Bus Inf Syst Eng
https://doi.org/10.1007/s12599-024-00854-x

RESEARCH PAPER

Hedonic Signals in Crowdfunding

A Comparison Across Crowdfunding Platform Types

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Received: 9 July 2020 / Accepted: 10 January 2024

Abstract This study draws on signaling theory to investigate the effect of hedonic signals in crowdfunding projects on funding performance. It compares the effect of hedonic signals across reward-, equity-, and donation-based crowdfunding platforms by combining archival data from 18 platforms and a large-scale panel of 64 experts that rate the strength of hedonic signals in 108 crowdfunding projects. Through the application of mixed linear modeling, the findings indicate a positive influence of stronger hedonic signals on funding performance. However, there are substantial differences across platform types. Increasing the strength of hedonic signals by one standard deviation increases funding performance by 28.9% on reward platforms, while there are no systematic effects on equity and donation platforms. This study contributes to existing crowdfunding research by clarifying the role of hedonic signals in crowdfunding and shedding light on the increasing need to better consider the characteristics of different crowdfunding platforms in crowdfunding research.

Accepted after four revisions by Stefan Stieglitz.

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Keywords Crowdfunding · Crowdfunding platforms · Signaling theory · Hedonic value · Comparison

1 Introduction

Crowdfunding is a source of alternative funding for individuals and startups that pursue cultural, social, or entrepreneurial projects. Instead of drawing on friends and family, bank loans, or venture capital, project initiators can raise capital through a public open call to activate potential capital givers from a crowd of Internet users via digital platforms (Agrawal et al. 2015; Mollick 2014).

Researchers have intensively investigated factors that drive funding decisions of capital givers and their underlying dynamics. A large part of this research follows signaling theory (Spence 1973; Connelly et al. 2011). Different traits of crowdfunding projects are considered as being cues with which project initiators can signal the value of their project to potential capital givers to receive funding. Research addresses signals that relate to the human (e.g., Davis et al. 2017; Vismara 2016; Vulkan et al. 2016), social (e.g., Courtney et al. 2017; Pati and Garud 2021; Kunz et al. 2017), and intellectual capital (e.g., Ahlers et al. 2015; Piva and Rossi-Lamastra 2018) of project initiators, or other project characteristics such as returns (e.g., Bürger and Kleinert 2021; Vulkan et al. 2016). The general argument is that such cues signal high project quality; that is, they may help convince potential capital givers to invest money.

However, there are many crowdfunding projects whose successful funding cannot be fully explained by the underlying assumption of rational capital givers processing such signals (Ren et al. 2021; Chan and Parhankangas 2016). For example, *Zack Danger Brown* collected more

Published online: 12 February 2024

than USD 55,000 from around 6,900 capital givers with a project about making potato salad on Kickstarter (Kickstarter 2016b). To understand such phenomena, research has started to address the subjective (e.g., Ren et al. 2021; Wang et al. 2021), emotional (e.g., Xiang et al. 2019; Wu et al. 2022), and hedonic side of crowdfunding (e.g., Zhao and Vinig 2017; Schulz et al. 2015; Zheng et al. 2017). For instance, researchers investigate the linguistic style of project descriptions to understand how positive and negative emotional language influences funding performance. In so doing, various studies investigate the project descriptions' sentiment (e.g., Jiang et al. 2020; Tafesse 2021; Chen et al. 2023) or related concepts such as positive psychology language (Anglin et al. 2018a). A second stream investigates the narratives and stories that capital givers construct (e.g., Herzenstein et al. 2011; Steigenberger and Wilhelm 2018; Palmieri et al. 2022; Jancenelle et al. 2018; Di Pietro et al. 2023). For instance, Li et al. (2017) show that signaling entrepreneurial passion is contagious and drives funding by increasing perceived enthusiasm of capital givers. Finally, research relates crowdfunding to non-verbal cues such as the visual appeal of projects (Scheaf et al. 2018; Kaminski and Hopp 2020) or the voice, beauty, and smile of capital givers (Hu and Ma 2021; Li et al. 2021; Allison et al. 2022). While these studies help understand the emotional side of crowdfunding, we still lack comprehensive insight into how hedonic signals shape funding performance. Hedonic value in crowdfunding goes beyond emotional arousal or specific narratives of project initiators and is a broader concept that also comprises of facets such as joy, excitement, or the imagination to participate in something "cool" (Zheng et al. 2017; Bitterl and Schreier 2018; Waterman 1993; van der Heijden 2004). In this regard, some researchers have related hedonic value also to the notion of sensation-seeking (Demir et al. 2021; Zhao and Vinig 2017).

Following signaling theory, research suggests that the effectiveness of hedonic signals depends on various boundary conditions. For instance, relating to project initiators as senders of hedonic signals for specific projects, Chen et al. (2016) and Xiang et al. (2019) investigate whether hedonic signals are more important for hedonic or utilitarian projects. Similarly, Allison et al. (2017) and Xiang et al. (2019) research whether hedonic signals are of varying effectiveness for different capital givers as receivers of those signals. Extending this argumentation, research distinguishes various types of crowdfunding platforms, e.g., reward, donation, and equity platforms (Hoegen et al. 2018; Bradford 2012). Initial studies show that employing positive language (Short and Anglin 2019) and signals in general can yield diverging effects across different platforms types (Dushnitsky and Fitza 2018). Thus, we do not know whether the effect of hedonic signals varies across platform types. Answering this question is important for two reasons: (1) From a theoretical perspective, crowdfunding platforms reflect the signaling environment in which hedonic signals are sent and received and we do not understand in detail how the characteristics of those environments influence signaling effectiveness (Steigenberger and Wilhelm 2018; Cumming et al. 2020; Connelly et al. 2011; Park and Patel 2015). (2) From an empirical perspective, existing studies have mainly focused on researching single reward-based crowdfunding platforms and Kickstarter in particular (Hoegen et al. 2018; Deng et al. 2022). Thus, existing research might suffer from a selection bias and lacks systematic comparisons across different types of crowdfunding platforms to understand the extent to which results are generalizable (Zhou et al. 2018; Zheng et al. 2014; Dushnitsky and Fitza 2018; Gleasure and Feller 2016; Huang et al. 2022; Short and Anglin 2019).

In this paper, we compare the strength of hedonic signals across reward, equity, and reward platforms. We apply a large-scale panel of 64 experts that rated the strength of hedonic signals in 108 crowdfunding projects from 18 different platforms. Overall, we found that the strength of hedonic signals is positively associated with the funding performance of crowdfunding projects; however, there are differences across platform types. Increasing the strength of hedonic signals by one standard deviation increases funding performance by 28.9% on reward platforms, while we find a negligible effect on equity and donation platforms. To the best of our knowledge, we are the first who systematically compare the effects of hedonic signals across these three different types of platforms. Our results clarify the role of hedonic signals in crowdfunding and underscore the neglected role of crowdfunding platforms as a boundary condition in the funding process in existing crowdfunding research.

The paper continues as follows: We develop the conceptual and theorical background in part 2. We develop hypotheses in part 3, followed by the methodology of our analysis in part 4. Subsequently, we present our results in part 5. Finally, part 6 includes the discussion of our results and their implications.

2 Theoretical Background

2.1 Crowdfunding

Crowdfunding is a collaborative funding approach that enables project initiators to access funding from a large number of individual capital givers through an open call on the Internet (Mollick 2014). Crowdfunding has three stakeholders: Project initiators, who seek funding for a

project; capital givers, who are willing to invest into a project; and crowdfunding platforms, serving as an infrastructure for posting and investing in crowdfunding projects (Belleflamme et al. 2014).

Crowdfunding research frequently differentiates between donation, reward, equity, and lending platforms (Hoegen et al. 2018; Bradford 2012). Donation platforms offer no material or financial rewards for capital givers that support the "social good" (e.g., Jian and Usher 2014; Sepehri et al. 2021; Gleasure and Feller 2016). By contrast, capital givers receive non-financial rewards on reward platforms that offer some sort of product pre-selling (Mollick 2014; Agrawal et al. 2015). On equity platforms, capital givers receive equity or equity-like arrangements, e.g., profit-sharing (e.g., Ahlers et al. 2015; Block et al. 2018; Vismara 2016). Lending platforms are used to loan money that is repaid with interest (Herzenstein et al. 2011; Lin et al. 2013). Lending platforms have many peculiarities, e.g., an automated assessment of credit default risk (Guo et al. 2016). Many platforms systematically cooperate with institutional investors such as banks or asset management firms that fund entire projects according to their investment strategy in an automated fashion (Milne and Parboteeah 2016). Studies indicate that 85% of consumer credits on US-based and 50% on European lending platforms are funded by such institutional investors (Milne and Parboteeah 2016; Ziegler and Shneor 2020). Because these differences contradict the goals of our study, we focus on reward, donation, and equity platforms.

2.2 Signaling Theory

Signaling theory explains situations where information asymmetries between parties exist by analyzing the signals sent by the different parties (Spence 1973). Spence (1973) defines such signals as activities of individuals that change the beliefs of other individuals in the market. The building blocks of signaling theory comprise of the signaler, the signal, the receiver, and the signaling environment. The signaler is an information insider who possesses an information advantage regarding a product when being compared with a receiver, i.e., an information outsider that does not possess the same information (Block et al. 2018; Connelly et al. 2011). Signals are sent to reduce information asymmetries regarding the quality of a product or the signaler's motivation and behaviors (Block et al. 2018; Connelly et al. 2011). The goal is to convince the receiver to perform a certain action, e.g., making an investment. Signals may have different characteristics such as their effectiveness, i.e., the degree to which signals may help overcome information asymmetries and fulfill the signaler's intentions (Block et al. 2018; Connelly et al. 2011).

The signaling process is set in a signaling environment that influences the signals' effectiveness. For instance, environmental distortion may invoke noise that undermines the signals' effectiveness and/or signals could be interpreted differently within specific environments (Park and Patel 2015). Despite the richness of research on signaling theory, there is little research on the signaling environment as such. Various researchers call for studies that address how certain environments are impacting the signaling process or its effectiveness (Park and Patel 2015; Connelly et al. 2011).

2.3 Hedonic Signals in Crowdfunding

The decision-making of individuals is driven by a wide range of utilitarian and hedonic values. Utilitarian value can be described as mission-critical, rational, decision-effective, and goal-oriented (Zhao and Vinig 2017; Holbrook and Hirschman 1982). Utilitarian values relate to a product's functional performance (Babin et al. 1994). By contrast, hedonic values refer to the emotional, intangible, and pleasure-related facets of such experiences (Holbrook and Hirschman 1982). Following a consumption perspective (Chan and Parhankangas 2016; Zhao and Vinig 2017), hedonic signals in crowdfunding may relate to the fun, feelings, and fantasies that it invokes (Allen and McGoun 2001; Waterman 1993; Elms 1966; Holbrook and Hirschman 1982). Fun reflects perceptions of *entertainment*, i.e., the enjoyment, pleasure, or excitement that can be derived from a certain activity, such as funding a project (Waterman 1993; van der Heijden 2004). Similarly, feelings relate to *arousal* that can be described as the strength of emotions created by such activities, i.e., the degree to which a project is emotionally activating (Holbrook and Hirschman 1982). Finally, fantasies shape the *imagination* of using a funded product (Elms 1966). Thus, we conceptualize the strength of hedonic signals as the extent to which project descriptions signal entertainment, arousal, and imagination.

Signaling theory distinguishes between different signals such as pointing or activating signals (Connelly et al. 2011). Pointing signals indicate a characteristic that separates the signaler from its competitors, while activating signals activate these properties at the side of the receiver (Connelly et al. 2011; Steigenberger and Wilhelm 2018). Similar ideas have been formulated in crowdfunding where researchers distinguish between utilitarian vs. hedonic (Schulz et al. 2015; Chen et al. 2016), informational/rational vs. emotional (Xiang et al. 2019; Majumdar and Bose 2018; Wu et al. 2022; Steigenberger and Wilhelm 2018), or objective vs. subjective signals (Wang et al. 2021).

Crowdfunding research has extensively focused on utilitarian signals to understand funding performance (e.g., Ahlers et al. 2015; Vismara 2016; Courtney et al. 2017; Kunz et al. 2017; Scheaf et al. 2018; Block et al. 2018; Jancenelle et al. 2018). For instance, research addresses signaling characteristics of project initiators, e.g., their human (e.g., Davis et al. 2017; Vismara 2016; Vulkan et al. 2016), social (e.g., Courtney et al. 2017; Pati and Garud 2021; Kunz et al. 2017), or intellectual capital (e.g., Ahlers et al. 2015; Piva and Rossi-Lamastra 2018). Similarly, research investigates signals that are related to rewards or other project characteristics (e.g., Allison et al. 2017; Di Pietro et al. 2023; Pati and Garud 2021; Vulkan et al. 2016; Bürger and Kleinert 2021).

Research also starts to focus on hedonic signals. One research stream investigates the linguistic style of project descriptions, e.g., the effects of positive (Allison et al. 2017; Jancenelle et al. 2018; Anglin et al. 2018a; Tafesse 2021; Ren et al. 2021; Defazio et al. 2021; Kim et al. 2016; Kuo et al. 2022) and negative language (Majumdar and Bose 2018; Chen et al. 2016; Rossolini et al. 2021; Kim et al. 2016; Kuo et al. 2022), as well as related aspects such as psychological distancing (Parhankangas and Renko 2017; Sepehri et al. 2021), humanizing (Larrimore et al. 2011), or interaction (Parhankangas and Renko 2017). A second stream touches on the narratives and stories that project initiators construct in their project descriptions and pitch videos. For instance, researchers address entrepreneurial passion (Davis et al. 2017; Li et al. 2017; Oo et al. 2019), user entrepreneurship (Oo et al. 2019), personal dreams (Allison et al. 2017), or the creation of group identities (Allison et al. 2017; Palmieri et al. 2022; Mitra and Gilbert 2014). A final stream of research is concerned with media usage and related cues. Although researchers acknowledge the potential of media for eliciting emotions and hedonic value (e.g., Allison et al. 2017; Courtney et al. 2017; Mollick 2014), there is only little research that investigates the qualities of such signals. In terms of visual cues, researchers investigate the effects of the signals' complexity (Mahmood et al. 2019), quality (Scheaf et al. 2018), and appeal (Kaminski and Hopp 2020) or focus on non-verbal cues such as the beauty and smile of project initiators (Hu and Ma 2021; Li et al. 2021). Similarly, Allison et al. (2022) show that voice features related to positive emotions increase funding performance.

Existing research on hedonic signals frequently applies approaches of text-mining to textual project descriptions or video transcripts. Frequently, researchers employ sentiment analyses (e.g., Tafesse 2021; Ren et al. 2021; Moradi and Dass 2019; Kim et al. 2016; Jiang et al. 2020; Chen et al. 2023) or other dictionary-based text-mining approaches that relate to concepts such as positive narrative tone (Allison et al. 2017) or positive psychological capital (Anglin et al. 2018a).[1] While they focus on the emotional appeal of projects, they may lack important aspects of hedonic value such as enjoyment and imagination (Babin et al. 1994; Elms 1966). Furthermore, researchers employ simplistic and holistic operationalizations of hedonic value, that is, binary dummies (Xiang et al. 2019; Chen et al. 2016; Kuo et al. 2022; Rossolini et al. 2021). While these studies advance our understanding of hedonic signals in crowdfunding, they have produced parsimonious and conflicting results. For instance, some researchers found that positive emotional signals have a positive effect on funding performance (Chen et al. 2016; Kuo et al. 2022; Allison et al. 2017; Peng et al. 2022; Davis et al. 2017; Jiang et al. 2020), while other researchers found that there is no direct effect (Tafesse 2021; Ren et al. 2021; Moradi and Dass 2019; Kim et al. 2016; Rossolini et al. 2021; Parhankangas and Renko 2017; Chen et al. 2023) or even that funding performance is positively influenced by negative emotional signals (Moradi and Dass 2019; Kim et al. 2016; Chen et al. 2016). Hence, research might benefit from a broader conceptualization and more rigorous measurement of hedonic signals to better understand their true nature.

2.4 Crowdfunding Platforms as Signaling Environment

The signaling environment in crowdfunding is determined by the platform (Steigenberger and Wilhelm 2018; Cumming et al. 2020). Although little research has been conducted on the level of crowdfunding platforms, research indicates that platforms differ substantially (Hoegen et al. 2018; Deng et al. 2022; Dushnitsky and Fitza 2018; Cumming et al. 2020; Haas et al. 2014). They may have a specific goal and purpose (Haas et al. 2014; Xiang et al. 2019) such that project initiators may self-select to find the "best spot" for their projects (Dushnitsky and Fitza 2018). Platforms may attract specific communities of capital givers that may share distinct values (Josefy et al. 2017). Also, platforms employ different rules, services, and funding mechanisms that may alter the dynamics of the funding process (Giudici et al. 2018; Ralcheva and Roosenboom 2020; Zhou et al. 2018; Cumming et al. 2020).

Conflicting results regarding the value of hedonic signals might also be explained by different boundary conditions. In regard to the signaler, researchers have investigated whether hedonic signals are more important for specific project types including hedonic (Xiang et al. 2019; Chen et al. 2016), social (Xiang et al. 2019;

[1] In these approaches, a text is compared against a dictionary which contains keywords associated with certain concepts (e.g., positive emotion words) to determine how strongly a text is associated with those concepts.

Parhankangas and Renko 2017), ecological (Rossolini et al. 2021), or intangible products (Tafesse 2021). Similarly, Anglin et al. (2018a) investigate how the project initiators' social and human capital influences the effects of positive psychological language. When looking to receivers, research has shown that the effectiveness of hedonic signals differs across capital givers (Xiang et al. 2019; Allison et al. 2017). In regard to signals as such, research has investigated the interaction of hedonic signals with other signal types, e.g., informational signals (Steigenberger and Wilhelm 2018). However, there is limited research that investigates crowdfunding platforms as signaling environment and how such environments as a contingency may affect the effectiveness of hedonic signals (Demir et al. 2021). For instance, Cumming et al. (2020) compare the two mechanism of Keep-it-All and All-or-Nothing.[2] They argue that All-or-Nothing-platforms are high-risk environments because a critical mass of capital givers must be reached such that project initiators have a stronger tendency to send signals that reduce the uncertainty for capital givers. Consequently, the effectiveness of signals might differ across platform types (Short and Anglin 2019). Hence, the scarcity of research on the signaling environment in signaling research is echoed by the crowdfunding community – we lack an understanding of how different types of platforms affect the effectiveness of (hedonic) signals.

There is also an empirical perspective that emphasizes the need for more research on crowdfunding platforms. Current reviews of the crowdfunding literature indicate that single platform studies are the de facto standard (Hoegen et al. 2018; Deng et al. 2022). Deng et al. (2022) identify 94 empirical papers that investigate determinants of successful funding in crowdfunding projects: 79 papers focus on reward platforms with Kickstarter being researched 53 times; only seven papers investigate multiple platforms. Thus, crowdfunding research shares the implicit assumption that results at the project level, i.e., determinants of funding performance, are generalizable across platforms (Dushnitsky and Fitza 2018; Alveson and Sandberg 2011) and existing studies might suffer from a selection bias.

Existing studies researching multiple platforms follow three different avenues. First, authors pool data from multiple platforms of one platform type to increase sample size and robustness of their results (Josefy et al. 2017; Giudici et al. 2018; Ralcheva and Roosenboom 2020; Block et al. 2018; Huang et al. 2022). Second, authors compare the effects of project characteristics on funding performance across different platform types (Anglin et al. 2018a; Dushnitsky and Fitza 2018; Bengtson 2019; Short and Anglin 2019). Finally, authors have investigated the services of platforms as financial intermediaries (e.g., Rossi and Vismara 2018; Haas et al. 2014). In sum, this research suggests that the generalizability of results cannot be taken for granted and that we must account for differences at two levels: (1) differences across platform types (e.g., reward vs. donation platforms) as well as (2) within platform types (e.g., diverging platform characteristics of reward platforms). Thus, various researchers call for comparing multiple platforms and platform types to advance our understanding of crowdfunding (Zhou et al. 2018; Zheng et al. 2014; Dushnitsky and Fitza 2018; Gleasure and Feller 2016; Huang et al. 2022; Short and Anglin 2019; Anglin et al. 2018a).

3 Hypotheses Development

3.1 Main Effect: The Effect of Hedonic Signal Strength on Funding Performance

Communication research suggests that project descriptions can be framed in a specific way to elicit a response from receivers (Entman 1993; Wang et al. 2020). Project initiators can actively create a "message strategy" to stimulate a favorable reaction towards a project and persuade potential capital givers to make a financial contribution (Xiang et al. 2019). In so doing, project initiators can employ a specific message frame to send a specific set of signals, i.e., hedonic signals (Chen et al. 2016; Anglin et al. 2018a).

For receivers, the processing of such signals reflects a cognitive process in which emotion and affect frequently precede an extensive evaluation and judgement (Kahneman and Frederick 2002; Drover et al. 2018). Processing hedonic signals in project descriptions involves an appraisal process in which resulting hedonic experiences will be naturally associated with the object that has invoked these experiences (Smith and Ellsworth 1985; Wang et al. 2020), i.e., the project for which the signal has been sent. Thus, hedonic signals that convey senses of entertainment, arousal, and imagination might favor the creation of such positive experiences for receivers (Anglin et al. 2018a). For instance, Li et al. (2017) demonstrate that strong hedonic signals such as entrepreneurial passion lead to increased perceptions of enthusiasm among capital givers that drives financial participation and information sharing behavior in social media. Thus, hedonic signals might be seen as an indication of product quality that may steer capital givers towards making an investment (Wang et al. 2020; Anglin et al. 2018a).

[2] Platforms with All-or-Nothing only pay out the collected funds to the project initiator if the funding goal was reached. Platforms featuring Keep-it-All pay out any collected amount.

Crowdfunding platforms reflect a high noise environment in which a variety of signalers send a multitude of signals to convince potential capital givers (Steigenberger and Wilhelm 2018; Anglin et al. 2018a). Given the limitations of the human mind, the cognitive resources that can be invested for processing signals is limited such that attention – the allocation of cognitive processing capacity to particular information – becomes a central filter for the interpretation and effectiveness of signals (Connelly et al. 2011; Drover et al. 2018). Research suggests that attention can either be allocated in a conscious, goal-driven approach or in a stimulus-driven, subconscious, and automatic fashion (Drover et al. 2018; Kahneman and Frederick 2002). Individuals have been shown to react more strongly on emotionally laden stimuli than on neutral ones because they activate the subconscious and automatic allocation of attention (Drover et al. 2018; Cacioppo et al. 1999; Steigenberger and Wilhelm 2018; Xiang et al. 2019). Thus, emotional stimuli can be powerful triggers of attention (Steigenberger and Wilhelm 2018; Cacioppo et al. 1999). Hedonic signals invoking positive emotional responses might help projects to stand out on platforms and attract the attention of capital givers (Steigenberger and Wilhelm 2018). Thus, hedonic signals might not only lead to more favorable perceptions of crowdfunding projects, but also steer the attention of capital givers towards them. We assume:

H1 *The strength of hedonic signals in crowdfunding projects is positively associated with their funding performance.*

3.2 Interaction Effects: Strength of Hedonic Signals Across Platform Types

Connelly et al. (2011) argue that the effectiveness of signals is directly related to the personal traits of the signaler. They consider the discrepancy of a signal (i.e., the broadcasted information) with the signaler (i.e., the signaler's unobservable quality) as an instance of ineffective signaling. They introduce *signal fit*, that is, the degree to which a signal corresponds to the sought after quality, e.g., the quality of a crowdfunding project (Nitani et al. 2019). Inconsistent signals of low fit are perceived as being ambiguous such that their usefulness is mentally discounted by the receiver. Hence, they are less effective in reducing information asymmetries and their ability to change the receivers' behaviors. Park and Patel (2015) extend these ideas to the signaling environment and argue that signals can be ambiguous in certain environments, that is, signal fit may not only reflect a function of the signal and the signaler but must also account for the environment in which the signal is sent.

Signal fit has also been applied to the crowdfunding domain. In the context of equity platforms, various authors argue that capital givers as rational investors put emphasis on high-fit signals and that sending fitting signals increases the chance of successful funding (Nitani et al. 2019; Di Pietro et al. 2023; Piva and Rossi-Lamastra 2018). For instance, Piva and Rossi-Lamastra (2018) show that different educational signals have varying fit, e.g., a business education of project initiators better fits the goal of running a successful startup than other types of education. Thus, project initiators with business education are more successful in attracting funds than their peers with other educational backgrounds. Similarly, Di Pietro et al. (2023) show that signals relating to past achievements of startups are better fitting to the expectations of the capital givers than signals relating to the startups' future plans because they are more effective in reducing information asymmetries. However, for radical innovations projects, these relations change. Signaling past achievements has low fit because these signals may not translate into the future – as opposed to future plan signals that exhibit high fit for these projects.

Signal fit suggests that the effectiveness of hedonic signals might be dependent on the environment in which they are sent, i.e., their effectiveness may vary across platform types. For instance, capital givers on equity platforms are usually described as being rational investors that invest higher amounts into single projects (Di Pietro et al. 2023; Block et al. 2018; Vulkan et al. 2016), while capital givers on reward platforms are frequently characterized as consumers (Chan and Parhankangas 2016) and/or members of specific creative communities (Josefy et al. 2017). Equity platforms host projects that offer financial gains that are of utilitarian nature, while the large majority of projects on reward platforms is of hedonic nature that frequently offer intangible, artistic, or experiential rewards (Chen et al. 2016). Given that successful crowdfunding projects require carefully crafted project presentations that meet the expectations and values of the target community of capital givers (Kunz et al. 2017; Josefy et al. 2017), it can be assumed that the effect of hedonic signals is stronger on reward platforms than on equity platforms because hedonic signals pronounce hedonic experiences of consumption- and pleasure-oriented capital givers (Chan and Parhankangas 2016; Zhao and Vinig 2017). In contrast, on equity platforms, rational capital givers might steer their attention pro-actively towards "hard facts" and other utilitarian signals that are evaluated in a process of conscious thought. Thus, we hypothesize:

H2a *The effect of hedonic signals' strength in crowdfunding projects on funding performance is weaker on equity platforms than on reward platforms.*

Similar arguments can be made when comparing the effects of hedonic signals between donation and reward platforms. On donation platforms, many projects are posted by project initiators that want to address ecological and societal challenges or that are personally affected by diseases, natural disasters, or other fates (Langley et al. 2020; Majumdar and Bose 2018; Snyder et al. 2016; Chen et al. 2023; Wu et al. 2022). Thus, capital givers' donation behavior alternates between purely altruistic and warm glow motivation, that is, donating for improving one's self-esteem (Gleasure and Feller 2016). While projects on reward platforms are frequently gearing towards entertaining and enjoyable experiences, donation projects may be frequently invoked by negative causes that quickly touch on normative and ethical questions (Snyder et al. 2016; Jancenelle et al. 2018). Although there might be exceptions, extensive hedonic signaling on donation platforms might reflect sending incongruent signals that might result in low fit. Consequently, we assume that the effect of hedonic signals on funding performance is less positive on donation platforms than on reward platforms where hedonic signals better support the expectations of more consumption-oriented capital givers. Thus, we assume:

H2b *The effect of hedonic signals' strength in crowdfunding projects on funding performance is weaker on donation platforms than on reward platforms.*

4 Methodology

To avoid common method variance, we combine archival data for 108 crowdfunding projects from 18 different platforms as well as an extensive expert evaluation of the strength of hedonic signals.

4.1 Data Collection

4.1.1 Archival Data: Crowdfunding Platforms

We collected data on 108 projects from 18 different crowdfunding platforms (for a project overview see Table A1 in Appendix 1, available online via http://link.springer.com). We consider this data set as appropriate because it allows us to investigate the effect of hedonic signals on funding performance across a considerably large number of projects while also accounting for the heterogeneity of crowdfunding platforms. To compare across different platform types, we included six reward, donation, and equity platforms that existing research has considered as being "typical" for their platform type, had an English or German website, and showed active business operations at the time of data collection. Table 1 gives an overview of the platforms.

In so doing, we considered all platforms as being archetypes, i.e., we assumed that each platform can be clearly mapped to one of these three platform types.[3] To create a balanced sample, we chose three successful and three unsuccessful projects from each platform. For each of the three successful and unsuccessful projects, we have applied a stratified sampling strategy in which the sampled projects that we esteemed as being typical for these platforms. (1) We sampled one successful and one unsuccessful "featured" project. Such featured projects are usually hand-picked by the platforms such that "featuring" can be seen as a strong quality signal (Mollick 2014; Anglin et al. 2018b). In the case of successful projects, these projects were taken from platform categories such as "successfully funded," "most popular," or "trending." For unsuccessful projects, we looked for similarly featured projects that had comparable visibility on the platforms. In case the platforms did not possess such categories, we sampled projects from the homepage. (2) We sampled a "most recent" project pair, i.e., projects that have shortly completed their funding phase according to the communicated project end on the platform. The reason for this choice was that we intended to include a series of very timely projects because evaluating hedonic signals may be biased by a selection that features too many older projects. (3) We sampled a project pair that we esteemed as being typical successful and unsuccessful projects at the platforms.

4.1.2 Expert Evaluation: Consensual Assessment Technique

The Consensual Assessment Technique (CAT; Amabile 1996) has been applied to evaluate the quality and creativity of images (Amabile 1996), videos (Clements et al. 2018), early stage business models (Ebel et al. 2016), or innovation ideas (Piller and Walcher 2006). Because measuring the strength of hedonic signals in crowdfunding projects has challenges that are similar to assessing creative products, i.e., their subjective nature (Holbrook and Hirschman 1982), we considered it as valid for our study. The CAT assumes that the most objective measure of subjective concepts is a consensus of subject-matter experts (Amabile 1996). The experts must assess quality independent of each other with defined criteria such that

[3] For instance, the platform FundedByMe featured multiple project types including equity-, donation-, and reward-based components. Because the platform was widely recognized as being an equity platform, we only sampled pure "equity projects" from the platform. In case of similar potential ambiguities, we added sampling details to Table 1.

Table 1 Investigated crowdfunding platforms

Type	Platform	Description	Exemplary sources
Donation Platforms	Betterplace (Germany)	Individuals can pledge time to support social and charitable projects	Langley et al. (2020)
	Dreambank (USA)	Individuals can support other individuals via fundraising campaigns	Bouaiss and Maque (2015)
	Fundly (USA)	Individuals can donate to online fundraising campaigns	Gonzales et al. (2016), Sepehri et al. (2021)
	Fundrazr (USA)	Supporting local projects or causes of friends and family	Dushnitsky and Fitza (2018), Snyder et al. (2016)
	GlobalGiving (USA)	Platform that allows non-profit organization to post their social projects	Ozcelik (2008), Bradford (2012)
	Socialfunders (Germany)	Individuals donate small amounts of money	Heieck et al. (2018)
Equity Platforms	Appbackr (USA)	Marketplace on which capital givers can invest in apps	Kim and Viswanathan (2019)
	AppsFunder (Belgium)	Platform on which capital givers can invest in apps in a revenue-sharing model	Ahlers et al. (2015)
	Crowdcube (UK)	Platform on which startups can raise equity capital (Only equity-based projects have been selected)	Ahlers et al. (2015), Ralcheva and Roosenboom (2020)
	Econeers (Germany)	Platform allowing investments in renewable energy and other green projects (Projects based on interests and royalties were sampled)	Dorfleitner and Braun (2019), Candelise (2016)
	FundedbyMe (Sweden)	Platform on which project initiators can choose different crowdfunding models for funding their entrepreneurial ventures (Only equity-based projects have been selected)	Mohammadi and Shafi (2018), Dubois and Gromek (2018)
	Seedmatch (Germany)	Platform on which startups can raise equity capital	Block et al. (2018), Dorfleitner et al. (2018)
Reward Platforms	Crowdfunder (UK)	Individuals can support projects from various categories for a reward	Kromidha (2015)
	Indiegogo (USA)	Individuals pledge money for a project and for which they receive a reward, product, or service	Li et al. (2017), Cumming et al. (2020)
	Kickstarter (USA)	Individuals pledge money for a project and for which they receive a reward, product, or service	Li et al. (2017), Mollick (2014)
	Rockethub (USA)	Individuals get rewards in exchange for financial contributions to a project	Strohmaier et al. (2019), Castelluccio (2012)
	Startnext (Germany)	Platform focusing on pre-selling products and projects from the arts and creative industries	Crosetto and Regner (2018), Bürger and Kleinert (2021)
	Vision Bakery (Germany)	Individuals can participate in projects of various categories for a reward	Strohmaier et al. (2019), Kraus et al. (2016)

they can leverage their domain expertise without any external influence. Expert consensus can be determined by calculating intra-class correlations (ICC) between the assessments (ICC > 0.7).

Experts independently rated the strength of hedonic signals in the project descriptions. As project descriptions might be exhaustive, including text, images, and videos, we aimed at keeping the cognitive load for each judge low. Following Ebel et al. (2016), experts judged six projects (three funded projects and three non-funded ones from six different platforms). We created an online evaluation platform that entailed each project and the evaluation criteria. For creating realistic project representations, we downloaded each project website and created image-based representations from which we removed all funding-related information. Further, the evaluation platform randomized

the order of each project for each judge. Videos were integrated such that they could be watched. All judges rated the projects on rating scales from one (lowest) to five (highest). We employed 64 experts from three panels. The first panel consisted of scientists with a track record in the domain of crowdfunding. The second panel included capital givers that had participated in at least one project. The third panel comprised project initiators that had started at least one project. We wanted to achieve a balanced view on hedonic signals because different experts may come up with distinct evaluations (Boudreau et al. 2015). Given this procedure, each project has been evaluated by at least one judge from each panel such that we have obtained a total of 384 independent expert evaluations.

4.2 Variables

Funding Performance. We consider the funding ratio, i.e., the final amount collected divided by the funding goal as our dependent variable. This measure is an ideal fit for our purpose because it allows a standardized comparison of projects with heterogenous funding needs in relation to their funding goals. It is agnostic regarding a platform's funding mechanisms and generalizes well to different platform types (Anglin et al. 2018b; Scheaf et al. 2018). Further, it differentiates between projects that largely exceed their funding goal or that just meet it (Anglin et al. 2018b). Finally, the funding ratio is frequently applied as a measure of funding performance such that it can be easily compared to existing research (Zheng et al. 2014; Deng et al. 2022; Chen et al. 2016; Scheaf et al. 2018; Steigenberger and Wilhelm 2018; Giudici et al. 2018). However, we recognize that the funding ratio is highly skewed and affected by a series of outliers. For instance, we sampled the *Pebble* project that collected more than USD 10 m while its funding goal was USD 100,000 (Kickstarter 2016a). Although such extreme success cases do not represent the normality in crowdfunding, they reflect an "empirical reality" (Rousseeuw and van Zomeren 1990; Liao and Brooks 2016) and are constantly reproduced by the scalable nature of the funding process on crowdfunding platforms. To deal with such outliers, we applied a log-transformation (ln(funding ratio + 1)) (Herzenstein et al. 2011; Scheaf et al. 2018).

Strength of Hedonic Signals. We measure the strength of hedonic signals using the item's arousal, excitement, and imagination with three items each within the CAT. The items are adapted to the context of crowdfunding based on previous scales that measured hedonic consumption and are displayed in Table A2 in Online Appendix 2 (Elms 1966; Holbrook and Batra 1987; Waterman 1993; Holbrook and Hirschman 1982; Schulz et al. 2015).

Platform Type Dummies. To indicate the three platform types, we create two dummy variables for which reward platforms serve as a reference group. We have one dummy *donation platform* that compares donation to reward platforms as well as a comparable dummy for *equity platforms*.

Funding Goal. We include the funding goal in USD, i.e., the requested amount of funding by project initiators. It may influence the funding performance and represents a strong signal about the project initiators' ambitions (e.g., Burtch et al. 2013; Mollick 2014; Ahlers et al. 2015).

Funding Duration. We include funding duration in days because projects that are quickly funded are associated with higher user engagement (Jancenelle et al. 2018; Galak et al. 2011; Ahlers et al. 2015). We infer the time between the project launch and the point of time it was either fully funded or finished non-successfully. Projects without a defined end are censored at 365 days (Ahlers et al. 2015).

Video. We include a dummy variable that indicates whether a project description features videos because they might be important for sending hedonic signals (e.g., Li et al. 2017; Davis et al. 2017; Chan and Parhankangas 2016; Scheaf et al. 2018; Pati and Garud 2021).

Sentiment. The strength of hedonic signals could be influenced by the project descriptions' sentiment (e.g., Parhankangas and Renko 2017; Herzenstein et al. 2011; Ren et al. 2021). Thus, we perform a sentiment analysis using Bidirectional Encoder Representations from Transformers (BERT; Devlin et al. 2018). BERT is a deep neural network for natural language processing that frequently outperforms alternative models in many tasks such as sentiment analysis (Gao et al. 2019). We use a pre-trained BERT model[4] that we have chosen because it reflects a multilingual sentiment classification model such that we can apply it to all English and German project descriptions. Further, the model was finetuned on product reviews that are conceptually close to project descriptions in crowdfunding. The model classifies text into five categories reflecting one to five stars.

Readability. We score the readability of the project descriptions calculating the Flesch Reading Ease for English and German because the overall comprehensibility of the project description might influence the effects of hedonic signals, for instance, hedonic signals could be more important for highly complex projects whose descriptions are hard to understand (Block et al. 2018; Steigenberger and Wilhelm 2018). The Flesch Reading Ease is a standardized measure of how easy a text is to read, i.e., high values indicate lower levels of required reading skills for comprehending a text (Hartley 2016).

[4] We used the transformers library for python (Wolf et al. 2020) that provides the "bert-base-multilingual-uncased-sentiment" model that we used for our analyses.

Project Dummies. We include a dummy variable that indicates whether a project reflects a *tangible product* because hedonic signals have been shown to be more important for such projects (Tafesse 2021). Further, we include a dummy *cultural project* indicating whether a project is of artistic or cultural natures because such projects have a hedonic character (Josefy et al. 2017).

5 Results

We first establish the validity and reliability of our hedonic signal measure and then test our hypotheses. All analyses are performed at the level of the expert evaluations to make full use of the data.[5]

5.1 Construct Validation

We first check the ICCs of our hedonic signal scores that have an average of 0.90, indicating good agreement (see Table A2 in Online Appendix 2 for item-specific ICCs). Further, we apply exploratory and confirmatory factor analysis to explore the structure of our hedonic signal measure and establish construct validity. We identify three clearly distinguishable factors for arousal, entertainment, and imagination, but we find these factors to be considerably correlated. Thus, we evaluate three different measurement model specifications: (1) an overarching single factor, (2) a second-order model in which the three first-orders factors jointly form the factor hedonic signal strength at a second level, (3) and a "bifactor model" that assumes that all items of all three factors are forming a general hedonic signal factor that accounts for the common variance among these items and that the items also load on specific group factors, such as arousal, that model additional common variance among the items forming these constructs that is not shared by the general factor (Reise 2012). We compare our models using common metrics applied in confirmatory factor analysis (e.g., Average Variance Explained, Composite Reliabilities) as well as global fit measures (e.g., Root-Mean-Square-Error of Approximation). In sum, these measures suggest that our data is best represented by modelling hedonic signal strength as a bifactor model. We refer to Online Appendix 2 for all details.

[5] We used R for our main analyses using the packages lavaan (Rosseel 2012), lme4 (Bates et al. 2015), and ImerTest (Kuznetsova et al. 2017).

5.2 Hypothesis Testing

Descriptive statistics and correlations are shown in Table 2. Our data is of hierarchical nature, i.e., we have data of 108 crowdfunding projects that belong to 18 distinct platforms. Thus, the comparison of the effect of hedonic signals on funding performance across different platform types may be biased by effects at the platform level. To account for such unobserved heterogeneity, we employ linear mixed models that can deal with such data structures by modeling such sources of grouped variance as random effects (Bates et al. 2015). Although there are also other approaches to model platform-level effects, e.g., fixed effect specifications that model platform effects as a series of dummy variables, random effects models have a conceptual advantage. While platform fixed effects would allow us to control for the effects of the specific platforms chosen for our study, a random effects model assumes that the platform effects are a random variable that is sampled from a larger population of platforms (Clark and Linzer 2015). Because our goal is to understand the effect of hedonic signals on different platform types, and there are many platforms beyond our sample, modelling random effects on the platform level allows for a better generalizability of our results. We estimated the following equation:

$$
\begin{aligned}
&Funding\ Performance_{ij} = \\
&\beta_0 + \beta_1 Hedonic\ Signals_{ij} + \beta_2 Donation\ Platform_j \\
&\quad + \beta_3 Reward\ Platform_j + \beta_4 Hedonic\ Signals_{ij} \\
&\quad \times Equity\ Platform_j + \beta_5 Hedonic\ Signals_{ij} \\
&\quad \times Donation\ Platform_j + Controls_{ij} + b_j + r_{ij}; \\
&b_j \sim Normal(0, \tau).
\end{aligned}
$$

$Funding\ Performance_{ij}$ Is the value of our dependent variable for the i^{th} project from the j^{th} crowdfunding platform. Similarly, $Hedonic\ Signals_{ij}$ refers to the corresponding values for the strength of hedonic signals. $Equity\ Platform_j$ and $Donation\ Platform_j$ refer to the two dummy variables that represent the three different platform types. The interaction terms $Hedonic\ Signals_{ij}$ *x* $Equity\ Platform_j$ and $Hedonic\ Signals_{ij}$ *x* $Donation\ Platform_j$ investigate the effect of hedonic signals across different platform types. $Controls_{ij}$ refers to a vector of variables including videos, tangible product, cultural project, funding goal and duration, readability, and sentiment that all refer to project level i and platform level j. The regression coefficients β and the residuals r_{ij} follow a linear regression model, while b_j refers to random intercepts that are estimated for the different platforms j and that share a normal distribution with a mean of 0 and a standard deviation of τ. We used z-standardized factors and variables for all measures (except

dummies and funding performance). Table 3 shows our results.

Model 1 includes only our controls. These results are in line with existing research showing that videos (e.g., Mollick 2014; Anglin et al. 2018a) and tangible products increase funding performance (Tafesse 2021), while higher funding goals are negatively associated with funding performance (e.g., Anglin et al. 2018a; Short and Anglin 2019). Further, we find readability to be negatively associated with funding performance indicating that high linguistic abilities of project initiators are positively associated with funding performance (e.g., Zhou et al. 2018; Parhankangas and Renko 2017), although the effect is only significant with $p \leq 0.1$. Also, the finding that cultural projects are associated with lower funding performance seems plausible (Bürger and Kleinert 2021). We find no significant effects for sentiment and funding duration.

In Model 2, we add the main effect of the hedonic signal strength and the platform type dummies. As hypothesized in H1, we find a positive and significant main effect for the strength of hedonic signals on funding performance ($\beta = 0.109$, $p < 0.01$). Given the logarithmic nature of our dependent variable, regression coefficients reflect the proportional change of funding performance for unit changes in the independent variables (Thornton and Innes 1989). Thus, these results suggest that increasing the strength of hedonic signals by one standard deviation (SD) increases funding performance by 11.5% across all platform types.[6] We accept H1.

Model 3 adds the interaction effects for testing H2a and H2b. Our results suggest that the coefficient for the strength of hedonic signals is positive and significant ($\beta = 0.254$, $p < 0.01$). Because we model reward platforms as the reference group, this coefficient refers to the effect of hedonic signals on funding performance on such platforms. This means that increasing the strength of hedonic signals by one SD increases the funding ratio by 28.9% on reward platforms. The interaction terms reflect the differences between the effect of hedonic signals on reward and equity (donation) platforms. Comparing the coefficient of the equity platform and hedonic signal interaction with the hedonic signals coefficient for reward platforms suggests that increasing hedonic signal strength has a less positive impact on funding performance on equity platforms ($0.254 - 0.193 = 0.061$). The coefficient for the equity platform and hedonic signal strength interaction is significant with $p < 0.05$ so that this

[6] For an exact interpretation, we need to take into account that regression coefficients are also on a log-scale and we need to transform them back to their original scale given the following equation (Thornton and Innes 1989): $\exp(\beta^*\Delta x) - 1$.

Table 2 Descriptive statistics and correlations

Variable	Mean	Min	Max	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Funding Performance (log)	0.685	0.000	5.228	0.809										
(2) Hedonic Signals	2.511	1.000	5.000	1.012	0.204**									
(3) Video	0.549	0.000	1.000	0.498	0.258**	0.235**								
(4) Tangible Product	0.190	0.000	1.000	0.393	0.258**	−0.013	0.305**							
(5) Funding Goal (in 1,000)	75.717	0.000	1,085.847	175.340	−0.031	−0.013	0.235**	0.053						
(6) Funding Duration	111.259	7.000	365.000	112.633	−0.135**	−0.100*	−0.486**	−0.218**	−0.117*					
(7) Cultural Project	0.159	0.000	1.000	0.366	−0.103*	0.051	0.222**	−0.211**	−0.159**	−0.112*				
(8) Readability	62.480	15.750	114.120	17.254	−0.030	−0.019	−0.129*	0.155**	−0.127*	−0.119*	−0.040			
(9) Sentiment	4.232	1.000	5.000	1.060	0.001	−0.096†	−0.079	0.145**	0.103*	−0.009	−0.082	−0.004		
(10) Equity Platform	0.328	0.000	1.000	0.470	−0.034	−0.085†	0.075	0.015	0.305**	−0.321**	−0.228**	−0.117*	−0.074	
(11) Donation Platform	0.359	0.000	1.000	0.480	−0.140**	−0.016	−0.565**	−0.308**	−0.125*	0.669**	−0.147**	0.067	−0.010	−0.523**

N = 384; SD = Standard Deviation; ** $p \leq 0.01$; * $p \leq 0.05$; † ≤ 0.1

Table 3 Regression results

	Model 1 (Controls)	Model 2 (Main Effects)	Model 3 (Interactions)
Intercept	0.413** (0.099)	0.468* (0.180)	0.456* (0.176)
Sentiment	−0.024 (0.041)	−0.017 (0.041)	−0.012 (0.041)
Funding Goal	−0.106* (0.043)	−0.094* (0.044)	−0.099* (0.044)
Funding Duration	−0.024 (0.055)	−0.041 (0.060)	−0.050 (0.059)
Readability	−0.098† (0.054)	−0.099† (0.053)	−0.104* (0.052)
Cultural Project	−0.360** (0.123)	−0.331** (0.127)	−0.383** (0.128)
Tangible Product	0.343** (0.117)	0.376** (0.120)	0.367** (0.119)
Videos	0.500** (0.113)	0.420** (0.122)	0.428** (0.121)
Donation Platform		−0.101 (0.188)	−0.101 (0.181)
Equity Platform		0.033 (0.215)	0.056 (0.209)
Hedonic Signals		0.109** (0.041)	0.254** (0.070)
Hedonic Signals × Donation Platform			−0.230* (0.097)
Hedonic Signals × Equity Platform			−0.193* (0.098)
R2	0.179	0.187	0.201
AIC	869.685	867.845	865.565

N = 384; ** $p \leq 0.01$; * $p \leq 0.05$; † ≤ 0.1; Standard errors in parentheses

difference is significant. We accept H2a. Similarly, we compare the coefficient of the donation platform and hedonic signal strength interaction with the coefficient of hedonic signals on reward platforms. This indicates that an increase of hedonic signal strength only marginally increases funding performance on donation platforms ($0.254 - 0.230 = 0.024$). This difference is significant ($p < 0.05$) such that we support H2b. To further verify these results, we apply a bootstrapping-based procedure that compares the fit between two mixed-linear models (Halekoh and Højsgaard 2014) and verify that adding the interaction terms significantly improves model fit ($p < 0.05$). Finally, we plot the marginal effects for the platform type and hedonic signal interaction (see Fig. 1).

5.3 Robustness Analyses

To further explore the nature of our results, we investigate whether the effect of hedonic signal strength on funding performance is significantly different from zero on equity and donation platforms, but we cannot detect such effects. Also, we do not find a significant difference between equity and donation platforms. Although recent simulation studies suggest that random effects specifications are equivalent or superior to fixed effects specifications in many situations and model choice should primarily be driven by the goals of the research (Bell et al. 2019; Clark and Linzer 2015), we investigate the threat of misspecifying platform-level effects. Thus, we perform a Hausman test verifying that random effects can be effectively applied. Also, we rule out the possibility that competing measurement models, e.g., the second order factor, would lead to alternative interpretations of our findings. Regarding sentiment, we test whether our results are robust to alternative measures that are applied in crowdfunding such as the *Linguistic Inquiry and Word Count* (e.g., Chen et al. 2023; Kim et al. 2016; Moradi and Dass 2019). A significant effect of sentiment on funding performance is not found.

6 Discussion and Implications

We find that sending stronger hedonic signals positively influences funding performance across all platform types. However, a more fine-grained evaluation yields substantial differences. We find the effect of hedonic signals on funding performance to be most prevalent on reward platform, while hedonic signals are of limited importance on equity and donation platforms.

6.1 Theoretical Implications

This paper advances existing crowdfunding and signaling research by evaluating the impact of hedonic signals between three crowdfunding platform types. We suggest three contributions:

Effect of Hedonic Signal in Crowdfunding Projects. Existing research relates hedonic signals in crowdfunding to aspects such as emotional arousal (Ren et al. 2021; Davis et al. 2017; Li et al. 2017) or to related but more specific concepts such as entrepreneurial passion (Davis et al. 2017; Li et al. 2017; Oo et al. 2019), positive psychology language (Anglin et al. 2018a), and sensation-seeking (Demir et al. 2021; Zhao and Vinig 2017). Extending this research, we offer a broader conceptualization of hedonic signals that is grounded in the

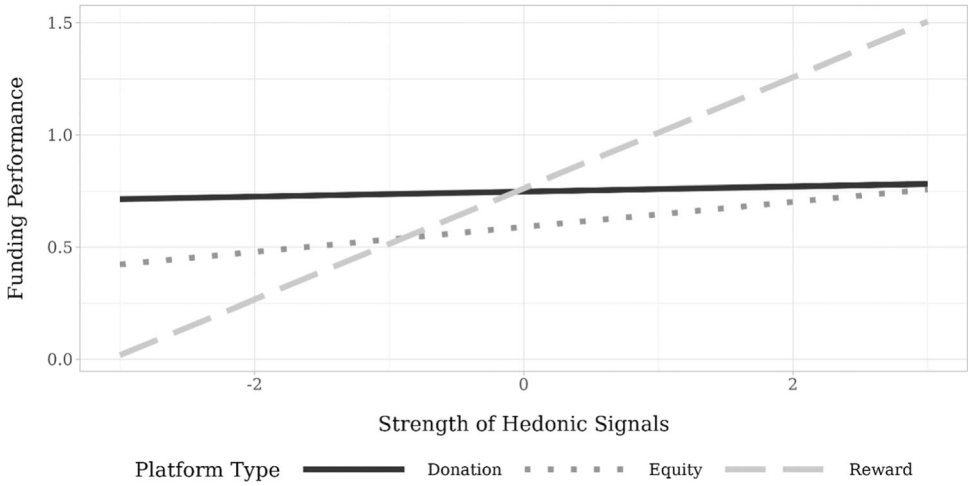

Fig. 1 Predicted marginal effects for strength of hedonic signals by platform type

dimensions in entertainment, arousal, and imagination including a rigorous data collection and construct validation procedure. Across all platforms, we find a systematic positive effect of hedonic signals on funding performance. This extends existing research that frequently relates hedonic value to measures of positive emotional arousal, sentiment, and language that has produced inconsistent and parsimonious results (Chen et al. 2016, 2023; Kuo et al. 2022; Allison et al. 2017; Peng et al. 2022; Davis et al. 2017; Jiang et al. 2020; Tafesse 2021; Ren et al. 2021; Moradi and Dass 2019; Kim et al. 2016; Rossolini et al. 2021; Parhankangas and Renko 2017). Contrary to our hedonic signal strength measure, we cannot detect a significant effect on funding performance for two alternative sentiment measurements.

Comparing Hedonic Signals across Crowdfunding Platform Types. We contribute to the crowdfunding literature by comparing the effect of hedonic signals on funding performance across different types of crowdfunding platforms.

First, we find systematic differences between the reward, equity, and donation platforms regarding the effect of hedonic signals on funding performance. These results contribute to a better understanding of boundary conditions under which sending hedonic signals is effective. Existing research has focused on signalers (Xiang et al. 2019; Chen et al. 2016; Parhankangas and Renko 2017; Rossolini et al. 2021; Tafesse 2021; Anglin et al. 2018a), receivers (Xiang et al. 2019; Allison et al. 2017) and the interaction of hedonic signals with other signal types (Steigenberger and Wilhelm 2018). We extend this research by conceptualizing crowdfunding platforms as signaling environment.

Featuring the notion of signal fit, our results show that sending hedonic signals is most important on reward platforms whose users are frequently described as consumption-oriented capital givers that strive for pleasant and enjoyable experiences (Zhao and Vinig 2017; Chan and Parhankangas 2016; Zheng et al. 2017). By contrast, we find no significant effect of hedonic signals on funding performance on equity platforms. These results support the notion of more rationale investors that put low emphasis on hedonic signals and might focus on more utilitarian signals such as the project initiators' education and background (Block et al. 2018; Di Pietro et al. 2023; Vulkan et al. 2016). Thus, our results suggest that sending hedonic signals on equity platforms reflects an instance of low signal fit. Sending such signals on equity platforms may conflict with the project initiators ' goals of successfully running/scaling a startup as well as capital givers' utilitarian motives of obtaining financial returns. This finding is noteworthy because it suggests that both types of crowdfunding platforms are supported by different communities of capital givers. However, current research frequently investigates entrepreneurial ventures and founders on reward platforms (e.g., Anglin et al. 2018a; Allison et al. 2017; Parhankangas and Renko 2017) – our results suggest that the generalizability of such findings to equity platforms and beyond needs careful investigation.

Similarly, the notion of low signal fit is also supported by looking at donation platforms on which we did not find a systematic impact of hedonic signal strength on funding performance. While capital givers on reward platforms participate for gaining a certain reward for themselves, capital givers participate on donation platforms mainly due to philanthropic reasons in order to address ecological and societal challenges or to support individuals that are personally affected by diseases, natural disasters, or other fates (Langley et al. 2020; Majumdar and Bose 2018; Snyder et al. 2016; Chen et al. 2023; Wu et al. 2022). Against that backdrop, creating a positive emotional reaction of capital givers, supported by sending strong hedonic signals, might not be effective on donation platforms. Instead, our results complement existing studies on donation platforms. These studies indicate that project initiators should highlight the

credibility and trustworthiness of their projects (Wu et al. 2022) as well as negative consequences and potential losses that may occur if capital givers do not act (Jang and Chu 2022; Wu et al. 2022). Thus, our results imply that sending hedonic signals on donation platforms might contradict the specific expectations of the intended altruistic behaviors of capital givers on donation platforms that are frequently driven by negative emotions such as guilt or embarrassment (Wang et al. 2022) or the desire to improve one's self-esteem (Gleasure and Feller 2016); low signal fit is the consequence. This finding underscores that funding performance is driven by different mechanisms on donation platforms and we need to better understand differences across different platform types.

Second, our research answers the call of various researchers to investigate the effects of signals and other determinants of funding performance across different crowdfunding platform types (Zhou et al. 2018; Zheng et al. 2014; Dushnitsky and Fitza 2018; Gleasure and Feller 2016; Huang et al. 2022; Short and Anglin 2019). This is particularly important because existing research on signaling in crowdfunding is focusing on reward platforms with Kickstarter being the most researched platform (Hoegen et al. 2018; Deng et al. 2022). Using the investigation of the effect of hedonic signals as an example, our study illustrates that signal effectiveness in crowdfunding might be strongly influenced by the underlying platform type and that reward platforms can diverge considerably from other platform types. Consequently, findings obtained on reward platforms cannot be taken for granted on other platform types because the extent to which existing findings are generalizable across platform types needs further exploration (Short and Anglin 2019; Dushnitsky and Fitza 2018). Thus, we need to consider the features of different platform types (and single platforms) more strongly in crowdfunding research to get a more nuanced and accurate understanding of the phenomenon. We believe that this is of high importance, because crowdfunding research has produced a large body of conflicting and parsimonious results. Better conceptualizing and theorizing crowdfunding platforms as an IT artefact (Dushnitsky and Fitza 2018) might help to understand and interpret these differences in the light of a longstanding discussion in the field of information systems (Akhlaghpour et al. 2013; Orlikowski and Iacono 2001).

Comparing Hedonic Signals in Different Signaling Environments. Conceptualizing crowdfunding platforms as signaling environments, our research also offers a contribution to signaling theory. Following the notion of signal fit, we investigate how hedonic signals as a specific signal type show different levels of effectiveness in three different signaling environments. Thus, we contribute to a better understanding of different signaling environments as contingencies of the signaling process (Connelly et al. 2011; Park and Patel 2015; Drover et al. 2018).

6.2 Practical Implications

Project Initiators. Our findings highlight the integration of hedonic signals in project descriptions on reward platforms. Sending these signals, project initiators must acknowledge that these signals can only be set within the given frameworks and project description templates of a chosen platform. Thus, setting hedonic signals involves shaping the textual project description, the images, the video pitch, or project updates. For example, if project initiators want to set hedonic signals, they need to accentuate opportunities that help capital givers imagine participating in the project and rendering the overall participation experience joyful. Research has shown that videos and updates seem to be most important here (Zheng et al. 2017; Li et al. 2017).

Crowdfunding Platforms. Our results are relevant for crowdfunding platforms. Reward platforms should think of adapting project presentation templates for better communicating hedonic value of projects. Potentially, they could also offer training programs for capital givers or design novel features that help capital givers invoke hedonic stimulation. For example, platforms could include gamification elements that support project initiators.

6.3 Limitations and Future Research

Our results must be interpreted in the light of their limitations. First, our sampling procedure does not comprise lending platforms because these platforms show substantial differences in the investment process (Guo et al. 2016; Milne and Parboteeah 2016; Ziegler and Shneor 2020). Although initial research has found that hedonic signals are also present in lending (Demir et al. 2021), the role of hedonic signals needs further research because they increasingly address institutional capital givers.

Second, by choosing crowdfunding projects and experts through rigorous selection criteria, we try to eliminate the influence of unconscious subjective biases. Although our analyses suggest that our results should generalize well to reward, equity, and donation platforms, additional studies might focus on the relationship between hedonic signals and their characteristics as well as personality traits and behaviors of capital givers to gain a more fine-grained understanding of the mechanisms through which hedonic signals create value. In this regard, getting a better understanding of sensation-seeking behaviors of capital givers might be fruitful. Also, the interaction of hedonic signals with related signals such as creative signals might be interesting. Extending that line of thought, we have

employed the perspective of signal fit to unravel the differential effects of hedonic signals on different types of crowdfunding platforms. We believe that also many other signals might be interpreted via the notion of signal fit. Future research could address this shortcoming of existing research by developing a more overarching theory of crowdfunding platform signal fit that provides guidance regarding which type of signal is important on different platform types.

Third, our analyses show diverging results across different types of platforms while we account for differences on the platform-level using a random effects model; yet more research is necessary to extend our findings. For instance, we consider platforms as being "archetypes" for the different platform types that we consider in our study. However, crowdfunding models are constantly evolving and platforms can also belong to multiple types, e.g., offering equity and/or rewards simultaneously. We believe that the specific design of crowdfunding platforms can be considered as the combination of many specific design choices, and we are only at the beginning to understand their effects across different platform types or their combinations. For instance, we see a lot of potential in more precisely measuring platform characteristics and dynamics and comparing their direct and indirect effects on funding performance across different platform types. For instance, it could be interesting to understand how platform dynamics, e.g., platform success or the size, activity, and composition of the associated community of capital givers, are influencing funding performance across different platform types.

Funding Open access funding provided by University of St.Gallen.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12599-024-00854-x.

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