artificiality of the simulated platform and the absence of real monetary stakes beyond modest participation rewards. Furthermore, the authors interpret behavioral conformity as rational updating, but the distinction between rational inference and heuristic imitation is blurred by the design: participants are given no opportunity to evaluate the intrinsic quality of the project, making herding behavior indistinguishable from blind conformity. Still, the study's contribution is substantial, as it provides rare causal evidence in a literature dominated by correlational inferences.

Social signaling plays a prominent role not only in reward and donation models but also in equity crowdfunding. The study of anchor investors demonstrates that high-credibility early investors exert substantial influence on later backers (Sendra-Pons et al., 2024). Anchor investors serve as a quality signal that reduces information asymmetry (Spence, 1973). Yet the same mechanism creates a potential vulnerability: campaigns without access to high-status early investors are systematically disadvantaged. The paper's configurational qualitative comparative approach provides credible evidence for the signaling effect, but the authors do not fully explore the possibility of platform-driven amplification: campaigns with anchor investors may receive preferential algorithmic placement, boosting their visibility independently of perceived quality. Thus, the observed effect may be partially endogenous to platform design rather than purely behavioral.

3.3 Keynesian Beauty Contest and Expectation-Driven Investment Decisions

Relatedly, equity crowdfunding exhibits sentiment-driven distortions that resemble Keynesian beauty contests. Trzebinski and Kołodziejczyk (2025) show that backers often make decisions based not on their own evaluation of intrinsic value, but on their expectations of what other investors will believe. This meta-cognitive process introduces second-order beliefs that shape investment timing and magnitude. While empirically compelling, the study's limitation lies in its sentiment extraction models, which rely on natural language processing techniques trained on general corpora rather than crowdfunding-specific texts. As a result, sentiment scores may misclassify sarcasm, entrepreneurial overconfidence, or platform-specific jargon. Nevertheless, the study highlights an essential insight: crowdfunding markets are not merely informational systems but social coordination arenas.

3.4 Gender Bias in Language Framing and Funding Evaluation

A complementary perspective emerges from studies examining the influence of social information and identity-based preferences. The notion that backers react not only to project quality but also to the founder's attributes is strongly supported by recent work on gender bias in entrepreneurial pitches. Lewin et al. (2024) show that evaluations of passion and attractiveness interact systematically with the gender of the entrepreneur. Using text analytics and survey experiments, they demonstrate that agentic language raises funding intent for male founders but not for females, while communal language helps female founders, while hurting males. The paper's design provides a sophisticated account of how cognitive biases translate into differential funding outcomes. However, its interpretation presents potential confounds. Passion and attractiveness are highly collinear with perceived confidence, authenticity, and communication competence, and these constructs are not fully controlled for. Moreover, the reliance on pitch videos without real funding consequences raises

concerns about ecological validity. On real platforms such as Kickstarter or Seedrs, backers make decisions under conditions of irreversible commitment, not hypothetical judgment. Despite these limitations, the findings underscore a central behavioral insight: identity cues are not peripheral but embedded in the core evaluative processes of crowdfunding participants.

3.5 Activist Choice Homophily and Identity-Aligned Investment Support

At the intersection of identity and proximity lies the phenomenon of homophily in investor activism. Greenberg and Mollick (2017) find that backers who identify with the demographic characteristics or political values of founders are disproportionately likely to support campaigns led by women. Unlike general gender bias, which discriminates against female entrepreneurs, activist choice homophily suggests that certain investor subgroups actively seek to counterbalance systemic disadvantage. Yet this effect is unevenly distributed and limited to specific investor archetypes. The authors argue that homophily is an intentional preference, not a heuristic error. While this interpretation is plausible, the study does not account for the possibility that activist backers may simply be more exposed to campaigns run by founders who share their identity markers due to algorithmic recommendation systems. Therefore, while the evidence for homophily is strong, its underlying mechanisms are not definitively identified.

3.6 Geographical Bias: From Home Preference to Local Investment Outcomes

Beyond gender, social proximity and identity alignment play a decisive role in shaping investment patterns. Research on home bias in crowdfunding shows that backers exhibit systematic preference for geographically proximate campaigns, contradicting the notion that online platforms eliminate spatial frictions. The work of Guo et al. (2018) reveals that backers initially cluster around local founders but expand geographically as the funding period progresses, a process the authors refer to as *distance diffusion*. Their analysis of more than 17 million observations demonstrates that successful campaigns attract geographically broader support earlier and more intensely than unsuccessful ones. However, the study conflates home bias (a static preference) with distance diffusion (a dynamic aggregation pattern). The former is an investor-level predisposition, while the latter reflects platform-wide temporal dynamics. By treating them as interchangeable, the authors risk overstating the explanatory power of geographical preference. Moreover, while the findings are statistically robust, the absence of causal identification prevents strong claims about why distance changes over time. Increased distance may simply reflect an increase in platform visibility rather than an intrinsic behavioral shift.

A complementary but more outcome-oriented perspective emerges in the work of Hornuf et al. (2022), who examine local bias in equity crowdfunding. By analyzing over 20,000 investments across two German platforms, they find that local bias persists even after controlling for personal ties and investor sophistication. Interestingly, angel-like investors and those with personal ties to founders exhibit particularly strong local preferences, while diversified investors do not. More importantly, local investments are significantly more likely to result in insolvency, suggesting that geographical bias is, in most cases, a behavioral anomaly rather than a rational strategy. This conclusion represents a rare attempt in the behavioral crowdfunding literature to link investor bias to investment outcomes. Nevertheless, even this strong claim is limited by survivorship bias, variability in platform disclosures, and the difficulty of disentangling investor competence from investor preference.

3.7 Choice Overload in Crowdfunding Decision-Making

Other behavioral distortions arise from the structure of choice itself. Choice overload, long studied in consumer decision-making, manifests acutely in crowdfunding environments where campaigns differ along numerous dimensions. Du et al. (2019) investigate the number of project options on backers' decisions reveals that an excessive variety of reward tiers or campaign alternatives can reduce contributions. The authors explain this through cognitive load and diminished motivation, consistent with classic choice overload theory. Yet the study relies heavily on hypothetical scenarios and fails to account for the fact that real crowdfunding decisions often involve sequential search, not simultaneous evaluation. In practice, platforms algorithmically curate options, making the backer experience much less *overloaded* than the experimental stimuli. Thus, while the findings are theoretically sound, their real-world applicability is uncertain. Crowdfunding involves high goal-directed motivation, and backers may be more resilient to overload than typical consumers in supermarket-style experiments.

3.8 Optimism Bias and Identifiable Victim Effect

In donation-based crowdfunding, biases manifest differently, often through affective and moral heuristics. The Unified Theory of Acceptance and Use of Technology (UTAUT)-based study on behavioral biases in donation campaigns by Theertana P. and Manohar L. (2021) shows that social influence, facilitating conditions, and perceived usefulness remain significant, but are strongly moderated by cognitive biases such as optimism bias, confirmation bias, and the identifiable victim effect. The authors argue that donors rely on simplified personal narratives rather than systematic evaluation, leading to predictable distortions in donation flows. While the paper's integration of

UTAUT and behavioral bias frameworks is conceptually innovative, it suffers from major limitations: its reliance on self-reported intentions rather than actual giving behavior and the absence of contextual richness typical of real charity campaigns. Nevertheless, the study's recognition of affective mechanisms anticipates more sophisticated neuroscientific evidence on charitable giving.

3.9 Limitations of the Behavioral Pillar

Taken together, behavioral crowdfunding research paints a complex picture of decision-making driven by heuristic shortcuts, social cues, identity salience, and contextual structure. Yet a critical synthesis reveals several unresolved tensions. First, the literature oscillates between interpreting behavioral patterns as rational responses to information asymmetry (as in rational herding and anchor investor signaling) and as irrational biases that reduce decision quality (as in local bias, gender bias bias, or overload effects). This inconsistency stems from the lack of a unified framework capable of distinguishing adaptive heuristics from maladaptive distortions.

Second, methodological heterogeneity poses challenges. Field data offer ecological validity but lack causal identification, while experiments provide causality but lack realism. Simulations introduce complexity but sacrifice generalizability. Without integrative models, conclusions remain fragmented.

A deeper limitation emerges when examining how these behavioral biases interact. For example, local bias may mitigate perceived risk through familiarity while simultaneously increasing susceptibility to identity-based cues. Gender bias interacts with beauty contest dynamics by amplifying the impact of social expectations on perceived project viability. Anchor investors can override choice overload by simplifying evaluation criteria. These interactions are rarely modeled explicitly, yet they are central to understanding how real backers behave. The absence of cross-study integration reflects a broader issue: behavioral crowdfunding research remains siloed, with each study emphasizing a specific mechanism while overlooking the broader decision ecosystem.

Despite these limitations, the literature offers several robust insights. Behavioral cues matter because crowdfunding is a high-uncertainty environment with limited objective quality signals. Asymmetric information, absent intermediaries, and the irreversible nature of contributions force backers to rely on heuristics. Social information is consistently powerful, whether through early contributions, anchor investor participation, or peer opinions. Identity cues, especially gender and geography, exert persistent influence. Cognitive load and choice architecture shape decision quality. Sentiment and

expectations play a central role in equity crowdfunding, aligning these markets more closely with beauty contests than with rational asset pricing.

To elevate this field, future research may adopt methodologies that capture the complexity of real-world decision-making. Mixed-method designs that combine field experiments, platform-level data, psychometric profiling of investors, and integrated behavioral-cognitive-neural measures would significantly strengthen causal claims. More importantly, theories must strive to distinguish adaptive heuristics from truly maladaptive biases that reduce welfare. Without this conceptual clarity, interpretations of investor behavior will remain inconsistent.

Understanding this duality is essential for developing a theoretical foundation that transcends descriptive findings and offers predictive insight. Crowdfunding will continue to evolve as platforms integrate algorithmic curation, AI-driven recommendations, and increasingly complex reward structures. As this evolution unfolds, so too will the behavioral dynamics that underpin backer decision-making. Only by adopting a rigorous, integrative, and critically grounded approach can researchers and practitioners fully grasp the intricate psychology of the crowd.

4 COGNITIVE SECTION

4.1 The Cognitive Foundations of Crowdfunding Decisions

Crowdfunding is a cognitively demanding environment in which individuals must navigate large quantities of multimodal, uncertain and often ambiguous information. Unlike traditional financial contexts, where formal due diligence and institutional screening reduce cognitive burden, crowdfunding decisions occur in settings where backers face limited time, reduced attention and high interpretative ambiguity. Behavioral research has documented stable patterns in these decisions, such as reliance on heuristics, susceptibility to social influence and sensitivity to narrative cues, yet these behavioral patterns cannot be fully understood without examining the cognitive processes that underlie them. Cognitive mechanisms determine how stimuli are encoded, how attention is allocated, how expectations shape interpretation, and how emotional material is integrated with linguistic content. The studies by Butticè et al. (2022), Costello and Lee (2022), and Guo et al. (2025) offer valuable insights into these mechanisms, each addressing a different dimension of cognitive processing. Together, they reveal that crowdfunding decisions emerge not from isolated biases or preferences but from a dynamic interplay between perception, prediction, cognitive load and emotional integration.

This chapter provides an extensive critical analysis of the cognitive foundations of crowdfunding decision-making, building upon the behavioral chapter and preparing conceptual ground for the neuroscientific analysis that follows. The discussion proceeds through three main lenses: visual attention and cognitive strain, expectancy formation through linguistic structure, and the multimodal integration of visual and textual emotional cues. Each of these perspectives highlights different cognitive constraints that shape how backers process information. Each of them also carries distinct methodological challenges that must be considered when interpreting the evidence.

4.2 Attentional Bottlenecks and the Construction of Investor Signal Sets

A central limitation of such research on crowdfunding is its implicit assumption that the signals founders display are automatically received, processed, and evaluated by investors. Investors construct a highly selective cognitive representation of the campaign, a signal set, which includes only those cues that manage to survive the severe attentional bottlenecks imposed by limited cognitive resources. The study by Butticè et al. (2022) provides one of the clearest empirical demonstrations of this process, using eye-tracking to map the moment-to-moment allocation of visual attention as equity crowdfunders inspect campaign pages. Their work represents an important step beyond traditional signaling theory, aligning directly with Drover et al. (2018) adovacy for a cognitive view of signaling

in entrepreneurial finance: signals do not matter because they exist, but because they are seen, attended to, and judged meaningful by bounded decision makers.

The authors show that visual attention in equity crowdfunding is both selective and patterned: investors rarely attend to all available cues, and the configuration of their signal set depends systematically on their human capital. Investors with higher general human capital (e.g., formal education) construct broader signal sets and require longer deliberation time, distributing their gaze across multiple campaign sections. In contrast, investors with higher specific human capital (industry familiarity, experience with similar ventures) form narrower, more focused signal sets and decide faster, likely relying on domain-specific schemata that compress search and highlight diagnostic cues. This asymmetry between broad search and schema-driven focus fits well with theories of expertise in cognitive psychology and suggests that not all investors process crowdfunding information in the same structural way. Crucially, it also undermines the normative assumption that more information or more detailed disclosures inevitably lead to better decisions.

However, while the study's design is more cognitively grounded than most equity-crowdfunding work, its core assumptions reveal important methodological tensions. The reliance on eye-tracking equates overt visual fixations with cognitive processing, but attention is not always synonymous with comprehension. A fixation indicates exposure, not necessarily encoding or integration with prior knowledge. Campaign pages may be looked at without being understood, and the paper does not disentangle superficial scanning from deeper evaluation: an omission particularly relevant in contrast with neuroimaging work that measures valuation directly at the neural level. Furthermore, the authors' operationalization of human capital is elegant in theory but crude in measurement: formal education is used as a proxy for general cognitive sophistication, and domain experience stands in for expertise. These proxies do not fully capture the constructs they are meant to represent. Numeracy, risk-processing ability, pattern recognition, ambiguity tolerance, and other cognitive features central to decision quality remain unmeasured. The result is an interpretation that occasionally drifts toward normative claims: that higher levels of education lead to broader information search, which in turn results in better decisions, without empirical evidence linking attention patterns to actual investment performance.

A further limitation lies in the mapping between areas of interest (AOIs) and internal cognitive categories. The authors define signal sets as those AOIs that receive sufficient fixation time, but AOIs reflect the researchers' categorization of campaign sections, not necessarily that of investors. Brief fixations on a team section may count as *signal inclusion* even if the investor ultimately weights

financial cues or narratives more heavily. This binary treatment of attention, fixated vs. not fixated, oversimplifies a cognitive process in which both depth and diagnostic matter. The ecological validity of the task also remains constrained: real crowdfunding environments involve scrolling, cross-campaign comparison, dynamic social cues, and platform-driven ranking effects that shape salience far more aggressively than a controlled lab page.

Despite these limitations, the study offers a crucial insight for the cognitive architecture of crowdfunding: what investors do not attend to is often more revealing than what they do. If a large share of signals goes unseen, then the informational fantasies embedded in platform design and founder disclosures collapse. Crowdfunding decisions, under this lens, are not structured by the full set of available cues but by a sparse, cognitively manageable subset filtered through prior knowledge, experience, and attentional constraints. The implications are deep. Signal effectiveness depends first on visibility, not content quality. Campaigns targeting novice investors may benefit from richer narratives and visual clarity, whereas campaigns aimed at domain-experienced investors may require fewer but more diagnostic cues. Most importantly, platform-level interventions that alter the order, size, or salience of sections can reshape the signal set itself, functionally steering investor cognition.

Placed within the broader cognitive chapter, this paper occupies a pivotal position. It formalizes the transition from behavioral heuristics (e.g., herding, home bias) to cognitive mechanisms (signal filtering, schema activation, selective visual search). At the same time, its limitations highlight the frontier: genuine cognitive modeling of crowdfunding requires going beyond gaze to incorporate memory, confidence, belief updating, and valuation. These dimensions would be more effectively captured more directly in EEG and fMRI studies. In this sense, Butticè et al. (2022) provide the structural front-end of cognition in crowdfunding: the pre-decision screening stage.

4.3 Cognitive Expectancies and the Interpretation of Linguistic Cues

While visual processing governs the initial access to information, linguistic structure determines how contributors interpret the meaning, credibility and viability of a project. Costello and Lee (2022) address this dimension using two complementary frameworks: the Language Expectancy Theory (LET) and Bayesian network modeling. LET posits that individuals hold implicit expectations about how persuasive messages should be constructed. These expectations operate subconsciously, shaping the ease with which information is processed and the credibility attributed to it. In crowdfunding, where formal verification of claims is limited, linguistic cues become especially important triggers for cognitive evaluation.

According to Costello and Lee (2022), campaigns that employ clear, direct and structurally coherent language are evaluated more positively. Contributors interpret clarity as a sign of competence and sincerity, while linguistic vagueness triggers skepticism. This effect is not merely stylistic, as it reflects a deeper cognitive mechanism in which linguistic fluency reduces prediction error. When a message aligns with expected rhetorical norms, it requires less cognitive effort to interpret and is thus processed more efficiently. This form of fluency-based credibility assessment is consistent with psycholinguistic findings showing that fluently processed statements are perceived as truer, irrespective of their factual content.

The Bayesian network modeling employed provides further insight by operationalizing expectancy formation as a computational updating process. Backers integrate textual features, such as lexical diversity, narrative sequencing and tone, into probabilistic inferences about project success. This approach reflects predictive coding theories in cognitive science, which propose that the brain continuously updates internal models by comparing incoming stimuli against prior expectations. In crowdfunding, textual cues act as evidence in an implicit Bayesian inference, adjusting contributors' beliefs about the creator's competence or the feasibility of the project.

Yet, despite its strengths, the study faces notable limitations. The reliance on machine-coded textual features presents an interpretative challenge. Linguistic markers such as sentiment scores, topic frequency or lexical variation do not directly correspond to cognitive states. They are proxies rather than measurements, meaning that conclusions about cognitive mechanisms must remain inferential. Moreover, while Bayesian networks offer a valuable computational perspective, they simplify the actual cognitive processes involved. Human cognition is noisy, parallel and influenced by context, whereas Bayesian networks operate under assumptions of conditional independence and discrete variable relationships. These differences limit the ecological validity of the model.

Furthermore, the study overlooks the multimodal nature of crowdfunding communication. Campaign narratives do not exist in isolation from images, videos or platform architecture. Textual cues are interpreted alongside visual cues, and these interactions shape cognitive expectations in ways the model cannot capture. Despite these limitations, Costello and Lee (2022) provide a powerful conceptual foundation for understanding how investors evaluate linguistic content through predictive and expectancy-driven processes.

4.4 Multimodal Integration: Emotion, Empathy and Cognitive Evaluation

Cognition in crowdfunding is not purely rational or linguistic. It is deeply intertwined with emotional and empathic processes. Guo et al. (2025) provide one of the most comprehensive examinations of how emotional valence and cognitive empathy jointly shape donation decisions in donation-based crowdfunding. Their findings illuminate the dual role of emotion in crowdfunding: it acts both as an attentional catalyst and as an input for deeper cognitive processing.

The researchers identify two distinct decision stages: the initial decision of whether to donate at all and the subsequent decision concerning how much to donate. The first stage is heavily influenced by positive emotional valence. Images that evoke warmth, hope or sympathy rapidly capture attention and lower cognitive resistance, increasing the likelihood that a campaign will be considered. This aligns with findings in affective neuroscience showing that emotional stimuli gain preferential access to attention and working memory. However, emotional activation alone does not determine contribution magnitude. Instead, the second stage relies primarily on cognitive empathy, a more deliberative process involving perspective-taking and simulation of the beneficiary's experience. Cognitive empathy requires executive control and memory retrieval, making it a cognitively demanding task that integrates emotion with reflective reasoning.

The study's multimodal design reveals that emotional images and textual descriptions cannot be understood independently. Emotional images attract attention and initiate engagement, but textual coherence is necessary to sustain cognitive elaboration. When visual and textual cues are congruent, when both suggest a coherent, future-oriented, emotional narrative, contributors exhibit more efficient cognitive integration and stronger willingness to give. This underscores the importance of multimodal coherence in campaign design. Campaigns that rely solely on emotional imagery without accompanying narrative depth may capture attention but fail to generate substantial contributions.

Despite its strengths, the study faces several limitations that are worth discussing. The most significant is its cultural context. The sample consists of participants from China, where emotional expression norms and prosocial motivations might differ from those in Western contexts. Cultural psychology shows that emotional valence and empathy can vary in both expression and cognitive processing across cultures. Therefore, the generalizability of the findings to international crowdfunding platforms remains uncertain.

4.5 Integrating Cognitive Mechanisms: A Comprehensive Cognitive Framework

Taken together, the studies by Butticé et al. (2022), Costello and Lee (2022), and Guo et al. (2025) depict crowdfunding as a cognitively constrained environment in which attention, expectation and

multimodal integration jointly shape decision-making. Attention determines which information is initially perceived. Expectation structures determine how linguistic cues are interpreted. Emotional and empathic processes determine how meaning is assigned and how strongly backers are motivated to act.

These mechanisms do not operate in isolation. Instead, they form a sequential and recursive process. A contributor's first engagement with a campaign is governed by attentional capture: visual salience determines which cues enter perception. These cues then activate cognitive schemas and expectations, shaping the interpretation of linguistic information. Emotional content further modulates attention and cognitive effort, guiding deeper elaboration. Ultimately, decisions emerge from the integration of these cognitive signals, constrained by working memory, shaped by predictive models and modulated by emotional resonance.

This framework helps explain why so many behavioral patterns documented earlier, such as herding, trust cues, bias toward attractive founders and resonance of narratives are not simply expressions of preference but consequences of underlying cognitive processes. Contributors rely on visually salient cues because attention is limited. They favor clear narratives because linguistic fluency reduces cognitive strain. They respond to emotional images because positive valence accelerates cognitive access. Behavioral responses reflect cognitive constraints.

4.6 Limitations of the Cognitive Pillar

Although cognitive research offers deeper explanatory power than behavioral models, the existing literature suffers from substantial methodological and conceptual limitations. A critical examination reveals that while each study provides valuable insights, none captures the full complexity of cognitive processing in crowdfunding.

The most significant challenge is the lack of ecological validity across all three approaches. In Butticé et al. (2022), the reliance on static screenshots fails to approximate the dynamism of real platforms, where attention is influenced by scrolling behavior, interactive elements and adaptive content. This limitation calls into question whether observed gaze patterns truly reflect naturalistic behavior or whether they reflect artificial constraints imposed by the experimental design. Without high-resolution temporal data capturing navigation and interaction, the attentional models remain incomplete.

Costello and Lee (2022) rely heavily on text analytics and machine-coded features, which introduces another layer of abstraction. Linguistic complexity, sentiment scores and structural metrics are treated

as proxies for cognitive constructs such as fluency or expectancy alignment, but the correspondence between these proxies and actual cognitive processes is rarely validated empirically. The Bayesian network modeling further simplifies cognition into discrete probabilistic relationships that may not reflect the distributed, nonlinear nature of human predictive processing. Thus, both the linguistic and computational components offer approximations rather than mechanistic explanations.

Guo et al. (2025), despite offering a richer multimodal framework, introduce cultural constraints and stimulus artificiality that limit generalizability. Emotional processing is highly context-dependent, and cognitive empathy may manifest differently across cultural groups. Without cross-cultural replication or real campaign stimuli, the ecological validity remains uncertain. Moreover, the separation between emotional arousal and cognitive empathy, although conceptually insightful, may overlook the complex neurocognitive overlap between the two.

Across all three papers, a deeper, structural limitation becomes apparent: the literature lacks integration. Each cognitive perspective addresses only one part of the decision-making process. Eye-tracking studies focus on perception and attention but ignore emotional and linguistic cues. Linguistic expectancy models address textual interpretation but exclude visual salience. Multimodal studies examine emotional integration but neglect predictive cognition and Bayesian updating. The absence of multi-method studies that combine eye-tracking, computational modeling and multimodal content analysis leaves the field theoretically fragmented.

This fragmentation prevents the literature from constructing a unified model of cognitive crowdfunding behavior. It also limits the potential for guiding platform design or campaign optimization. Without understanding how visual salience interacts with linguistic expectancy or how emotional cues influence predictive models, interventions remain superficial. The cognitive literature must adopt a more integrative, multi-method approach to achieve explanatory power comparable to that of mature cognitive sciences.

Cognitive mechanisms provide the essential explanatory layer between behavioral patterns and neurobiological foundations. The current cognitive literature remains limited by methodological constraints, narrow operationalizations and lack of cross-modal integration. Future research must bridge these gaps, integrating attention, prediction and multimodal processing into a coherent cognitive architecture. Only by doing so can we fully understand how individuals navigate the complex informational environments of crowdfunding platforms. This cognitive foundation prepares the conceptual ground for the neuroscientific analysis that follows, situating cognitive mechanisms within their biological substrates.

5 FUNDAMENTALS OF APPLIED NEUROSCIENCE: UTILITY, VOCABULARY AND METHODOLOGIES

5.1 The Necessity of Neuroscientific Evidence in Explaining Crowdfunding Success

While behavioral and psychological research has identified numerous correlates of crowdfunding success, these approaches implicitly assume that aggregating individual preferences and choices is sufficient to explain market-level outcomes. However, recent evidence from neuroforecasting research challenges this assumption. In a series of studies, Genevsky and colleagues demonstrate that although self-reported preferences and individual choices reliably predict behavior at the individual level, they fail to forecast aggregate crowdfunding outcomes once projects are exposed to real online markets (Genevsky & Knutson, 2015; Genevsky, Yoon, & Knutson, 2017).

In contrast, neural measures of anticipatory affect, particularly activity in the nucleus accumbens, consistently predict which crowdfunding and microlending campaigns will succeed at the market level, often outperforming both behavioral choices and self-reported evaluations (Genevsky & Knutson, 2015; Genevsky et al., 2017). Importantly, this neural activity precedes conscious choice and reflects early affective valuation processes that are shared across individuals. More recent evidence further shows that these affective neural signals generalize across samples with varying demographic representativeness, whereas behavioral forecasts systematically deteriorate as sample representativeness decreases (Genevsky, Tong, & Knutson, 2025).

These findings indicate that not all components of individual decision-making scale equally to collective behavior. Neuroeconomic models suggest that early affective responses, indexed by activity in reward-related circuits, constitute a more generalizable component of value, whereas later integrative and deliberative processes, often associated with medial prefrontal regions, incorporate more idiosyncratic considerations that are less informative at the aggregate level (Genevsky et al., 2025). As a result, behavioral biases commonly observed in crowdfunding, such as herding, social proof, or activist choice homophily, may arise from heterogeneous underlying mechanisms, only some of which meaningfully contribute to market-level outcomes.

From this perspective, neuroscience is not introduced as a substitute for psychological explanations, but as a necessary constraint on them. By identifying which components of decision-making reliably generalize across individuals and predict collective outcomes, neuroscientific evidence helps distinguish between mechanisms that merely correlate with individual choice and those that constitute the final determinants of crowdfunding success (Genevsky et al., 2017; Genevsky et al., 2025).

5.2 Neuroscientific Methodologies

Recent attempts to integrate neuroscience into crowdfunding research have relied on a restricted but methodologically coherent set of tools, primarily drawn from affective neuroscience and decision neuroscience. Importantly, the goal of these studies is not to localize cognition in a fine-grained neuroanatomical sense, but to identify neural signals that precede and predict aggregate-level economic behavior, such as donation volumes, funding success, or collective engagement. As a result, the neuroscientific methods employed prioritize predictive validity and temporal sensitivity over exhaustive neural coverage.

The dominant methodology in this literature is functional magnetic resonance imaging (fMRI), typically used in task-based paradigms where participants are exposed to crowdfunding stimuli (e.g., project descriptions, images, or videos) and asked to make donation or investment decisions. The fMRI enables the identification of brain regions whose blood-oxygen-level-dependent (BOLD) responses systematically covary with valuation, affective engagement, and motivational processes. Across multiple studies, fMRI has been used not to explain individual choices per se, but to test whether neural responses averaged across small samples can forecast population-level outcomes, a paradigm often referred to as *neuroforecasting*.

Complementing fMRI, a smaller but conceptually important subset of studies employs electroencephalography (EEG) and event-related potentials (ERPs). EEG-based approaches provide high temporal resolution and are particularly suited to capturing rapid affective and attentional responses elicited by crowdfunding cues. ERP components such as the P300 and late positive potential (LPP) are commonly interpreted as markers of attentional allocation and emotional salience, while feedback-related negativity (FRN) is associated with expectancy violation and outcome evaluation. In crowdfunding contexts, EEG methods are used to investigate how quickly and automatically investors respond to social information, such as popularity signals or conformity cues, rather than to model deliberative financial reasoning.

Some studies further integrate psychophysiological measures, including skin conductance responses (SCR) and heart rate variability (HRV), as peripheral indicators of autonomic arousal. These measures are typically interpreted as proxies for affective intensity rather than discrete emotions and are often used in conjunction with neural data to strengthen inferences about emotional engagement. Additionally, a limited number of contributions employ eye-tracking techniques to assess visual attention and information processing, particularly in multimodal campaign environments combining text and images. While not neuroscientific in a strict sense, eye-tracking is frequently aligned with neural interpretations of salience and attentional prioritization.

5.3 Neural Systems in Crowdfunding Research

Across these methodologies, the neural systems most consistently implicated belong to three broad functional domains. First, valuation and motivational systems, centered on the nucleus accumbens (NAcc) and the ventromedial prefrontal cortex (vmPFC), play a central role. Activity in these regions is commonly interpreted as reflecting anticipatory value, approach motivation, and reward-related processing. Crucially, several studies demonstrate that NAcc responses measured during exposure to crowdfunding campaigns can predict subsequent funding success at the market level, even when self-reported preferences fail to do so. This finding underpins much of the rationale for introducing neuroscience into crowdfunding research.

Second, affective salience and emotional processing systems are prominently featured. The anterior insula is frequently associated with emotional arousal, uncertainty, and empathic responses, particularly in donation-based crowdfunding. Together with components of the limbic system, these regions are interpreted as mediating the intensity of emotional reactions to human suffering, urgency cues, or moral appeals embedded in campaigns. Importantly, the literature generally treats these activations as indicators of affective engagement, not as evidence of specific emotional states.

Third, a set of regions associated with social cognition and mentalizing, including the temporoparietal junction (TPJ) and medial prefrontal cortex (mPFC), emerges in studies examining social influence, conformity, and identifiable victim effects. Activation in these areas is commonly linked to perspective-taking, norm sensitivity, and the processing of others' intentions. In crowdfunding contexts, such mechanisms are invoked to explain why investors respond to social signals, peer behavior, or narrative framing, particularly under conditions of informational uncertainty.

Notably, higher-order executive control regions (e.g., dorsolateral prefrontal cortex) appear far less consistently in this literature. This absence reflects a substantive theoretical stance rather than a methodological limitation: crowdfunding decisions, especially in donation-based and reward-based settings, are predominantly modeled as affect-laden and socially embedded choices, rather than as outcomes of explicit optimization or analytical reasoning.

Taken together, the neuroscientific literature on crowdfunding is characterized by a focused methodological toolkit and a convergent set of neural systems, all aligned with the study of valuation, affect, and social influence. Rather than offering a comprehensive neural model of decision-making, these studies provide a targeted contribution: demonstrating that neural measures of affective and motivational engagement can improve the prediction and interpretation of collective crowdfunding behavior, thereby complementing traditional behavioral and cognitive approaches.

6 NEUROSCIENTIFIC SECTION

6.1 A Neuroscientific Perspective on Crowdfunding: From Neural Valuation to Neuroforecasting

Behavioral and cognitive approaches can describe how backers respond to cues such as early momentum, social proof or emotionally charged narratives, but they remain unaware of the underlying biological machinery that turns these cues into funding decisions. Neuroeconomics fills this gap by mapping valuation, affect and social influence onto specific brain systems and by testing whether activity in these systems can predict not only individual choices, but also aggregate market outcomes. In the context of crowdfunding, this perspective is especially relevant because most decisions are taken under uncertainty, with limited hard information and strong affective and social components.

Neuroscience has repeatedly shown that economic behavior is grounded in a small set of recurrent circuits. The nucleus accumbens (NAcc), embedded in the ventral striatum, reliably encodes anticipatory positive arousal and approach motivation. The anterior insula tracks negative or general arousal, often linked to anticipated losses or norm violations. Regions in the medial prefrontal cortex (MPFC) integrate affective and contextual information into a coherent value signal. Posterior cingulate and parietal regions contribute to value-based attention, and temporoparietal and frontal midline areas are involved in social cognition, norm processing and conflict monitoring. The set of eleven studies examined in this chapter exploit this architecture using fMRI, EEG, ERP and fNIRS to shed a light on how people value projects, respond to others' behavior and donate to identifiable beneficiaries in crowdfunding-like settings.

6.2 Neural Valuation in Ambiguous Financial Environments

A first cluster of work focuses on how anticipatory affective circuits bias financial decisions before outcomes are known. (Courtney et al., 2017) (2017)'s contribution to the emerging field of neurofinance argued that dopaminergic reward circuits underlie approach–avoidance dynamics in investing, distinguishing between anticipatory NAcc responses during potential gains and medial prefrontal responses during outcome evaluation. This work suggested that dopamine-driven arousal can bias expectations and risk preferences, providing a mechanistic foundation for phenomena such as overconfidence and speculative exuberance. Although Peterson (2005) did not study crowdfunding directly, the same logic applies when projects are highly uncertain and payoffs are distant, anticipatory affect in the NAcc is likely to exert disproportionate influence relative to slow, analytic evaluation.

NAcc Activity as a Predictor of Market-Level Funding Success

Genevsky and Knutson (2015) pushed this logic into the territory of real digital markets by examining microlending decisions on Kiva. In a large dataset of more than 13,000 loan requests, they first showed that positive affective features of borrowers' photographs promoted loan success. They then recorded fMRI data from a separate sample of participants evaluating these loans. Importantly, activity in the NAcc during exposure to each loan request predicted which loans would be successfully funded online and did so above and beyond both the neuroimaging sample's own choices and their explicit affect ratings. Models including only NAcc activation achieved better classification of loan success than models including only behavior, suggesting that neural measures capture hidden components of valuation not expressed in overt choice. From a crowdfunding perspective, this is a key result: it implies that affective neural responses elicited by project cues may be more diagnostic of market success than what investors consciously report.

6.3 Neural Responses in Internet-Attention Markets

The same anticipatory-affect architecture has been applied to internet attention markets. Tong et al. (2020) used fMRI to examine whether neural responses to video onset could forecast engagement in a YouTube-like environment. Activity in NAcc and MPFC, together with reduced activity in anterior insula, predicted whether individuals chose to continue watching a video. Critically, when neural activity was averaged across participants, NAcc and anterior insula responses at video onset forecasted aggregate view frequency and duration on the platform, outperforming models based on ratings and sampled viewing alone. These findings extend the anticipatory affect–integration–motivation framework to time allocation rather than money allocation, but the underlying mechanism is the same: early subcortical and medial prefrontal signals encode a fast valuation of the stimulus that generalizes across individuals.

Although the study concerns video content rather than crowdfunding per se, it is conceptually close to reward-based crowdfunding platforms, where backers browse multiple projects and must decide not only whether to pledge but also how much attention to devote to each campaign. The evidence that NAcc and anterior insula responses forecast engagement suggests that banners, thumbnails, and short project videos may be effective not because they transmit more cognitive information, but because they trigger stronger anticipatory affect and reduce perceived threat or ambiguity. In other words, attention and engagement on crowdfunding platforms are likely constrained by the same anticipatory affect mechanisms that drive video consumption in attention markets.

Taken together, these valuation studies support a simple but powerful claim: when individuals face noisy, thinly informative environments such as crowdfunding platforms, early activity in reward-related circuits plays a central role in shaping which opportunities are pursued and which are ignored. The brain appears to compute a fast, affect-laden go/no-go signal that is only partially reflected in conscious choice or self-report. This explains why traditional behavioral measures often fail to fully predict campaign success and opens the door to using neuroimaging as a complementary forecasting tool.

6.4 Affective Mechanisms

Crowdfunding is not only about monetary returns, as a substantial share of campaigns are donation-based. In these last ones, backers receive no financial reward, and decisions are driven by prosocial motives. Classic behavioral work on the identifiable victim effect shows that individuals prefer to give to vivid, identified beneficiaries rather than to anonymous or statistical victims, even when the latter strategy would save more lives. Neural evidence clarifies the mechanism behind this seemingly irrational preference.

6.4.1 Warm-Glow Anticipatory Effect

Genevsky et al. (2013) conducted a within-subject fMRI study in which participants were exposed to charitable appeals for orphans, depicted either with photographs (identifiable victims) or silhouettes (non-identifiable). Behaviorally, participants donated more when photographs were present. Neurally, photographs elicited increased NAcc activity and positive arousal, whereas anterior insula responses associated with negative arousal or empathic distress did not predict giving. Mediation analyses indicated that NAcc activity statistically accounted for the effect of photographs on donations. The results support a warm glow anticipatory-affect model: identifiable information promotes giving because it recruits positive arousal and reward circuitry, not because it triggers guilt or pain. In donation-based crowdfunding, this suggests that emotionally powerful beneficiary images and narratives increase contributions primarily by amplifying anticipated prosocial pleasure.

6.4.2 Interhemispheric Functional Connectivity

Bak et al. (2024) extended this line of research to charitable crowdfunding using fNIRS to capture prefrontal hemodynamic responses while participants viewed positive, negative and neutral project images. Instead of a simple valence effect, the authors found that donation intention correlated with stronger interhemispheric functional connectivity in the prefrontal cortex, independent of whether the images were positive or negative. This pattern implies that what matters is not just raw affective

intensity, but the degree to which empathic and perspective-taking processes in the PFC are engaged and coordinated. In practical terms, this means that images and descriptions that invite viewers to mentally simulate the beneficiary's situation or to adopt a first-person perspective may be more effective than those that merely shock or sadden.

The two studies together sketch a layered model of prosocial crowdfunding behavior. At an early stage, identifiable, vivid cues recruit NAcc activity and positive anticipatory affect, creating a baseline bias toward giving. At a later stage, prefrontal circuits supporting empathy and perspective taking integrate this affective bias with moral and contextual considerations, influencing the ultimate donation amount. Warm glow and empathy are thus not competing explanations but hierarchical components of a single valuation process. For campaign design, this implies that optimal appeals should combine emotionally engaging, identifiable imagery with narrative elements that foster cognitive–empathic engagement, rather than relying exclusively on either.

6.5 Electrophysiological Evidence

Beyond individual valuation and prosocial motives, crowdfunding is inherently social. Contributors rarely decide in isolation: they observe early funding trajectories, endorsements and peer behavior, and they update their own judgments accordingly. Behavioral evidence of herding in crowdfunding is well established, but only electrophysiological studies provide a detailed temporal map of how social information is processed and how it changes preferences.

6.5.1 ERP Components in Social Conformity

Wang et al. (2019) used EEG to study social conformity in a financial crowdfunding task where participants rated their willingness to invest in real projects, then observed manipulated group ratings, and later rated the same projects again. The key question was whether neural signals during exposure to group opinion would predict subsequent preference changes. Their results revealed two temporally distinct ERP components. First, when participants' own rating deviated from the group judgment, a more negative feedback-related negativity (FRN) was observed at frontocentral sites, consistent with conflict detection and reward prediction error signals in the anterior cingulate cortex. Second, a centroparietal P300 component, peaking around 300 ms, tracked the magnitude of social influence: larger P300 amplitudes were associated with greater subsequent conformity in willingness-to-invest ratings, both in averaged and single-trial analyses. The authors concluded that FRN reflects the initial emotional conflict between self and group, whereas P300 indexes later evaluative processing that leads to behavioral adjustment.

This dual-ERP pattern aligns with dual-process theories of decision-making. FRN corresponds to a fast, affective alarm signal that something is off relative to expectations, while P300 reflects slower cognitive evaluation and integration of social information. The crucial point is that only the latter predicts whether the investor will actually move toward the crowd. In a crowdfunding environment, this means that simply feeling out of sync with others is not enough to generate herding. What matters is the subsequent stage in which the brain evaluates whether the crowd's opinion is a relevant and trustworthy input into valuation.

6.5.2 The Role of Confidence in ERP Signals Moderation

Zheng et al. (2021) refined this picture by introducing confidence as a moderator. In their EEG-based two-stage willingness-to-invest task, investors with lower confidence in their initial judgments were more likely to conform to group ratings, especially under large opinion conflicts. At the neural level, FRN amplitudes indexed early detection of disagreement, while late positive potential (LPP) amplitudes reflected the motivational salience of social information. Crucially, confidence modulated the LPP but not the FRN: low-confidence investors showed stronger LPP responses to group ratings, indicating that they attributed greater importance to others' opinions during valuation. This finding suggests that confidence acts as a metacognitive gate for social influence. When individuals are uncertain, their brains devote more motivational resources to processing consensus cues, making them more susceptible to herding.

6.5.3 ERP Analysis Under Peer Influence

Ye et al. (2022) extended ERP analysis to donation decisions under peer influence. In an online charitable giving paradigm, they identified a P2–N2–P3 cascade during exposure to peer donation information. Early P2 reflected emotional reward anticipation, N2 indexed conflict monitoring in the presence of discrepant social cues, and P3 captured the integration of social information into motivational salience, ultimately predicting donation behavior. Again, social proof is shown not to be a superficial nudge but a dynamic neurocognitive process with distinct temporal stages.

Across these studies, a coherent neural story of herding emerges. Social information first triggers a rapid conflict or prediction error signal when personal judgments diverge from perceived consensus. Then, depending on confidence and context, cortical valuation systems either discount or up-weight the crowd's opinion. If up-weighted, parietal and frontal ERPs such as P300 and LPP reflect the increased motivational significance of aligning with the group, and this is what ultimately drives preference shifts. For crowdfunding platforms, this implies that design choices which both make

social information highly visible and reduce individual confidence (for example, by highlighting project complexity or uncertainty) may substantially amplify herding.

6.6 Neuroforecasting and the Prediction of Market-Level Outcomes

The most provocative claim of the neuroscientific literature is that neural signals can forecast market-level outcomes more accurately than behavior alone. Genevsky and Knutson's microlending work already pointed in this direction: NAcc activity averaged across a small neuroimaging sample predicted which Kiva loans would be successfully funded by thousands of online lenders, and models including neural activity outperformed those including only choices or affect ratings.

Building on this, Genevsky et al. (2017) tested whether similar mechanisms apply to reward-based crowdfunding. Using fMRI, they recorded brain activity while participants evaluated Kickstarter projects and decided whether they would hypothetically fund them. NAcc activation in response to project cues predicted not only individual intentions but also real-world campaign success weeks later, again outperforming self-report and behavioral intention measures. The study showed that the same anticipatory affective signals that bias individual judgment also scale to collective outcomes, effectively allowing small samples of brains to forecast what large populations will do.

Tong et al. (2020) conceptually replicated the "brain beats behavior" result in attention markets: while ratings and sampled viewing captured part of the variance in aggregate video engagement, models including NAcc and anterior insula activity at video onset achieved superior forecasting performance and reduced information criteria metrics. These converging results suggest that neural data encode higher-dimensional, less noisy proxies of latent preferences than either self-reports or observed choices, which are constrained by limited opportunity sets and social desirability.

6.7 The Implications of Neuroforecasting in Crowdfunding Research

For crowdfunding research, neuroforecasting has two major implications.

First, it challenges purely observational models that attempt to infer preferences from revealed behavior alone. If the brain contains predictive information not expressed in immediate choices, then economists and marketers who rely exclusively on choice data risk systematically underestimating the importance of affective and social factors.

Second, it opens the possibility of using small-scale neuroimaging studies to test design variations (e.g., image framing, video style, reward structure) before launching full campaigns, leveraging

neural signals as an early indicator of market potential. This is not a realistic operational tool for everyday platforms yet, given costs and ethical concerns, but conceptually it reframes the mapping from micro-level neural processes to macro-level financial dynamics.

6.8 Generalizability of Neural Signals and the Limits of Behavioral Aggregation

Recent work by Genevsky et al. (2025) provides a crucial theoretical clarification for the neuroforecasting results reviewed above, directly addressing why neural measures often outperform behavior in predicting aggregate outcomes. Rather than attributing this advantage to superior measurement precision alone, the authors propose a decomposition of decision-making into components that differ in their degree of cross-individual generalizability.

Using a series of neuroforecasting tasks across domains, the study shows that early affective valuation signals, particularly those indexed by activity in reward-related regions such as the nucleus accumbens, exhibit a high degree of consistency across individuals. These signals reflect fast, stimulus-driven responses to anticipated value that are relatively insensitive to idiosyncratic preferences, strategic reasoning, or contextual reinterpretation. As a result, when neural activity is averaged across small samples, these early affective components retain predictive power at the population level.

In contrast, later-stage processes associated with deliberation, contextual integration, and explicit choice, often reflected in self-reports or overt behavioral decisions, incorporate individual-specific beliefs, norms, and constraints. While these processes are critical for explaining individual choice, they introduce noise when the goal is to forecast aggregate behavior. Behavioral aggregation therefore tends to overweight idiosyncratic variance, especially in small or unrepresentative samples, leading to systematic deterioration in predictive accuracy as representativeness decreases.

This distinction has direct implications for crowdfunding research. Many behavioral regularities observed in crowdfunding, such as herding, social proof, or identity-based support, may arise from heterogeneous underlying mechanisms. Some of these mechanisms, particularly those grounded in early affective valuation, scale reliably to market-level outcomes, while others remain individual- or context-specific. Neuroforecasting results suggest that neural measures selectively capture the former, offering a principled explanation for why “brain beats behavior” in predicting campaign success.

Importantly, this perspective reframes the role of neuroscience in crowdfunding. Neural data do not replace behavioral analysis, but constrain it by identifying which components of decision-making

generalize across individuals and therefore matter for collective dynamics. From this standpoint, neuroscience acts as a filter that separates surface-level behavioral correlates from the mechanistic drivers of market-level outcomes, strengthening the explanatory foundations of crowdfunding research rather than merely adding another layer of description.

6.9 Limitations of the Neuroscientific Pillar

Despite the explanatory appeal of these neuroscientific studies, several methodological and conceptual limitations constrain their direct application to crowdfunding.

A first, obvious limitation is ecological validity. Most fMRI and EEG tasks use simplified, static stimuli: single photographs, short text descriptions, or fixed group-rating displays stripped from the rich, dynamic context of real platforms. Real crowdfunding environments involve scrolling, search, recommendation algorithms, comments, stretch goals, updates and time pressure. These additional elements shape both attention and affect. Neural responses measured in stripped-down tasks may therefore capture only a subset of the processes relevant in the wild. The strong predictive performance of NAcc signals in microlending, Kickstarter and YouTube studies suggests some robustness to context, but it is not clear how these signals interact with platform-level features such as ranking algorithms or social network structures.

Second, sample sizes and compositions are often modest and homogeneous. The microlending fMRI sample included 28 subjects, while EEG studies on crowdfunding herding and confidence relied on around 25 participants, mostly university students. Cultural, socio-economic and age-related differences in emotional expression, trust and risk tolerance may significantly modulate neural responses to crowdfunding cues. Without cross-cultural and more diverse samples, it is hazardous to generalize specific ERP or fMRI markers to global crowdfunding markets.

Third, each neuroimaging modality captures only part of the underlying process. fMRI offers relatively high spatial but low temporal resolution. EEG/ERP provides millisecond temporal resolution but poor localization. fNIRS focuses on superficial cortical hemodynamics. None of these methods alone can fully map the cascade from perceptual processing to valuation to choice. Multi-modal designs that combine methods are rare in the literature. As a result, current models remain somewhat fragmented: anticipatory reward signaling, empathic integration and social conflict monitoring are typically studied in isolation rather than as components of a single unified neural computation.

A fourth limitation is the interpretability and ethical use of neuroforecasting. Demonstrating that NAcc activation forecasts campaign success or video engagement is raises questions about how such knowledge would be used in practice. Platforms or campaigners could, in principle, optimize imagery and narratives to maximize anticipatory reward responses, regardless of whether the underlying projects are socially valuable or financially sound. There is a moral risk of designing neuro-optimized campaigns that exploit emotional vulnerabilities rather than supporting informed investment. This is particularly problematic in equity or lending-based crowdfunding where backers bear real financial risk.

Finally, most studies treat neural responses as individual-level traits or state markers, without fully integrating them into broader models of market dynamics. For example, we still know little about how neural predictors interact with algorithmic recommendation systems, social network effects, and information cascades over time. The fact that early NAcc responses forecast aggregate outcomes suggests a strong initial-condition effect, but it does not clarify how subsequent learning, news or updates are encoded at a neural level before being fed back into the process.

Despite these limitations, the neuroscientific literature provides a coherent multi-level architecture that can be integrated with the behavioral and cognitive chapters of this review. At the deepest level, anticipatory affective circuits in the NAcc, anterior insula and MPFC generate fast, probabilistic valuations of projects or beneficiaries based on visual and textual cues. These signals are especially influential in crowdfunding because objective information is scarce and outcomes are delayed. At an intermediate level, cortical systems supporting empathy, perspective taking and executive control, particularly in the prefrontal cortex, refine these valuations in prosocial settings, as shown by fNIRS connectivity patterns predicting donation intention. Finally, social brain networks and conflict-monitoring systems process peer information, generate FRN and ERP cascades when personal and group opinions diverge, and modulate the motivational weight of social proof depending on confidence and context.

In combination, these findings support a simple but powerful interpretation: crowdfunding decisions are not random deviations from rational benchmarks, but expressions of an evolved neural architecture geared toward rapid affective evaluation, social learning and empathic engagement under uncertainty. Visual framing, early backer numbers, peer donations and identifiable beneficiaries are effective not because individuals are naïve, but because these cues align with deep biological mechanisms for allocating limited resources to uncertain opportunities involving others.

The next chapters can build on this architecture to propose an integrated framework that formally links behavioral biases, cognitive constraints and neural processes, providing concrete managerial implications for platform design, campaign strategy and investor education.

7 AN INTEGRATED BEHAVIORAL – COGNITIVE - NEUROSCIENTIFIC FRAMEWORK OF CROWDFUNDING DECISIONS

7.1 Rationale for an Integrated Framework

The crowdfunding literature has generated a vast number of empirical findings documenting systematic regularities in backers' behavior, including herding effects, local and identity-based biases, sensitivity to narrative and visual cues, and strong dependence on early momentum and social information. While these patterns are robust, their interpretation remains fragmented. Behavioral studies typically describe *what* happens, cognitive research partially explains *how* information is processed, and neuroscientific evidence identifies *why* certain cues exert disproportionate influence. However, these levels of analysis are rarely integrated into a unified explanatory model.

This fragmentation generates two critical limitations. First, identical behavioral outcomes (e.g., herding) may arise from fundamentally different underlying mechanisms, making it difficult to distinguish adaptive heuristics from maladaptive biases. Second, the absence of a causal architecture prevents the development of predictive and generalizable theories of crowdfunding decision-making. To address these limitations, this review proposes an integrated framework that formally links behavioral phenomena, cognitive constraints, and neural valuation mechanisms into a coherent, multi-level causal structure.

The framework rests on a central premise: crowdfunding decisions are not driven by isolated biases, but emerge from the interaction between attentional filtering, neural valuation, and socially embedded behavioral expression.

7.2 Core Architecture of the Framework

The proposed framework is organized into three analytically distinct but causally connected layers:

1. Cognitive–Attentional Layer (Gatekeeping Mechanism)
2. Neural Valuation Layer (Mechanistic Core)
3. Behavioral Outcome Layer (Observable Expression)

Crucially, these layers do not represent parallel explanations but instead form a directional causal sequence in which attentional selection precedes neural valuation, and neural valuation in turn gives rise to behavioral bias and observable choice. Each layer constrains and shapes the subsequent one.

7.2.1 The Cognitive - Attentional Layer: Attention as a Gatekeeper

The first stage of crowdfunding decision-making is governed by severe cognitive constraints. Digital crowdfunding platforms expose users to large volumes of multimodal information under conditions of limited time and attentional capacity. As a result, only a subset of available cues enters cognitive processing. This attentional bottleneck determines the signal set upon which all subsequent evaluation depends.

Empirical evidence from eye-tracking studies shows that backers do not process campaign information exhaustively. Instead, attention is selectively allocated to visually salient, emotionally charged, or schema-consistent elements such as images, videos, early funding indicators, founder characteristics, and simplified financial cues. Linguistic fluency and narrative coherence further reduce cognitive load by aligning with implicit expectancy structures, allowing information to be processed more efficiently.

At this stage, no valuation has yet occurred. Attention functions as a pre-valuation filter, determining which signals are available for integration. Information that fails to pass this attentional gate is functionally nonexistent for the decision-maker, regardless of its objective relevance. This explains why increasing informational disclosure does not necessarily improve decision quality and why campaign design, visual salience, and narrative structure exert such a strong influence on outcomes.

7.2.2 The Neural Valuation Layer: From Signals to Subjective Value

Once selected by attention, campaign cues are processed by distributed neural systems responsible for valuation, affect, risk assessment, and social cognition. This layer constitutes the mechanistic core of the framework.

Neuroeconomic evidence indicates that subjective value under uncertainty is computed through the interaction of several recurrent neural systems. Anticipatory reward signals, particularly in the nucleus accumbens, encode approach motivation and positive arousal in response to promising or emotionally engaging stimuli. In parallel, the anterior insula tracks uncertainty, anticipated loss, and affective arousal associated with risk. Medial prefrontal regions integrate affective and contextual information into a unified value signal, while temporoparietal networks support mentalizing, trust inference, and credibility assessment.

Importantly, neural valuation operates largely outside conscious awareness and precedes explicit choice. Neural responses to campaign cues have been shown to predict aggregate market outcomes

more accurately than self-reported preferences or observed choices within experimental samples. This indicates that neural signals capture latent valuation processes that are only partially expressed in behavior.

In social contexts, such as crowdfunding, valuation is further shaped by peer information. Electrophysiological evidence reveals a temporally structured process: early conflict detection signals (e.g., FRN) arise when personal evaluations diverge from social consensus, followed by evaluative integration signals (e.g., P300) that determine whether social information is incorporated into valuation. Sustained motivational engagement (e.g., LPP) reflects the emotional and social significance attributed to the information, modulated by individual confidence and contextual uncertainty.

Thus, neural valuation explains why certain cues (early backers, emotionally expressive images, credible endorsements) carry disproportionate weight: they directly engage evolved neural systems optimized for decision-making under uncertainty and social interdependence.

7.2.3 The Behavioral Outcome Layer: Biases as Emergent Expressions

The final layer of the framework consists of observable behavioral patterns traditionally labeled as 'biases'. Within this integrated perspective, biases are not treated as irrational deviations from normative benchmarks, but as emergent outcomes of constrained cognition and neural valuation.

Herding behavior, for example, can arise from rational Bayesian updating or from conformity driven by low confidence and heightened sensitivity to social signals. At the behavioral level, these mechanisms appear identical. At the neural level, however, they are distinguishable by the presence and magnitude of conflict-monitoring and motivational integration signals. Similarly, local bias reflects reduced perceived risk due to familiarity and trust cues, rather than simple geographic preference. The identifiable victim effect emerges from enhanced anticipatory reward and empathic engagement, not from heightened distress alone.

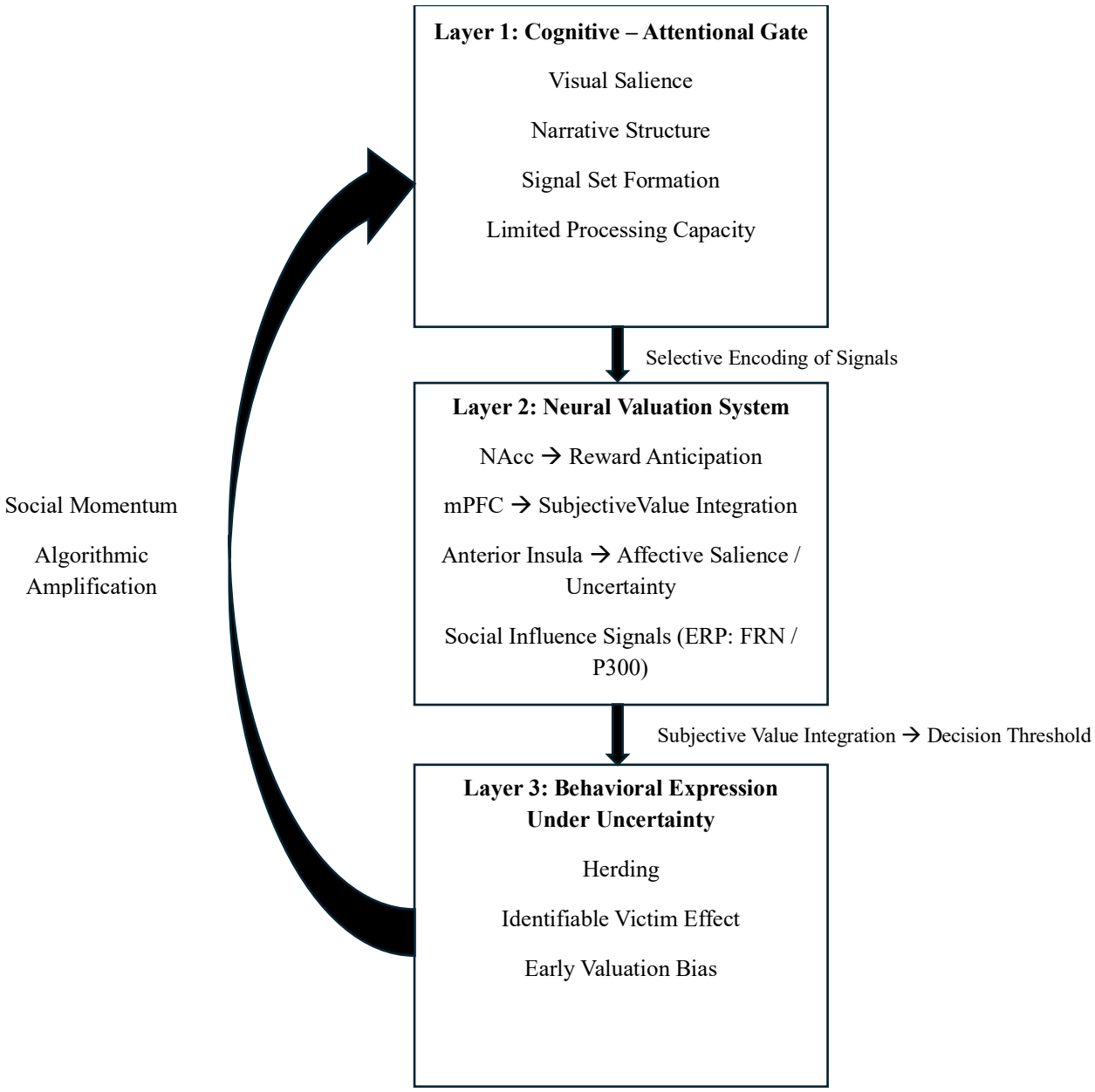
By grounding behavioral patterns in underlying mechanisms, the framework resolves inconsistencies in the literature. It explains why some biases improve decision efficiency under uncertainty (adaptive heuristics), while others systematically distort allocation (maladaptive biases). Behavioral outcomes are therefore understood as the surface-level manifestations of deeper cognitive and neural processes, rather than independent explanatory constructs.

7.3 Integrated Causal Architecture: Dynamic Scope, Functional Mapping and Limitations

Although the framework is directionally structured, it is not strictly linear. Behavioral outcomes generate feedback that reshapes attentional priorities and neural valuation over time. Early funding success increases visibility, alters attentional allocation for subsequent users, and amplifies reward-related neural responses. Platform algorithms further modulate these dynamics by curating exposure and emphasizing specific social signals. Over time, this creates self-reinforcing feedback loops that can lead to rapid success or failure independent of intrinsic project quality.

This dynamic perspective highlights crowdfunding as a complex adaptive system rather than a static decision environment.

Figure 1. A multi-level neuro-cognitive architecture of crowdfunding bias formation



While the figure provides the structural architecture, Table 3 offers a functional specification of how core behavioral domains map onto underlying valuation processes. Table 3 demonstrates a mechanistic reorganization of the literature rather than as a descriptive summary of prior studies. Its purpose is not to restate empirical findings, but to reorganize them according to the primary valuation mechanisms that generate observable behavioral patterns.

Each row of the table follows a precise logic.

Behavioral Domain identifies the surface-level regularity documented in the literature, such as herding, identifiable victim effect, and early funding engagement.

Primary Computational Mechanism specifies the core valuation process hypothesized to generate that behavioral expression. This column shifts the focus from *bias* to mechanisms, such as conflict detection, anticipatory reward computation, and subjective value integration. Basically, it addresses the following issue: what type of neural computation must occur for this behavior to emerge?

Key Brain Systems do not imply anatomical reductionism. They represent the principal neural circuits consistently associated with the identified computational mechanism across the reviewed neuroscientific literature. These systems operate as distributed networks rather than isolated regions.

Level of Evidence clarifies whether the mapping is supported by direct neuroscientific evidence in crowdfunding-like paradigms (e.g., fMRI, EEG, fNIRS, neuroforecasting) or whether it is based on insights from broader decision-making and social neuroscience research that elucidates valuation and prosocial mechanisms relevant to crowdfunding contexts.

Importantly, the table does not assume one-to-one correspondence between a behavioral bias and a single brain region. Instead, it proposes that multiple behavioral phenomena can be interpreted as modulations of a limited set of recurrent valuation computations.

For example, herding may emerge from early conflict detection (FRN) followed by social modulation of subjective value (P300, mPFC integration).

The identifiable victim effect reflects enhanced anticipatory reward signaling integrated within medial prefrontal valuation circuits.

Initial funding propensity is associated with fast go/no-go affective valuation signals, often indexed by nucleus accumbens activation.

Aggregate funding outcomes appear particularly sensitive to cross-individually generalizable reward anticipation signals, as demonstrated by neuroforecasting studies.

Thus, *Table 3* operationalizes the integrated framework by translating behavioral surface patterns into mechanistic valuation architecture. It provides a functional bridge between *Chapters 3, 4* and *6*, clarifying how heterogeneous findings can be interpreted within a unified causal structure.

Table 3. Functional Mapping of Core Crowdfunding Biases onto Neural Valuation Mechanisms

Behavioral Domain	**Primary Computational Mechanism**	**Key Brain Systems**	**Level of Evidence**
Herding and Social Conformity	Conlict detention followed by social modulation of subjective value	Feedback Related Negativity (ACC - Related signals) P300 Medial Prefrontal Cortex (mPFC) valuation systems	Direct electrophysiological evidence in crowdfunding-like tasks
Identifiable Victim Effect (Prosocial Lending)	Warm-glow anticipatory reward response integrated in valuation circuits	Nucleus Accumbens (Nacc) Medial Prefrontal Cortex (mPFC) Prefrontal Cortex (PFC) connectivity	Direct fMRI and fNIRS evidence in charitable crowdfunding contexts
Initial Project Engagement and Funding Propensity	Anticipatory affect and fast go/no-go valuation signals	Nucleus Accumbens (NAcc) Anterior Insula mPFC	Direct fMRI and fNIRS evidence from microlending and reward-based crowdfunding studies
Aggregate Funding Outcomes	Cross-individually generalizable reward anticipation signals	NAcc (primary) Valuation network	Direct neuroforecasting evidence (Kickstarter, Kiva, attention & simulated markets)

The framework is applicable across reward-based, donation-based, equity-based, and lending-based crowdfunding models, while allowing for variation in dominant mechanisms. Reward-based models emphasize anticipatory reward and identity expression. Donation-based models rely more heavily on empathic engagement and prosocial valuation. Equity and lending models involve stronger interaction between risk-processing, trust inference, and social information. Although the same core architecture applies, the relative weighting of specific neural and cognitive components differs by context.

Theoretically, the framework contributes in three fundamental ways. First, it provides a unifying causal structure that reconciles behavioral, cognitive, and neuroscientific findings. Second, it generates testable hypotheses suitable for multi-method research designs integrating behavioral experiments, eye-tracking, electrophysiology, and neuroimaging. Third, it reframes crowdfunding as a natural laboratory for studying decision-making under uncertainty, extending beyond financial markets to digital choice environments more broadly.

At the same time, important limits must be acknowledged. The proposed mapping does not reduce behavioral biases to localized neural substrates. Neural systems operate as distributed networks, and current evidence remains partial. While anticipatory reward signaling and medial prefrontal value

integration appear central across domains, many behavioral regularities have yet to be systematically examined using neuroimaging methods. Future research should aim to more precisely link additional biases to specific neural dynamics and to strengthen the causal architecture connecting individual neural computation to aggregate market outcomes.

By moving from isolated behavioral effects to mechanistic integration, the framework advances the field toward a more predictive, integrative, and biologically grounded science of crowdfunding behavior.

8 FUTURE RESEARCH DIRECTIONS

The interdisciplinary nature of crowdfunding has generated a rich yet fragmented body of research that spans behavioral economics, cognitive psychology, and neuroscience. Although each strand has contributed important insights, none has yet provided a unified model capable of explaining the complexity of real-world crowdfunding dynamics. What emerges clearly from this review is that existing studies operate within methodological and conceptual silos: behavioral work describes robust deviations from rationality, cognitive studies illuminate attentional and interpretative bottlenecks, and neuroscientific contributions reveal foundational mechanisms of affect, valuation and social influence. Still, these domains seldom communicate with one another. As a result, the field currently resembles a mosaic of partial explanations rather than a theoretically integrated science. Future research should focus not on expanding these silos independently, but on weaving them into a comprehensive framework that can capture the multilayered nature of decision-making under uncertainty on digital platforms.

8.1 Improve Ecological Validity

A first fundamental limitation that future research must address is the lack of ecological validity that characterizes much of the current evidence base. Most experimental studies isolate stimuli from their natural context: crowdfunding campaigns are reduced to screenshots, static images, or brief text fragments, which participants evaluate under laboratory constraints. Yet the actual experience of navigating platforms such as Kickstarter, Indiegogo or GoFundMe is dynamic, sequential, and mediated by complex user-interface architectures. Decisions unfold over time. Attention fluctuates with scrolling behavior. Recommendation algorithms shape stimulus exposure, and the visibility of early contributions alters the cognitive landscape in which subsequent decisions occur. Without incorporating these temporal, structural, and algorithmic features, laboratory findings risk misrepresenting how backers allocate attention, evaluate trust, experience affective resonance, and interpret social cues. Future research should therefore leverage partnerships with real platforms to collect high-resolution interaction data: clickstreams, hover times, scrolling trajectories, update engagement patterns, integrating them into cognitive and neuroscientific paradigms. Only through naturalistic stimuli and temporally evolving decision tasks will the field be able to capture the true complexity of digital choice environments.

8.2 The Need for Methodological Integration

A second critical avenue for future research concerns methodological integration. Eye-tracking, EEG, fNIRS, fMRI, text analytics, and behavioral modeling each illuminate different layers of the decision process, yet to date they have been deployed largely in isolation. Eye-tracking reveals how selective attention constructs the perceptual field within which valuation occurs, but it cannot uncover whether attended cues are encoded deeply or merely scanned. EEG captures millisecond-level temporal dynamics of conflict detection, salience, and conformity, but lacks the spatial resolution necessary to identify underlying affective and valuation networks. fMRI provides access to the temporal core reward and risk circuits that encode anticipatory affect, but its granularity is too coarse to map decision evolution in real time. Text analytics uncovers latent linguistic signals in campaign narratives, but only as proxies for cognitive processes, not direct measurements. Bringing these methods into dialogue is not a technical indulgence. It is a theoretical necessity. Crowdfunding is not governed by isolated mechanisms but by continuous interactions between selective attention, predictive processing, affective valuation, risk assessment, and social cognition. Multi-method designs, such as combining eye-tracking with EEG to map how gaze patterns translate into cognitive conflict or salience or merging fMRI valuation signatures with linguistic expectancy features extracted from campaign narratives, would allow researchers to reconstruct the full neural and cognitive pipeline from stimulus exposure to final behavioral choice. Without this methodological integration, the field will remain conceptually fragmented and empirically constrained.

8.3 Increase the Sample Size

A third limitation that future studies must overcome lies in the restricted diversity and small sample sizes that dominate current research, particularly in neural studies. Most of the neuroscientific crowdfunding work relies on modest participant numbers, usually fewer than thirty, often drawn from homogenous university populations. This poses both statistical and interpretative problems: neural responses related to empathy, trust, identity, risk tolerance, and social conformity can vary substantially across gender, age, cultural background, socioeconomic status, and prior financial experience. Donation-based decisions, for instance, are strongly shaped by culturally embedded norms around empathy and moral identity. Similarly, cognitive biases such as home bias or gender bias are sensitive to social context, yet the neural underpinnings of these effects remain untested across diverse populations. Future research should embrace larger, more heterogeneous samples, leveraging scalable neuroimaging techniques such as EEG or fNIRS to investigate whether the mechanisms identified in small-scale studies replicate across broader populations. Only then will it be possible to determine whether the neural predictors of campaign success, the electrophysiological

cascades of social conformity, or the attentional signatures of signal-set formation reflect universal cognitive architectures or culture-specific patterns of decision-making.

Beyond methodological concerns, a deeper conceptual gap persists in the literature: the absence of a unified theoretical model that links behavioral anomalies, cognitive constraints, and neural mechanisms into a coherent causal structure. Behavioral studies typically identify what appears to be irrational or biased behavior but do not account for its cognitive or biological origins. Cognitive studies reveal attentional bottlenecks and expectancy structures but remain silent on the neural architecture that generates them. Neuroscientific contributions identify affective and social circuits that shape valuation, yet they rarely account for how attention determines which cues enter these circuits, or how pre-existing cognitive schemas influence neural responses. The next stage of research must therefore move toward integrative causal models: Bayesian networks, hierarchical predictive coding frameworks, or structural equation models, that trace how campaign characteristics evoke attentional capture, how attentional filtering shapes neural valuation, how valuation triggers behavioral intentions, and how social information dynamically updates these processes. Such frameworks would allow scholars to distinguish systematically between adaptive heuristics, those that reflect efficient responses to uncertainty, and maladaptive biases, those that distort decision quality without informational benefit. Without such conceptual integration, contradictions will persist: for example, is herding a rational Bayesian response to social information or an expression of low-confidence conformity? Does identifiable victim imagery operate primarily through emotional arousal or through increased perspective taking? Does home bias reflect informational familiarity or neural risk-aversion signals? An integrative model is required to reconcile these competing interpretations.

8.4 Consider the Temporal Dimension of Decision-Making

Future research should also devote greater attention to the temporal dimension of decision-making. Crowdfunding unfolds not as a single act but as a longitudinal sequence. Backers return to campaigns multiple times, absorb evolving social cues, interact with updates, monitor funding progress, and revise expectations as deadlines approach. Yet almost all empirical studies examine decisions in isolated snapshots, ignoring learning, belief updating, and dynamic reevaluation. Cognitive psychology and computational neuroscience offer a rich toolkit: reinforcement learning models, drift-diffusion frameworks, dynamic Bayesian inference. These ones could be deployed to understand how campaign trajectories shape neural responses and behavioral outcomes over time. Mapping the neurocognitive evolution of decisions across repeated exposures would reveal not only how initial impressions form, but how they stabilize, weaken, or reverse as new information becomes available.

Such temporal modeling would be especially valuable in explaining phenomena like late-stage funding surges, plateau phases, or sudden collapses in support, and in identifying early neural markers of campaigns that will later go viral.

8.5 Investigate the Impact of Algorithms

Another frontier for future research is the role of algorithmic mediation in shaping cognitive and neural responses. Modern crowdfunding platforms do not present campaigns neutrally: they curate content through personalized recommendation algorithms, trending badges, geographic filters, and social signals. These algorithmic architectures are not passive environments but active inputs into the decision-making process. They determine which campaigns users are exposed to, how early momentum is displayed, how similarity cues are constructed, and which narratives gain visibility. Yet the psychological and neural consequences of such algorithmic structures remain almost entirely unexamined. Understanding whether algorithmic recommendations amplify herding, alter anticipatory affect, reduce cognitive strain, or shift perceived credibility would provide critical insights into the emerging interaction between artificial intelligence systems and human neurocognitive mechanisms. Research in this domain holds both scientific and ethical relevance, especially as platforms move toward increasingly personalized and potentially manipulative interface designs.

8.6 Optimizing for Social Welfare

Finally, the predictive potential of neuroforecasting represents both a promising and delicate research frontier. Studies demonstrating that neural responses can forecast aggregate campaign success more accurately than behavior raise profound methodological opportunities and equally profound ethical challenges. If neural markers, particularly anticipatory reward responses, are reliable predictors of future market-level outcomes, they could be used to pre-test campaign videos, optimize narrative structures, or inform platform recommendation algorithms. Yet such applications risk privileging campaigns that most effectively trigger biologically grounded affective responses, rather than those that are socially valuable, innovative, or trustworthy. Future research should therefore pair predictive investigations with normative inquiry, asking not merely what can be forecasted but what ought to be optimized. The relationship between neural effectiveness and ethical responsibility must be examined systematically. As crowdfunding increasingly intersects with AI-driven design tools capable of tailoring narratives, imagery, and interfaces to human biological predispositions, the need for transparent and ethically aligned scientific frameworks will only become more pressing.

In summary, the next decade of crowdfunding research must shift from isolated mechanisms to integrated systems, from laboratory stimuli to naturalistic environments, from homogeneous convenience samples to diverse populations, and from static decision snapshots to dynamic, temporally sensitive models. By embracing methodological plurality, theoretical synthesis, and ethical reflexivity, future research can illuminate the full depth of human decision-making in digital financial ecosystems, offering insights that are simultaneously scientifically robust, practically relevant, and socially responsible.

9 MANAGERIAL IMPLICATIONS

Crowdfunding operates at the intersection of finance, psychology, cognition and neurobiology. As demonstrated throughout this review, backers do not behave as rational agents maximizing expected value. Instead, they process campaigns through limited attention, heuristic interpretation, emotional valuation, social influence, empathic resonance, and fast affective neural signals. Managerial implications must therefore be grounded in the actual mechanisms that drive funding outcomes, not in idealized assumptions about investor rationality. In this sense, effective campaign and platform strategies must acknowledge that success depends on aligning presentation, timing, and interactions with the behavioral patterns, cognitive constraints and neural systems described in earlier chapters. This section translates these insights into actionable implications for practitioners, organizing them by type of crowdfunding: reward-based, donation-based, equity-based, and lending-based, as each model leverages distinct motivations and therefore interacts differently with attentional, affective, and social processes. The objective is not merely to offer suggestions, but to map each recommendation onto a clearly identified mechanism in the integrated framework developed in this thesis, showing how campaign outcomes can be improved by designing for human cognition and biology rather than against them.

9.1 Reward-Based Crowdfunding: Designing for Attention, Emotion and Early Momentum

Reward-based crowdfunding is the archetypal environment where narratives, perceptual salience and anticipated emotional value dominate decision-making. Unlike equity or lending models, where financial return is part of the backer's calculus, reward-based backers typically seek identification, novelty, enjoyment or a sense of participation in a creative project. As Mollick (2014) and Deng et al. (2022) note, success in this domain is driven less by informational precision than by perceptual and emotional resonance. The implications for campaign managers are therefore deeply shaped by the cognitive and neural mechanisms described earlier.

The first and most fundamental implication concerns the primacy of attention as a gatekeeper. As shown in the cognitive chapter, campaigns compete in an attentional market where users scroll rapidly through dozens of projects. Visual salience determines which cues enter working memory and which are ignored. Videos, in particular, act as high-bandwidth attention anchors, integrating visual, auditory, facial and narrative information into a multimodal stimulus that engages both perceptual and affective processing systems. The empirical literature (including Tong et al., 2020) demonstrates that early milliseconds of video exposure engage anticipatory reward circuitry and forecast downstream engagement. Campaign managers should therefore treat the project video not as an

optional enhancement but as the central stimulus through which valuation begins. Static images lack the temporal dynamics required to recruit reward-related neural responses that predict attention and pledge intention.

Narrative clarity is equally essential. As Costello and Lee (2022) show, linguistic fluency creates expectancy alignment, reducing cognitive strain and increasing perceived credibility. This means that campaign descriptions must be written with syntactic simplicity, logical sequencing and emotionally engaging framing. The goal is not to overwhelm the backer with exhaustive detail but to create a cognitively coherent storyline that anticipates and satisfies implicit rhetorical expectations. Campaigns that violate these expectations (through vagueness, excessive technicality, or incoherent structure) impose greater cognitive load and increase skepticism.

Reward-based campaigns must also acknowledge the deep role of identity and homophily. Findings by Greenberg and Mollick (2017) indicate that backers often support founders whose identity characteristics they share or admire. This implies that founders belonging to underrepresented groups may benefit from foregrounding elements of their personal journey, resilience or community significance, activating what the behavioral literature describes as activist choice homophily. Such identity-based cues are not manipulative; they are interpretable signals that increase narrative authenticity and activate empathic and normative evaluation systems.

A further implication emerges from neural evidence that anticipatory affect predicts aggregate funding outcomes. Genevsky and Knutson's neuroforecasting studies show that NAcc activation in response to project cues predicts campaign success better than self-reported preferences. For campaign managers, this suggests that project imagery, video introductions and reward descriptions must be crafted to evoke positive anticipatory arousal: excitement, curiosity, delight, rather than neutral or ambiguous affect. Emotional hooks early in the video or description matter disproportionately because they shape the fast, affect-laden valuation signal that precedes conscious evaluation.

Platforms also play a crucial role in shaping success. Recommendation systems can be redesigned to reflect behavioral and cognitive principles. For example, platforms may highlight campaigns with strong early momentum, not merely as a social signal but because early funding acts as a heuristic that reduces uncertainty and increases perceived viability. Similarly, platforms can leverage geographic home bias, by showing users projects from their region. This would not act as a distortion but as a facilitator of trust in high-uncertainty contexts. Transparency about such algorithms remains

important to preserve fairness, but platform architecture should acknowledge the psychological realities documented in this thesis.

A final reward-based implication concerns the ethical dimension of optimization. If platforms adopt machine-learning models that suggest revisions to campaign text, visuals or structure based on behavioral science, akin to a "Grammarly for crowdfunding", they must ensure that these tools do not privilege certain narratives or identities in ways that distort equal access. Ethical design requires that algorithmic nudges be transparent, optional, and aimed at raising minimum quality standards rather than giving unfair advantages.

9.2 Donation-Based Crowdfunding: Leveraging Empathy, Identifiability and Cognitive Integration

Donation-based crowdfunding differs from reward-based models because backers receive no material benefit. Their decision is grounded in prosocial motivation, empathic resonance, moral identity and perspective taking. The behavioral and neuroscientific literature makes clear that emotional and empathic mechanisms dominate valuation in this domain, and that cognitive empathy plays a distinct role in determining donation amounts. Managerial implications must therefore align closely with these mechanisms.

The first key implication concerns the identifiable victim effect. Neural evidence from Genevsky et al. (2013) shows that identifiable beneficiaries, represented through vivid, emotionally expressive photographs, recruit NAcc activation and increase donation likelihood. Importantly, it is not negative affect or guilt that predicts giving, but positive anticipatory arousal associated with warm-glow altruism. This means that campaigns should avoid abstract, statistical or highly generalized descriptions of suffering. Instead, they should foreground specific individuals or groups, using imagery that conveys dignity, humanity and emotional immediacy.

Yet donation magnitude depends not only on affect but also on cognitive empathy, as demonstrated by Guo et al. (2025). Cognitive empathy involves perspective taking, mental simulation and contextual understanding, supported by prefrontal networks. This implies that after capturing attention and emotional resonance through imagery, campaign managers must provide structured, clear and concrete information about how donations will be used, what impact they will produce, and why the beneficiary's situation requires intervention. This dual-stage model: emotional capture followed by cognitive elaboration, mirrors the two-stage neural model of altruistic giving described in the neuroscientific literature. Campaigns that rely exclusively on emotion without cognitive depth

struggle to sustain engagement, while those that emphasize logistics without emotional appeal fail to activate giving intention.

The third implication concerns attention shifts and novelty. According to Tusche et al. (2016) effective charitable appeals activate regions associated with attentional reorientation and social cognition, such as the TPJ and posterior superior temporal sulcus. Campaign managers should therefore incorporate elements that induce mild novelty, prompting attentional re-engagement, such as unexpected narrative twists, compelling contrasts, or specific details that differentiate the beneficiary's story. These elements should not be sensationalistic but should generate cognitive friction sufficient to sustain engagement and promote deeper perspective taking.

Platforms also have ethical responsibilities in this domain. Because donation-based crowdfunding deals with vulnerable individuals, platforms must verify the legitimacy of campaigns and the accuracy of beneficiary representations. Ethical oversight reduces the risk of fraudulent or exploitative appeals that manipulate empathic responses without delivering actual help. Platforms may also experiment with interface designs that facilitate reflective giving rather than impulsive responses, nudging users toward informed and responsible generosity.

The final implication is the importance of multimodal coherence. Emotional imagery, narrative framing and structural information must align to avoid cognitive dissonance. Inconsistent cues, such as overly dramatic images paired with sterile descriptions, reduce trust and disrupt the integration of affective and cognitive processing. Donation-based campaigns therefore require unusually high standards of coherence between emotion, narrative and factual exposition.

9.3 Equity-Based Crowdfunding: Mitigating Information Asymmetry, Managing Risk Signals and Structuring Social Information

Equity crowdfunding is the domain closest to traditional finance, yet behavioral and cognitive mechanisms remain deeply influential. Backers face severe information asymmetry, uncertain future returns, and limited ability to evaluate underlying fundamentals. As a result, attention, signaling, heuristic reasoning and social influence shape investment decisions more than classical models predict.

The first managerial implication concerns signal visibility. As demonstrated by Butticè et al. (2022), equity investors rarely process all available information. Instead, they construct selective signal sets based on prior knowledge, human capital and attentional constraints. Campaign managers must therefore ensure that diagnostic signals: team competence, prior achievements, financial projections,

traction metrics are made visually salient and placed early in the campaign page. Long, dense blocks of text often go unread. Key information must be extracted into visually distinct modules that facilitate rapid encoding.

A second implication emerges from research on local bias (Hornuf et al., 2022). Local investors often display stronger willingness to invest, not because of superior information but because geographic proximity reduces perceived risk. Campaign managers may thus benefit from explicitly communicating local partnerships, community involvement or regional endorsements to amplify familiarity signals. Platforms can also ethically leverage geographic sorting features to increase campaign visibility among investors predisposed to perceive lower contextual uncertainty.

A third implication concerns anchor investors and social proof. As shown by Sendra-Pons et al. (2024), the presence of early, high-credibility backers reduces information asymmetry and increases subsequent investment. Campaign managers should strategically sequence their campaign launch to secure early commitments from reputable investors: angel networks, sector experts, or well-known entrepreneurs, before exposing the campaign to the broader public. These early endorsements function as cognitive shortcuts that reduce perceived due diligence burden, especially for inexperienced investors.

Neuroscientific evidence adds another layer. ERP studies by Wang et al. (2019) and Zheng et al. (2021) show that social information triggers conflict-monitoring signals and later evaluative processing, with conformity depending on confidence. Campaign managers should therefore provide cues that bolster investor confidence in their own judgment: clear metrics, transparent financials, coherent business models, because confident investors are less susceptible to irrational herding and more likely to make stable, higher-value commitments. Conversely, platforms must balance the visibility of social information so that it supports informed decision-making rather than promoting speculative cascades.

Finally, equity campaigns must account for beauty contest dynamics. As shown by Trzebiński & Kołodziejczyk (2025), investors often forecast not intrinsic value but the beliefs of other investors. Campaigns should therefore cultivate predictable signals of professionalism, timeliness, and responsiveness, because consistency reduces second-order uncertainty and shapes expectations about future investor perceptions.

9.4 Lending-Based Crowdfunding: Designing for Trust, Reliability and Predictive Transparency

Lending-based crowdfunding shares features with equity models but places even greater emphasis on trust, perceived risk and anticipated repayment. Genevsky and Knutson's (2015) microlending studies show that positive affective cues predict aggregate loan success better than explicit ratings or self-reported judgments. This implies that trust formation in lending contexts is shaped by fast, affective responses to borrower cues, not solely by risk-based evaluation.

Campaign managers (or borrowers) must therefore pay close attention to visual and narrative signals of reliability. Photographs that convey warmth, stability and authenticity activate anticipatory affect that increases willingness to lend. Borrowers should avoid overly formal or impersonal imagery, which may signal distance or risk. Narratives must balance emotional resonance with concrete commitments, such a repayment plans, collateral and use of funds to allow both affective and cognitive systems to converge on a coherent valuation.

Platforms should emphasize transparent and interpretable creditworthiness indicators. While algorithmic scoring is common, scores must be communicated in ways that reduce cognitive ambiguity. As the cognitive literature shows, ambiguous information increases reliance on affective heuristics and may distort allocation. Clear, intuitive metrics, such as debt-to-income ratios, repayment histories and verified employment support cognitive integration and mitigate excessive responsiveness to superficial cues.

Social proof should be shown with caution in lending contexts. Excessive visibility of others' investments may amplify herding dynamics that do not reflect underlying borrower quality. Platforms may instead highlight signals of platform reliability, like historical repayment rates, default statistics and successful case studies to shift focus from peer imitation to structural trustworthiness.

The last implication concerns ethical responsibility. Because lending-based crowdfunding involves material financial risk, platforms must avoid emotionally manipulative designs that exploit fast affective neural responses. The objective should be to create environments that support both affective engagement and informed, cognitively grounded evaluation.

9.5 Synthesis

Across all four crowdfunding types, managerial implications converge on a common insight: campaigns and platforms must design for the actual human mind and brain, not for an idealized rational agent. Attention is limited. Affective valuation is fast and predictive. Social information shapes preferences through conflict monitoring and evaluative integration. Cognitive empathy, linguistic fluency and identity cues all play critical roles. Effective management requires

acknowledging this complexity and deploying it ethically, transparently and strategically. These implications directly stem from the integrated behavioral–cognitive–neural framework established in this thesis and demonstrate how interdisciplinary insights can be operationalized to improve real-world crowdfunding outcomes.

10 CONCLUSION

The primary objective of this review was to critically assess how crowdfunding research has conceptualized backer decision-making and to evaluate whether existing approaches adequately explain the mechanisms underlying observable funding outcomes. Across behavioral, cognitive, and neuroscientific domains, the literature has generated a substantial body of empirical findings documenting systematic regularities in backer behavior. However, these findings have largely evolved in parallel rather than within a unified explanatory structure. The central contribution of this review lies in addressing this fragmentation by proposing an integrated neuro-cognitive-behavioral framework that connects observable market dynamics to underlying attentional and valuation mechanisms.

With respect to RQ1, the review demonstrates that behavioral research has been highly effective in identifying robust patterns such as herding, social conformity, early momentum effects, and the identifiable victim effect. These studies convincingly show that crowdfunding decisions are shaped by social information, heuristics, and affective cues rather than purely rational evaluation of project fundamentals. Nevertheless, behavioral approaches predominantly operate at the level of outcomes. They describe what occurs but often remain underspecified regarding the mechanisms through which specific cues exert influence. Similar behavioral patterns may arise from distinct underlying processes (reward anticipation, uncertainty reduction, or social learning) yet are frequently treated as homogeneous effects. As a result, explanatory precision is limited.

Cognitive perspectives partially address this limitation by emphasizing attentional bottlenecks and selective information processing. In digitally mediated environments characterized by high stimulus density, backers cannot process all available information. Instead, visual salience, narrative coherence, and socially amplified signals compete for limited cognitive resources. This attentional gate shapes which signals are encoded and subsequently evaluated. While this perspective advances mechanistic clarity by identifying processing constraints, it does not fully specify how encoded signals are transformed into subjective value computations that ultimately guide economic choice. The transition from attention to valuation remains theoretically implicit in much of the cognitive literature.

Neuroscientific and neuroeconomic research further deepens the explanatory architecture by investigating the neural systems involved in reward anticipation, uncertainty processing, and value integration. Evidence suggests that anticipatory reward signals, medial prefrontal valuation processes, and affective salience mechanisms contribute to decision-making under risk and

ambiguity. In selected domains relevant to crowdfunding, particularly prosocial giving and social conformity, direct neuroimaging and electrophysiological evidence demonstrates that social information modulates valuation systems rather than merely influencing beliefs at a descriptive level. However, neuroscientific contributions remain relatively sparse within crowdfunding-specific contexts and are often conducted in controlled experimental paradigms detached from real platform dynamics. Moreover, they are rarely integrated with attentional and behavioral layers into a coherent causal model. Taken in isolation, each perspective, behavioral, cognitive, and neuroscientific, captures a necessary but incomplete dimension of backer decision-making.

Addressing RQ2, this review reconceptualizes key findings through a three-layer integrated architecture linking cognitive - attentional gating, neural valuation systems, and behavioral expression under uncertainty. At the first layer, crowdfunding is framed as an attentional marketplace in which exposure does not equate to processing. Visual prominence, narrative design, and socially amplified cues determine which projects pass through attentional filters under limited processing capacity. Importantly, early funding success and algorithmic amplification reshape attentional allocation over time, creating feedback loops that influence subsequent decision contexts.

At the second layer, selectively encoded signals feed into neural valuation systems responsible for computing subjective value. Here, reward anticipation, medial prefrontal integration, and affective uncertainty processing converge to generate decision-relevant value signals. Within this architecture, social cues do not merely provide informational input; they modulate the computation of value itself. This perspective reframes behavioral biases not as arbitrary deviations from rationality, but as emergent properties of structured valuation mechanisms operating under uncertainty and social influence. The neuroscientific layer thus adds mechanistic depth by specifying how social and affective signals interact with reward-based valuation systems.

At the third layer, behavioral expressions such as herding, early valuation bias, and the identifiable victim effect are interpreted as surface-level manifestations of underlying valuation dynamics. In certain domains, partial correspondences between behavioral patterns and neural systems can be identified. For example, the identifiable victim effect aligns with evidence of anticipatory reward activity and medial prefrontal connectivity within prosocial valuation circuits. However, the framework does not assume one-to-one mappings between specific biases and discrete brain regions. Neural processes operate within distributed and interacting networks, and similar

behavioral outcomes may emerge from overlapping computational mechanisms. The goal of the framework is therefore not reductive localization, but functional integration.

In addressing RQ3, the adoption of an integrated neuro-cognitive-behavioral framework carries significant theoretical, methodological, and practical implications. Theoretically, it provides causal coherence by linking observable crowdfunding outcomes to identifiable attentional and valuation processes. It shifts the interpretation of many crowdfunding biases from static anomalies to dynamic expressions of valuation under social and informational constraints. Furthermore, by incorporating feedback loops between behavioral outcomes and attentional allocation, the model positions crowdfunding as a complex adaptive system rather than a static decision environment.

Methodologically, the framework encourages research designs that combine behavioral platform data with experimental manipulations capable of distinguishing attentional effects from valuation effects. It also supports the use of neurophysiological measures in ecologically valid paradigms to test whether anticipatory reward signals predict aggregate funding trajectories beyond self-report measures. Rather than pursuing simplistic brain-bias mappings, future research can investigate how distributed valuation networks interact with socially amplified signals in real-world contexts.

From a managerial perspective, the framework suggests that effective campaign design must align across attentional capture, valuation enhancement, and behavioral threshold activation. Visual salience and early momentum influence attentional entry. Narrative structure and affective cues shape valuation. Social proof and timing mechanisms lower decision thresholds. The integration of these layers highlights that campaign success depends not on isolated cues, but on coherent alignment between attention, affect, and value computation.

Ultimately, the added value of incorporating neuroscience into crowdfunding research lies not in providing deterministic brain localization, but in strengthening the causal architecture connecting individual - level valuation processes to aggregate market outcomes. By integrating behavioral regularities, cognitive constraints, and neural valuation mechanisms within a unified framework, this work advances crowdfunding research beyond descriptive taxonomies of bias toward a mechanistically informed understanding of decision-making in digitally mediated financial environments. In doing so, it positions crowdfunding as a fertile domain for interdisciplinary inquiry at the intersection of finance, psychology, and neuroscience, and provides a structured foundation for future research seeking to bridge micro-level neural computation and macro-level market dynamics.

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