DISSERTATION

The Effects of Affective Cues on the Performance of Reward-Based Crowdfunding Projects

Theoretical Foundations and Empirical Evidence

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Zusammenfassung (German Summary)

Crowdfunding ist eine zunehmend relevante Möglichkeit für Unternehmer, innovative Geschäftsideen zu realisieren. Durch die direkte Ansprache über das Internet kann Kapital von (nicht-)professionellen Investoren (Unterstützern) zur Finanzierung von Projekten eingeworben werden (Shneor und Vik, 2020). Eine Vielzahl an *reward-based Crowdfunding*-Projekten, bei denen die Unterstützer für ihren finanziellen Beitrag Produkte, Dienstleistungen oder andere nicht-monetäre Belohnungen erhalten, verfehlen allerdings ihr ursprüngliches Finanzierungsziel (Belleflamme et al., 2015; Wessel et al., 2017).

Die *Finanzierungsperformance* eines Crowdfunding-Projekts, operationalisiert als z.B. die Höhe der eingeworbenen Unterstützungsbeiträge, wird maßgeblich durch die *Projektpräsentation* bestimmt. Da sie die primäre Informationsquelle darstellt, wird die Entscheidung, ein Projekt zu unterstützen, in der Regel unter Unsicherheit getroffen (Hoegen et al., 2017; Wang et al., 2021). Um die Informationsasymmetrie bei der Investitionsentscheidung zu reduzieren, nutzen Crowdfunding-Unterstützer neben Informationen auch verbale und nonverbale Signale. Diese Signale werden über die Kommunikationskanäle des Projekts übertragen (insb. textuelle Beschreibung, Bilder, Pitch-Videos) (Courtney et al., 2016; Warnick et al., 2021). Sie dienen als zusätzlichen Indikatoren und ermöglichen einen Rückschluss auf die Qualität des Projekts und des Unternehmers (Lin und Boh, 2021). Von *affektiven Signalen* spricht man, wenn emotionale Inhalte dargestellt werden.

Die Forschung zeigt, dass die wahrgenommenen affektiven Signale einen wesentlichen Einfluss auf den affektiven Gemütszustand, auf die gezogenen Schlussfolgerungen sowie auf das Handeln des Empfängers haben (Loewenstein und Lerner, 2003). Dabei können sie auch finanzielle Entscheidungen des Empfängers beeinflussen (Achar et al., 2016). Um einen positiven Einfluss zu erzielen, wird empfohlen, dass affektive Signale an den Kontext angepasst sein sollten, in dem sie zum Ausdruck gebracht werden. Die Auswirkung affektiver Signale ist beispielsweise davon abhängig, in welchem Maße der Empfänger diese als angemessen empfindet. Eine hohe Anzahl an dargestellten Emotionen kann beispielsweise als unauthentisch und unangemessen wahrgenommen werden, je professioneller die Beziehung ist (Cheshin et al., 2018; van Kleef und Côté, 2022).

Inwiefern sich die Darstellung affektiver Signale auf die Investitionsentscheidung im Kontext des reward-based Crowdfunding auswirkt, ist kaum erforscht. Insbesondere ist zu diskutieren, wie affektive Signale effektiv eingesetzt werden können, um die Finanzierungsperformance zu steigern (Hoegen et al., 2017). In der reward-based Crowdfunding-Literatur finden sich jedoch nur wenige Erkenntnisse darüber, welche affektiven Signale und in welcher Menge affektive Signale in jenem Computer-mediierten

Kommunikationskontext dargestellt werden sollten. Vor diesem Hintergrund ist das Ziel der kumulativen Dissertation, Forschern und Praktikern theoretisch fundierte und empirisch validierte Ergebnisse über den Zusammenhang zwischen der Darstellung affektiver Signale in einer Projektpräsentation und der Finanzierungsperformance zu geben. Die übergeordnete Forschungsfrage dieser Dissertation lautet demzufolge:

Forschungsfrage: *Wie wirken sich affektive Signale in der Präsentation auf die Finanzierungsperformance von reward-based Crowdfunding-Projekten aus?*

Um diese Forschungsfrage zu beantworten, ist die Dissertation in drei Teile gegliedert. Der erste Teil konzentriert sich auf die Auswirkung von verschiedensten Signalen auf die Finanzierungsperformance. Durch eine systematische Aufarbeitung der reward-based Crowdfunding-Literatur wird ein strukturierter und ganzheitlicher Überblick über die in der empirischen Forschung untersuchten Signale und deren Einfluss auf die Finanzierungsperformance gegeben. Durch quantitatives Zusammenfassen der empirischen Ergebnisse gibt die Literaturstudie zudem einen Einblick in die generelle Wirkungsrichtung konzeptionell ähnlicher Signale. Die Ergebnisse zeigen, dass für einige Signale, wie beispielsweise „Appell an die Nachhaltigkeit" und „wahrgenommener Narzissmus", die nachgewiesenen Effekte in eine eindeutige Richtung zeigen. Für Signale, wie beispielsweise „wahrgenommene unternehmerische Eigenschaften" und „negative verbale affektive Signale" ist die Richtung der Effekte weniger eindeutig und bedarf weiterer Untersuchung. Die Ergebnisse der Literaturstudie bieten einen umfassenden Überblick für Forschung und Praxis, um ein übergreifendes Verständnis der Auswirkung von Signalen auf die Finanzierungsperformance im reward-based Crowdfunding Kontext zu entwickeln.

Der zweite Teil fokussiert sich auf die Mechanismen und Auswirkungen von *affektiven Signalen*, die über die Projektpräsentationen dargestellt werden. Es wird insbesondere der Zusammenhang zwischen der Darstellung von affektiven Signalen und der Finanzierungsperformance untersucht und inwiefern dieser Zusammenhang durch kontextuelle Faktoren beeinflusst wird. Hierfür wurden drei empirische Studien durchgeführt. Die erste Studie untersucht den Einfluss von sozialer Präsenz auf den Erfolg von Crowdfunding-Projekten. Die empirischen Ergebnisse zeigen, dass eine sozial-reichhaltige Projektpräsentation und das Partizipationsverhalten des Unternehmers, nicht aber eine sozial-reichhaltige Profilseite des Unternehmers den Erfolg beeinflussen. Um vertiefte Erkenntnisse über den wirksamen Einsatz affektiver Signale zu gewinnen, wurden aufbauend auf dieser Studie zwei weitere empirische Studien durchgeführt. Bezüglich der Wirkung von lachenden und traurigen Gesichtsausdrücken in Bildern konnte gezeigt werden, dass der Effekt auf die Finanzierungsperformance von der dargestellten Menge abhängt. Darauf aufbauenden können die Ergebnisse der dritten Studie bestätigen, dass neben emotionalen

Gesichtsausdrücken in Bildern ebenso affektive Wörter in Texten, affektive Sprache in Pitch-Videos sowie emotionale Gesichtsausdrücke in Pitch-Videos einen umgedreht U-förmigen Effekt auf die Finanzierungsperformance haben. Die zuerst positive Wirkung von dargestellten affektiven Signalen nimmt bei zunehmender Menge wieder ab und wirkt meist negativ. Dieser nicht-lineare Zusammenhang wird zusätzlich durch Kontextfaktoren des reward-based Crowdfundings moderiert. Dazu zählen die Qualität der Unternehmer-Unterstützer-Beziehung sowie Faktoren, welche die Unsicherheit einer Investitionsentscheidung erhöhen. Für Forschung und Praxis lässt sich festhalten, dass die Darstellung affektiver Signale in der Projektpräsentation einen wesentlichen Einfluss auf die Finanzierungsperformance hat, wobei moderate Mengen an affektiven Signalen die beste Wirkung im Sinne einer maximalen Finanzierungsperformance erzielen. Daher sollte die Darstellung affektiver Signale nicht willkürlich erfolgen, sondern an den Kontext (Investitionsentscheidung im reward-based Crowdfunding) angepasst werden.

Der dritte Teil analysiert, wie verbale und nonverbale affektive Signale zu orchestrieren sind, um einen optimalen Einfluss auf die Finanzierungsperformance zu erzielen. Dabei wird eine multimodale Perspektive eingenommen und berücksichtigt, dass Projektpräsentationen aus verschiedenen Kombinationen von Kommunikationskanälen bestehen können, die gleichzeitig unterschiedliche Mengen an affektiven Signalen darstellen. Entsprechend wird das Zusammenspiel von affektiven Wörtern in Texten, affektiver Sprache in Pitch-Videos, emotionalen Gesichtsausdrücken in Bildern und emotionalen Gesichtsausdrücken in Pitch-Videos untersucht. Neben der Bestätigung der nicht-linearen Wirkungsweise von affektiven Signalen auf die Finanzierungsperformance erlaubt der verwendete Konfigurationsansatz eine multimodale Perspektive. Drei Konfigurationen zeigen, dass spezifische Kombinationen von affektiven Signalen und Computer-mediierte Kommunikationskanälen für eine hohe Finanzierungsperformance wesentlich sind. Für Forschung und Praxis lässt sich festhalten, dass sich bei multimodalen Plattformen mehrere Kombinationen von verschiedenen Faktoren ergeben, die dennoch zum selben Ergebnis führen.

In Bezug auf die zentrale Fragestellung der kumulativen Dissertation lässt sich zusammenfassend feststellen, dass die (bewusst oder unbewusst) dargestellten affektiven Signale einen maßgeblichen Einfluss auf die Investitionsentscheidung in einem Kontext wie dem reward-based Crowdfunding haben. Im Speziellen hat die Verwendung von affektiven Signalen in der Projektpräsentation über Computer-mediierte Kommunikationskanäle einen umgedreht U-förmigen, nicht-linearen, d.h. von der dargestellten Menge abhängigen Einfluss auf die Finanzierungsperformance des Crowdfunding-Projekts. Mit diesen Erkenntnisgewinnen leistet die Dissertation einen Beitrag zur Forschung und Praxis der Wirtschaftsinformatik, primär im Bereich des reward-based Crowdfunding.

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API	Application programming interface
BIC	Bayesian information criteria
CATA	Computer-aided text analysis
CF	Crowdfunding
CFP	Crowdfunding platform
CV	Computer vision
DV	Dependent variable
EASI	Emotion as Social Information
FAQ	Frequently asked questions
fsQCA	Fuzzy-set qualitative comparative analysis
ihs	inverse hyperbolic sine transformation
IS	Information systems
LIWC	Linguistic Inquiry and Word Count
MRA	Multiple regression analysis
MS	Microsoft
NeuroIS	Neuro-Information-Systems
NRC	National Research Council
OLS	Ordinary least squares
QCA	Qualitative comparative analysis
RBCF	Reward-based crowdfunding
RC	Robustness check
RQ	Research question
VC	Venture capital
VIF	Variance inflation factor

Introductory Paper

1 Introduction

Crowdfunding is more and more becoming an opportunity for entrepreneurs to realize new and innovative business ideas that may not yet appeal to venture capitalists or angel investors. Thereby, crowdfunding entrepreneurs raise capital and finance their projects by appealing directly to the public via the Internet (Beaulieu et al., 2015; Shneor and Vik, 2020). According to recent crowdfunding reports, it is estimated that the global crowdfunding market reached a value of US$17.51 billion in 2021, and it is expected to double by 2028 (SkyQuest Technology, 2022). Although crowdfunding has made progress with increasing familiarity and participation (Crowdfunding.de, 2020), a significant number of *reward-based crowdfunding* (RBCF) projects, in which supporters (i.e., backers) receive products, services, or other non-monetary rewards in exchange for their financial contribution, fail to meet their funding targets (i.e., pledge goals). Take Kickstarter, the most prominent reward-based crowdfunding platform, as an example. Of the 631,484 projects launched, only 261,111 were successfully funded, yielding a success rate of 41% (Kickstarter, 2024). This aspect is exacerbated because most reward-based crowdfunding platforms, such as Kickstarter, have become more competitive and use the "all-or-nothing" model, in which a minimum pledge goal must be reached within a limited timeframe. If the pledge goal is not met within this timeframe, the funds are not transferred, and the crowdfunding project is canceled (Belleflamme et al., 2015; Wessel et al., 2017).

The *project presentation* as the primary source of information is one of the key aspects that significantly determines the crowdfunding project's *funding performance*, operationalized as whether the project has successfully reached the targeted pledge goal, how much funding the project has raised, or how many backers have supported the project. As with any investment decision, investments in crowdfunding projects are typically made in an environment of uncertainty where backers must cope with information asymmetry (Hoegen et al., 2017; Wang et al., 2021). In contrast to professional investors who make investment decisions by analyzing business plans, financial reports, and, to some extent, the subjective impressions of entrepreneurs (Frese and Gielnik, 2014), crowdfunding backers need to substitute for those missing resources and personal access to entrepreneurs. In this regard, to mitigate information asymmetry, backers make use of *verbal and nonverbal cues* displayed via the project presentation when evaluating the crowdfunding project (Courtney et al., 2016). Thus, knowing how to present crowdfunding projects to facilitate funding decisions becomes particularly important for entrepreneurs in reward-based crowdfunding (Mollick, 2014).

1.1　The Effect of Affective Cues on Funding Performance

In reward-based crowdfunding, the project presentation commonly consists of written narratives and pictures and is typically accompanied by a pitch video with a spoken voice-over (Koch and Siering, 2019; Warnick et al., 2021). The project presentation describes the business idea for which entrepreneurs are seeking funding. To increase funding performance, knowing what verbal and nonverbal cues to display through the mentioned communication modalities is vital (e.g., Cappa et al., 2020; Letwin et al., 2024; Wang et al., 2023). Regarding the signaling theory (Spence, 2002), cues reflect specific snippets of information embedded in a communication modality that signals additional information. This helps backers learn about a specific context and enables them to make more informed decisions (Li et al., 2017). That said, verbal and nonverbal cues conveyed through the project's communication modalities can serve as proxies for backers to gain additional insight into the quality and overall merit of the project, including the entrepreneur (e.g., Lin and Boh, 2021). Verbal cues refer to written or spoken words, while nonverbal cues refer to communication through means other than words, such as facial expressions. When cues convey emotional expressions, they are referred to as *affective cues*.

Regarding affective cues, it is considered that the display of emotional expressions has the potential to affect funding decisions (Hoegen et al., 2017; Li et al., 2017). In general, decision-making research has established that the perception of affective cues is a powerful driver to affect the recipient's affective state, inferences, attitudes, and behaviors (Loewenstein and Lerner, 2003; van Kleef and Côté, 2022). While studies from the venture capital domain suggest that emotional expressions such as perceived passion do not influence investment decisions (Chen et al., 2009), affective cues may be more effective in reward-based crowdfunding. Unlike professional investors, reward-based crowdfunding backers typically lack the expertise and experience to conduct due diligence (Li et al., 2017). They seem to be driven not only by rational and economic concerns but also by the desire to see a project come to life (Bretschneider and Leimeister, 2017). Thus, crowdfunding backers may be more susceptible to an affective, emotional project presentation.

While it thus seems reasonable to assume that the display of affective cues will consistently have a positive impact on funding behavior, this assumption ignores that the effect of affective cues is shaped by the context in which they occur. To be effective, the display of affective cues must match the context qualitatively (i.e., showing the right emotion) and quantitatively (i.e., showing emotions at the right intensity, i.e., amount/number). The effect of affective cues is thus determined by the degree to which recipients perceive them as appropriate (van Kleef and Côté, 2022), that is, "correct for the situation and in correct

proportion to the evoking circumstances" (Shields, 2005, p. 7). For example, expressing emotions is more common in personal and socially close relationships and is therefore deemed appropriate within these communication contexts (Berscheid and Ammazzalorso, 2003; Cheshin, 2020; Smoski and Bachorowski, 2003). Conversely, intense emotional expressions are more likely to be perceived as inauthentic and inappropriate to the extent that the relationship is professional (Cheshin et al., 2018; van Kleef, 2009).

Besides the insights offered for in-person communication (Cheshin et al., 2018; van Kleef, 2009; van Kleef and Côté, 2022), the current literature on reward-based crowd-funding provides little guidance on the effects and effective utilization of affective cues displayed through the project presentation. Thus, it is critical for researchers and entre-preneurs in the context of reward-based crowdfunding to understand the mechanisms by which affective cues displayed through the project presentation affect funding behavior and how affective cues can be effectively leveraged to increase funding performance (Hoegen et al., 2017). Also, it remains to be clarified how affective cues need to be dis-played, considering the social and contextual factors prevalent in the reward-based crowdfunding context. Research investigating the perception and effects of affective cues has typically focused on examining personal, face-to-face communication in do-mains such as service encounters and negotiations (Cheshin et al., 2018; van Kleef, 2009; van Kleef and Côté, 2022). However, the effects of affective cues on behavior have re-ceived less attention on multi-sided platforms where communication is mediated by in-formation technology. Especially, it remains to be investigated how entrepreneurs should display affective cues throughout different communication modalities of the project presentation to effectively increase funding performance.

Against this background, the overarching objective of this dissertation is to provide re-searchers and practitioners with a comprehensive understanding of the effect of affective cues displayed throughout the project presentation in the context of reward-based crowd-funding. The studies presented within this dissertation offer theoretically grounded and empirically verified insights regarding the relationship between displaying affective cues and funding performance. Moreover, recommendations for practice are provided. Thus, this dissertation poses the following overarching research question:

Research question: *How do affective cues in the presentation affect the performance of reward-based crowdfunding projects?*

The following section presents a more detailed analysis, dividing the overarching research question into three more detailed ones. These illustrate the specific research gaps that this dissertation intends to address.

1.2 Research Questions

The project presentation displays distinct verbal and nonverbal cues that backers use to inform their funding decisions when evaluating the project (Courtney et al., 2016; Zhou et al., 2016). Thus, understanding which cues (not only affective cues) influence funding decisions in reward-based crowdfunding is crucial, especially in an environment where the content of the project presentation significantly affects the funding performance of the crowdfunding project (e.g., Cappa et al., 2020; Mollick, 2014; Wang et al., 2023).

With an increasing number of studies that have focused on empirically examining cues influencing funding behavior in the context of reward-based crowdfunding, comprehending their effects on funding performance is challenging. First, different studies use various measures for a conceptually similar cue, making comparisons difficult. Second, the effects of conceptually similar cues on funding performance also vary, showing positive, non-significant, negative, or inverted U-shaped effects. This makes it challenging to provide associations regarding the prevalent effect of conceptually similar cues on funding performance (e.g., Anglin et al., 2018; Bollaert et al., 2019; Gafni et al., 2019). Third, research typically focuses on a single set of cues within a single modality (e.g., text, pictures, or videos), lacking an overview of how conceptually similar cues are analyzed across distinct modalities. That said, research has often investigated cues in isolation, with findings fragmented across the literature. While some systematic literature reviews exist (e.g., Alhammad et al., 2022; Hoegen et al., 2017), reward-based crowdfunding literature lacks conceptualization and a straightforward understanding of how distinct verbal and nonverbal cues displayed through the project presentation affect funding performance. Synthesizing and discussing fragmented and inconsistent findings can help researchers understand and assess the prevailing effects of distinct cues. For practitioners, the lack of a clear understanding makes it difficult to distinguish which verbal and nonverbal cues are critical to display for increasing funding performance. To derive a more comprehensive understanding of the effects stemming from cues, the first research question is:

Research question 1: *How do distinct cues in the presentation affect the performance of reward-based crowdfunding projects?*

Social psychology research has recognized affective cues for their potential to influence decision-making, suggesting that the perception of affective cues can compensate for missing information, shaping a decision-maker's evaluation of a situation (Loewenstein and Lerner, 2003). This effect is well-documented in the context of service encounters and negotiation, where communication is typically personal and face-to-face (Achar et al., 2016; van Kleef, 2009; van Kleef, 2014). However, the effects of affective cues

expressed on multi-sided platforms, where communication is mediated by information technology, have been less extensively studied. Specifically, research on reward-based crowdfunding has primarily examined basic aspects of communication modalities, such as the length of the description (Zheng et al., 2014), the number of pictures (Koch and Siering, 2019), and the presence of a pitch video (Mollick, 2014). While the emotional appeal of project presentations has been sporadically examined (Steigenberger and Wilhelm, 2018), research often assumes that displaying higher numbers of affective cues leads to better funding performance (Koch and Siering, 2019; Li et al., 2017). However, findings in this area are inconsistent and inconclusive (Shneor and Vik, 2020).

For affective cues to be effective, social psychology research suggests that they must align with the context in which they are expressed both qualitatively (i.e., displaying the right emotion) and quantitatively (i.e., displaying the emotion at the right intensity, amount). Thus, the effects of affective cues seem to be determined by the degree to which recipients perceive them as appropriate. Also, social psychology research suggests that the effects can be moderated by contextual factors characterizing the interaction (van Kleef, 2009; van Kleef and Côté, 2022). Yet, these assumptions lack a robust theoretical foundation and empirical verification in the context of reward-based crowdfunding, in which the entrepreneur-backer relationship is predominantly professional and business-oriented, as well as moderated by computer-mediated communication modalities (Mollick, 2014). Thus, it is important to investigate what kinds of affective cues should be displayed through the project presentation and what amount of affective cues are most effective in supporting funding performance. Furthermore, it remains unclear which social and contextual factors may impact the relationship between affective cues and funding performance. Practitioners can also struggle to appeal emotionally to backers (Steigenberger and Wilhelm, 2018). To address these gaps, the second research question is:

Research question 2: *How do affective cues in the project presentation affect funding performance, and what factors influence this relationship?*

Project presentations allow for the utilization of various combinations of different modalities, such as textual descriptions, pictures, and pitch video (Yang et al., 2020). Yet, studies have largely ignored that crowdfunding platforms are multi-modal, such that the project presentation concurrently displays varying amounts of verbal and nonverbal affective cues through various combinations of modalities. Instead, most research has focused on affective cues conveyed via a single modality without considering a multi-modal perspective (e.g., Koch and Siering, 2019; Li et al., 2021; Parhankangas and Renko, 2017; Wang et al., 2016). As such, the interplay of affective cues between multiple modalities of the presentation of reward-based crowdfunding projects has been largely unexplored.

Emotion research has indicated that the recognition and perception of affective cues are facilitated when perceived concurrently via multiple modalities (Gerdes et al., 2014; Klasen et al., 2014; Paulmann and Pell, 2011). However, whether the integration of multi-modal emotional expression not only facilitates emotion recognition and perception but also reinforces the effects of affective cues on funding behavior remains to be investigated (van Kleef and Côté, 2022). Moreover, in contexts characterized by a high degree of complexity, there are often different means that lead to the same result (De Crescenzo et al., 2020; Pappas and Woodside, 2021). Yet, it has hardly been examined if different combinations of affective cues can substitute for, reinforce, or mitigate each other. Thus, entrepreneurs face the challenge of deciding whether to display affective cues through one, multiple, or all modalities and whether there are combinations of affective cues that are most effective in raising high funding. In general, studies that examine the combined effects and interplay of affective cues across expressive modalities are still rare (van Kleef and Côté, 2022). Thus, the literature offers little guidance for researchers and entrepreneurs on how to orchestrate affective cues across various modalities to achieve an optimal impact on funding performance. In response to this gap, the third research question is:

Research question 3: *How should a project presentation display affective cues across distinct communication modalities to affect funding performance effectively?*

1.3 Structure of Dissertation

This cumulative dissertation addresses the overarching research question through an introductory paper and five research papers. The five research papers are organized into three parts, with each part corresponding to one of the three research questions.

The first part focuses on how the display of distinct cues affects the funding performance of reward-based crowdfunding projects. It includes a systematic literature review that synthesizes previous research, provides a comprehensive, concept-centric categorization of distinct cues, and reports their prevailing effect on funding performance (Paper I).

The second part focuses on cues related to the emotional appeal of the project presentation, their effects on funding performance, and the extent to which this relationship can be influenced. It starts with an empirical study of how displayed cues related to social presence affect funding performance (Paper II). Building on these findings, two additional empirical studies examine how the intensity at which affective cues are displayed, i.e., the number of affective cues, affects funding performance (Papers III and IV).

In detail, the first study examines how a socially rich project presentation, a socially rich profile page, and the entrepreneur's participation behavior affect funding performance on

two reward-based crowdfunding platforms. It provides initial evidence regarding the positive effects of cues associated with social presence and related to the perception of emotional appeal (Cyr et al., 2007; Hassanein and Head, 2006) (Paper II). Upon these insights, the second study examines how different kinds and the number of facial emotional expressions in pictures affect funding performance. Analyzing the inverted U-shaped effects of affective cues shows that emotional expressions cannot be used unconstrained, as typically suggested. Instead, they should be tailored to the context in which the interaction occurs (Paper III). Upon that, the third study examines how affective cues, displayed via key (non)verbal presentation modalities (Mollick, 2014), affect funding performance (i.e., affective words in text, affective speech in pitch videos, and facial emotional expressions in pictures and pitch videos). It also considers social-contextual factors that may impact the effect of affective cues on funding behavior (van Kleef and Côté, 2022). Analyzing the inverted U-shaped effects of affective cues across modalities shows how intensively they can be displayed to be most effective. Social-contextual factors characterizing the relationship quality and project uncertainty influence these non-linear effects (Paper IV).

The third part provides a multi-modal perspective, examining the interplay of the concurrently displayed affective cues in project presentations. Thereby, the empirical study examines affective words in text, affective speech in pitch videos, facial emotional expressions in pictures, and facial emotional expressions in pitch videos. The results of the empirical study contribute to the understanding of how to orchestrate and combine affective cues across various communication modalities to achieve an optimal impact on funding performance (Paper V). Figure 1.1 provides a summary of the structure of the dissertation.

Of the five research papers, two are published in peer-reviewed journals, one is under review, and one is in revision for the second round of review. One paper is published in a peer-reviewed conference proceeding. Table 1.1 lists these five papers according to the structure of the dissertation. None of the papers' contents have been modified. For consistency, all papers have been reformatted regarding heading numbers, tables, figures, font types and sizes, and citation and reference styles. Because the papers were written at different times, terminology and wording may vary slightly.

The remainder of the introductory paper is structured as follows: The next section describes the research context of this cumulative dissertation. Then, the research methods used, including the literature review, regression analysis, polynomial regression with moderating effects, and fuzzy-set qualitative comparative analysis, are described in detail. Next, the main research results of the five papers are presented. Building on these results, the contributions and implications of the dissertation are discussed. Finally, limitations and future research directions are outlined, ending with a brief conclusion.

Introductory paper – motivation, research context, methodology, main results, and contributions

Part 1: Effects of cues on reward-based crowdfunding performance

Paper I
Objective: To review and synthesize empirical findings regarding effects of cues on funding performance.
Method: Literature review – qualitative systematic review

Part 2: Effects of affective cues on funding performance and influencing factors

Relationship between social presence and funding performance

Paper II
Objective: To examine how cues related to social presence affect funding performance.
Method: Quantitative empirical research – multiple linear regression analysis

Effective use of affective cues and resulting effects

Paper III
Objective: To examine how facial emotional expressions (happiness and sadness) in pictures affect funding performance.
Method: Quantitative empirical research – polynomial regression analysis

Paper IV
Objective: To examine how verbal and nonverbal affective cues affect funding performance and the moderating effects of social-contextual factors.
Method: Quantitative empirical research – polynomial regression analysis with moderating factors

Part 3: Effects of multi-modal emotion expression on funding performance

Paper V
Objective: To examine how to orchestrate verbal and nonverbal affective cues to achieve an optimal impact on funding performance.
Method: Quantitative empirical research – polynomial regression analysis and fsQCA

Figure 1.1   Structure of the dissertation

Table 1.1   Overview of the included papers

#	Paper
I	**Raab, M.** (2023). The Influence of Campaign Presentation Cues on Crowdfunding Performance – Reviewing the Empirical Reward-Based Crowdfunding Literature, *Pacific Asia Journal of the Association for Information Systems*, 15(3), pp. 105-131. https://doi.org/10.17705/1pais.15304
II	**Raab, M.**, Friedrich, T., Schlauderer, S., and Overhage, S. (2017). Understanding the Role of Social Presence in Crowdfunding: Evidence from Leading U.S. and German Platforms, in *Proceedings of the 25th European Conference on Information Systems (ECIS)*, Guimarães, Portugal, pp. 1758-1774. https://aisel.aisnet.org/ecis2017_rp/113/
III	**Raab, M.**, Schlauderer, S., Overhage, S., and Friedrich, T. (2020). More Than a Feeling: Investigating the Contagious Effect of Facial Emotional Expressions on Investment Decisions in Reward-Based Crowdfunding, *Decision Support Systems*, 135. https://doi.org/10.1016/j.dss.2020.113326
IV	**Raab, M.**, Schlauderer, S., and Overhage, S. When Emotions Become Inappropriate: How Social-Contextual Factors Moderate the Effect of Emotional Expressions on Funding Decisions in Reward-Based Crowdfunding, *Electronic Commerce Research and Applications*. under review
V	**Raab, M.**, Schlauderer, S., and Overhage, S. I've Got a Feeling – A Multi-Modal Perspective on how Emotional Expressions Affect Investment Decisions in Reward-Based Crowdfunding, *Small Business Economics*. in revision for the second round of review

2   Research Context

This cumulative dissertation examines the effects of affective cues on funding performance in the context of reward-based crowdfunding. The papers included in this dissertation build upon the fundamental concepts of reward-based crowdfunding, the effects of affective cues, and the prevailing challenges associated with making funding decisions under information asymmetry.

2.1   Characteristics of Reward-Based Crowdfunding

Beyond traditional financial resource providers such as banks and venture capital firms, crowdfunding has emerged as an approach to raising money directly from the public via the Internet for new and innovative projects (Schwienbacher and Larralde, 2012). Thereby, Mollick (2014, p. 2) defines crowdfunding as *"the efforts by entrepreneurial individuals and groups – cultural, social, and for-profit – to fund their ventures by drawing on relatively small contributions from a relatively large number of individuals using the Internet, without standard financial intermediaries."*

Over the past decade, many crowdfunding platforms have emerged that differ in their mode of operation. Four distinct crowdfunding models can be distinguished: equity-, lending-, donation-, and reward-based crowdfunding (Beier and Wagner, 2015; Kuppuswamy and Bayus, 2018). These models differ in what backers receive in exchange for their financial contribution: equity shares (equity-based), interest (lending-based), or no financial return (donation-based). Note that this dissertation focuses on *reward-based crowdfunding*, where backers receive non-monetary rewards like products or services. Most reward-based crowdfunding platforms follow the "all-or-nothing" model, in which a minimum pledge goal must be reached within a limited timeframe. If the pledge goal is not met within this timeframe, the project is canceled, and funds are returned to backers (Ahlers et al., 2015; Belleflamme et al., 2015; Gleasure and Feller, 2016).

Reward-based crowdfunding involves several key parties, each playing a distinct role in the funding process. On the one hand, *entrepreneurs*, also known as project initiators or founders, initiate the crowdfunding project to raise funds, set the pledge goal, define the rewards, and promote their project to persuade backers. Thus, the *project* refers to the specific venture or initiative for which the entrepreneur is seeking funding. On the other hand, *backers*, also known as investors or supporters, make small investments to support the project, often without expertise in venture evaluation. The relationship between the entrepreneur and the backers in rewards-based crowdfunding is usually professional and

business-oriented, as the entrepreneurs seek funding, and the backers want to receive the reward offered in exchange for their financial contribution. Since the interaction is enforced by computer-mediated communication modalities, the relationship can also be classified as socially distant. Finally, the crowdfunding *platform* acts as an intermediary, connecting entrepreneurs and backers by providing an online platform where entrepreneurs can create and manage their projects and backers can discover and fund them. Also, the platform manages the financial transactions and hosts the project presentation (Belleflamme et al., 2015; Li et al., 2017; Mollick, 2014; Zhang and Chen, 2019).

Figure 2.1   Structure, communication modalities, and content of a project presentation

The *project presentation* serves as the primary source of information on reward-based crowdfunding platforms and typically follows a standardized structure, as illustrated in Figure 2.1 (left – schematic). It includes a title, tagline or short description, followed by a visual element such as a pitch video or a picture. In addition, project statistics and information are provided, such as the pledge goal, current funding status, number of backers, time remaining, geographic location, tags, and social media sharing buttons. Furthermore, backers can explore the project in greater depth by scrolling down, which includes a brief profile of the entrepreneur, links to an update and comments section, and a list of available rewards. Next, a project description, accompanied by pictures, is also part of the presentation. That said, to communicate the project, i.e., the business idea for which

the entrepreneur seeks funding, a project presentation is prepared. It typically utilizes verbal and nonverbal modalities, i.e., textual descriptions ¶, pictures 🖼, pitch video ◼️, and speech 🎙. Note that the term project presentation is used in this dissertation when referring to the communication of the business idea utilizing the aforementioned key verbal and nonverbal communication modalities of the presentation (Mollick, 2014). See red-dotted outlines as illustrated in Figure 2.1 (right – visual representation).

In this context, text is the most basic and common modality used in project presentations. It is essential for information disclosure and significantly influences funding decisions. The more information is disclosed, the better backers can comprehend the project (Anglin et al., 2018; Wang et al., 2021; Zhou et al., 2016). Pictures are also essential in influencing funding decisions, adding a visual element, capturing attention, and aiding comprehension (Koch and Siering, 2019; Yang et al., 2020). Unlike static pictures, pitch videos show the project in motion and can include audio/speech, making them the most effective modality for conveying information (Bi et al., 2017; Flusser, 2000; Koch and Siering, 2019; Mollick, 2014; Wang et al., 2021). That said, the project presentation is multi-modal, such that it communicates the business idea through various (combinations of) modalities (Mollick, 2014). Altogether, the project presentation enables backers to evaluate the project before making a funding decision (Beier and Wagner, 2015; Mollick, 2014). Likewise, the objective of the project presentation is to communicate the business idea, providing cues to persuade potential backers (Mollick, 2014). Note that this dissertation focuses on *affective cues* displayed through the communication modalities that are text ¶, picture 🖼, pitch video ◼️, and speech 🎙 (see red-dotted outlines in Figure 2.1).

2.2 The Effects of Affective Cues

Social psychology research has consistently highlighted the social effects of affective cues, particularly how one person's emotional expressions influence the thoughts, feelings, and/or behaviors of one or more other people (van Kleef, 2009; van Kleef and Côté, 2022). For example, experiencing someone's expressed happiness will likely evoke similar feelings in the recipient and may lead them to conclude that things are going well. They may also infer the sender's appraisal of the situation or personality. In an economic context, this, in turn, can influence the recipient's economic decisions (Achar et al., 2016; Loewenstein and Lerner, 2003; van Kleef, 2009).

The studies comprising this cumulative dissertation build upon the Social Presence Theory (Short et al., 1976), the Emotional Contagion Theory (Hatfield et al., 1994), and the Emotion as Social Information (EASI) model (van Kleef, 2014). These theories facilitate

an understanding of how verbal and nonverbal affective cues displayed through various modalities of the project presentation affect backers' attitudes and funding behavior in reward-based crowdfunding.

Empirical research has shown that the perception of social presence, i.e., the feeling of being socially present with others, exerts a positive influence on consumers' perceptions of trust, enjoyment, and emotional appeal. This, in turn, can positively affect purchase intentions on multi-sided platforms (Cyr et al., 2007; Hassanein and Head, 2006). Moreover, promoting social presence via perception of connectedness with and awareness of others in a computer-mediated communication context is an important factor in establishing relationships (Short et al., 1976; Zhang and Benyoucef, 2016). Elements and features of a website that can promote social presence include socially rich texts and pictures (Cyr et al., 2007; Hassanein and Head, 2006), personal profile pages (Kear, 2010), and actions of participation (Tonteri et al., 2011). Thus, to understand the impact of a socially rich project presentation, a socially rich profile page, and an entrepreneur's participation behavior on funding performance, Paper II draws on the Social Presence Theory.

To gain further insight into the effects of affective cues on behavior, researchers refer to the Emotional Contagion Theory (Hatfield et al., 1994). This theory posits that affective cues spread autonomously and subconsciously from sender to recipient, progressing through three stages: mimicry, feedback, and contagion. Affective cues can thus evoke affective states in recipients that are similar to those of the sender by triggering affective reactions (Hatfield et al., 1993; van Kleef, 2009). For example, observing another person's facial expression of happiness can lead to the triggering of a similar affective state. Those triggered emotional responses can lead to positive appraisals of the situation and more optimistic judgments, which affect behavior (Loewenstein and Lerner, 2003; Peace et al., 2006; van Kleef and Côté, 2022). Thus, to understand the effects of facial emotional expressions on funding performance, Paper III employs the Emotional Contagion Theory.

While the concept of affective reactions is widely acknowledged, the Emotion as Social Information model (van Kleef, 2009) further suggests that affective cues can trigger affective reactions and inferential processes. Affective reactions lead to emotional responses, while inferential processes lead to cognitive responses, such as more deliberate assumptions about people and situations based on the experienced affective cue (van Kleef, 2009). Both processes inform the recipient's behavioral responses, such as economic decisions (Jin et al., 2024; van Kleef and Côté, 2022). According to the EASI model, the social effects of affective cues depend significantly on the context in which the communication takes place, which is regulated by norms and expectations (van Kleef, 2009; van Kleef and Côté, 2022). Thus, to be effective, displayed emotional expressions

should align with the context both qualitatively (i.e., showing the right emotion) and quantitatively (i.e., showing the emotion with the right intensity, amount). The effects of affective cues are hence determined by the degree to which recipients perceive them as appropriate (van Kleef and Côté, 2022), that is, as "correct for the situation and in correct proportion to the evoking circumstances" (Shields, 2005, p. 7). Social and contextual factors, including display rules, can further shape norms and expectations regarding the display of affective cues in a particular context. For instance, display rules drive perceptions of how affective cues should be displayed in a certain situation by different social roles or groups (Parkinson and Manstead, 2015). Accordingly, when the display of affective cues violates (explicit or implicit) social norms, expectations, and emotional display rules, affective cues can be perceived as inappropriate, causing negative effects on subsequent behaviors. For example, high amounts of emotional expressions are more likely to be perceived as inauthentic and inappropriate to the extent the relationship is professional or the ambiguity of the situation (Cheshin et al., 2018; van Kleef, 2009; van Kleef and Côté, 2022). Thus, to understand the relationship between affective cues across different communication modalities and funding performance, Papers IV and V draw on the EASI model in the context of reward-based crowdfunding. Collectively, this cumulative dissertation adopts three theoretical lenses when investigating the effects of affective cues.

2.3 Decision-Making under Asymmetric Information

Investments in crowdfunding projects, like any investment, are decisions made under information asymmetry and uncertainty (Akerlof, 1970; Wang et al., 2021). Information asymmetry arises from the unequal distribution of information between entrepreneurs and backers, favoring entrepreneurs (Stiglitz, 2000). Entrepreneurs typically have a comprehensive understanding of their projects, including functionality, quality, and potential for success (Mollick, 2014). In contrast, backers often face challenges due to incomplete information about the project and are at a disadvantage regarding the venture's quality and the entrepreneur's behavioral intent (Huang et al., 2021; Wang et al., 2021). Backers must rely on the unverified information provided through the project presentation, often during the early, uncertain development stages of the project (Belleflamme et al., 2015; Hoegen et al., 2017). Moreover, successful outcomes are not guaranteed. Even if a project reaches its funding goal, the reward as promised is not assured (Tuo et al., 2019). Consequently, backers cope with information asymmetry and uncertainty when contemplating funding decisions (Courtney et al., 2016). To mitigate information asymmetry, backers often compensate for the lack of information by consciously or subconsciously making use of the verbal and nonverbal cues displayed through the project presentation when evaluating the

crowdfunding project (Courtney et al., 2016). Those intentionally or unconsciously displayed verbal and nonverbal cues can serve as proxies for additional information (e.g., Dang-Pham et al., 2021; Lin and Boh, 2021; Moritz and Block, 2016).

When decisions are made under information asymmetry, decision-making processes can be influenced by impressions such as the emotional appeal of a product presentation (Riegelsberger et al., 2003). Since backers do not have access to business plans and lack the expertise to conduct thorough due diligence, affective cues can help to compensate for missing information by shaping the recipient's appraisal of the situation, product, and/or entrepreneur (Achar et al., 2016; Li et al., 2017; van Kleef, 2009). For example, triggered feelings of happiness can lead to a more positive appraisal of a presented object (Peace et al., 2006) and more optimistic judgments (Loewenstein and Lerner, 2003). Based on the displayed affective cues, recipients may also infer the character of the entrepreneur (Hareli and Hess, 2010) and the venture's future success (Huang and Pearce, 2015) or use their emotions as a heuristic in evaluating the entrepreneur and the venture (Baron, 2008). For instance, while displaying passion is positively perceived (Li et al., 2017), expressing positive affective cues unconstrained can be perceived as overconfidence (Shipman and Mumford, 2011). In professional communication scenarios, displaying higher numbers of emotional expressions may generally not be viewed favorably but rather be perceived as inauthentic (Wang et al., 2016). In this regard, backers may suspect impression management motives behind the display of high numbers of affective cues, i.e., a manipulative attempt that uses affective cues as strategical means (Jiang et al., 2023; Parhankangas and Ehrlich, 2014). Thus, higher numbers of affective cues are more likely to be perceived as inappropriate to the extent the relationship is professional, causing negative effects on subsequent behaviors (Cheshin et al., 2018; van Kleef, 2009).

That said, the effects of affective cues are based on the concept that their perception shapes the recipient's affective state and inferences, which, in turn, are incorporated into the decision-making process and influence behavior. In this regard, it is generally argued that the displayed affective cues must align with the context in which they are expressed to be effective (Loewenstein and Lerner, 2003; van Kleef and Côté, 2022). However, the current crowdfunding literature provides little guidance on how to effectively utilize the project presentation's emotional appeal in a computer-mediated communication context, such as reward-based crowdfunding. In this context, relationships are business-oriented, and funding decisions are driven by the rewards offered but also the desire to see a project come to life. Therefore, researchers and entrepreneurs need to gain a deeper understanding of the mechanisms by which the display of affective cues affects funding decisions and how affective cues can be effectively leveraged to increase funding performance.

3 Research Methodology

This dissertation applies various research methods, including a qualitative systematic review and quantitative research methods with different data analysis techniques. Utilizing multiple research methods provides different insights regarding the overarching research question, allowing for an investigation of the effects of affective cues on funding performance from various perspectives. The following sections describe the applied research methods used in each paper, which are also typically applied in crowdfunding research.

3.1 Literature Review – Qualitative Systematic Review

Reviewing previous literature is essential in any research project (Webster and Watson, 2002). It helps to understand the current research knowledge, synthesizes empirical evidence, facilitates theory development, and identifies issues that require additional investigation. A literature review, typically presented in the theoretical background section of an article, provides the foundation and context for the research question. Stand-alone literature reviews, on the other hand, aim to summarize or synthesize the literature of a research area, providing a starting point for researchers interested in a particular topic (Mulrow, 1987; Paré et al., 2015). When literature reviews abstract data from quantitative studies and synthesize the reported effects, they are referred to as qualitative systematic reviews (Paré et al., 2015).

In this dissertation, Paper I conducts a qualitative systematic review to summarize and synthesize the existing empirical reward-based crowdfunding literature on how distinct verbal and nonverbal cues in various communication modalities affect funding performance. This method is appropriate since empirical research has often investigated cues in isolation, with results fragmented across the literature and without providing a straightforward understanding of how these cues may generally affect funding performance (cf. section 1.2). Thus, the literature review aims to provide a structured and comprehensive overview of the cues examined and their reported effects on funding performance.

The literature review follows the two-step approach recommended by Webster and Watson (2002): identification of relevant literature and structuring of the review. The identification process involves querying digital libraries, i.e., ACM Digital Library, AIS Electronic Library, EBSCOHost, IEEE Xplore, SAGE Journals, ScienceDirect, SpringerLink, and Web of Science, using search terms that reflect the central aspects of the research topic, e.g., "reward-based crowdfunding," "cue," "content," "signal," and "appeal." A full-text search is performed without restrictions on specific publication outlets and years.

To ensure a certain quality level, only peer-reviewed academic articles are considered, including leading information systems, economics, and entrepreneurship journals. After the initial search, articles are assessed for eligibility and screened for relevance, focusing on those with empirical evidence on the relationship between the display of cues and funding performance. After the screening, backward and forward searches are conducted.

In the second step, a concept-centric approach is used to structure the literature review (Webster and Watson, 2002). The concepts are represented by synthesizing the cues analyzed in the articles into coherent sub-categories that convey a focal message. This involves carefully reading each article and aggregating conceptually similar cues based on their measurement approaches, appeals, perceptions, and conceptualization. This iterative process results in a structured and comprehensive categorization of cues, i.e., sub-categories such as "perceived narcissism" or "appeal to intrinsic motives."

To conclude the effects of each sub-category, the direction of the reported effects between each hypothesized cue and funding performance is recorded. *Vote-counting* is used to aggregate these effects (Light and Smith, 1971). This method is a quasi-quantitative technique and is applied to compare the aggregated numbers of the reported significant positive, non-significant, significant negative, and (in this review) inverted U-shaped effects. Thereby, vote-counting can provide a quantitative summary. The aforementioned effect with the largest number concludes the prevalent direction of the sub-category. As a limitation, the vote-counting technique does not consider sample size or effect size. Table 3.1 summarizes the qualitative systematic review included in this dissertation.

Table 3.1   Procedure of the qualitative systematic review

Criteria	*Literature review*
	Paper I
Objective	To review and synthesize empirical findings regarding the effects of cues on funding performance.
Type of review	Qualitative systematic review
Review procedure	Consists of two steps, as recommended by Webster and Watson (2002).
Included databases	ACM Digital Library, AIS Electronic Library, EBSCOHost, IEEE Xplore, SAGE Journals, ScienceDirect, SpringerLink, and Web of Science.
Search terms	["reward-based crowdfunding" OR "reward based crowd funding"] AND ["cue*" OR "content" OR "signal*" OR "appeal*"]
Search period	No restriction regarding the year (until October 2022).
Inclusion criteria	Articles that reported empirical evidence on the relationship between the cue displayed and funding performance.
Identified articles	71 as relevant identified academic articles.
Review structuring	Concept-centric classification of cues into sub-categories. Vote-counting to assess the sub-category's prevalent effect on funding performance (significant positive effect, non-significant effect, significant negative effect, or inverted U-shaped effect). Providing research agendas and recommendations for future RBCF research.

3.2 Quantitative Research

Quantitative research is a set of methods for studying real-world phenomena to test hypotheses and answer research questions. It is often applied when pre-existing knowledge and structured data are available, like the crowdfunding domain. Researchers using quantitative methods typically follow a linear process. It involves developing research models and hypotheses, creating measurement instruments to quantify observations, collecting empirical and numerical data, and conducting statistical analysis. Then, the results are reported and discussed (Creswell and Creswell, 2017; Recker, 2021). Since quantitative research relies on established theoretical assumptions, theories, and research models to explore cause-and-effect relationships, it is typically confirmatory rather than exploratory. Altogether, quantitative research emphasizes the collection of large-scale empirical data to assess the status of predefined variables within real-world phenomena. Thereby, measurements link empirical observations to hypothetical relationships. This results in high determinism, a key characteristic of quantitative research methods (Recker, 2021).

In quantitative research, data is collected using structured methodologies such as surveys, experiments, or internet research with content analysis to minimize the researcher's influence on outcomes. Findings from quantitative research approaches are often generalized to larger populations based on the sampled data. This requires consideration of the representativeness of the sample with respect to the target population (Recker, 2021).

Quantitative research approaches assess variables using numerical scales and categorize them as dependent or independent (Krippendorff, 2004; Recker, 2021). The effect of independent variables on dependent variables is tested using statistical models that allow researchers to interpret and draw conclusions about their relationships. Common statistical techniques include descriptive statistics (e.g., mean, standard deviation) and inferential statistics (e.g., regression analysis) (Recker, 2021). Section 3.4 discusses the statistical data analysis techniques applied in this dissertation.

Quantitative research is also characterized by its reliability and internal validity. Reliability ensures consistency in the measurement of variables, while validity ensures accurate measurement. These characteristics are present when a controlled research setting is used (Creswell and Creswell, 2017). Additionally, other researchers should be able to replicate the study and obtain similar results, adding to the validity of the findings. Thus, the results are quantifiable and replicable. The goal is to produce objective findings unaffected by bias (Creswell and Creswell, 2017; Gelo et al., 2008). Thus, quantitative research aims to objectively study hypothetical cause-and-effect relationships in real-world phenomena so that novel findings can be discovered, explained, and documented (Recker, 2021).

3.3 Internet Research and Online Content Analysis

As Papers II, III, IV, and V build on non-reactive internet research and quantitative online content analysis, typically applied in quantitative crowdfunding research, both aspects are described next. Non-reactive internet research refers to methods such as web mining to gather data and insights from online resources like websites (Reips, 2012). Web mining employs tools to extract specific data and content from a website for easy access and analysis (Huhtamäki et al., 2015). This non-reactive approach is used in this dissertation for several reasons. Compared to surveys, interviews, and experiments, it minimizes the influence of the researcher on those involved and the outcomes. The aspect of interest is not directly interacted with and does not contain biases resulting from reacting to the research situation. This approach also allows for the study of large samples and the analysis of behavior on online platforms in real-world settings without the reactivity common in other research methods (Reips, 2006; Reips, 2012). For example, unlike experiments with surveys, which typically brief participants and can only assess intended funding behavior (Li et al., 2017), internet research can access the real-world decisions of backers (e.g., funding raised) from large samples of projects publicly accessible via the Internet.

The analysis of the data and content collected through web mining, which is typically embedded in text, pictures, audio, or video, can be referred to as quantitative online content analysis (Reips, 2006; Reips, 2012). This approach analyzes and transforms the collected data and content to extract dependent and independent variables of interest embedded in the verbal and nonverbal modalities of the website. This includes manual content analysis and automated methods such as computer-aided text analysis (CATA) or computer vision (CV). Regarding the automated methods, CATA systematically categorizes text-based data using software tools and dictionaries that represent theorized constructs (McKenny et al., 2013). CV uses machine learning algorithms to recognize features in images like human faces and facial emotional expressions (Warnick et al., 2021). Both methods can derive numerical data for statistical analysis (Riffe et al., 2019; Sjøvaag and Stavelin, 2012). To reduce the bias inherent in manual content analysis that impacts the validity and reliability of the coding (Creswell and Creswell, 2017; Recker, 2013), the studies in this dissertation employ automated methods to deterministically extract variables from structured and unstructured data for testing cause-and-effect relationships. The following paragraphs outline the automated content analysis methods used in each paper.

The first quantitative empirical study (Paper II) examines the effects of a socially rich project presentation and entrepreneur's participation behavior on funding performance. CATA and CV were applied to 830 Startnext and 780 Kickstarter projects (websites). The

independent variables reflecting the social richness of project descriptions and profile descriptions are measured as the number of affective words in the respective text segments using CATA with the NRC Word-Emotion Association Lexicon by Mohammad and Turney (2013). The independent variables reflecting the social richness of the project pictures and profile pictures were measured as the depiction of humans using CV with Microsoft's Cognitive Services Face API (Microsoft, 2017). The entrepreneur's participation was assessed by automatedly counting answered comments and previously backed projects.

The second quantitative empirical study (Paper III) examines the effects of facial expressions of happiness and sadness displayed through pictures on funding performance. CV and CATA were applied to 18,696 Kickstarter projects. The independent variables reflecting the number of happy and sad facial emotional expressions are measured using CV with Microsoft's Cognitive Services Emotion API (Microsoft, 2023). Additionally, the Microsoft Video Indexer API (Microsoft, 2021) measured the duration of faces visible in the pitch video. In contrast to Paper II, the CATA software LIWC by Pennebaker et al. (2015) was applied to measure the number of positive and negative affective words in the textual description. Note that the variables reflecting the duration of faces visible and the number of affective words were only included as control variables.

The third and fourth quantitative empirical studies (Papers IV and V) examine the effects of affective words in the textual description, affective speech in the pitch video, and facial emotion expressions in pictures and facial emotion expressions in the pitch video on funding performance. CATA and CV were applied to 16,967 Kickstarter projects. The independent variables, which reflect the number of affective written and spoken words, were measured using the CATA software LIWC (Pennebaker et al., 2015). The independent variables, reflecting the number of facial emotional expressions in pictures and the pitch video, were measured using CV with Microsoft's Cognitive Services Emotion API (Microsoft, 2023). Note that Papers III, IV, and V use the same data set and CATA and CV methods but provide three different perspectives on the overarching research question.

The following dependent variables are used to assess the effects of affective cues on funding performance: funding success, measured as a binary variable indicating whether the pledge goal was reached; the total amount of funding raised after project duration ends; the total number of backers after project duration ends; or the average pledge per backer, calculated by dividing the amount of funding raised by the number of backers.

Due to the limitations of the online content analysis applied, the studies could not directly measure, for instance, perceived social presence or the appropriateness when displaying many affective cues. However, the implied effects are informed by the theories utilized.

Table 3.2 summarizes the quantitative studies included in this dissertation. Table 3.2 also lists the applied data analysis techniques, which are discussed in the next section.

Table 3.2   Overview of the quantitative studies

Criteria	*Quantitative study*			
	Paper II	Paper III	Paper IV	Paper V
Objective	To examine how cues related to social presence displayed via project descriptions, profile pages, and entrepreneurs' participation behaviors affect funding success.	To examine how facial emotional expressions of happiness and sadness displayed via project pictures affect funding performance.	To examine how verbal and nonverbal affective cues displayed across different modalities affect funding performance, and how this relationship is influenced by social-contextual factors.	To examine how verbal and nonverbal affective cues displayed across different modalities affect funding performance, and what configurations effectively promote funding performance.
CF model	Reward-based CF	Reward-based CF	Reward-based CF	Reward-based CF
Data source (sample size)	Kickstarter (n=780) Startnext (n=830)	Kickstarter (n=18,696)	Kickstarter (n=16,967)	Kickstarter (n=16,967)
Dependent variable(s)	Funding success	Funding raised Number of backers° Funding success°	Funding raised Number of backers° Pledge per backer°	Funding raised Number of backers° Funding success°
Independent variables of interest	# affective written words in project description # affective written words in profile page # pictures with humans in project description # pictures with humans in profile page # answered comments by entrepreneur # backed projects by entrepreneur	# facial expressions of happiness in pictures # facial expressions of sadness in pictures	# affective written words in project description # affective spoken words in pitch video # facial emotional expressions in pictures # facial emotional expressions in pitch video # backed projects by entrepreneur• # updates• # answered comments by entrepreneur• # created projects by entrepreneur• Pledge goal•	# affective written words in project description # affective spoken words in pitch video # facial emotional expressions in pictures # facial emotional expressions in pitch video
Applied CV tool(s)	MS Face API	MS Emotion API MS Video Indexer	MS Emotion API	MS Emotion API
Applied CATA tool	NRC Lexicon	LIWC	LIWC	LIWC
Applied data analysis techniques(s)	Multiple linear regression	Polynomial regression and U-Test	Polynomial regression with moderation and U-Test	Polynomial regression and U-Test fsQCA

Notes: CF = crowdfunding; n = number of analyzed crowdfunding projects; ○ = applied for robustness checks; # = number of…; ● = moderating variable; MS = Microsoft

3.4 Applied Data Analysis Techniques

The quantitative studies included in the dissertation used various data analysis techniques, such as multiple linear regression, polynomial regression with moderation, U-Test, and fuzzy-set qualitative comparative analyses, to test the hypothesized causal relationships.

3.4.1 Regression Analysis

Regression analysis is a set of statistical, variance-based approaches that quantify the relationship between one or more independent variables and a dependent variable. The objective is to analyze how changes in independent variables affect the dependent variable, allowing for predictions and inferences about cause-and-effect relationships. This helps confirm or reject hypotheses empirically (Draper and Smith, 1998).

There are various types of regression analysis, such as linear regression, which hypothesizes a linear relationship between one independent and a dependent variable. *Multiple linear regression* considers more than one independent variable. *Polynomial regression*, investigating a non-linear relationship, is discussed in section 3.4.2. The selected estimator depends on the dependent variable. *Binary logistic regression* estimates the relationship between independent variables and a binary dependent one using a logistic function. It is applied to regression models that account for the binary dependent variable "success" (Papers II, III, and V). *Ordinary least squares* estimates the relationship between independent variables and a continuous dependent one (Draper and Smith, 1998). It is applied to regression models that account for the continuous dependent variables "funding amount raised," "number of backers," and "pledge per backer" (Papers III, IV, and V).

To assess the goodness of fit of ordinary least squares regression models, the adjusted R^2 coefficient of determination is reported. It indicates the proportion of variance in the dependent variable explained by the independent variables. An adjusted R^2 of 1 indicates that the regression predictions fit the data perfectly. In comparison to the standard R^2, the adjusted R^2 accounts for the number of predictors, preventing inflation from non-meaningful predictors. For binary logistic regressions, pseudo-R^2 values are reported, e.g., the McFadden (1973) or Nagelkerke (1991) R^2 statistics, with McFadden (1973) R^2 values between 0.2 and 0.4 and Nagelkerke (1991) R^2 values above 0.5 indicating a good fit. The improvement of model fit after adding additional independent variables is tested using *F*-tests and Bayesian information criteria (BIC). A significant *F*-statistic indicates a significant difference between the models. The model with the lower BIC value indicates a better model fit (Vrieze, 2012). Multicollinearity is checked using the variance inflation factor (VIF), which should be below ten for each independent variable (Neter et al., 1990).

3.4.2 Polynomial Regression and U-Test

Polynomial regression, a special case of multiple linear regression, models the relationship as a nth-degree polynomial, accounting for a non-linear relationship between the independent and dependent variables. In contrast to linear assumptions, in which the dependent variable increases or decreases with increasing values of the independent variable, a non-linear, *inverted* U-shaped relationship describes a curve where the dependent variable initially increases with increasing values of the independent variable up to a peak (the turning point), after which it decreases. Conversely, a U-shaped relationship shows a decrease to a low point (the turning point), followed by an increase. These curves illustrate scenarios in which the effect of the independent variable on the dependent variable changes direction at the turning point (Haans et al., 2016; Lind and Mehlum, 2010).
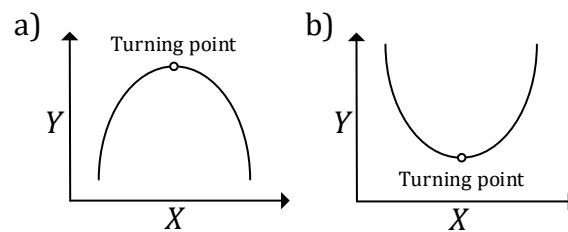
Figure 3.1   Polynomial regression (2nd-degree) – (a) inverted U-shaped and (b) U-shaped curve

A polynomial regression model (cf. Equation 3.1) is used to provide evidence for a non-linear relationship, e.g., an inverted U-shaped effect. In addition to the linear term of the independent variable, a quadratic term of the independent variable is added, allowing the regression model to estimate a curved, non-linear relationship (Haans et al., 2016; Lind and Mehlum, 2010). Thus, to examine the hypothesized *inverted* U-shaped effects of the independent variables "facial expressions of happiness," "facial expressions of sadness," "affective written words," "affective spoken words," "facial emotional expressions in pictures," and "facial emotional expressions in videos" on funding performance, these variables are modeled as 2nd-degree polynomials (applied in Papers III, IV, and V).

$$Y = \beta_o + \beta_1 X + \beta_2 X^2 + \varepsilon \tag{3.1}$$

Equation 3.1 Polynomial regression model

Y is the dependent variable, β_o is the intercept, β_1 is the coefficient for the independent variable X, β_2 is the coefficient for the quadratic term of the same independent variable, and ε is the error term. For expositional simplicity, no control variables are included.

A significant negative β_2 is necessary to indicate an *inverted* U-shaped relationship, a significant positive β_2 would indicate a U-shaped relationship. However, a significant β_2 coefficient alone is not sufficient to formally verify an (inverted) U-shaped relationship.

Therefore, the three-step procedure suggested by Lind and Mehlum (2010) is applied. First, β_2 must be significant and of the expected sign. Note that the sign of β_2 must be negative for an *inverted* U-shape relationship. Second, the slopes at the end of each data range must be sufficiently steep. Thus, both slope tests must be significant, otherwise the relationship might be merely one-half of an (inverted) U-shape. Third, the turning point must be located well within the data range of the independent variable. Steps two and three are carried out with an appropriate *U-Test* (Haans et al., 2016). Papers III, IV, and V apply this test to formally verify an *inverted* U-shaped relationship. Note that it is also recommended to test for multicollinearity, i.e., VIF, as higher-degree polynomial terms can be highly correlated. Using polynomial regression to identify non-linear relationships can uncover complex dynamics between the independent and dependent variables and provide insights that linear models cannot reveal (Haans et al., 2016).

To account for the moderating effects of contextual factors, a third variable Z can be introduced (cf. Equation 3.2). The variable Z moderates the relationship between X and Y so that this relationship changes for varying values of Z. This involves adding the interaction term of the moderator Z and the independent variable X, as well as Z and X^2. These interaction terms allow the regression model to estimate the steepening or flattening of a non-linear, (inverted) U-shaped relationship (Haans et al., 2016).

$$Y = \beta_o + \beta_1 X + \beta_2 X^2 + \beta_3 XZ + \beta_4 X^2 Z + \beta_5 Z + \varepsilon \qquad (3.2)$$

Equation 3.2 Polynomial regression model with a moderating factor Z

Following the recommendations of Haans et al. (2016), flattening depends only on a significant positive β_4 for inverted U-shaped relationships and a significant negative β_4 for U-shaped relationships. Steepening occurs with a significant negative β_4 for inverted U-shaped relationships and a significant positive β_4 for U-shaped relationships. Paper IV investigates the flattening or steepening effect of an inverted U-shaped relationship.

3.4.3 Fuzzy-Set Qualitative Comparative Analysis

Fuzzy-set Qualitative Comparative Analysis (fsQCA) is a configurational approach to analyze complex patterns in social science and behavioral research. Based on set theory and Boolean algebra, fsQCA constructs configurations, i.e., causal recipes. These are distinct combinations of conditions (independent variables) associated with an outcome of interest (dependent variable) (Mattke et al., 2022; Pappas and Woodside, 2021; Pflügner et al., 2024; Ragin, 2008). By accounting for combinations of conditions, fsQCA can enable systemic and holistic perspectives on IS phenomena (Pappas and Woodside, 2021), examining complex causalities among multiple influencing conditions and

accounting for equifinality. Complex causalities mean that an outcome often results from multiple interrelated conditions, i.e., a combination of conditions, rather than one condition in isolation. Equifinality reflects that, in contexts characterized by a high degree of complexity and multifaceted nature, an outcome can be achieved through multiple different combinations of conditions that are equally effective, reflecting different paths to the same result (Pappas and Woodside, 2021; Pflügner et al., 2024; Ragin, 2008). To identify these configurations, fsQCA utilizes quantitative methods that can deal with large numbers of cases (i.e., reward-based crowdfunding projects) (Ordanini et al., 2014; Pappas and Woodside, 2021; Ragin, 2008).

The fsQCA approach involves three steps: calibration, testing for necessary conditions, and analysis of sufficient configurations (Ragin, 2008). In step one, data are transferred into fuzzy sets, where conditions and outcomes can range from 0 (low level, fully out of a set) to 1 (high level, fully in a set) (Ragin, 2008). For example, a fuzzy set value of 0.70 represents a rather high level of the condition, while a fuzzy value of 0.30 represents a rather low level. The point of maximum ambiguity has a fuzzy value of 0.50, meaning that it is unclear whether the observation is classified as closer to being in the set (presence of the condition) or out of the set (absence of the condition). For linear relationships, the "S-shape" function is used, and for non-linear relationships, the "Bell-shape" function is used to transfer data into fuzzy sets by direct calibration (Ragin, 2008). In step two, the fsQCA tests whether any condition is necessary for the outcome, meaning that the condition appears in all observations with the outcome of interest (Dusa, 2019). In step three, the fsQCA tests for sufficient configurations, which reflect a combination of conditions that lead to a particular outcome. To do so, a truth table is constructed, listing all possible configurations (2^k, where k is the number of conditions). Then, recommended frequency thresholds, consistency thresholds, and proportional reduction in inconsistency thresholds are applied to identify meaningful configurations (Fiss, 2011; Maggetti and Levi-Faur, 2013; Mattke et al., 2022; Pappas and Woodside, 2021). Next, the Quine-McCluskey algorithm simplifies the truth table to reveal the sufficient configuration, reflecting a combination of conditions (Dusa, 2019). Typically, more than one sufficient configuration exists. As the choice of thresholds for calibration can impact the results, additional validation tests should be applied (Mattke et al., 2022).

This dissertation applies fsQCA as it complements the regression analysis by providing an additional perspective on causal relationships. While the regression analysis tests for the significance of individual independent variables or specific interaction terms on a dependent variable assuming symmetric relationships, fsQCA examines whether certain conditions are necessary or whether distinct combinations of conditions are sufficient for

an outcome. In this regard, fsQCA accounts for complex causalities, equifinality, and asymmetric relationships. For regression analyses, factors leading to positive outcomes are mirror images of the negative outcome, i.e., only the sign of the factor is reversed. Regarding fsQCA, both positive and negative outcomes (i.e., high and low funding performance) can have multiple sufficient configurations, reflecting distinct, interrelated combinations of conditions. This allows for a comprehensive exploration of causal relationships, overcoming some limitations of regression analysis. Also, it is argued that the results of multiple n^{th}-degree interaction terms in a regression analysis are difficult to interpret. The fsQCA approach can facilitate the interpretation with configurations. Also, fsQCA can provide results explained by infrequent, often smaller parts of the dataset that are typically not captured by regression analyses. This can result in additional insights. These differences, however, should be seen as complementary strengths. Accounting for variance-based effects (regression analysis) and a configurational perspective (fsQCA) can provide more nuanced insights into the same research objective. The regression results, for example, can be used to specify the high and low levels of a condition (fully in or out of a set) more precisely, approaching the fsQCA calibration process with substantive knowledge about the effects of the condition. Overall, for complex phenomena with multiple interacting factors, e.g., concurrent display of affective cues, the use of both data analysis techniques can provide a robust approach for analyzing and reporting distinct aspects of the cause-and-effect relationships being examined (Fiss, 2011; Mattke et al., 2022; Pappas and Woodside, 2021; Ragin, 2008; Vis, 2012). Furthermore, it is recommended to perform both fsQCA and regression analysis, as the triangulation of findings from both data analysis techniques can strengthen the validity of conclusions (Vis, 2012).

Thus, Paper V uses, in addition to regression analysis, fsQCA to identify combinations of modalities and affective cues (conditions) leading to high funding (outcome). This provides a multi-modal perspective and suggests configurations on how to orchestrate and combine affective cues across various modalities to achieve an optimal impact on funding performance. To reflect the non-linear relationship between affective cues and funding performance, Paper V uses the non-linear regression results to adjust the fsQCA calibration process (see section 15.3.2.2 of Paper V for a detailed description) (Dusa, 2019).

In conclusion, this dissertation uses primarily quantitative but distinctive research methods and data analysis techniques to address the main research question of this dissertation from multiple perspectives. In so doing, the quantitative empirical studies examine how affective cues, displayed via various computer-mediated communication modalities of the project presentation, can be quantified and how these measurements of affective cues affect funding performance. The limitations of this approach are discussed in section 6.

4   Main Research Results

This cumulative dissertation consists of five research papers with a focus on the effects of affective cues on the performance of reward-based crowdfunding projects. It is divided into three parts, where each part addresses one of the three central research questions. Part I presents a literature review (Paper I). It synthesizes the effects of distinct cues on funding performance (including affective cues), addressing the first research question. Part II consists of three quantitative empirical studies (Papers II, III, and IV). They examine the effects of affective cues on funding performance and influencing factors, addressing the second research question. Part III consists of one quantitative empirical study (Paper V). It provides a multi-modal perspective on the effects of affective cues on funding performance, addressing the third research question. Next, the main research results of each paper and their relevance to the research questions are provided.

4.1   Paper I: Literature Review on the Effects of Cues on Funding Performance [1]

The objective of Paper I is to review and synthesize the empirical reward-based crowdfunding literature regarding the reported effects of distinct cues on funding performance. Understanding which cues affect funding decisions in reward-based crowdfunding is crucial, as the content of the project presentation significantly affects funding performance (e.g., Cappa et al., 2020; Mollick, 2014; Wang et al., 2023). When potential backers evaluate the crowdfunding project, they perceive and consider multiple verbal and nonverbal cues, enabling them to make more informed decisions (Courtney et al., 2016; Zhou et al., 2016). However, while many studies have focused on cues that affect decision-making in reward-based crowdfunding, the reported findings are fragmented and often inconclusive. Thus, it is vital to synthesize the empirical findings and provide a structured, comprehensive, and concept-centric categorization of how distinct cues affect funding performance.

Following the recommendations of Webster and Watson (2002), the literature review identifies 71 articles that reported empirical evidence on the effects of cues on funding performance. Thereby, Paper I can also provide an overview of the current research in terms of platforms analyzed, theoretical lenses applied, and operationalizations of funding performance. Most articles analyze Kickstarter (58/71) and apply signaling theory (17/71)

(Connelly et al., 2011) as a theoretical lens. Table 4.1 summarizes the operationalization of funding performance, with "success," "funding raised," "number of backers," and "funding ratio" commonly utilized to refer to the effects of the cues analyzed.

Table 4.1   Summary of the applied funding performance variables in RBCF of Paper I

Funding performance	Definition	n
Success	If the project raised its pledge goal = 1, otherwise = 0	47
Funding raised	Funding raised after the project duration ends	32
Number of backers	Number of backers after project duration ends	23
Funding ratio	Funding raised divided by pledge goal	21
Funding intention	Intention to fund a project	8
Social media exposure	Number of likes and shares on social media	2
Pledge per backer	Funding raised divided by the number of backers	2
Pledge per day	Funding raised divided by project duration	1
Time to raise pledge goal	Number of days it took to raise the pledge goal	1
Sharing intention	Intention to share the project on social media	1
Margin	Funding raised minus pledge goal	1

Note: n = number of articles

The concept-centric classification reveals that the empirical reward-based crowdfunding literature has explored many distinct cues, resulting in three main research topics: *communication strategies, perceived entrepreneurs' characteristics*, and *appeal to emotions*. Each topic has four to five sub-categories. Most research focuses on cues related to the following sub-categories: *perceived entrepreneurial traits* and *appeal to extrinsic motives*, followed by *positive verbal affective cues* and *language characteristics*. Figure 4.1 illustrates the concept-centric classification of the cues analyzed and the prevalent direction of each sub-category on funding performance.
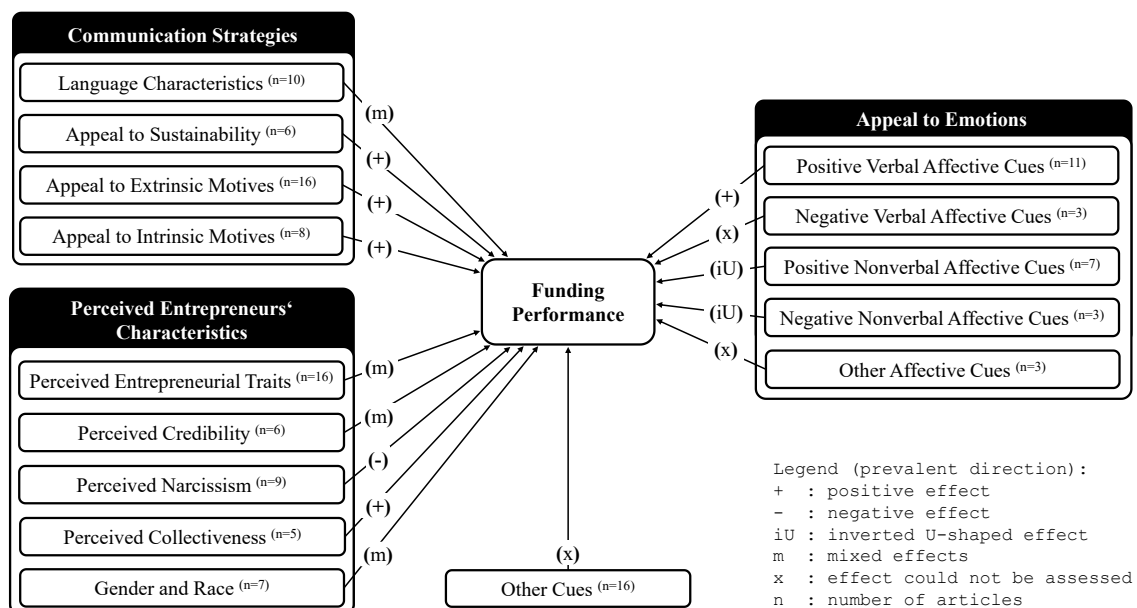
Figure 4.1   Prevalent direction of each concept-centric classification on funding performance

To synthesize the effects of each sub-category, Paper I applies vote-counting (Light and Smith, 1971). Thereby, the significant negative effects, non-significant effects, significant positive effects, and inverted U-shaped effects are counted and grouped together to assess the prevalent effect's direction in each sub-category on funding performance.

Table 4.2 illustrates the vote-counting results for the sub-category *positive verbal affective cues* as an example. It also reports the associated modalities and how the sub-category has been conceptualized by listing commonly analyzed cues. Cues related to positive verbal affective cues are "number of positive emotional words," "ratio of positive emotional words," "tone," or "sentiment." These cues, analyzed only in the textual descriptions of project presentations, affect funding performance. Vote-counting reports mainly positive effects (16/27), but also negative (2/27) and a few non-significant effects (8/27). A first indication of an inverted U-shaped effect (1/27) is also reported. These vote-counting results indicate a prevailing *positive effect* between *positive verbal affective cues* and funding performance. Since articles often consider multiple funding performance variables (e.g., as robustness checks), the number of reported effects can exceed the number of articles analyzed. The vote-counting results for each sub-category are detailed in Paper I.

Table 4.2   Vote-counting results for the sub-category *positive verbal affective cues* of Paper I

Positive verbal affective cues (n=11)						
Cues related to written positive emotional words, e.g., "number of positive emotional words," "ratio of positive emotional words," "tone," or "sentiment."						
More positive than negative/non-significant effects. First indications of an inverted U-shape effect.						
		Effect on funding performance (vote-count)				
		–	o	+	inv. u	Σ_m
Embedded in	**Text**	2 [59]	8 [8,11,24,43,50]	16 [7,11,18,28,33, 43,59]	1 [4]	27
	Σ_e	2	8	16	1	

Notes: n = number of articles; – = significant negative effect (p<0.05); o = non-significant effect; + = significant positive effect (p<0.05); inv. u = significant inverted U-shape effect; […] = references; Σ_m = sum of each modality; Σ_e = sum of each effect.

In conclusion, Paper I presents a qualitative systematic review of the empirical reward-based crowdfunding literature, summarizing the effects of cues on funding performance, which addresses the first research question. Particularly, Paper I shows that many studies have examined and reported the effects of a wide range of distinct cues. It also systematically structures and synthesizes the reported effects, revealing a prevalent effect on funding performance for sub-categories such as *positive verbal affective cues, appeal to sustainability*, and *perceived narcissism*. However, the effects for sub-categories like *perceived entrepreneurial traits*, *language characteristics*, and *negative verbal affective cues* are less straightforward and require further investigation.

4.2 Paper II: Relationship Between Social Presence and Funding Performance [2]

The objective of Paper II is to examine the effects of a socially rich project presentation, a socially rich profile page, and the entrepreneur's participation behavior on funding performance. While early research on reward-based crowdfunding has focused on factors such as the length of the project description and the number of pictures (Koch and Siering, 2015; Mollick, 2014), the content of the project presentations, in particular cues that facilitate the perception of social presence, has not been investigated. Since the content of a product presentation affects behavior (e.g., Cyr et al., 2007; Hassanein and Head, 2006), it is vital to better understand how specific cues displayed through the project presentation's communication modalities affect the success of crowdfunding projects.

Paper II's research model follows the social presence theory and differentiates between the media richness view and the relational view to analyze the effects of socially rich projects and the entrepreneur's participation behavior (Kehrwald, 2008). In this regard, the media richness view measures the number of affective words and the depiction of humans in the project presentation and the entrepreneur's profile page. These cues facilitate the perception of being socially present with another person and capture a certain aspect of the presentation's emotional appeal (Cyr et al., 2007; Gefen and Straub, 2003; Hassanein and Head, 2006). The relational view examines the entrepreneur's participation behavior as measured by the entrepreneur's responses in the comment section and the number of projects backed. In addition, the research model includes several commonly analyzed project-related control variables. Regarding the dependent variable, funding performance is assessed by whether the project was successfully funded.

Paper II analyzed data from 830 Startnext projects and 780 Kickstarter projects using non-reactive internet research and quantitative online content analysis. The research model was evaluated using multiple linear regression, considering an assumed linear effect of the independent variables on funding success. The independent variables reflecting the social richness of project descriptions and profile descriptions are measured as the number of affective words in the respective text segments using the NRC Word-Emotion Association Lexicon. The independent variables reflecting the social richness of project pictures and profile pictures are measured as the depiction of humans using Microsoft's Cognitive Services Face API. The entrepreneur's participation was assessed by counting

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[2] Raab, M., Friedrich, T., Schlauderer, S., and Overhage, S. (2017). Understanding the Role of Social Presence in Crowdfunding: Evidence from Leading U.S. and German Platforms, in *Proceedings of the 25th European Conference on Information Systems (ECIS)*, Guimarães, Portugal, pp. 1758-1774. https://aisel.aisnet.org/ecis2017_rp/113/

the number of answered comments and previously backed projects. Figure 4.2 presents the research model and the main research results of the regression analysis.
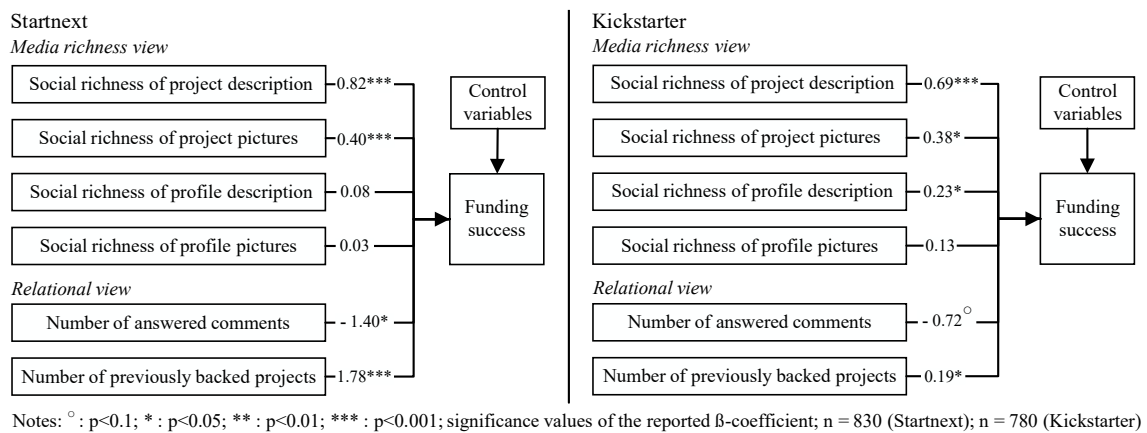
Figure 4.2   Research model and main research results of Paper II

The regression results of Paper II provide empirical evidence that backers' funding decisions are susceptible to the display of cues that facilitate the perception of being socially close to another person and relate to the emotional appeal of the project presentation. While the social richness of project descriptions and project pictures is positively associated with the success of crowdfunding projects, a socially rich profile page has a rather limited effect. Specifically, the social richness of profile descriptions has only a significant effect on the success of Kickstarter projects. The social richness of profile pictures has no effect, regardless of the platform. Regarding the entrepreneur's participation behavior, the number of answered comments has a negative effect, and the number of previously backed projects has a positive effect on the success of crowdfunding projects.

In conclusion, Paper II empirically demonstrates that certain cues, displaying social presence via computer-mediated communication modalities, can affect funding decisions in the context of reward-based crowdfunding. The study empirically shows that the social richness of a project presentation and the entrepreneur's participation behavior, but barely the social richness of an entrepreneur's profile page, affect funding success. The results of Paper II provide initial empirical evidence of how the emotional appeal of a project presentation affects funding performance, addressing the dissertation's second research question. This is evidenced by the observation that affective words and depictions of humans displayed via the project presentation have an effect on funding success. Although facial emotional expressions are not assessed, they can be assumed to be present when humans are depicted (Warnick et al., 2021). Also, the relationship between the emotional appeal of a project presentation and funding success does not seem to be influenced by the platform's size or regional context, as the results show minimal differences between Startnext (a smaller German platform) and Kickstarter (a leading international platform).

4.3 Paper III: Non-linear Effects of Facial Emotional Expressions on Funding Performance [3]

The objective of Paper III is to examine the effects of facial emotional expressions of happiness and sadness, displayed through project presentation pictures. Previous reward-based crowdfunding studies have reported how sentiment or tone, i.e., the emotional appeal of textual descriptions, affects funding performance (Koch and Siering, 2019; Wang et al., 2017). However, the effects remain largely unexplored for distinct kinds of facial emotional expressions, as well as for the number of facial emotional expressions, i.e., the displayed intensity, in nonverbal computer-mediated communication modalities like pictures. Building upon Paper II, which only examined the depiction of humans via the project pictures, Paper III provides more substantiated insights into the effects of distinct facial emotional expressions on funding performance.

Paper III's research model follows the Emotional Contagion Theory and, in general, the assumption that emotional expressions must align with the context qualitatively (i.e., displaying the right kind of emotion) and quantitatively (i.e., displaying the emotion with the right intensity) to be effective (van Kleef, 2014). Regarding the qualitative aspect, Paper III examines the effects of facial expressions of happiness and sadness. Each one reflects a different valence, i.e., positive and negative emotional expression, and has the potential to influence economic decisions (Peace et al., 2006; van Kleef et al., 2010). Regarding the quantitative aspect, Paper III considers an inverted U-shaped effect of facial emotional expressions on funding performance, such that the display of facial expressions of happiness and sadness starts with a positive effect only until overly high numbers, i.e., too much of a good thing, begin to trigger negative effects. In addition, the research model includes several commonly analyzed entrepreneur- and project-related control variables. The dependent variable is reported as the amount of funding raised.

Paper III analyzes 18,696 Kickstarter projects using non-reactive internet research and quantitative online content analysis. The research model is evaluated using polynomial regression with a U-Test to formally verify the existence of an inverted U-shaped relationship between the number of facial expressions of happiness and sadness in pictures and funding performance. These independent variables are measured using Microsoft's Cognitive Services Emotion API. Figure 4.3 presents the main research results, i.e., U-Test results and a graphical representation of the resulting inverted U-shaped relationship.

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[3] Raab, M., Schlauderer, S., Overhage, S., and Friedrich, T. (2020). More Than a Feeling: Investigating the Contagious Effect of Facial Emotional Expressions on Investment Decisions in Reward-Based Crowdfunding, *Decision Support Systems*, 135. https://doi.org/10.1016/j.dss.2020.113326
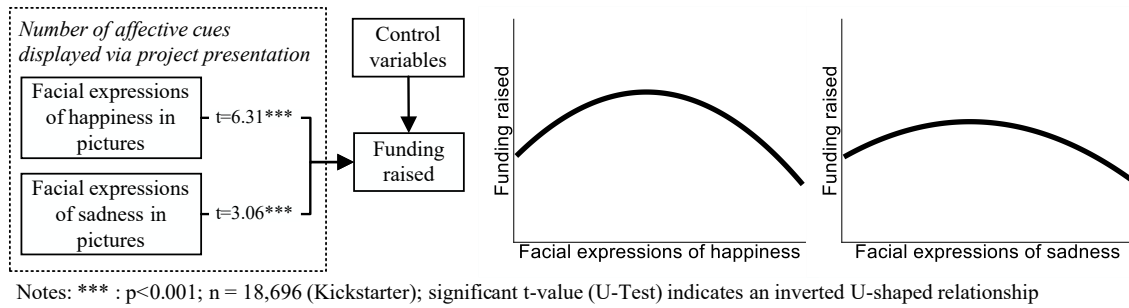
Figure 4.3   Research model and research results of Paper III

The regression results of Paper III provide novel empirical evidence that backers' funding decisions are susceptible to nonverbal emotional expressions. Specifically, facial expressions of happiness and sadness, displayed through project presentation pictures, have a non-linear, inverted U-shaped relationship with funding performance. That said, after exceeding a certain threshold, the positive and optimal impact (near the turning point) on funding performance by displaying a moderate number of facial emotional expressions diminishes, and displaying higher numbers of facial emotional expressions results in negative effects. Additional robustness checks verify the stability of the results, e.g., when accounting for other dependent variables (cf. Appendix of Paper III). Paper III also highlights that the relationship between facial emotional expression and funding performance is non-linear, regardless of the valence. Also, facial expressions of happiness can raise higher amounts of funding than facial expressions of sadness when displayed at an optimal level. When further accounting for and differentiating between project types, i.e., artistically related and technology-related projects, the non-linear effects slightly differ. Particularly, facial expressions of sadness only have an inverted U-shaped effect on funding raised regarding artistically related projects and no effect regarding technology-related projects. However, the relationship between facial expressions of happiness and funding raised is non-linear regardless of the project type.

In conclusion, Paper III empirically demonstrates that facial expressions of happiness and sadness, displayed through project presentation pictures, have an inverted U-shaped effect. Thus, the results of Paper III provide additional empirical evidence of how the emotional appeal of project presentation pictures affects funding performance, addressing the dissertation's second research question. Thereby, the relationship between facial emotional expressions and funding performance is non-linear and appears to be significantly influenced by the amount displayed. Moderate instead of high amounts result in the highest numbers of funding raised. This inverted U-shaped effect is not influenced by the kind of emotional expression (happiness vs. sadness) but slightly by the project type (artistically related vs. technology-related).

4.4 Paper IV: Moderating Impact of Social-Contextual Factors on the Effective Use of Verbal and Nonverbal Affective Cues [4]

The objective of Paper IV is to further examine the *non-linear* relationship between *verbal affective cues* (affective words in text and speech) as well as *nonverbal affective cues* (facial emotional expressions in pictures and pitch video) and funding performance. Previous reward-based crowdfunding studies have suggested that affective cues (e.g., number of positive emotional words, perceived passion) positively affect funding performance. In general, they mostly assumed a linear effect, such that more affective cues lead to stronger, positive effects. However, studies have reported inconclusive results regarding the display of higher numbers of affective cues (Koch and Siering, 2019; Li et al., 2021; Parhankangas and Renko, 2017; Wang et al., 2016). Furthermore, Paper III only examined affective cues in project presentation pictures. Therefore, it is not entirely clear how intensively affective cues should be expressed in other verbal and nonverbal communication modalities of the project presentation to be most effective, i.e., to achieve high funding, especially through the pitch video and speech. Also, none of the few studies that have accounted for the non-linear effects of specific affective cues in isolation (Jiang et al., 2020b; Warnick et al., 2021; Zhou et al., 2016) considered the moderating impact of social or contextual factors prevalent in reward-based crowdfunding. In this context, interactions between entrepreneurs and backers are mediated by information technology, their relationship is business-oriented, professional, and socially distant, and decisions are made under uncertainty (Mollick, 2014). Thus, insights are needed into how intensively affective cues can be expressed via the various communication modalities of the project presentation to effectively increase funding performance. Social-contextual factors influencing the assumed inverted U-shaped relationship between affective cues and funding performance must also be considered (van Kleef and Côté, 2022).

The research model of Paper IV follows the Emotion as Social Information model (van Kleef, 2009), and that subsequent behavior is determined by the degree to which recipients perceive the number of displayed affective cues as appropriate (van Kleef and Côté, 2022). Building on the findings of Paper III, Paper IV considers an inverted U-shaped effect of verbal and nonverbal affective cues on funding performance. Thereby, up to a moderate number of verbal and nonverbal affective cues, the effect is positive, until

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[4] Raab, M., Schlauderer, S., and Overhage, S. When Emotions Become Inappropriate: How Social-Contextual Factors Moderate the Effect of Emotional Expressions on Funding Decisions in Reward-Based Crowdfunding, *Electronic Commerce Research and Applications*. under review

overly high numbers of affective cues trigger negative effects. Furthermore, Paper IV examines how social-contextual factors, particularly the quality of the relationship between entrepreneurs and backers and the level of uncertainty under which the funding decision must be made, impact the inverted U-shaped relationship. Depending on the manifestation of the social-contextual factors, it is expected that higher numbers of affective cues will be tolerated to a greater or lesser extent. In addition, the research model includes several commonly analyzed project-related control variables. Funding performance is reported as the amount of funding raised.

Paper IV analyzes 16,967 Kickstarter projects using non-reactive internet research and quantitative online content analysis. The research model has been evaluated using polynomial regression with a U-Test to formally verify an inverted U-shaped relationship between verbal and nonverbal affective cues and funding performance. Flattening or steepening effects are analyzed following Haans et al. (2016). The number of verbal affective cues in text and speech (emotional words) is measured using the LIWC (Pennebaker et al., 2015). The number of nonverbal affective cues in pictures and pitch video (facial emotional expressions) is measured with Microsoft's Cognitive Services Emotion API (cf. section 14.4.1 of Paper IV). Social-contextual factors reflecting project uncertainty and relationship quality are identified by automatically extracting the information from project presentations. These moderating variables are detailed in Figure 4.4. It also presents the main research results, i.e., U-Test results for each affective cue on funding performance and the moderating impact of the social-contextual factors on the non-linear relationship of each affective cue. Figure 4.5 presents a graphical representation of the inverted U-shaped relationships and moderating effects. Note that Figure 4.5 shows only the moderating effect on the number of *emotional spoken words*. All graphical representations for each moderation are reported in Paper IV Appendix Figure 14.4 – Figure 14.8.

Notes: *** : p < 0.001; ** : p < 0.01; * : p < 0.05; n = 16,967 (Kickstarter); emo. exp. = emotional expressions; significant t-value (U-Test) indicates an inverted U-shaped relationship; (a)(b)(c)(d) reflect the the moderating effect of the social-contextual factor on the respective affective cue (ß-coefficient)
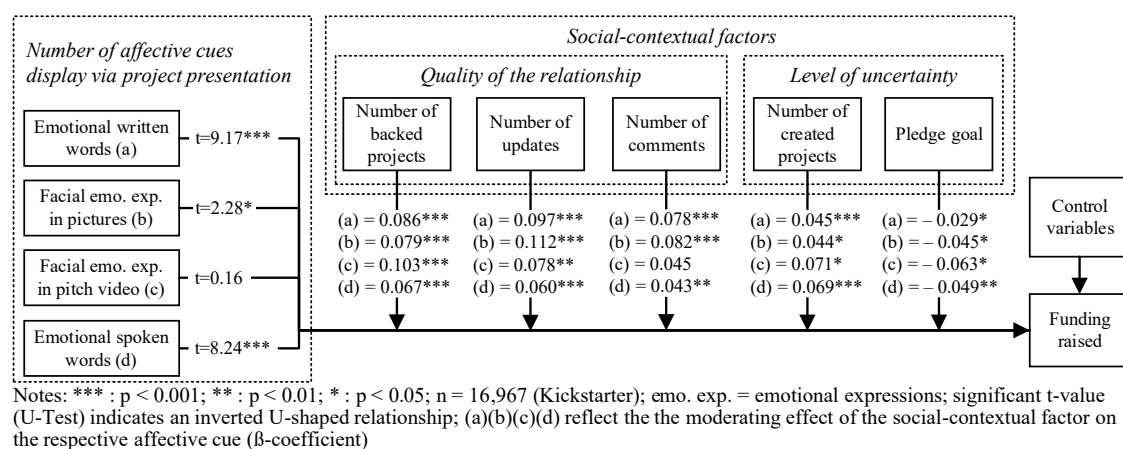
Figure 4.4   Research model, research results reflecting the non-linear effects, and research results reflecting the moderating impact of factors on non-linear relationships from Paper IV
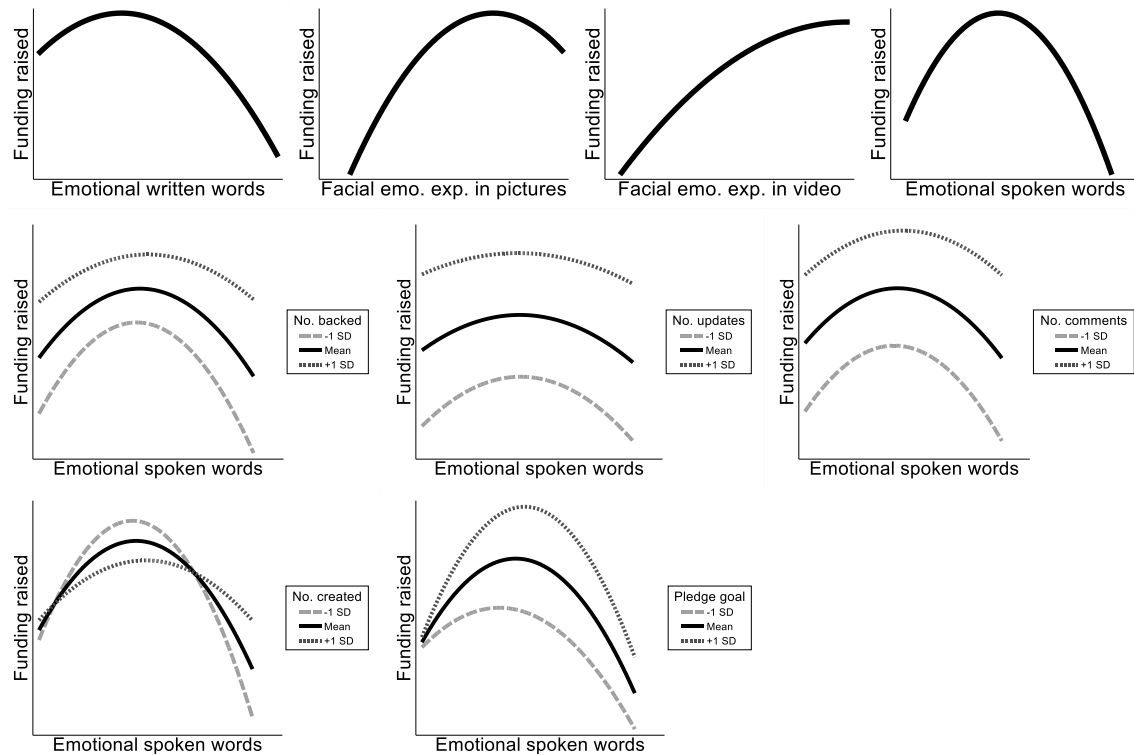
Figure 4.5 Graphical depiction of the non-linear effects and the moderating impact from Paper IV

The regression results are twofold. First, Paper IV provides empirical evidence that back-ers' funding decisions are susceptible to verbal and nonverbal affective cues. Specifically, the number of affective words in text and speech and the number of facial emotional expressions in pictures and pitch videos have a non-linear relationship with funding per-formance. The initial positive effect of displaying affective cues decreases beyond a cer-tain threshold and, in most cases, turns negative. For facial emotional expressions in the pitch video, a saturation rather than an inverted U-shaped effect is observed. Second, the moderation analysis shows that the non-linear effect of affective cues on funding perfor-mance is not the same for all projects but is influenced by social-contextual factors. Spe-cifically, higher numbers of affective cues are tolerated more (the curve is flatter) if en-trepreneurs take action to establish a closer, familiar relationship with backers (*higher relationship quality*). Also, affective cues are tolerated more (the curve is flatter) if the pledge goal is lower and entrepreneurs are more experienced (*lower level of uncertainty*). Additional robustness checks verify the stability of the results, e.g., when only accounting for positive affective cues or other dependent variables (cf. Appendix 14.8 of Paper IV).

In conclusion, Paper IV empirically shows that the number of displayed verbal and non-verbal affective cues has a non-linear relationship with funding performance. Also, Paper IV provides novel insights into how the inverted U-shaped relationship is influenced by social-contextual factors prevalent in reward-based crowdfunding (quality of the relation-ship and level of uncertainty), addressing the dissertation's second research question.

4.5 Paper V: Multi-Modal Perspective on Effective Use of Verbal and Nonverbal Affective Cues [5]

The objective of Paper V is to further examine the non-linear relationship between verbal affective cues (affective words in text and speech) as well as nonverbal affective cues (facial emotional expressions in pictures and pitch video) and funding performance. In comparison to Paper IV, it explores the interplay between affective cues across communication modalities (i.e., concurrent display of affective cues through textual descriptions, pictures, pitch video, and speech), providing a multi-modal perspective. Project presentations allow for the utilization of various combinations of distinct modalities, conveying varying amounts of affective cues. However, most studies focused on affective cues displayed through a single modality, largely ignoring the multi-modal and multifaceted nature of project presentations (e.g., Koch and Siering, 2019; Li et al., 2021; van Kleef and Côté, 2022; Yang et al., 2020). Thus, the interplay of affective cues across multiple modalities remains underexplored, with no recommendations for optimal combinations that support high funding performance. In this regard, it remains unclear if affective cues in different modalities reinforce or substitute each other. Current evidence from studies related to the EASI indicates that affective cues elicit similar responses regardless of the modality, i.e., functional equivalence (van Kleef and Côté, 2022). Yet, it has also been suggested that concurrently perceived affective cues across modalities can enhance the accuracy of emotion recognition and understanding, potentially having additive effects (Gerdes et al., 2014; Klasen et al., 2012; Paulmann and Pell, 2011). Whether such additive effects affect funding performance remains uncertain (van Kleef and Côté, 2022). Therefore, a multi-modal perspective is vital for understanding how affective cues should be orchestrated across modalities to influence funding performance effectively.

The research model of Paper V follows the Emotion as Social Information model (van Kleef, 2009), and that the effects of affective cues are determined by the degree to which recipients perceive them as appropriate (van Kleef and Côté, 2022). Building upon Paper IV's insights, Paper V also considers an inverted U-shaped effect of verbal and nonverbal affective cues on funding performance. Furthermore, Paper V considers the interplay of concurrently displayed affective cues in project presentations. Paper V also argues, in line with the equifinality principle, that in contexts characterized by a high degree of complexity and multifaceted nature, an outcome can be achieved through multiple and

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[5] Raab, M., Schlauderer, S., and Overhage, S. I've Got a Feeling – A Multi-Modal Perspective on how Emotional Expressions Affect Investment Decisions in Reward-Based Crowdfunding, *Small Business Economics*. in revision for the second round of review

different combinations of conditions that are equally effective (Pappas and Woodside, 2021). Thus, Paper V's research model examines the non-linear effects (cf. section 3.4.2) and configurational aspects of affective cues (cf. section 3.4.3). The research model includes several commonly analyzed entrepreneur- and project-related control variables. Funding performance is reported as the amount of funding raised.

Paper V analyzes 16,967 Kickstarter projects using non-reactive internet research and quantitative online content analysis. The research model has been evaluated using polynomial regression with a U-Test to formally verify an inverted U-shaped relationship between affective cues and funding performance. The number of verbal affective cues in text and speech (emotional written and spoken words) is measured using the LIWC (Pennebaker et al., 2015). The number of nonverbal affective cues in pictures and pitch video (facial emotional expressions) is measured with Microsoft's Cognitive Services Emotion API (cf. section 15.3.1.2 of Paper V). In addition, Paper V uses fsQCA to identify different combinations of modalities and affective cues that may lead to high funding performance. Figure 4.6 presents the main research results, particularly the U-Test, as well as a graphical representation of the inverted U-shaped relationships. Figure 4.7 shows the fsQCA results, reporting four configurations.

Notes: *** : $p < 0.001$; ns = non-significant; n = 16,967 (Kickstarter); emo. exp. = emotional expressions; significant t-value (U-Test) indicates an inverted U-shaped relationship
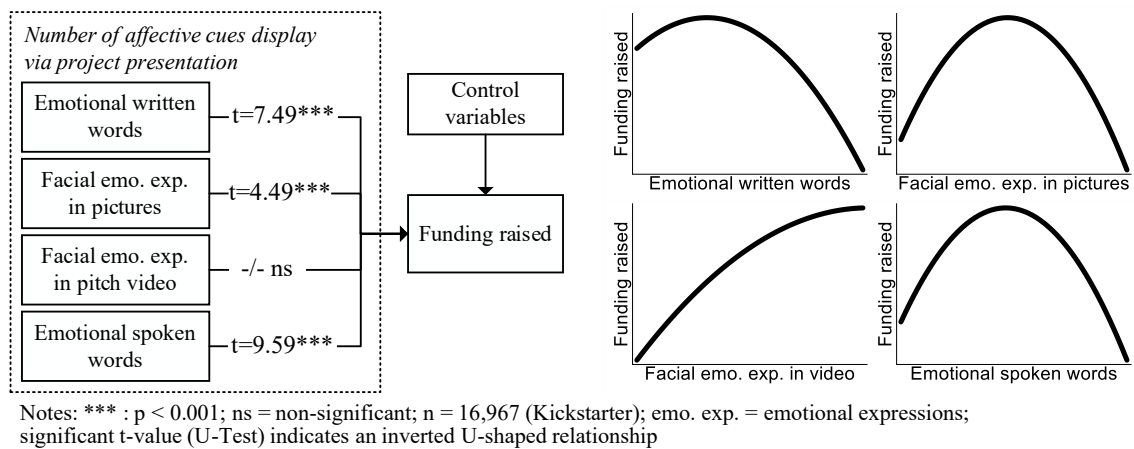
Figure 4.6   Research model, regression results, and graphical representation of Paper V

fsQCA configuration	Emotional written words	Facial emo. exp. in pictures	Facial emo. exp. in pitch video	Emotional spoken words	Number of words	Number of pictures	Video duration	Number of spoken words	Outcome
C1 – affective verbal	●			●	●	●	●	●	High funding raised
C2 – affective video			●	●	●	●	●	●	
C3 – affective non-video	●	●	○	○	●	●	○	○	
C4 – non-affective		○	○	○	○	○	○	○	Low funding

Notes: The symbol ○ indicates the absence and ● indicates the presence (near turning point) of the condition. Blank cells indicate a "don't care" situation. In this case, the affective cue plays a subordinate role and may be either present or absent.

Figure 4.7   fsQCA results of Paper V

The results are twofold. First, Paper V reaffirms the empirical evidence that the number of affective words in text and speech and the number of facial emotional expressions in pictures and pitch videos have a non-linear relationship with funding performance. The positive effect of displaying affective cues decreases beyond a certain threshold and, in most cases, turns negative. For facial emotional expressions in the pitch video, a saturation rather than an inverted U-shaped effect can be observed. Additional robustness checks verify the stability of the results (cf. Appendix 15.7 of Paper V). For example, the results do not differ significantly when differentiating between project types, i.e., artistically related and technology-related projects, or valence, i.e., positive and negative affective cues, emphasizing the non-linear effects of affective cues on funding performance.

Second, the fsQCA complements the regression results and provides a multi-modal perspective on the effective use of affective cues in reward-based crowdfunding. The fsQCA reports how affective cues can be effectively orchestrated across different modalities to reach an optimal outcome, i.e., high funding raised, with three configurations: *affective verbal* (C1), *affective video* (C2), and *affective non-video* (C3) *presentation*. These configurations show that it is not mandatory to express affective cues in all modalities to achieve an optimal outcome. Yet, no modality and no affective cue is a necessary factor. Also, none of them alone is sufficient to reach high funding. Thus, a certain combination of affective cues is essential to achieving an optimal outcome. Since the relationship between affective cues and funding performance is non-linear, it is most effective to express an 'optimal' level of affective cues until the positive effect diminishes or even turns negative. Furthermore, it is not a drawback when all modalities display affective cues at their 'optimal' level (i.e., near the turning point), as the reported "don't care" conditions are irrelevant. Also, the three configurations show that it is sufficient to display affective cues through two modalities. Therefore, conveying an 'optimal' level of affective cues through two modalities seems to be the most efficient, optimized way. Projects reaching only low funding performance have in common that the presentation lacks almost any emotional appeal (cf. C4 – *non-affective presentation*). Additional post-hoc tests and sensitivity analyses verify the stability of the results (cf. Table 15.6 and Appendix 15.7 of Paper V).

To provide additional insight into the multi-modal effects of affective cues on funding performance, a post-hoc regression analysis further examines the interplay between affective cues across modalities. Table 9.1 presents the results of a polynomial regression with moderation that examines the impact of an affective cue of one modality on the non-linear relationship of an affective cue of another modality (cf. section 9 – Introductory Paper – Appendix). Note that this analysis is an addendum to Paper V. With respect to the identified configurations of the fsQCA yielding an optimal outcome by displaying a

particular combination of affective cues at an 'optimal' level, i.e., near the turning point, the following interdependencies are investigated: to reflect C1, the interplay between emotional written words and emotional spoken words; to reflect C2, the interplay between facial emotional expressions in pitch videos and emotional spoken words; and to reflect C3, the interplay between emotional written words and facial emotional expressions in pictures. Figure 9.1 provides a graphical representation of the interdependence of affective cues across these combinations (cf. section 9 – Introductory Paper – Appendix). The positive and significant coefficient for most *"affective cue ^{2}" × "moderator affective cue"* interaction terms provide preliminary indications that the non-linear, inverted U-shaped curves flatten when affective cues are displayed across multiple modalities. This may indicate the presence of a synergistic confluence of affective cues, whereby the display of multi-modal emotional expressions is complementary, as suggested by the fsQCA configurations. Likewise, the non-linear relationship seems steepened when affective cues are displayed through a single modality. Furthermore, Figure 9.1 provides preliminary indications that higher funding can be raised when affective cues are displayed at an 'optimal' level across multiple modalities, which corroborates the fsQCA results. A marginally higher level of funding could be raised if emotional written words (as the moderating variable) were displayed to a somewhat lesser extent. Since affective cues are perceived through multiple sensory channels and processed by interconnected memory systems (Gerdes et al., 2014; Jacob et al., 2014; Klasen et al., 2014), determining which affective cue is the moderating one may prove challenging. Further research, e.g., NeuroIS, is therefore required to address this aspect in more depth. Figure 9.1 also provides preliminary indications that displaying affective cues across modalities beyond their 'optimal' level amplifies the negative effects of intensive use of affective cues, resulting in lower funding performance. Likewise, displaying almost no affective cues results in lower funding performance. With the applied regression analysis, this addendum shows an additional methodological approach to exploring the multi-modal effects of affective cues on funding performance and the effective use of affective cues, complementing the fsQCA.

In conclusion, Paper V empirically shows that verbal and nonverbal affective cues have a non-linear relationship with funding performance. Furthermore, Paper V provides an additional, multi-modal perspective regarding the interplay between affective cues and how they can be orchestrated across modalities to effectively affect funding performance, addressing the dissertation's third research question. Thereby, Paper V provides nuanced insights that, in complex, multi-modal, and multifaceted contexts, an outcome often results from multiple interrelated conditions rather than one in isolation. Also, an outcome can be achieved through various combinations of conditions that are equally effective.

5   Contributions and Implications

This cumulative dissertation contributes to both theoretical contributions and practical implications, which are discussed in the following sections.

5.1   Contributions to Theory

The dissertation consists of five research papers, divided into three parts, with each part addressing one of the three central research questions. Part I synthesizes the effects of distinct cues on funding performance. Part II examines the effects of affective cues on funding performance and influencing factors. Part III provides a multi-modal perspective on the effects of affective cues. Each part contributes to the theoretical discourse in a distinct manner.

5.1.1   Effects of Cues on Reward-Based Crowdfunding Performance

Many studies have examined conceptually similar cues displayed via reward-based crowdfunding project presentations, but findings are often fragmented and inconclusive (e.g., Anglin et al., 2018; Bollaert et al., 2019; Defazio et al., 2020; Li et al., 2021). Accordingly, the reward-based crowdfunding literature lacks a holistic understanding regarding the relationship between the display of distinct verbal and nonverbal cues and funding performance. To address this gap, the first part of this dissertation presents a qualitative systematic review, synthesizing the effects of researched cues expressed through the project presentation (Paper I). While some literature reviews exist, they lack a comprehensive analysis of the various examined cues in verbal and nonverbal modalities and their reported effects (e.g., Alhammad et al., 2022; Hoegen et al., 2017).

The synthesis of the empirical findings of reward-based crowdfunding studies provides a comprehensive overview of the cues examined. It highlights their role as proxies for backers to assess additional information and inform their funding decisions when evaluating the project. By examining the relationship between conceptually similar cues displayed through the project presentation and their effects on funding performance (significant negative, non-significant, significant positive, and inverted U-shaped effect), the review offers an aggregated view of these effects and their prevailing direction. Paper I adds to the literature (e.g., Alhammad et al., 2022; Hoegen et al., 2017) by emphasizing that the communication modalities (i.e., text, pictures, and video), the content, and especially the cues embedded within these modalities, are essential to impact decision-making.

The literature review in Paper I identifies several gaps in reward-based crowdfunding research and suggests areas for future investigation. While studies have analyzed conceptually similar cues related to "entrepreneurial characteristics," "communication strategies," and "emotional appeal" (cf. section 4.1), aspects such as financial indicators remain underexplored. Paper I also recommends analyzing new or previously examined cues, especially embedded in pictures, pitch videos, and speech. These modalities have received less attention. Also, research has mostly focused on cues conveyed via a single modality without considering a multi-modal perspective and potential interaction effects (Hoegen et al., 2017). Thus, the effects of distinct combinations of cues on funding decisions and their potential for reinforcement or substitution are unclear.

Certain sub-categories, such as "appeal to sustainability," "perceived narcissism," or "perceived collectiveness," show effects that point in a clear direction. Conversely, the prevailing direction of other sub-categories, such as "negative verbal affective cues," "entrepreneurial traits," and "perceived credibility," is more difficult to assess or is not yet clear. Further research is therefore needed to understand the nuances of their impact on funding performance. In so doing, research can also consider contextual factors.

Paper I also proposes that when studies report both positive and negative effects of conceptually similar cues on funding performance, such contrasting findings may indicate a non-linear relationship. Consequently, future research should consider both linear and non-linear effects of cues. Accounting for non-linear effects may help researchers integrate the contrasting findings into a joint framework.

Furthermore, Paper I identifies shortcomings in the reviewed articles and provides suggestions for future research. For instance, most studies used secondary data obtained through internet research and quantitative online content analysis. Thus, conducting surveys and experiments to measure the effects of cues on funding performance during decision-making is beneficial to investigating and understanding the mechanisms of how cues impact funding behavior. Paper I also encourages the adoption of theoretical frameworks beyond signaling theory (Connelly et al., 2011) to provide a comprehensive understanding of how distinct cues influence decision-making. For example, the EASI model (van Kleef, 2009) could be applied when examining affective cues, while role congruity theory (Eagly and Karau, 2002) can be utilized when examining gender-related cues. Additionally, as research has primarily focused on the English-speaking platform Kickstarter, Paper I recommends diversifying reward-based crowdfunding research by investigating European and Asian platforms. Overall, the review presented in Paper I serves as a foundation for future research on the efficacy of cues, helping researchers to comprehend the effects of cues and identify less-explored research areas.

5.1.2   Effects of Affective Cues on Funding Performance and Influencing Factors

Social psychology research indicates that affective cues must align with the context qualitatively (i.e., displaying the right emotion) and quantitatively (i.e., displaying the emotion with the right intensity, amount) to be effective (van Kleef, 2014). When these norms are violated, affective cues are perceived as inappropriate, causing negative effects on subsequent behaviors. Furthermore, explicit or implicit display rules shape expectations about the appropriateness of emotional expressions (van Kleef, 2009; van Kleef and Côté, 2022). While the latter assumptions have primarily been examined in face-to-face communication, they lack theoretical and empirical verification in contexts where affective cues are displayed through computer-mediated communication modalities, such as the reward-based crowdfunding context. Moreover, reward-based crowdfunding research has often assumed that high amounts of affective cues lead to stronger, positive effects (e.g., Koch and Siering, 2019; Li et al., 2017). However, the reported findings are inconsistent and inconclusive (Shneor and Vik, 2020). To address these research gaps, the second part of this dissertation includes three empirical studies (Papers II, III, and IV) that provide theoretical and empirically validated insights into the effects of affective cues on funding performance and influencing factors.

Papers II, III, and IV contribute to the application of theories to better understand the relationship between affective cues and funding performance. Paper II introduces the concept of social presence (Short et al., 1976) in the context of reward-based crowdfunding. It shows that cues related to the perception of social presence are vital to understanding funding behavior in reward-based crowdfunding, where the relationship between entrepreneur and backer can be socially distant (Mollick, 2014). Paper III introduces the Emotional Contagion Theory (Hatfield et al., 1993), which suggests that affective cues, particularly facial emotional expressions, have a contagious effect. They may elicit subconscious, automatic affective reactions in backers, evoking a similar or complementary emotional state to that of the sender. As reflected by the results, this, in turn, can affect funding behavior, providing initial evidence that facial emotional expressions, even when expressed via the project presentation, influence decision-making. Papers IV and V utilize the Emotion as Social Information model (van Kleef, 2009) to understand further the non-linear effects of affective cues on funding performance. It illustrates that the effects of affective cues are determined by the degree to which backers perceive them as appropriate, which is shaped by social and contextual factors prevalent in the context of reward-based crowdfunding. Thus, EASI advances crowdfunding research by showing how the

effects of affective cues are dependent on the communication context in which they are displayed. In conclusion, this dissertation employs a set of lenses theoretically grounded in social presence, emotional contagion, and emotion as social information. This offers additional perspectives on how affective cues affect funding behavior besides the frequently applied signaling perspective (e.g., Jiang et al., 2020a; Koch and Siering, 2019).

Regarding the empirical contributions, Paper II demonstrates that the social richness of a project presentation and the entrepreneur's participation behavior positively affect funding success. However, the social richness of an entrepreneur's profile page has barely an effect. These results provide initial empirical evidence that the emotional appeal of project presentations significantly affects funding performance. While previous studies have focused on factors such as the length of the project description and the number of pictures (Koch and Siering, 2015; Mollick, 2014), Paper II provides insights into how cues facilitating social presence and emotional appeal increase funding success.

Papers III, IV, and V build on Paper II. Paper III examines how the valence and number of facial emotional expressions affect funding performance. It demonstrates that facial expressions of happiness and sadness, particularly the amount displayed, affect funding behavior. It provides the first empirical evidence of an inverted U-shaped relationship, where the positive effect of facial expressions of happiness and sadness diminishes after a threshold, with higher numbers resulting in negative effects. Accordingly, Paper III shows that moderate usage of affective cues rather than high numbers is most effective. Moreover, the effects are non-linear, regardless of their valence. This suggests that emotional punctuation, i.e., using an optimal level of positive and/or negative affective cues that support the message, could increase the persuasiveness of the project presentation. For example, a negative emotion can be expressed when emphasizing the seriousness of a problem and a positive emotion when highlighting the solution to the problem (Warnick et al., 2021). Unlike studies focusing solely on the number of pictures (Beier and Wagner, 2015; Koch and Siering, 2019; Zhou et al., 2016), Paper III provides insights into how the content, i.e., the emotional appeal of project pictures, affects funding performance.

Papers IV and V build on the reported non-linear effects of facial emotional expression in pictures of Paper III. They further examine the non-linear effects of affective cues systematically across the main verbal and nonverbal communication modalities, especially concerning the hardly examined pitch video and speech. Papers IV and V reaffirm the non-linear effect of facial emotional expressions in pictures on funding performance and extend the non-linear relationship to affective words in text and speech and facial emotional expressions in pitch videos. Given the professional, business-oriented nature of the entrepreneur-backer relationship (Mollick, 2014), displaying higher numbers of affective

cues appears to violate display rules about the appropriateness, i.e., how affective cues should be displayed by entrepreneurs when seeking funding in the context of reward-based crowdfunding. The negative effects of displaying a high number of affective cues align with research on the social effects of emotion in other professional settings such as service providing (e.g., Cheshin et al., 2018; van Kleef and Côté, 2022). This emphasizes the assumption that a positive impact on the recipient's behavior is more likely when the displayed affective cues are perceived as appropriate regarding the context in which the communication occurs. In this regard, this dissertation provides empirical evidence that affective cues cannot simply be used unconstrained, as typically suggested (e.g., Li et al., 2021; Parhankangas and Renko, 2017; Wang et al., 2016), but need to be tailored to the professional, business-oriented context of reward-based crowdfunding to successfully persuade backers. In this regard, this dissertation highlights that moderate use of affective cues is most effective, and displaying high numbers can be "too much of a good thing."

In addition, Paper IV provides empirical evidence on how specific social-contextual factors further influence the non-linear relationship between affective cues and funding performance, which has not been investigated thus far (van Kleef and Côté, 2022). The study considers the quality of the relationship between entrepreneurs and backers and the level of uncertainty under which funding decisions must be made. Thereby, it investigates two broad sets of factors that characterize the social context in which affective cues are displayed and perceived (van Kleef and Côté, 2022). In so doing, Paper IV takes a novel approach to examine when affective cues become inappropriate in reward-based crowdfunding and which social-contextual factors lead to higher numbers of affective cues being tolerated to a greater or lesser extent. The analyzed social-contextual factors may help explain the display rules prevalent in reward-based crowdfunding, i.e., how intensively affective cues can be displayed in this context by entrepreneurs seeking funding.

Regarding additional contextual factors that may influence the relationship between affective cues and funding performance, Paper II provides empirical evidence that the effects of emotional appeal on funding success do not seem to be influenced by the platform's size or regional context. The results show minimal differences between Startnext and Kickstarter. This comparison advances crowdfunding research that has primarily focused on Kickstarter (e.g., Allison et al., 2017; Koch and Siering, 2019). Furthermore, the relationship between each affective cue and funding performance is inverted U-shaped, non-linear regardless of the communication modality, i.e., text, speech, picture, and video (Papers IV and V), as well as project type, i.e., artistically related and technology-related projects (Paper V). Likewise, the dissertation shows that a non-linear relationship between affective cues and funding performance is present regardless of whether

accounting for the valence, i.e., positive affective cues (Papers III, IV, and V), negative affective cues (Papers III and V), or no differentiation (Papers IV and V). In reward-based crowdfunding, positive affective cues are the most dominantly expressed ones (e.g., Koch and Siering, 2019; Warnick et al., 2021). Only when accounting for the valence *and* the project type, Paper III can report some nuanced differences for facial expressions of sadness. They have an inverted U-shaped effect on funding performance only in artistically related projects and no effect in technology-related projects. However, the relationship between facial expressions of happiness and funding performance is non-linear regardless of the project type. Overall, the dissertation considers various factors regarding their influence on the inverted U-shaped relationship between the display of affective cues and funding performance in reward-based crowdfunding.

While studies in professional contexts such as service providing or negotiation have focused on examining the effects of affective cues within face-to-face communication, this dissertation demonstrates that affective cues also elicit behavioral responses in a communication context mediated by information technology. Overall, by examining the effects of affective cues on behavioral responses and influencing factors, this dissertation focuses on areas that have generally "received little or no attention" (van Kleef and Côté, 2022, p. 648). This advances information systems and entrepreneurship research in the context of reward-based crowdfunding.

5.1.3 Effects of Multi-Modal Emotion Expression on Funding Performance

Although entrepreneurs can utilize verbal and nonverbal modalities with varying amounts of affective cues to persuade backers, research on reward-based crowdfunding has largely overlooked the multi-modal aspect of project presentations. Thus far, the majority of studies have concentrated on the analysis of affective cues from a single modality and in isolation, ignoring a multi-modal perspective on the effects of affective cues (e.g., Koch and Siering, 2019; Li et al., 2021; van Kleef and Côté, 2022; Yang et al., 2020). Consequently, the interaction between affective cues across modalities remains underexplored, including whether and how affective cues in different modalities might reinforce or substitute each other. The literature also offers limited guidance on how to orchestrate affective cues across modalities for an optimal outcome, i.e., high funding raised (van Kleef and Côté, 2022). To address this research gap in reward-based crowdfunding and social psychology research, the third part of this dissertation presents an empirical study (Paper V) that provides a multi-modal perspective on the effective use of affective cues in reward-based crowdfunding and how to approach it methodologically.

Paper V follows a recent call by van Kleef and Côté (2022) to compare the social effects of affective cues across multiple expressive modalities (i.e., face, voice, and words) in one research approach, employing also regression analysis and fsQCA. Thus far, current regression analysis crowdfunding studies would conclude to display affective cues across all modalities (e.g., Koch and Siering, 2019; Steigenberger and Wilhelm, 2018; Wang et al., 2016; Warnick et al., 2021; including Paper IV). However, fsQCA considers that an outcome, in contexts characterized by a high degree of complexity, results from a combination of conditions rather than one in isolation. Also, the outcome can be reached with multiple different configurations that are equally effective. In this regard, fsQCA shows that it is not mandatory to display affective cues across all modalities for an optimal outcome. Nevertheless, it is not a drawback if all modalities display affective cues at their 'optimal' level. The fsQCA results provide novel insights that neither an isolated use of affective words in text or speech nor the display of facial emotional expressions in pictures or videos is a necessary but also not a sufficient condition to reach high funding. Instead, distinct combinations of affective cues at 'optimal' levels, i.e., near the turning point, across multiple modalities are sufficient. That said, the audiovisual integration of affective cues in videos, the concurrent perception of affective cues in textual descriptions and pictures, and the combination of affective textual descriptions and speech seem to reinforce each other's effects across modalities, resulting in higher funding. On the other hand, a project presentation lacking almost any emotional appeal fails to secure funding. This further emphasizes that the reported combinations of affective cues jointly shape the emotional experience and influence funding decisions in reward-based crowdfunding.

In this context, the fsQCA results contribute to research on multi-modal emotion expression, which has highlighted that emotion detection and recognition are enhanced with concurrent access to multiple affective cues of different modalities (e.g., Gerdes et al., 2014; Klasen et al., 2012; Paulmann and Pell, 2011). Based on the configurations identified as conducive to high funding, Paper V suggests that multi-modal emotion expression not only improves emotion perception and processing but also reinforces the effects of affective cues and significantly affects behaviors such as funding decisions. While Paper V supports the functional equivalence hypothesis, which posits that the effects of affective cues are similar across expressive modalities (van Kleef and Côté, 2022), it also extends this perspective. As such, the interplay between affective cues across expressive modalities must be considered to understand better the effects of affective cues on behavior in this multi-modal, computer-mediated communication context.

Following the recent recommendations of Pappas and Woodside (2021), methodologically, the combination of regression analysis and fsQCA provides comprehensive and

complementary insights, overcoming some limitations of regression analysis in examining complex causalities. While the regression analysis provides insights into the non-linear relationship between affective cues and funding performance, the fsQCA shows that no single configuration can explain the diverse characteristics of project presentations that lead to high funding. Instead, multiple configurations of affective cues can reach high funding in complex, multi-modal environments. FsQCA further simplifies the interpretation of models with otherwise multiple n^{th}-degree interaction terms (e.g., the inverted U-shaped effects of concurrently displayed affective cues across modalities). It also uncovers additional insights from smaller parts of datasets often overlooked by regression analysis, such as the C3 – *affective non-video* configuration. As the calibration process is more precise through the use of substantive knowledge (Ragin, 2008), the non-linear regression results can be used to specify the 'optimal' level of a condition. That said, the combined approach of regression analysis and fsQCA provides a framework for examining causal relationships, complementing each other by providing different perspectives on the effects of affective cues. As outlined in Table 5.1, each part of this dissertation makes substantial theoretical contributions that respond to the three central research questions.

Table 5.1   Summary of the main theoretical contributions of this dissertation

Part	Theoretical contributions
Part 1: Effects of Cues on Reward-Based Crowdfunding Performance	• Providing a systematic literature review of the effects of distinct cues on funding performance in the context of reward-based crowdfunding. • Comprehensive overview of the researched cues and an aggregated summary of the reported effects and their prevalent direction. • Identification of research gaps and recommendations for future research.
Part 2: Effects of Affective Cues on Funding Performance and Influencing Factors	• Investigating the effects of affective cues in a context where communication is mediated by information technology. • Applying a set of lenses that are theoretically grounded in the concepts of social presence, emotional contagion, and emotion as social information. This offers additional perspectives on how affective cues affect funding behavior, besides the frequently applied signaling perspective. • Social richness of a project presentation and the entrepreneur's participation behavior increase funding success. • Affective cues embedded in textual descriptions (affective written words), speech (affective spoken words), pictures (facial emotional expressions), and pitch video (facial emotional expressions) have an inverted U-shaped, non-linear relationship with funding performance. • The inverted U-shaped, non-linear relationship is influenced by factors such as the quality of the relationship and the level of uncertainty.
Part 3: Effects of Multi-Modal Emotion Expression on Funding Performance	• FsQCA provides a configurational perspective on the effects of affective cues and complements regression analyses. • Displaying affective cues across all modalities is not mandatory, nor is the display of any affective cue in isolation a necessary but also not a sufficient condition to reaching higher funding performance. • Instead, distinct combinations of affective cues at an optimal level (i.e., near the turning point) across two modalities are needed and are the most efficient way to reach higher funding performance.

5.2 Implications for Practice

This dissertation offers several practical implications for entrepreneurs developing project presentations, backers, and crowdfunding platform operators. The implications relate to the display of cues, especially affective cues, to increase reward-based crowdfunding performance. Each part contributes to the practical implications in a distinct manner.

The first part of this dissertation reports a qualitative systematic review that provides practitioners with consolidated knowledge on which and how cues affect funding performance (Paper I). The review can be used by entrepreneurs as a means of identifying the most influential cues to display through project presentations. For example, entrepreneurs should highlight rewards, express gratitude and passion, and use relationship-building language to positively affect funding performance (Koh et al., 2020; Li et al., 2017; Nielsen and Binder, 2020; Yuan and Wang, 2020). However, entrepreneurs should be aware of the cues they unconsciously display, as not all encourage funding decisions, such as perceived narcissism, vague and informal language, or cues of intimidation (Butticè and Rovelli, 2020; Calic et al., 2021; Costello and Lee, 2022). Thus, platform providers can provide recommendations on best practices. For backers who may not be aware of the potential impact of cues on their behavior, the review also aims to inform backers of how cues can influence funding decisions.

The second part of this dissertation demonstrates how the display of affective cues affects funding performance and how this effect is influenced by the context in which the affective cues are expressed (Papers II, III, and IV). These insights should help practitioners to appeal emotionally to backers effectively and increase funding performance.

In this regard, Paper II offers entrepreneurs insights on the cues and actions that increase social presence in a context where the interaction between entrepreneurs and backers is mediated by information technology and their relationship is typically business-oriented, professional, and socially distant. That said, entrepreneurs should incorporate socially rich, emotional text and images of humans, preferably themselves, into the project presentations to increase the probability of success. In addition to these design recommendations, entrepreneurs should actively engage in crowdfunding communities by supporting other projects, fostering reciprocity, which, in turn, increases the likelihood of success.

To benefit from a socially rich and emotional project presentation, entrepreneurs must ensure that the affective cues displayed are qualitatively and quantitatively appropriate to the reward-based crowdfunding context, i.e., displaying the right affective cues with the right amount. Regarding the display of facial emotional expressions, Paper III recommends displaying happiness and sadness in pictures but cautions against excessive use.

The positive effects diminish with increasing intensity. Thus, the display of affective cues should complement the presentation, not dominate it. At moderate instead of high numbers, facial expressions of happiness and sadness can be effective in driving funding performance. To illustrate, entrepreneurs might use images of people expressing happiness, including themselves, when experiencing the promised reward (for example, see Figure 2.1) or expressing negative emotions to emphasize the seriousness of a problem.

In addition to providing design recommendations on how to effectively display facial emotional expressions through pictures, Papers IV and V also highlight the non-linear effects of affective cues in text, speech, and pitch video on funding performance. Regardless of the communication modality, the valence, or the project type, it is recommended to avoid high numbers of affective cues. They unfold negative effects and may discourage potential backers from supporting the project. Thus, entrepreneurs should be aware that the positive effects of displaying affective cues can be reversed. According to the literature, excessive use of affective cues may appear inauthentic, inappropriate, or reduce perceived competence, which contradicts backers' expectations of rationality and professionalism (Wang et al., 2016). Thus, entrepreneurs should balance the display of affective cues within each modality and adhere to the implicit display rules of professional, business-oriented communication. In general, a moderate number of affective cues increases funding performance and seems appropriate to approach backers on an emotional level. Overall, the effectiveness of affective cues in the context of reward-based crowdfunding is contingent on the extent to which they are perceived as appropriate.

In practice, however, it may be difficult to accurately hit a moderate, appropriate amount. In this regard, Paper IV illustrates how social-contextual factors can help mitigate adverse effects when displaying slightly higher amounts of the affective cues that would have negative effects on funding performance. Paper IV suggests that entrepreneurs should support other projects and engage with backers to foster personal relationships. Within personal and socially close relationships, emotional communication is more common and is therefore perceived as more appropriate (Berscheid and Ammazzalorso, 2003; Cheshin, 2020; Smoski and Bachorowski, 2003). In addition, backers seem to have a lower tolerance for a higher number of affective cues when they are uncertain about the outcome of a decision. Therefore, projects with high pledge goals and inexperienced entrepreneurs should be cautious about displaying higher amounts of affective cues via the project presentation, as such displays may not be perceived as appropriate within such a context.

The third part of this dissertation provides insights that enable entrepreneurs to better understand which combination of verbal and nonverbal affective cues affect funding performance (Paper V). Given that project presentations allow for different combinations of

modalities with varying amounts of affective cues (Koch and Siering, 2019; Yang et al., 2020), Paper V shows that a project presentation must provide a certain level of emotional appeal to achieve high funding. For entrepreneurs, it is not mandatory to display affective cues across all modalities, however, displaying affective cues through only one modality is not sufficient to reach high funding. Displaying an 'optimal' level of affective cues (i.e., a moderate amount, which is near the turning point) across two modalities is a key factor in reaching high funding. The following recommendations are made: First, an 'optimal' level of verbal and nonverbal affective cues should be displayed in pitch videos. This makes affective cues in written descriptions and pictures less relevant. Second, in contrast, when no pitch video is available, the project presentation should display an 'optimal' level of verbal and nonverbal affective cues in the textual description and pictures. Third, by emphasizing an 'optimal' level of verbal affective cues in textual descriptions and speech, entrepreneurs can focus, for instance, on product features via the nonverbal modalities. Each of these combinations of affective cues can lead to a more efficient and persuasive project presentation. Overall, operators of reward-based crowdfunding platforms should provide guidelines on how to emotionally appeal to potential backers.

As outlined in Table 5.2, each part of this dissertation provides practical recommendations for entrepreneurs seeking to effectively use affective cues in reward-based crowdfunding project presentations to increase funding performance.

Table 5.2   Summary of the main practical implications of this dissertation

Part	Practical implications
Part 1: Effects of Cues on Reward-Based Crowdfunding Performance	• Literature review provides consolidated knowledge on how and which cues affect funding performance. • Results of the literature review provide guidelines on how and which cues to display intentionally to increase funding performance, and to be mindful of unconsciously displayed cues with negative effects.
Part 2: Effects of Affective Cues on Funding Performance and Influencing Factors	• Integrating socially rich cues into project presentations, such as emotional text and images of humans, increases the success of the crowdfunding project. Engaging with the crowdfunding community, such as funding other projects to foster reciprocity increases the likelihood of success. • Displaying affective cues in the form of emotional written words (in the textual description), emotional spoken words (in the pitch video), and facial emotional expressions (in the pictures and pitch video) can positively affect funding performance. However, affective cues cannot simply be used unconstrained because displaying an optimal level (a moderate number of affective cues, not high numbers) results in the highest funding performance. • Social-contextual factors, like the level of uncertainty and the quality of the relationship, can influence backers' tolerance for displaying high numbers.
Part 3: Effects of Multi-Modal Emotion Expression on Funding Performance	• The project presentation requires a certain level of emotional appeal to reach high funding performance. This can be achieved efficiently when displaying affective cues at optimal levels across two modalities. • High funding performance can be reached through multiple different combinations of conditions that are equally effective.

6   Limitations

Several limitations should be considered when interpreting the results of this cumulative dissertation. The literature review in Paper I is limited by the search terms used, the databases consulted, and the relevance screening applied. The literature review also excluded articles on predictive accuracy and focused solely on cues that are considered to have a direct effect on funding performance. Conceptually similar cues are grouped based on the underlying concepts, theories, measurement approaches, and perceptions. However, alternative approaches may exist to synthesizing the analyzed cues. In addition, vote-counting does not consider sample size or effect size. The use of methods such as meta-analysis with statistical methods is recommended for further investigations, specifically when examining and discussing the effects of selected sets of (conceptually similar) cues (Joseph et al., 2007; Paré et al., 2015). In general, the results that reflect the prevalent direction of cues on funding performance apply only to reward-based crowdfunding.

This dissertation presents a series of empirical studies examining the effects of affective cues on funding performance displayed through different communication modalities of a project presentation (Papers II, III, IV, and V). Since each empirical study focused exclusively on reward-based crowdfunding platforms that also operate under the "all-or-nothing" business model, namely, Startnext (a German platform) and Kickstarter (the leading international platform), the findings on the effects of affective cues on funding performance cannot easily be generalized and transferred to other crowdfunding platforms and business models. At the platform level, these include donation-, lending-, and equity-based crowdfunding platforms (cf. section 2.1). At the business model level, this includes the "keep-it-all" model, in which the entrepreneur retains any pledged funds even if the project does not reach the targeted pledge goal. This business model is used, for example, by the reward-based crowdfunding platform Indiegogo and significantly amplifies the risk of loss to backers (Huang et al., 2021).

Due to the limitations of the applied internet research and quantitative online content analysis, collecting and analyzing data directly from crowdfunding websites (cf. section 3.3), Paper II could not provide empirical evidence that the displayed affective cues and the entrepreneur's participation behavior increased the perception of social presence. In this regard, Paper III could not directly measure if facial emotional expressions triggered an emotional contagion process. Also, Paper IV's and V's research approach could not measure whether backers perceived higher numbers of affective cues as inappropriate. However, the findings of the empirical studies in this cumulative dissertation align well with the theoretical predictions and proposed effects of the Social Presence Theory (Paper

II), the Emotional Contagion Theory (Paper III), and the Emotion as Social Information model (Papers IV and V). This alignment suggests that the findings are adequate to explain the observed phenomenon and make inferences plausible. For example, Warnick et al. (2021) argued that reported non-linear effects can serve as a proxy for when the display of affective cues is perceived as appropriate. Yet, alternative explanations may exist.

Regarding the examined communication modalities, this dissertation focused on affective words in the written and spoken narration as well as facial emotional expressions in the pictures and pitch video, i.e., text, speech, pictures, and videos. These computer-mediated communication modalities are critical for pitching a business idea (Mollick, 2014). However, the effects of affective cues expressed through other modalities, such as the comment or the update section (Courtney et al., 2016), the title, or the tagline (Wang et al., 2017), have not been considered in this dissertation. Also, the effects of affective cues may be partially attributed to other factors, such as body movements, postures, gestures, voice pitch, or voice loudness that may contribute to the emotional appeal of the presentation (Bonaccio et al., 2016; Chen et al., 2009).

Despite the differentiation of seven basic emotions, namely anger, contempt, disgust, fear, happiness, sadness, and surprise (Ekman, 1992), only Paper III examined specific emotional expressions, namely sadness and happiness in pictures. Thus, the reported inverted U-shaped effects in Papers IV and V may not be generalizable for each basic emotion, as the analyzed *affect* variables reflect the total emotional appeal of the modality, with happiness reflecting the most dominant affective cue (e.g., Koch and Siering, 2019; Warnick et al., 2021). However, robustness checks are applied to account for these issues (cf. sections 14.5.2 and 15.4.2). The valence of the affective cues has been considered, providing a rough distinction between positive and negative affect.

Referring to the measurement of affective cues in Papers II, III, IV, and V, these studies used various tools, dictionaries, and machine learning algorithms. Although LIWC is widely acknowledged and often applied to identify emotional words in text and speech (e.g., Yuan et al., 2021) and the applied Microsoft computer vision APIs identify facial emotional expressions at a level comparable to humans (Kuntzler et al., 2021), results are dependent on the tools used. Thus, different tools could produce slightly different results.

Overall, as this dissertation applies only internet research with tool-assisted content analysis, mostly with respect to Kickstarter, the results of this dissertation are limited in generalizability. While such research methods are typically applied in reward-based crowdfunding research (Stasik and Wilczyńska, 2018), further research is required to substantiate the findings on how affective cues affect funding behavior.

7 Future Research Directions

The contributions and limitations of this dissertation suggest several directions for future research. The literature review presented in Paper I examines only reward-based crowdfunding. However, conceptually similar cues related to, for instance, emotional appeal, entrepreneurs' characteristics, and communication strategies are also examined in other crowdfunding types (e.g., Leonelli et al., 2020; Majumdar and Bose, 2018; Yazdani et al., 2024; Zhao et al., 2022). Comparing the effects of cues across donation-, lending-, and equity-based crowdfunding could reveal similarities as well as differences on distinct platforms. This can advance the understanding of how cues affect decision-making under uncertainty in similar, yet differing, computer-mediated communication contexts.

This dissertation examines the effects of affective cues only on the platforms Kickstarter and Startnext, where backers receive products, services, or rewards in exchange for their financial contributions. Consequently, future research could explore the effects of affective cues on other reward-based crowdfunding platforms (e.g., Indiegogo with a "keep-it-all" business model), as well as donation-, lending-, or equity-based crowdfunding, where backers may have different motivations and incentives to support a project (Belleflamme et al., 2015). For example, in donation-based crowdfunding (e.g., Go-FundMe), where funding decisions are driven by idealistic motives (Gerber and Hui, 2013), higher numbers of affective cues could still be expected to have a positive effect on funding performance and may be tolerated more. In equity- and lending-based crowdfunding (e.g., Crowdcube), where financial returns are expected (Ahlers et al., 2015), an inverted U-shaped effect may be more pronounced, thus, higher numbers of affective cues less tolerated. Comparing the effects of affective cues across crowdfunding types can help to further explain how motivations, incentives, and distinct contextual factors influence the perception of affective cues and their effect on decision-making. In addition, the findings of this dissertation may inspire research to examine the effects of affective cues in other multi-sided platform contexts where decisions are made with a certain level of uncertainty, such as e-commerce (Gefen and Straub, 2004).

Papers II, III, IV, and V analyzed the effects of written and spoken emotional words and facial emotional expressions on funding performance, emphasizing their significant impact on decision-making (Achar et al., 2016; van Kleef, 2014). However, as affective cues can also be expressed through other means, future research should consider affective cues displayed and inferred through, for example, body movements, vocal intonation, postures, and gestures (Hatfield et al., 2014; van Kleef et al., 2012). In addition, differentiating between the basic emotions of anger, contempt, disgust, fear, happiness, sadness, and

surprise when analyzing affective cues may provide additional distinctive insights (Ekman, 1992). Although research often distinguishes positive and negative emotions, recent findings suggest no systematic relationship between valence and behavioral responses (van Kleef and Côté, 2022). Thus, further research is required to ascertain whether the effects of affective cues depend on their valence or the context in which they are perceived. In this regard, Warnick et al. (2021) provide initial insights.

Social psychology research suggests that affective cues are most effective when they align with the context in which they occur, as violations can diminish their initial positive effect. Besides relationship quality and decision-making uncertainty (Paper IV), future research should examine additional influencing factors such as culture, power, status, and personality traits of entrepreneurs and backers (van Kleef and Côté, 2022). Also, research can analyze whether product-related aspects, such as perceived innovativeness (Chan and Parhankangas, 2017), financial aspects, such as additional stretch goals (Yasar et al., 2022) or the design of the reward menu (Weinmann et al., 2022), or the concurrent display of other cues, such as appeal to sustainability or intrinsic motivations (Siebeneicher and Bock, 2022), impact the perception and the effects of affective cues. A better understanding of the context in which funding decisions are made helps explain in more detail when higher numbers of affective cues are tolerated to a greater or lesser extent.

Although the presentation allows for the utilization of various combinations of modalities, conveying varying amounts of affective cues, research largely overlooks this multi-modal aspect (e.g., Koch and Siering, 2019; Li et al., 2021; van Kleef and Côté, 2022; Yang et al., 2020). Paper V offers initial insights for reward-based crowdfunding, but a multimodal perspective could also provide additional insights for donation-, lending-, or equity-based crowdfunding. In this regard, researchers could differentiate between basic emotions and explore how the (mis)alignment of basic emotional expressions across multiple modalities affects funding decisions (Yazdani et al., 2024). Additionally, affective cues displayed in updates and comments can be considered when extending the multimodal perspective. From a methodological perspective, future studies could analyze the interplay between (affective) cues across modalities using regression analysis. Thereby they could further explore the potential for "superiority" effects (Jacob et al., 2014; Kim and Lennon, 2008). This would provide additional insight into whether (affective) cues in different modalities may interact in a manner that is substitutive or complementary.

Given the constraints of the online content analysis applied in Papers II, III, IV, and V, i.e., collecting and analyzing data directly from crowdfunding platforms, it is recommended that research also reexamine the findings using experimental designs (Lederman,

2006). Experimental designs could, for example, investigate how affective cues, perceived during the decision-making process, influence backers' perceptions of the entrepreneur, the project, and consequently the funding behavior. Experimental designs also allow for measuring the effects of affective cues on perceived social presence (Hassanein and Head, 2006), how affective cues trigger affective reactions (Watson and Clark, 1988), and how affective cues are used to inform behavior (van Kleef and Côté, 2022). Thereby, it may assess the perceived appropriateness of high numbers of affective cues (Cheshin et al., 2018) and their role in impression management (Campbell and Kirmani, 2000). Considering a multi-modal perspective, experimental designs can help to explain why the integration of multi-modal emotional expressions not only facilitates the perception of emotions but also why the interplay between (specific) affective cues reinforces the effects of affective cues on behavior (van Kleef and Côté, 2022). Thereby, NeuroIS methods can be applied, such as electroencephalography or functional magnetic resonance imaging, to provide direct physiological measurements. It can also detect unconscious processes missed by quantitative online content analysis. This helps to examine how backers perceive and process affective cues, the triggering of reciprocal emotions, the role of emotional expressivity and emotion perception ability, or how decision-making processes are affected by affective cues in visually noisy presentations (Dimoka et al., 2012).

Papers II, III, IV, and V focus on the effects of affective cues on funding performance, specifically on funding success, funds raised, number of backers, and pledge per backer. While funding performance is typically reflected by the financial outcome, affective cues may also influence other outcomes. These may include the time to raise the pledge goal (Li et al., 2021), intention to share projects on social media (Li et al., 2017), perception of impression management (Jiang et al., 2023), perceived trustworthiness of the entrepreneur or project (Strohmaier et al., 2019), or backer participation behavior. Considering these dependent variables can provide a more comprehensive understanding of the relationship between affective cues and funding performance in reward-based crowdfunding.

Since the empirical studies in this dissertation use specific dictionaries and algorithms to quantify the number of affective cues in each modality, future studies should employ alternative tools and approaches to assess the emotional appeal of the project presentation.

Finally, Paper V shows that the integration of regression analysis and fsQCA provides comprehensive and complementary findings. Research should, therefore, emphasize a combined approach involving both research methods. This can yield more nuanced and comprehensive insights, especially in complex and multi-modal environments where an outcome often results from a combination of conditions, rather than one condition in isolation (Pappas and Woodside, 2021).

8 Conclusion

Knowing how to present a project, i.e., the business idea, and which displayed cues facilitate funding decisions is important for entrepreneurs to increase funding, especially in reward-based crowdfunding (Mollick, 2014). However, there is limited knowledge about the relationship between the display of affective cues through different communication modalities and funding performance. The overall objective of this dissertation is to support researchers and practitioners in obtaining a comprehensive understanding of the effects of affective cues displayed through the project presentation, and their potential to affect funding decisions in the context of reward-based crowdfunding.

By systematically reviewing and synthesizing the reward-based crowdfunding literature, this dissertation provides a structured and comprehensive overview of the cues affecting funding performance. The literature review reveals several distinct cues (e.g., appeal to sustainability and perceived narcissism) for which the effects point in a clear direction, while for several other cues (e.g., perceived entrepreneurial traits and negative verbal affective cues), the effects are less straightforward and require further investigation. This dissertation employs a set of lenses theoretically grounded in social presence, emotional contagion, and emotion as social information. These theories help to better understand the effects of affective cues on funding behavior. The empirical results of this dissertation demonstrate that the social richness of a project presentation and the entrepreneur's participation behavior, but not the social richness of an entrepreneur's profile page, affect funding success. Building on these findings, this dissertation demonstrates that the emotional appeal of the project presentation has a significant effect on the funding outcome. In particular, affective words in text, affective speech in pitch videos, and facial emotional expressions in pictures and pitch videos have an inverted U-shaped, non-linear relationship with funding performance. Moderate instead of high numbers of affective cues lead to higher funding. Also, this dissertation provides initial evidence that the inverted U-shaped effect of affective cues is influenced by social-contextual factors prevailing in reward-based crowdfunding, such as relationship quality and project uncertainty. Showing how affective cues can be orchestrated and combined across different modalities to effectively impact funding performance introduces a novel multi-modal perspective.

In conclusion, this cumulative dissertation offers theoretically grounded and empirically verified insights with practical recommendations regarding the effects of affective cues on funding performance in reward-based crowdfunding. This dissertation aims to provide a foundation for future research endeavors that investigate the effects of affective cues on multi-sided platforms, where communication is mediated by information technology.

9   Appendix

Table 9.1   Addendum to Paper V examining the interaction effects of affective cues across different modalities

	Funding raised [a]	
Emotional written words ^{2} x Emotional spoken words	0.029 **	(0.01)
Emotional spoken words ^{2} x Emotional written words	0.043 **	(0.01)
Facial emo. exp. in pitch video [a] ^{2} x Emotional spoken words	-0.050	(0.03)
Emotional spoken words ^{2} x Facial emo. exp. in pitch video [a]	0.059 **	(0.02)
Emotional written words ^{2} x Facial emo. exp. in pictures [a]	0.048 ***	(0.01)
Facial emo. exp. in pictures [a] ^{2} x Emotional written words	0.042 *	(0.02)
Emotional written words	0.107	(0.06)
Emotional written words ^{2}	-0.167 ***	(0.01)
Facial emo. exp. in pictures [a]	0.317 ***	(0.05)
Facial emo. exp. in pictures [a] ^{2}	-0.118 ***	(0.02)
Facial emo. exp. in pitch video [a]	0.328 ***	(0.04)
Facial emo. exp. in pitch video [a] ^{2}	0.012	(0.04)
Emotional spoken words	0.591 ***	(0.07)
Emotional spoken words ^{2}	-0.213 ***	(0.02)
Team members [a]	0.339 ***	(0.02)
FAQ items [a]	0.365 ***	(0.02)
Backed [a]	0.637 ***	(0.02)
Created [a]	0.107 ***	(0.02)
No. rewards	0.675 ***	(0.02)
Project duration	-0.094 ***	(0.02)
Pledge goal [a]	-0.060 **	(0.02)
No. words	0.301 ***	(0.05)
No. pictures	0.583 ***	(0.03)
Video duration	0.068	(0.04)
No. spoken words	-0.051	(0.06)
Emotional written words x Facial emo. exp. in pictures [a]	-0.235 ***	(0.04)
Emotional written words x Emotional spoken words	-0.207 ***	(0.04)
Facial emo. exp. in pitch video [a] x Emotional spoken words	-0.137 **	(0.04)
Adjusted R^2	0.481	

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; n = 16,967; [a] inverse hyperbolic sine transformation (ihs); emo. exp. = emotional expressions; standard error in parentheses
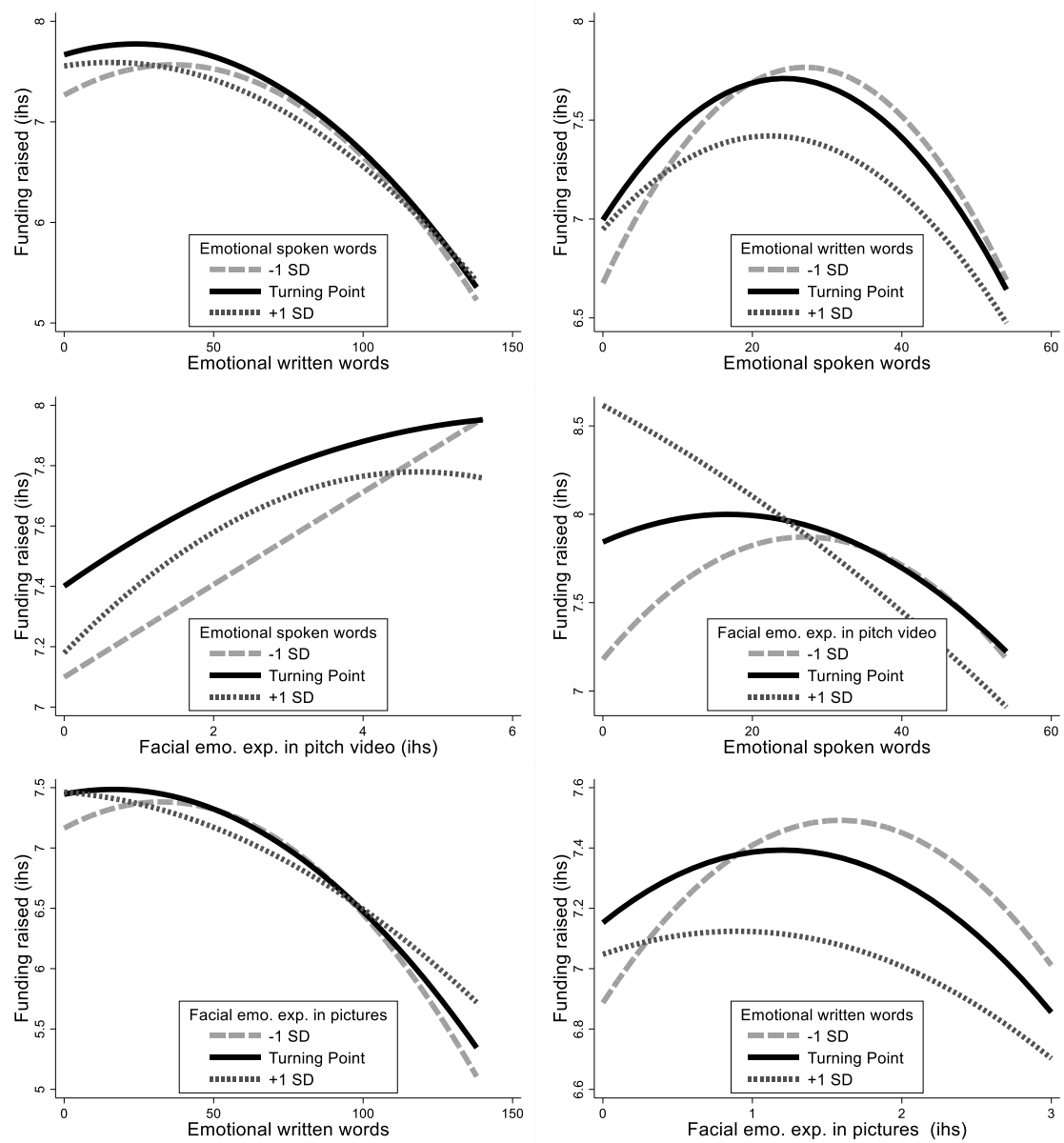
Figure 9.1 Graphical representation of the interplay between affective cues for the addendum to Paper V

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Part 1:

Effects of Cues on Reward-Based Crowdfunding Performance

11 Paper I: Literature Review on the Effects of Cues on Funding Performance

Table 11.1 Fact sheet Paper I

Fact	Description
Title	The Influence of Campaign Presentation Cues on Crowdfunding Performance – Reviewing the Empirical Reward-Based Crowdfunding Literature
Author	Maximilian Raab[1] maximilian.raab@uni-bamberg.de [1]University of Bamberg An der Weberei 5 96047 Bamberg, Germany
Publication type	Journal Article
Publication outlet	Pacific Asia Journal of the Association for Information Systems (PAJAIS)
Status	Published
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URL	https://doi.org/10.17705/1pais.15304

The Influence of Campaign Presentation Cues on Crowdfunding Performance – Reviewing the Empirical Reward-Based Crowdfunding Literature

Abstract. <u>Background</u>: *Reward-based crowdfunding (RBCF) is an established funding mechanism for entrepreneurs, in which they present their ideas through campaign presentations to persuade backers. Compared to investors, who focus more on the merits of the information presented, crowdfunding backers pay attention to cues such as the entrepreneurs' characteristics and the appeal of the campaign. Accordingly, researchers investigated cues, i.e., snippets of information embedded within different communication modalities that facilitate the interpretation of the campaign and entrepreneur. Thus, knowledge of how cues affect decision-making and funding performance has become important for researchers and practitioners. However, current research often investigated cues in isolation that are fragmented across literature and does not provide a straightforward understanding of how cues embedded in campaign presentations affect funding performance. <u>Method</u>: This review synthesizes past RBCF literature to provide a comprehensive concept-centric categorization of how cues affect funding performance. <u>Results</u>: The review analyzed 71 articles and identified three main research topics, namely "communication strategies", "perceived entrepreneurs' characteristics", and "appeal to emotions". The review developed 14 corresponding concept-centric sub-categories of cues and reported their effects on funding performance (significant negative, non-significant, significant positive, inverted U-shaped). Vote-counting shows that some sub-categories tend to have overall positive or negative effects, with first indications of an often-neglected inverted U-shape effect. Yet, the effect's direction is not straightforward for all sub-categories. Also, further research is necessary to explore what specific combinations of cues moderate, complement, or substitute for each other's effects, including non-linear assumptions. Also, there is room to investigate fruitful, not yet analyzed, cues and theoretical lenses. <u>Conclusion</u>: This review contributes to the RBCF literature by providing detailed insights into the effects of cues embedded within the campaign presentation on funding performance. Such a better understanding can benefit all involved parties.*

Keywords: Reward-Based crowdfunding, funding performance, verbal cues, nonverbal cues, literature review

Part 2:

Effects of Affective Cues on

Funding Performance

and Influencing Factors

12 Paper II: Relationship Between Social Presence and Funding Performance

Table 12.1 Fact sheet Paper II

Fact	Description
Title	Understanding the Role of Social Presence in Crowdfunding: Evidence from Leading U.S. and German Platforms
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Understanding the Role of Social Presence in Crowdfunding: Evidence from Leading U.S. and German Platforms

Abstract. *As a novel opportunity to acquire capital from the masses, crowdfunding has attracted great attention in academia and practice. So far, little is known about the factors that promote the success of crowdfunding projects, however. In this paper, we examine in how far the social presence perceived on a project's website influences the success of the respective crowdfunding project. Based on a data-driven analysis of 2.000 project websites from the largest crowdfunding platforms in the U.S. and Germany, we show that the perceived social presence has a significant influence on the success of crowdfunding projects. The obtained results indicate that using socially rich pictures and a socially rich description in the project presentation positively affects the success of a crowdfunding project. A socially rich profile page of the founder(s) in contrast appears to have a rather limited effect. The success of crowdfunding projects seems to be dependent on the participation behavior of the founder, however. Our results indicate that having backed other projects positively influences the success of one's own initiative. The number of answered comments might have a negative effect on the success of the initiative, though.*

Keywords: Crowdfunding, success factors, social presence, data-driven analysis

13 Paper III: Non-linear Effects of Facial Emotional Expressions on Funding Performance

Table 13.1 Fact sheet Paper III

Fact	Description
Title	More Than a Feeling: Investigating the Contagious Effect of Facial Emotional Expressions on Investment Decisions in Reward-Based Crowdfunding
Authors	Maximilian Raab[1] maximilian.raab@uni-bamberg.de
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Publication outlet	Decision Support Systems (DSS)
Status	Published
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URL	https://doi.org/10.1016/j.dss.2020.113326

More Than a Feeling: Investigating the Contagious Effect of Facial Emotional Expressions on Investment Decisions in Reward-Based Crowdfunding

Abstract. *Reward-based crowdfunding provides a unique instrument to acquire capital from small investors for a specific project. To successfully campaign for the desired funds, however, entrepreneurs also need to understand the subconscious factors, which influence the funding behavior of potential investors. In pursuit of that goal, this study examines how facial emotional expressions, which are shown in the pictures of project presentations, affect the funding decision. Building upon the emotional contagion theory and evaluating the emotions displayed on the pictures of 18,696 project webpages with a machine-learning algorithm, we show that facial expressions of happiness and sadness positively affect (i.e., encourage) the funding decision. Other than in venture capital markets, an emotional approach of potential investors might hence be a viable strategy in reward-based crowdfunding. As persuasion tool, emotions should nevertheless be used judiciously since we found high intensities of facial emotional expressions to negatively affect the funding decision.*

Keywords: Reward-based crowdfunding, funding behavior, emotional contagion, facial emotional expressions, data-driven analysis

14 Paper IV: Moderating Impact of Social-Contextual Factors on the Effective Use of Verbal and Nonverbal Affective Cues

Table 14.1 Fact sheet Paper IV

Fact	Description
Title	When Emotions Become Inappropriate: How Social-Contextual Factors Moderate the Effect of Emotional Expressions on Funding Decisions in Reward-Based Crowdfunding
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Status	Under review

When Emotions Become Inappropriate: How Social-Contextual Factors Moderate the Effect of Emotional Expressions on Funding Decisions in Reward-Based Crowdfunding

Abstract. *Investment decisions in reward-based crowdfunding are significantly shaped by the emotional appeal of campaign presentations. However, it remains still largely unclear how intensively emotional expressions should be used to most effectively persuade backers to fund a project. Building upon Emotion as Social Information theory, which suggests that effective emotional expressions must match social expectations and be perceived as appropriate by recipients, we studied the effect of emotional expressions in the text, pictures, and pitch videos of 16,967 Kickstarter campaigns. We found that the impact of emotional expressions on the investment decision is curvilinear across all modalities, meaning that it deteriorates or even reverses with higher intensities. We also found that this effect is moderated by the quality of the relationship between founder and backers and the level of uncertainty under which the investment decision must be made. These factors seem to influence backers' tolerance of more intensive emotional expressions.*

Keywords: reward-based crowdfunding, emotional expressions, social-contextual factors, Emotion as Social Information theory, non-linear regression analysis

14.1 Introduction

Reward-based crowdfunding provides a popular means for founders to acquire funds directly from the crowd to realize innovative product ideas, which are typically still in the prototype stage (Mollick, 2014). To decide if and to what extent such a project should be funded, potential backers are given access to a campaign presentation, which can transmit both detailed information and more implicit cues. Founders can usually provide a written narrative, pictures, and a pitch video to communicate a project's idea. As the decision to fund a project is made based on the content of the campaign presentation, knowledge of how to use these communication modalities in a way that encourages funding decisions becomes a critical success factor for founders (Letwin et al., 2024; Mollick, 2014).

Prior studies have shown that the transmission of emotional expressions as affective cues via the available communication modalities can positively affect the funding decision of potential backers (Koch and Siering, 2019; Lin and Boh, 2021). As potential backers do not have access to the advertised product and lack the expertise to conduct serious due

diligence, emotional expressions can obviously provide a substitute for missing information and help to shape their appraisal of the situation and/or the product (Li et al., 2017; van Kleef, 2009). Yet, although these findings suggest adding emotional expressions to campaign presentations, there is still limited understanding of how such expressions should exactly be used to effectively influence funding behavior. Among others, it remains unclear how intensively founders should use emotional expressions as cues to convince potential backers. While most studies assume that higher amounts of emotional expressions will have a stronger effect on funding behavior (e.g., Koch and Siering, 2019; Li et al., 2017), more recent studies have reported saturation or even adverse effects of high intensities of emotional expressions (e.g., Wang et al., 2016; Warnick et al., 2021). The effect of emotional expressions might also be influenced by the personality traits of the founders and the backers (e.g., Allison et al., 2017; Letwin et al., 2024). Apparently, emotional expressions should thus not simply be used in maximum intensity but need to be tailored to the context in which the interaction occurs. It remains to be clarified how this can be achieved and which factors need to be taken into consideration, though.

To contribute to the closure of this research gap, we present the results of a study in which we systematically examined how the intensity of emotional expressions influences funding behavior and how it needs to be adapted considering the social-contextual factors prevalent in the reward-based crowdfunding domain. We analyze the following research questions: *How does the number of emotional expressions in a campaign presentation influence investment behavior? How is this relationship influenced by social-contextual factors?* To answer these questions, we refer to the theoretical Emotions as Social Information (EASI) model. It suggests that the effect of emotional expressions depends on their perceived appropriateness, which is moderated by situational, social-contextual factors. Against this background, we hypothesize that there exists a peak intensity of emotional expressions which should be transmitted to effectively influence the funding behavior. Based on EASI theory, we moreover propose two sets of moderating variables, which influence the effect that the intensity of emotional expressions has on funding behavior.

To test our hypotheses, we analyze the emotional expressions contained in the text, pictures, and pitch videos of 16,967 campaign presentations that we gathered from Kickstarter, a leading reward-based crowdfunding platform. The emotional expressions contained in the text and speech were identified using a dictionary approach (LIWC, Pennebaker et al. (2015)). Facial emotional expressions shown in the pictures and videos were recognized using a machine-learning algorithm (Emotion API, Microsoft (2023)). To examine potential non-linear effects, we conducted multiple regression analyses. The results

of our study provide new insights into the effect of emotional expressions on funding behavior. First, we show that the intensity of emotional expressions should not be increased indefinitely but needs to match the social context in which the expressions occur. Consistent with the predictions of EASI theory, we found that emotional expressions do not only have a positive impact on funding behavior but can also unfold negative effects if they seemingly deviate from norms and expectations of the backers. Second, we show that the effect that the intensity of emotional expressions unfolds is moderated by the level of uncertainty under which investment decisions must be made and the quality of the relationship between founder and backers. These insights provide guidelines for the practical use of emotional expressions in the reward-based crowdfunding domain. Regarding academia, they also answer a call to study moderators of the effects of emotions in more detail as they generally "have received little or no attention" (van Kleef and Côté, 2022, p. 648) so far.

We proceed as follows: next, we discuss theoretical foundations and related work. We then develop the hypotheses underlying our study. After providing details of our research approach, we present and discuss the results of our study in detail. The manuscript is concluded with a short summary of the central findings.

14.2 Theoretical Background and Related Work

14.2.1 The Influence of Affective Cues on Decision-Making

Reward-based crowdfunding campaigns are typically presented using a written description of the project that is accompanied by pictures and a pitch video with a spoken voice-over. Founders can use these modalities to communicate the project's idea by transmitting both detailed information and more implicit cues to persuade backers. Cues are information snippets that support the recipient's learning about a specific context. In campaign presentations, verbal cues are expressed using written or spoken words, while nonverbal cues are communicated through means other than words such as facial expressions (Koch and Siering, 2019; Warnick et al., 2021). If cues contain emotional expressions, they are called affective cues.

Research has shown that affective cues transmitted via the available modalities can influence the funding behavior (Li et al., 2017; Raab et al., 2020). To explain this effect, extant studies in the reward-based crowdfunding domain often refer to the theoretical concept of primitive emotional contagion. This concept assumes that emotional expressions elicit subconscious, automatic affective reactions in the recipient, which evoke an emotional

state similar or complementary to that of the sender (Hatfield et al., 1993). The evoked emotional state can in turn influence behavioral responses and economic decisions (Li et al., 2017).

While the concept of primitive emotional contagion is widely acknowledged today, it cannot explain findings suggesting that the impact of affective cues depends significantly on the context in which a communication occurs (van Kleef and Côté, 2022). A growing body of literature emphasizes that the effect of emotions is not always the same but rather is regulated in light of the social norms and expectations prevalent in the context of the interaction (van Kleef, 2009). To better understand how and why affective cues can influence backers' attitudes and decision-making behavior in reward-based crowdfunding, we therefore build upon the Emotion as Social Information (EASI) model (van Kleef, 2009) and the related research stream. The EASI model suggests that emotional expressions provide social information, which can trigger both automatic affective reactions and inferential processes in the recipient. While affective reactions lead to emotional responses, inferential processes lead to cognitive responses such as more deliberate assumptions about the senders' attitude or the situation in which the interaction occurs (van Kleef, 2009). Both processes inform the behavioral responses of the recipient and can influence economic decisions (Jin et al., 2024; van Kleef and Côté, 2022). However, research has shown that both the relative impact of the two processes and the resulting behavioral response vary depending on the social situation in which emotions are expressed. To be effective, displayed emotional expressions must match the social context in which they occur both qualitatively (i.e., showing the right emotion) and quantitatively (i.e., showing the right intensity of emotions). The effect of emotional expressions is hence determined by the degree to which recipients perceive them as appropriate (van Kleef and Côté, 2022), that is as "correct for the situation and in correct proportion to the evoking circumstances" (Shields, 2005, p. 7).

Studies related to EASI theory have shown that the perceived appropriateness of emotional expressions is moderated by social-contextual factors that characterize the situation in which the interaction occurs. Broadly, two clusters of social-contextual factors can be distinguished: the first cluster characterizes the extent to which recipients are motivated (and able) to engage in information processing. This appears to be influenced by factors such as the time pressure, the ambiguity/uncertainty of the situation, and the power of recipients (van Kleef and Côté, 2022). Studies have for instance shown that negotiators react differently to emotional expressions of anger and happiness depending on the time pressure they are acting in (van Kleef et al., 2004). The second cluster of social-contextual factors characterizes the emotional display rules (i.e., rules about how emotions may be

expressed) that exist in a certain situation. These rules seem to be shaped by factors such as the personality traits and the culture of the recipient as well as the quality of the relationship between the expresser and recipient (van Kleef and Côté, 2022). Studies have for instance found that the use of smileys in an email message was deemed appropriate and led to more favorable impressions in an informal setting but led to less favorable impressions in a formal setting (Glikson et al., 2017).

Other than the notion of primitive emotional contagion, the EASI model hence proposes a significantly context-dependent, social effect of emotional expressions. The identified social-contextual factors provide a theoretical framework for understanding how the social context in which emotional expressions occur shapes their interpretation and impact (van Kleef and Côté, 2022). To utilize emotional expressions effectively, expressers must understand and adapt to the given situation and its socio-contextual factors. As it is generic in nature, the EASI model may thus also provide recommendations for founders on how to put emotional expressions to practical use and develop effective campaign presentations.

14.2.2 Related Work

Prior research in the reward-based crowdfunding domain has shown that emotional expressions such as affective words in the written/spoken narration or facial emotional expressions in the pictures/pitch video can positively affect funding behavior (Koch and Siering, 2019; Li et al., 2017). Most studies thereby assume a linear effect, meaning that more emotional expressions should lead to a stronger effect on funding performance. However, especially more recent studies also reported a non-linear effect and observed that the impact on funding behavior appears to deteriorate or even reverse at higher intensities of emotional expressions (Jiang et al., 2020; Raab et al., 2020; Warnick et al., 2021; Zhou et al., 2016). So far, it is hence not entirely clear if higher amounts of emotional expressions can strengthen the observed effect on the funding behavior and how many emotions should be expressed to be most effective.

While the overall effect of higher intensities of emotional expressions is still debated, especially studies that assumed a linear relationship have also begun to investigate moderator variables that influence the effect of emotional expressions on funding behavior. Some studies have investigated traits of the backers' personality such as their experience and motivation to participate in the crowdfunding project (Allison et al., 2017; Franzoni and Tenca, 2023; Lin and Boh, 2021; Yuan et al., 2021). Others have analyzed product characteristics such as the product type (Chen et al., 2023; Lohmar et al., 2023; Parhankangas and Renko, 2017; Tafesse, 2021; Xiang et al., 2019), brand prominence

(Moradi and Badrinarayanan, 2021), perceived product innovativeness and creativity (Davis et al., 2017; Li et al., 2017), or the availability of technical demonstrators (Steigenberger and Wilhelm, 2018). A third set of studies has started to investigate the moderating influence of founders' personality traits such as their gender (Letwin et al., 2024) or perceived domain expertise (Jiang et al., 2023). These studies have in common that the effect of moderating influences was not examined for all available communication modalities. So far, the examinations rather focused on specific communication modalities.

While the mentioned studies provide indications that the effect of emotional expressions also depends on the social context in reward-based crowdfunding, they overlook theoretically motivated factors, which characterize existing emotional display rules in the reward-based crowdfunding domain and backers' situational motivation to engage into deliberate information processing. In light of EASI theory, especially social-contextual factors such as the quality of the relationship between founders and backers and the uncertainty of the project could be important determinants that shape the effect of emotional expressions in reward-based crowdfunding campaigns (van Kleef, 2009; van Kleef and Côté, 2022). Analyzing the impact of moderating influences moreover appears to be particularly promising in light of a non-linear effect of emotional expressions as they can contribute to explaining under which circumstances they are perceived as inappropriate and, thus, as too much of a good thing. Yet so far none of the few studies that identified a non-linear effect has taken moderating influences into account. By using the EASI model as basis to analyze the impact of moderator variables on the (presumably) non-linear effect of emotional expressions, we hence focus on an unexplored but potentially impactful research area.

14.3 Hypotheses Development and Research Model

14.3.1 Non-linear Effect of the Intensity of Affective Cues on Funding Behavior

Studies in the reward-based crowdfunding domain have shown that incorporating affective cues within campaign presentations can positively influence the funding decisions of potential backers. Drawing on the concept of primitive emotional contagion, many studies have proposed – and oftentimes observed – that the transmission of higher amounts of emotional expressions via the available modalities leads to a stronger response and, accordingly, further increases funding performance (e.g., Li et al., 2017; Lin and Boh, 2021). While it seems thus reasonable to assume a linear or at least monotonous effect of

the intensity of emotional expressions on funding performance, this perspective ignores that the social effects of affective cues are shaped by their perceived appropriateness (Shields, 2005; van Kleef and Côté, 2022). Research related to EASI theory found that quantitative deviations from social expectations and (explicit or implicit) emotional display rules may be perceived as inappropriate, thus causing negative effects on subsequent behaviors (van Kleef and Côté, 2022). In professional communication contexts, studies often have observed non-linear relationships between the intensity of emotional expressions and their perceived appropriateness. A study in the customer service domain for instance found that customers perceived intense emotional displays by service providers (other than moderate ones) as inappropriate, leading to reduced trust in the service provider and lower satisfaction with the service/product (Cheshin et al., 2018).

We assume that a similar valuation of emotional expressions exists in the reward-based crowdfunding domain. For instance, while entrepreneurial enthusiasm basically is positively perceived (Li et al., 2017), expressing high intensities of enthusiasm may come across as overconfidence, which is linked to issues such as failing to recognize problems and lacking the ability to observe changes and make necessary adjustments (Shipman and Mumford, 2011). In professional communication scenarios, high intensities of emotional expressions may generally not be viewed favorably but rather be felt as inauthentic or lead to the senders' competence being questioned as their rationality is perceived as reduced. Such inferences contradict backers' expectation that founders should demonstrate competence (Wang et al., 2016). Also, backers might suspect impression management motives behind the display of high amounts of emotional expressions. Intensive emotional expressions might hence be felt as a manipulative attempt that uses affective cues as strategical means (Jiang et al., 2020; Jiang et al., 2023; Parhankangas and Ehrlich, 2014). We therefore assume that high intensities of affective cues may make backers rather feel suspicious and resistant (Jiang et al., 2020). Accordingly, we propose that the display of affective cues will have a positive effect only until too high intensities, i.e., too much of a good thing, begin to trigger counteracting effects. Altogether, we hence suggest a curvilinear, inverted U-shaped relationship:

H1: Affective cues in the project presentation have an inverted U-shaped effect on funding performance.

14.3.2 Moderating Influence of Social-Contextual Factors

Research related to EASI theory has identified two broad clusters of factors that characterize the social context of emotional expressions and can influence their perceived ap-

propriateness (van Kleef and Côté, 2022). The first cluster encompasses factors that determine situational emotional display rules, while the second cluster describes the situational motivation of recipients to engage in information processing. We assume that both types of social-contextual factors also play a role in shaping the backers' appraisal of the emotional expressions contained in campaign presentations. Depending on the manifestation of the factors, we expect that higher intensities of emotional expressions will be tolerated to a greater or lesser extent.

14.3.2.1 Moderating Influence of the Quality of the Relationship

The relationship between the founder and the backers in reward-based crowdfunding mostly is professional and business-oriented in nature as the founders seek funding while the backers want to receive the offered reward (Mollick, 2014). Because the interaction is mediated by information technology, the relationship can also be classified as socially distant. Given this setting, research in the crowdfunding domain has shown that visible interactions of the founder and active participation in the crowdfunding community can lead to trust-building relationships with backers, which in turn have positive effects on their funding decisions (Zheng et al., 2016; Zvilichovsky et al., 2015).

One promising approach for an entrepreneur to participate in the community is to *support other projects* as backer. Founders who engage in reciprocal funding show their commitment to the crowdfunding community beyond their own projects and showcase their authentic interest in supporting the success of other crowdfunding endeavors (Koch and Siering, 2015; Zvilichovsky et al., 2015). They also signal that they have experience with and know the information needs and concerns of potential backers. Backing other projects can hence trigger a sensation of reciprocity such that the community sympathizes with the founder and tends to give back support (Koch and Siering, 2015; Zvilichovsky et al., 2015).

Founders can also build closer relationships with the community by regularly *posting updates* and *replying to comments*. Updates can be used to provide latest information on the project's progress or to express appreciation for the funding progress (Mollick, 2014; Xu et al., 2014). By replying to comments, the founder of the project can directly communicate with the community and address backers' individual concerns. They can also provide additional information to increase trust in the project or express their appreciation for the provided feedback (Clauss et al., 2017; Zheng et al., 2016). Studies have shown that frequent communication can be an effective tool for founders to connect to backers and support relationship building (Beaulieu et al., 2015; Wang et al., 2021). Frequent interactions with the community especially signal that founders are willing to devote time

and effort to develop a relationship with backers (Clauss et al., 2017; Koch and Siering, 2015; Mollick, 2014; Xu et al., 2014). Posting updates and replying to comments can hence help to transform the impersonal and distant relationship with backers into a more personal and closer one.

We assume that endeavors to strengthen the relationship with backers and to make it more personal also have a moderating influence on the effect of higher intensities of emotional expressions. Generally, emotional communication in personal and socially close relationships is more common and thus perceived as more appropriate than in relationships with higher social distance (Berscheid and Ammazzalorso, 2003; Cheshin, 2020; Smoski and Bachorowski, 2003). Studies have shown that emotional display rules vary in both contexts and found that intense numbers of emotional expressions are more likely to be perceived as inauthentic and inappropriate to the degree that the relationship is professional in nature (Cheshin et al., 2018; van Kleef, 2009). We hence assume that higher intensities of emotional expressions might be perceived as less inappropriate in socially closer relationships between the founder and the backers, whereas they might be perceived as inappropriate to a higher degree in more distant relationships. Accordingly, we hypothesize that the inverted U-shaped relationship between the display of affective cues and the resulting funding performance should be less pronounced (i.e., the curve should be flatter) if the relationship is socially closer and otherwise be more pronounced (i.e., the curve should be steeper):

H2(a): The inverted U-shaped relationship between affective cues and funding performance will be flattened (steepened) when the number of backed projects by the founder is higher (lower).

H2(b): The inverted U-shaped relationship between affective cues and funding performance will be flattened (steepened) when the number of updates by the founder is higher (lower).

H2(c): The inverted U-shaped relationship between affective cues and funding performance will be flattened (steepened) when the number of comments by the founder is higher (lower).

14.3.2.2 Moderating Influence of Uncertainty

In the reward-based crowdfunding domain, funding decisions typically must be made under a certain level of uncertainty as the advertised products are still in the prototype stage, no detailed business plans are provided, and backers lack the expertise to conduct serious due diligence (Li et al., 2017; Mollick, 2014). Given these circumstances, research has

shown that founders can (partially) manage uncertainty concerns by setting the *pledge goal*, which in turn influences funding decisions. Higher pledge goals are often associated with larger and/or more complex projects. In addition, they are more difficult to achieve. With higher pledge goals, funding decisions hence must be made with a higher degree of uncertainty regarding the campaign's success (Koch and Siering, 2015; Koch and Siering, 2019; Mollick, 2014).

Uncertainty concerns are also mitigated when the project is conducted by *experienced founders*. Founders who have previously been engaged in conducting projects have gained knowledge, competencies, and learned to better understand the risks associated with crowdfunding (Kleinert, 2023; Koch and Siering, 2015). They are hence perceived as more competent than novice founders who campaign for the first time (Koch and Siering, 2019). In contrast, funding decisions typically must be made with a higher degree of uncertainty regarding the project quality when the founder has less experience (Courtney et al., 2016; Wang et al., 2021).

We assume that the perceived level of uncertainty also has a moderating influence on the effect of higher intensities of emotional expressions. Research has shown that emotional expressions basically can provide a substitute for missing information and help to shape a decision-maker's appraisal of a situation or product (Li et al., 2017; van Kleef, 2009). Yet, studies also found that the motivation of individuals to engage in deliberate information processing increases to the degree that situations are less clear (van Kleef and Côté, 2022). In such situations, backers might therefore prefer explicit information over emotional expressions in the campaign presentation. Accordingly, higher intensities of emotional expressions might more likely be perceived as an inappropriate impression management strategy. We hence assume that higher intensities of emotional expressions might be perceived as less inappropriate if the level of uncertainty is lower, whereas they might be perceived as inappropriate to a higher degree if the level of uncertainty increases. Accordingly, we hypothesize that the inverted U-shaped relationship between the display of affective cues and the resulting funding performance should be more pronounced (i.e., the curve should be steeper) if the uncertainty level is higher and otherwise be less pronounced (i.e., the curve should be flatter):

H2(d): The inverted U-shaped relationship between affective cues and funding performance will be flattened (steeper) when the founder's founding experience is higher (lower).

H2(e): The inverted U-shaped relationship between affective cues and funding performance will be steeper (flattened) when the project's pledge goal is higher (lower).
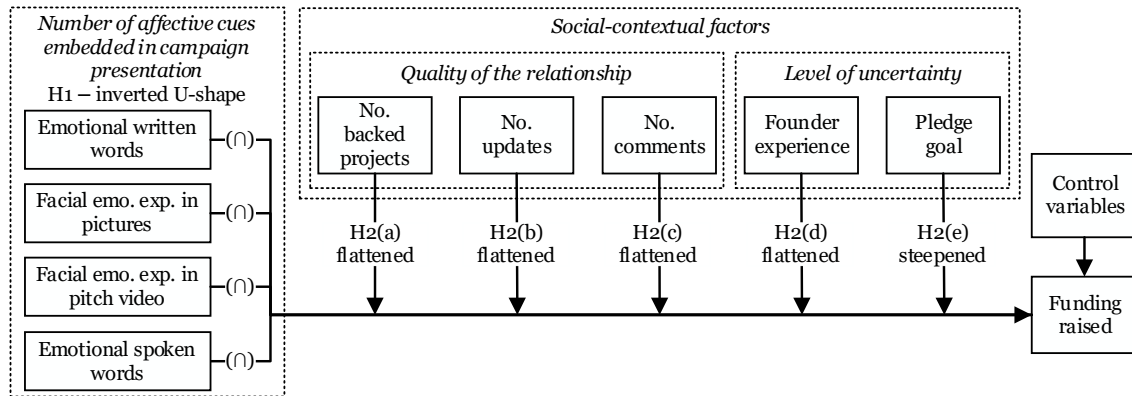
Figure 14.1 Research model

14.4 Data and Research Approach

We adopted a data-driven research methodology (Mollick, 2014) to evaluate our hypotheses, collecting our dataset from the reward-based crowdfunding platform Kickstarter. Our dataset focused on publicly accessible data concerning founders and projects, spanning all projects, both successful and unsuccessful, from September 2016 to May 2017. To mitigate the influence of outliers, we excluded projects aiming for a funding goal above $200,000. Projects with durations shorter than seven days or descriptions under 100 words were also excluded, as these generally suggest a minimal effort toward fundraising (Mollick, 2014). Additionally, to maintain consistency in the analysis of verbal cues, we excluded projects not presented in English. Our final dataset comprised 16,967 projects.

14.4.1 Variable Descriptions

Dependent Variable. To evaluate the effects of affective cues conveyed through both verbal and nonverbal modalities on funding performance, we focus on the total amount of funding raised at the end of the campaign. This metric, "*funding raised*", captures the effectiveness of founders in creating a persuasive project presentation that influences backers' decision-making processes. It also reflects the culmination of backers' decisions to financially back the founders' ideas, regardless of whether the campaign has met its initial funding target (Jiang et al., 2020; Li et al., 2017).

Independent Variables. We operationalized our independent variables (H1) based on the number of affective cues embedded in each modality. Specifically, we investigated the affective cues embedded in textual descriptions (affective written words), speech (affective spoken words), pictures (facial emotional expressions), and the pitch video (facial

emotional expressions), the main modalities that are typically used to present the campaign (Mollick, 2014).

To quantitatively measure the amount of affective cues in the project description and the speech of the transcribed pitch video, we used the Linguistic Inquiry Word Count software (LIWC, Version 2015) (Pennebaker et al., 2015). LIWC is widely adopted in psychology, entrepreneurship, and information systems to quantify linguistic constructs of text samples (e.g., Lin and Boh, 2021). LIWC contains a validated dictionary that classifies each word and word steam into one or more linguistic categories. To measure the emotional aspects of written and spoken language, we utilized the LIWC category *"affect"*. This category accounts for all words that have an emotional appeal and trigger affective responses in the recipients, e.g., "happy", "love", "ugly", or "cried" (Pennebaker et al., 2015). The amount of written and spoken affective words (i.e., *affect. words* and *affect. speech*) is the sum of *affect*-labeled words expressed within the written description and spoken pitch video, respectively.

To quantitatively measure the affective cues embedded in pictures and the pitch video, we calculated the amount of facial emotional expressions displayed. We utilized the "Emotion API", a machine learning algorithm (Microsoft, 2023), to identify the facial emotional expressions depicted within images. The algorithm identifies human faces and characterizes their emotional expression using a vector of confidence scores for seven basic emotions: anger, contempt, disgust, fear, happiness, sadness, and surprise. The affect scores are calculated and normalized to values between zero and one for each face. Values closer to "one" indicate a more dominantly expressed emotion. For example, a displayed face is likely to have a broad smile if the algorithm returns a value of "one" for happiness. If the algorithm detected more than one face in a picture, we added up all the individual affect scores within the picture. In so doing, we factored in that more faces can display a higher bandwidth of affective expressions. Likewise, we added up all the aggregated affect scores for all the pictures to obtain the total score for each project (i.e., *affect. pictures*). To achieve consistency, we followed the same approach for the pitch video using the same algorithm to recognize facial expressions in each video frame. Likewise, in case the algorithm detected more than one face in a frame, we added up all the individual affect scores within the frame. Finally, we added up the aggregated affect scores of all frames to obtain the total score for the full video divided by the number of frames per second to account for different frame rates (i.e., *affect. video*). For example, if the algorithm returns the score "ten", the video shows highly emotional facial expressions for ten seconds.

Table 14.2 Descriptive statistics and correlations

	Variables	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9
1	Funding raised	9,235	26,390	0	190,832									
2	Pledge goal	13,865	21,834	77	200,000	0.26								
3	No. backed	6.14	17.24	0	117	0.16	-0.07							
4	No. created	0.38	2.15	0	14	0.09	-0.10	0.45						
5	No. updates	2.87	4.21	0	21	0.43	0.03	0.32	0.18					
6	No. comments	3.26	11.64	0	875	0.69	0.12	0.26	0.18	0.49				
7	Affect. words	28.25	26.48	0	139	0.29	0.14	0.20	0.09	0.40	0.28			
8	Affect. pictures	0.75	1.78	0	10.02	0.26	0.11	0.08	0.00	0.23	0.15	0.35		
9	Affect. video	15.29	29.44	0	153.37	0.06	0.03	0.00	-0.07	0.10	-0.03	0.15	0.20	
10	Affect. speech	9.91	12.51	0	54	0.19	0.11	0.04	0.07	0.20	0.09	0.30	0.23	0.59

Notes: n=16,967; all variables are winsorized at the 1st and 99th percentiles; all correlations equal or above |0.03| are significant at p < 0.05;

Moderating Variables. Regarding the social-contextual factors (H2) reflecting the level of uncertainty under which the investment decision must be made, we measured the amount founders seek to raise (*pledge goal*) (Mollick, 2014) and the founders' experience as the number of previously created projects (*no. created*) (Kleinert, 2023; Koch and Siering, 2015). Concerning the quality of the relationship between founders and backers, we valued the reciprocity effect as the number of previously backed projects (*no. backed*) (Koch and Siering, 2015; Zvilichovsky et al., 2015). Regarding actions that can strengthen their relationship, we measured the number of posted updates (*no. updates*) (Beier and Wagner, 2015; Kunz et al., 2016) and the number of comments written by the founder during the funding period (*no. comments*) (Clauss et al., 2017; Wang et al., 2021). Table 14.2 shows the descriptive statistics of the researched dependent, independent, and moderating variables together with their correlation matrix.

Control Variables. Based on previous research, we also included additional project and presentation-related control variables that influence funding performance. We controlled for the campaign's category (Chan and Parhankangas, 2017), the project duration (Anglin et al., 2018; Mollick, 2014), the project description's number of words, the number of pictures (Koch and Siering, 2019), and the pitch video's duration (Raab et al., 2020) and number of spoken words (Parhankangas and Renko, 2017)

14.4.2 Research Approach

To answer our research questions, we employed ordinary least squares regressions with funding raised as the dependent variable. To mitigate the influence of outliers, we winsorized the variables at the 1st and 99th percentile (e.g., Haans et al., 2016; Lohmar et al., 2023). As some variables had a right-skewed distribution but meaningful zero values, we normalized them by conducting an inverse hyperbolic sine transformation (ihs) for variables with skewness greater than two: $\sinh^{-1}(y) = \log(y_i + (y_i^2 + 1)^{1/2})$ (Anglin et al., 2018).

We decided on this kind of transformation to preserve the interpretation of the zero values.

14.5 Results

14.5.1 Regression Analyses

Table 14.3 presents the findings of our regression analyses. The outcomes of Model 1, which includes only the control and moderating variables, are in line with prior research investigating founder- and presentation-related factors (e.g., Koch and Siering, 2019; Mollick, 2014; Wang et al., 2021). Model 2 introduces the affect-related independent variables and their squared terms to answer H1. A conducted F-test comparing Model 1 with Model 2 indicates that the addition of the independent variables (affective cues) increased the model fitness (F-Test χ^2 (8, 16,934) = 109.10, p <.001).

Hypothesis H1 assumes an inverted U-shaped relationship between affective cues and funding raised. Following the recommendations of Lind and Mehlum (2010), we used a three-step procedure to formally establish this relationship: First, the squared term has to be negative and significant. Second, the slopes at the end of each data range must be sufficiently steep. Third, the turning point must fall within the data range. To test steps two and three, it is recommended to conduct an appropriate U-test (Haans et al., 2016; Lind and Mehlum, 2010).

Model 2 shows a positive and significant impact of affective words ($\beta = 0.248$ p<0.001) and a negative and significant impact of its squared term ($\beta = -0.167$, p<0.001). The turning point is 47.94, located within the observed data range. The U-test furthermore confirms the inverted U-shape ($t = 9.17$, p<.001). The amount of facial expressions in pictures has a positive and significant impact on the total funding raised ($\beta = 0.322$, p<0.001), its squared term is negative and significant ($\beta = -0.077$, p<0.001). The turning point is 3.52 (ihs: 1.97), located within the observed data range. The U-test furthermore confirms the inverted U-shape ($t = 2.28$, p<.05).

The amount of facial expression in the pitch video has a positive and significant impact ($\beta = 0.369$, p<0.001). Its squared term is negative and significant ($\beta = -0.092$, p<0.01). The turning point is 128.96 (ihs: 5.55), closely located within the observed data range. The U-test could not confirm an inverted U-shaped relationship ($t = 0.16$, p>.05), as the slope at the upper bound reflecting high levels of facial expressions is not significant, i.e., is not sufficiently steep. The amount of affective spoken words has a positive and significant impact ($\beta = 0.373$, p<0.001). Its squared term is negative and significant ($\beta = -0.163$,

p<0.001). The turning point is 24.20, located within the observed data range. The U-test furthermore confirms the inverted U-shape ($t = 8.24$, p<.001).

Thus, our results confirm an inverted U-shape relationship for affective cues in all modalities except for emotional facial expressions in the pitch video. Those non-verbal affective cues in the pitch video have a non-linear saturation effect (Haans et al., 2016; Lind and Mehlum, 2010). Figure 14.2 supports the interpretation of the results.
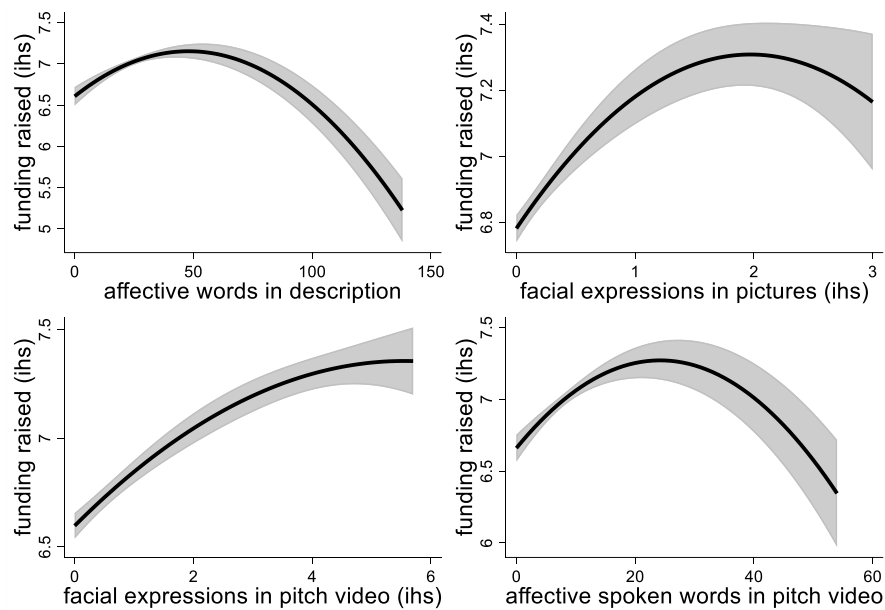
Figure 14.2 Non-linear effects of affective cues on funding performance (H1)

To analyze whether a flattening or steepening can be measured, we followed the recommendations of Haans et al. (2016). We therefore included the interactions between the squared terms for each affective cue and each moderating variable in Model 3-7 to answer H2(a)-H2(e).

In Model 3 (H2$_a$), we analyze if the number of projects that founders backed previously moderates the relationship between the affective cues and funding raised. The positive and significant coefficients for each affective cue ^{2} × no. backed projects indicate that the slopes of the curvilinear relationships are flatter for projects when founders have supported more projects previously, supporting H2(a). In Model 4 (H2$_b$), we analyze if the *number of updates* moderates the relationship between the *affective cues* and *funding raised*. The positive and significant coefficients for each *affective cue ^{2} × no. updates* indicate that the slopes of the curvilinear relationships are flatter for founders who posted more updates, supporting H2(b). In Model 5 (H2$_c$), we analyzed if the *number of comments* moderates the relationship between the *affective cues* and *funding raised*. The positive and significant coefficients for *affective words ^{2} × no. comments, affective pictures ^{2} × no. comments,* and *affective speech ^{2} × no. comments* indicate that the slopes of the

curvilinear relationships are flatter for founders who participated with more comments. Although in the hypothesized direction, no significant moderating effect could be reported for *affect. video ^{2} × no. comments*. Thus, H2(c) is largely supported.

In Model 6 (H2$_d$), we analyzed if the *number of created projects* moderates the relationship between the *affective cues* and *funding raised*. The positive and significant coefficients for each *affective cue ^{2} × no. created* indicate that the slopes of the curvilinear relationships are flatter for founders with more created projects, supporting H2(d). In Model 7 (H2$_e$), we analyzed if the *pledge goal* moderates the relationship between the *affective cues* and *funding raised*. The negative and significant coefficients for each *affective cue ^{2} × pledge goal* indicate that the slopes of the curvilinear relationships are steeper for projects with a higher requested pledge goal, supporting H2(e).

To illustrate the moderating effects and to support the interpretation of the results, we calculate the average marginal effects for the interaction at different levels of each moderating variable (i.e., –1 SD, mean, +1 SD) and depict the effect sizes in Figure 14.3. Note that we show only the moderating effects on *affective spoken words* in Figure 14.3. All graphical representations for each reported moderation can be accessed via Appendix Figure 14.4 - Figure 14.8.

Table 14.3 Regression results

	(1) Funding raised [a]	(2) Funding raised [a]	U-test	(3) Funding raised [a] Z = No. backed [a]
Control variables				
Category dummy	included	included		included
No. words	0.153 *** (.02)	0.202 *** (.04)		0.192 *** (.04)
No. pictures	0.498 *** (.03)	0.390 *** (.03)		0.378 *** (.03)
Video duration	0.142 *** (.03)	0.090 ** (.03)		0.044 (.03)
No. spoken words	0.391 *** (.03)	0.066 (.06)		0.052 (.06)
Duration	-0.137 *** (.02)	-0.118 *** (.02)		-0.109 *** (.02)
Moderator variables				
Pledge goal [a]	0.164 *** (.02)	0.096 *** (.02)		0.121 *** (.02)
No. backed [a]	0.409 *** (.02)	0.346 *** (.02)		0.129 *** (.04)
No. created [a]	-0.028 (.02)	0.002 (.02)		-0.034 ° (.02)
No. updates [a]	1.325 *** (.02)	1.211 *** (.02)		1.180 *** (.02)
No. comments [a]	0.455 *** (.03)	0.512 *** (.03)		0.547 *** (.02)
Main effects				
Affect. words		**0.248 *** (.05)**	t=9.17 ***	0.240 *** (.05)
Affect. words [2]		**-0.167 *** (.01)**		-0.154 *** (.01)
Affect. pictures [a]		**0.322 *** (.04)**	t=2.28 *	0.378 *** (.04)
Affect. pictures [a 2]		**-0.077 *** (.02)**		-0.090 *** (.02)
Affect. video [a]		**0.369 *** (.03)**	t=0.16	0.369 *** (.03)
Affect. video [a 2]		**-0.092 ** (.03)**		-0.100 *** (.03)
Affect. speech		**0.373 *** (.06)**	t=8.24 ***	0.407 *** (.06)
Affect. speech [2]		**-0.163 *** (.02)**		-0.164 *** (.02)
Moderation effects | Z = moderator				
Affect. words × Z				-0.330 *** (.03)
Affect. words [2] × Z				**0.086 *** (.01)**
Affect. pictures [a] × Z				-0.297 *** (.04)
Affect. pictures [a 2] × Z				**0.079 *** (.02)**
Affect. video [a] × Z				-0.135 *** (.03)
Affect. video [a 2] × Z				**0.103 *** (.03)**
Affect. speech × Z				-0.136 *** (.03)
Affect. speech [2] × Z				**0.067 *** (.02)**
Adjusted R^2	0.528	0.551		0.564

Table 14.3 Regression results (continued)

	(4) Funding raised [a] Z = No. updates [a]		(5) Funding raised [a] Z = No. comments [a]		(6) Funding raised [a] Z = No. created [a]		(7) Funding raised [a] Z = Pledge goal [a]	
Control variables								
Category dummy	included		included				included	
No. words	0.192***	(.04)	0.197***	(.04)	0.205***	(.04)	0.206***	(.04)
No. pictures	0.378***	(.03)	0.386***	(.03)	0.404***	(.03)	0.369***	(.03)
Video duration	0.044	(.03)	0.025	(.03)	0.044	(.03)	0.075*	(.03)
No. spoken words	0.052	(.06)	0.089	(.06)	0.072	(.06)	0.064	(.06)
Duration	-0.109***	(.02)	-0.122***	(.02)	-0.111***	(.02)	-0.109***	(.02)
Moderator variables								
Pledge goal [a]	0.133***	(.02)	0.102***	(.02)	0.108***	(.02)	0.348***	(.04)
No. backed [a]	0.350***	(.02)	0.335***	(.02)	0.361***	(.02)	0.356***	(.02)
No. created [a]	-0.034°	(.02)	-0.021	(.02)	-0.239***	(.04)	0.010	(.02)
No. updates [a]	0.919***	(.04)	1.169***	(.02)	1.188***	(.02)	1.204***	(.02)
No. comments [a]	0.577***	(.03)	0.484***	(.04)	0.544***	(.03)	0.493***	(.03)
Main effects								
Affect. words	0.230***	(.05)	0.222***	(.05)	0.244***	(.05)	0.257***	(.05)
Affect. words ^{2}	-0.153***	(.01)	-0.156***	(.01)	-0.165***	(.01)	-0.173***	(.01)
Affect. pictures [a]	0.432***	(.04)	0.356***	(.04)	0.323***	(.04)	0.293***	(.04)
Affect. pictures [a] ^{2}	-0.099***	(.02)	-0.086***	(.02)	-0.078***	(.02)	-0.078***	(.02)
Affect. video [a]	0.346***	(.03)	0.377***	(.03)	0.379***	(.03)	0.387***	(.03)
Affect. video [a] ^{2}	-0.086**	(.03)	-0.111***	(.03)	-0.108***	(.03)	-0.096***	(.03)
Affect. speech	0.385***	(.06)	0.378***	(.06)	0.366***	(.06)	0.358***	(.06)
Affect. speech ^{2}	-0.159***	(.02)	-0.153***	(.02)	-0.156***	(.02)	-0.161***	(.02)
*Moderation effects	Z = moderator*							
Affect. words × Z	-0.358***	(.03)	-0.311***	(.03)	-0.153***	(.03)	0.154***	(.03)
Affect. words ^{2} × Z	**0.097*** **	**(.01)**	**0.078*** **	**(.01)**	**0.045*** **	**(.01)**	**-0.029* **	**(.01)**
Affect. pictures [a] × Z	-0.368***	(.04)	-0.238***	(.03)	-0.156***	(.04)	0.147***	(.04)
Affect. pictures [a] ^{2} × Z	**0.112*** **	**(.02)**	**0.082*** **	**(.01)**	**0.044* **	**(.02)**	**-0.045* **	**(.02)**
Affect. video [a] × Z	-0.132***	(.03)	-0.153***	(.03)	-0.123***	(.03)	0.071*	(.03)
Affect. video [a] ^{2} × Z	**0.078** **	**(.03)**	**0.045 **	**(.03)**	**0.071* **	**(.03)**	**-0.063* **	**(.03)**
Affect. speech × Z	-0.151***	(.03)	-0.080*	(.03)	-0.129***	(.04)	0.184***	(.04)
Affect. speech ^{2} × Z	**0.060*** **	**(.01)**	**0.043** **	**(.01)**	**0.069*** **	**(.02)**	**-0.049** **	**(.02)**
Adjusted R^2	0.566		0.560		0.556		0.556	

Notes: ○ p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001; n = 16,967; [a] inverse hyperbolic sine transformation (ihs); standard error in parentheses

Figure 14.3 Moderating effects of each social-contextual factor on affective speech (H2)

14.5.2 Robustness Checks

We also conducted robustness checks to verify the stability of our results. These results can be accessed via Appendix Table 14.4 - Table 14.9.

First, we calculated the variance inflation factors (VIFs) of Model 1-7 to check for multicollinearity among the independent and moderating variables. Our results indicated that all VIFs are below the commonly recommended threshold of 10, except for *No. spoken words* (10.97 – 11.04) and *Affective speech* (12.31 – 12.57) that are slightly above the recommended threshold. Multicollinearity, however, is not likely to be a concern, as *Affective speech* is mutually dependent on *No. spoken words* (Neter et al., 1990). When excluding the control variable *No. spoken words*, all VIFs are below the recommended threshold. Also, the model fit did not change after removing *No. spoken words* (F-Test χ^2 (1, 16,934) = 1.34, $p = 0.246$). Moreover, the results remain robust (Table B1).

Second, we checked for bias introduced by winsorization (e.g., Haans et al., 2016; Lohmar et al., 2023) and conducted our analyses of Model 1-7 with winsorization at the 2nd and 98th, as well as 3rd and 97th percentiles, respectively. The results remain robust (Table B2 and Table B3).

Third, we evaluated the robustness of our findings with different operationalizations of our dependent variable to verify the stability of our regression analysis. We operationalized the impact of affective cues on funding decisions by accounting for how many people have been persuaded to support the project (*no of backers*) (Jiang et al., 2020). The results remain robust for all interactions but *affect. words ^{2} × pledge goal, affect. pictures ^{2} × pledge goal*, and *affect. video ^{2} × pledge goal*, in which the coefficients have still the same

direction but are no longer significant (Table B4). Also, we accounted for the average amount a backer invested in a particular project by dividing the amount of money raised by the number of backers (*backer pledged*) (Chan and Parhankangas, 2017). The results remain robust for all interactions but *affect. video* ^{2} × *no. created*, in which the coefficient has still the same direction but is not significant (Table B5).

Fourth, as our *affect* variables reflect the total emotional appeal of a modality, we also used a different operationalization that reflects the most dominant expressed emotion (e.g., Koch and Siering, 2019; Warnick et al., 2021). Thus, we account for positive verbal and nonverbal emotional expressions. To do so, we utilized the LIWC category "*posemo*" for positive verbal cues and facial emotional expressions of *happiness* for positive non-verbal cues. The results remain robust (Table B6). Overall, these additional analyses increase our confidence in the reliability of our results.

14.6 Discussion

14.6.1 Key Findings

The results of our study show that investment decisions in reward-based crowdfunding are considerably shaped by the emotional appeal of campaign presentations. Conveying emotions in the form of affective written words (in the text), affective spoken words (in the video), and facial emotional expressions (in the pictures and video) can positively influence funding behavior. However, our results indicate that affective cues should not straightforwardly be used in maximum intensity, but that their number ought to be adapted to the professional, business-oriented context of reward-based crowdfunding in two ways.

First, the regression analysis shows that the effect of affective cues is *non-linear* across all modalities. We provide empirical support that the positive impact of displaying affective cues decreases beyond a certain threshold and, in most cases, turns negative. Our results suggest that the turning point, in which the intensity of emotional expression has the greatest impact on funding performance, reflects an optimal level of emotional expressions. Building upon EASI theory and the findings of studies in other professional domains, we assume that this turning point describes the intensity of emotional expressions that is perceived as most appropriate by the backers. Research has shown that emotional expressions can provide a substitute for missing information and thus help shape the appraisal of a situation and/or the product (Li et al., 2017; van Kleef, 2009). Accord-

ingly, we found that emotional expressions effectively foster the making of the investment decision until a certain level of intensity is reached. Next to this positive effect, however, research has also observed that high levels of emotional expressions tend to be perceived as inauthentic and inappropriate in professional communication contexts (Cheshin et al., 2018; van Kleef and Côté, 2022). In line with this observation, we found that high levels of emotional expressions unfold a negative effect on the investment decision in reward-based crowdfunding. We can hence assume that high intensities of emotional expressions violate backers' expectations of serious communication and tend to lead them not to support the project. Interestingly, we observed a saturation rather than an inverted U-shaped effect for facial emotional expressions in the video. While we would have to speculate as to the cause of this finding, it still suggests that high intensities of emotional expressions at least lead to diminishing returns.

Second, the moderation analyses show that the effect of emotional expressions on the funding behavior is not uniform for all crowdfunding projects but is moderated by the manifestations of situational *social-contextual factors*. Our results provide empirical evidence that the *quality of the relationship* between founder and backers influences backers' tolerance of higher intensities of emotional expressions. Our results specifically suggest that higher intensities of emotional expressions are tolerated more if the founder successfully takes actions to establish a closer (i.e., more trusted and familiar) relationship to backers. Drawing from research related to EASI theory, we can assume that the quality of the relationship changes emotional display rules such that higher intensities of emotional expressions are perceived as less inappropriate if the relationship is closer and more familiar (Berscheid and Ammazzalorso, 2003; Cheshin, 2020; Cheshin et al., 2018). We also found that backers' tolerance of higher intensities of emotional expressions is influenced by the *level of uncertainty* under which the investment decision must be made. Concretely, our results suggest that higher intensities of emotional expressions are tolerated more if the pledge goal is lower and/or the founder is more experienced and thus viewed as more competent (Koch and Siering, 2019). From EASI theory, we can infer that higher levels of uncertainty increase the motivation of backers to engage in deliberate information processing (van Kleef and Côté, 2022). In such scenarios, emotional expressions tend to be more quickly viewed as distracting and, thus, as inappropriate.

Taken together, the results of our study provide novel insights into how emotional expressions affect investment decisions in reward-based crowdfunding and how their effect is moderated by situational social-contextual factors. Our findings have implications for academia and practice alike.

14.6.2 Implications for Academia

As regards academia, the results of our study contribute to the research stream that investigates how emotional expressions influence investment decisions in reward-based crowdfunding. While especially earlier studies (e.g., Allison et al., 2017; Koch and Siering, 2019) have assumed linear or monotonous relationships between the intensity of emotional expressions and the funding behavior, our study contributes to painting a more differentiated picture of the effect. In line with other recent studies (Jiang et al., 2020; Raab et al., 2020; Warnick et al., 2021; Zhou et al., 2016), we argue that the effect actually is curvilinear in nature, meaning that it deteriorates or even reverses at higher intensity levels. Other than these studies, our investigation thereby encompasses and shows the effect for all available communication modalities. Contributing to impression management research in entrepreneurship in general (e.g., Parhankangas and Ehrlich, 2014), our results suggest that moderate as opposed to high intensities of affective cues successfully persuade backers.

Our study moreover belongs to the few that account for moderating factors. While recent studies provide initial indications that the effect of emotional expressions in reward-based crowdfunding depend on the social context in which the interaction occurs (e.g., Lohmar et al., 2023; Tafesse, 2021), they overlook theoretically motivated factors that characterize situational emotional display rules and backers' motivation to engage in deliberate information processing. With the quality of the relationship between founders and backers and the uncertainty, we take a new perspective to explain when emotions become inappropriate, which (to our best knowledge) has not been explored before in the reward-based crowdfunding domain. To further complete this picture, we call for using theories such as the EASI model, which explain the effects of emotions as a complex social rather than a mostly biological process. Our results suggest that the effects of emotional expressions should be assessed taking into account the situation in which the interaction occurs and its characteristic social-contextual factors.

That said, the results of our study also inform research related to EASI theory. By focusing on the effect of the intensity of emotional expressions on behavioral responses and potential moderating factors, we focus on two areas that generally "have received little or no attention" (van Kleef and Côté, 2022, p. 648). The identified moderating factors hence also contribute to advancing the knowledge base emerging around EASI theory. The identified curvilinear relationship corroborates observations that have recently been made in other professional domains such as service providing (Cheshin et al., 2018). Whereas

studies in these domains are typically focusing on examining personal face-to-face communication, our results indicate that the effects are similar in scenarios where communication is mediated by information technology.

14.6.3 Implications for Practice

For practice, our results provide guidelines on how emotional expressions can be effectively used in reward-based crowdfunding campaigns. To convince potential backers, founders should include affective cues into their campaign presentations. While a certain intensity level of emotional expressions seems desirable to achieve an optimal impact, founders should use high intensities with caution as they tend to unfold negative effects and may put off potential backers. To effectively employ emotional expressions to influence backers, founders hence must ensure that they keep following emotional display rules of the professional, business-oriented communication setting. That said, there also exist social-contextual factors that can influence backers' tolerance of higher intensity levels of emotional expressions. Because it can be difficult to accurately hit the optimal intensity level in practice, these factors can be used strategically to mitigate adverse effects if the intensity level deviates slightly. Drawing from our results, founders could support other projects, add frequent updates to their own campaign presentation, and reply to comments to build a closer, more personal relationship with backers. In such relationships, higher intensities of emotional expressions seem to be tolerated to a greater extent, meaning that they are perceived as less inappropriate than in distant relationships. Higher intensities of emotional expressions are also more likely to be tolerated if the uncertainty under which the funding decision must be made is lower. The higher the pledge goal and the more inexperienced the founder, the more cautious they should hence be when using high intensities of emotional expressions. Next to founders, our results also have implications for platform operators such as Kickstarter, who could develop guidelines on how to use emotional expressions based on our findings.

14.6.4 Limitations and Future Research

The results of our study should be interpreted in the light of several limitations, which provide opportunities for future research. First, we have only used data gathered from Kickstarter as a single source. While it is one of the worldwide leading reward-based crowdfunding platforms, future research could verify our results with data from platforms such as Indiegogo, which implement slightly different funding models. Second, our results are dependent on the tools and algorithms utilized to identify emotions. Although

LIWC is widely acknowledged and often applied (e.g., Yuan et al., 2021) and the Microsoft Emotion API identifies emotional expressions on a level comparable to humans (Kuntzler et al., 2021), it is conceivable that other tools would have produced slightly different results. Future research could therefore test our results using other tools. Third, we have only considered affective words in the written and spoken narration as well as facial emotional expressions in the pictures and video. To further broaden the picture, future studies could investigate the effect of body movements, postures, and gestures, which can also convey emotional expressions. Likewise, future research should investigate the role of additional moderating factors such as culture, power, status, and personality traits like agreeableness (van Kleef and Côté, 2022). Finally, we must emphasize that we did not measure perceived appropriateness as a direct variable in this study. Instead, we inferred the mechanisms behind the observed effects based on EASI theory. As both the theoretical prediction of the effects and the proposed moderating factors were consistent with our observations, we consider the conducted inferences to be plausible. Future research could try to replicate our findings using experimental designs, in which the impact of intense emotional expressions on perceived appropriateness can be directly measured.

14.7 Conclusion

Research has shown that incorporating emotional expressions into campaign presentations can positively affect funding behavior in the reward-based crowdfunding domain (Koch and Siering, 2019; Lin and Boh, 2021). While confirming the potential benefit of emotional expressions, our study contributes to drawing a more differentiated picture of their effect. Our results show that the effect of emotional expressions is curvilinear in nature across all modalities, which means that the positive impact on funding behavior will eventually deteriorate or even reverse with higher intensities of emotional expressions. Building on EASI theory, we therefore suggest that emotional expressions should not simply be used with maximum intensity but need to be adapted to the social context and its situational emotional display rules and expectations to be effective. While our results indicate that there exists an optimal peak level of emotional expressions that is perceived as most appropriate by the backers, we also identified socio-contextual factors that shape emotional display rules and expectations and thus moderate the effect. Our results suggest that backers tend to perceive higher intensities of emotional expressions as less inappropriate if the founder manages to establish a closer, more personal relationship with them. We also found that the tolerance for a larger number of emotional expressions tends to increase as the level of uncertainty under which the investment decision

must be made decreases. These results show that the effect of emotional expressions should not be studied in isolation but taking into account the specific context in which the interaction occurs. With our findings, we hope to motivate further endeavors into this direction. As other multi-sided platforms utilize similar communication modalities, we encourage researchers to also examine social-contextual effects of emotional expressions and moderating influences in donation, lending, and equity-based crowdfunding, crowdsourcing, or e-commerce platforms.

14.8 Appendix
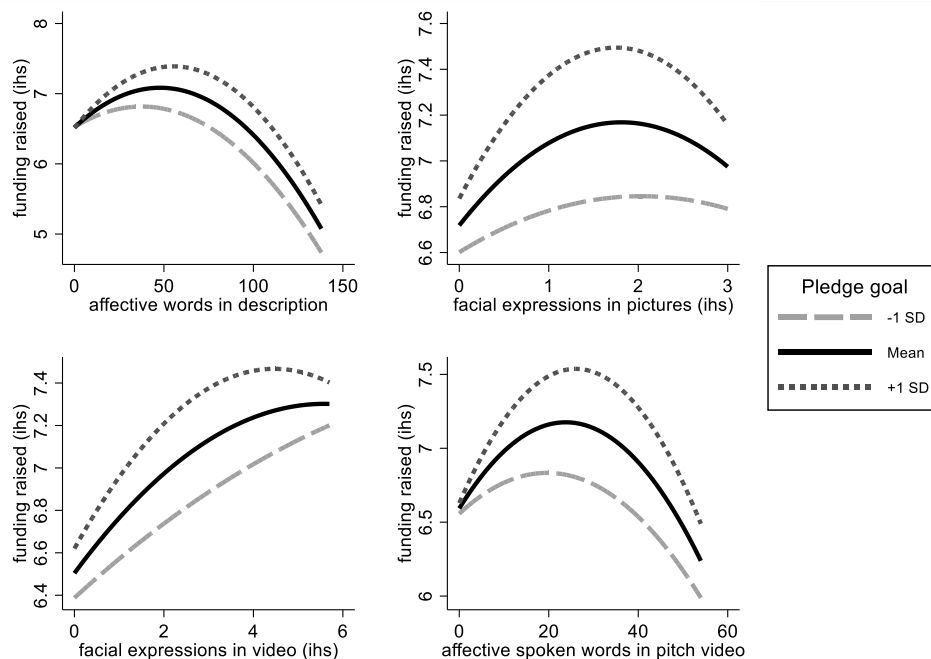
Figure 14.4 Non-linear effect of affective cues on funding performance moderated by "pledge goal"
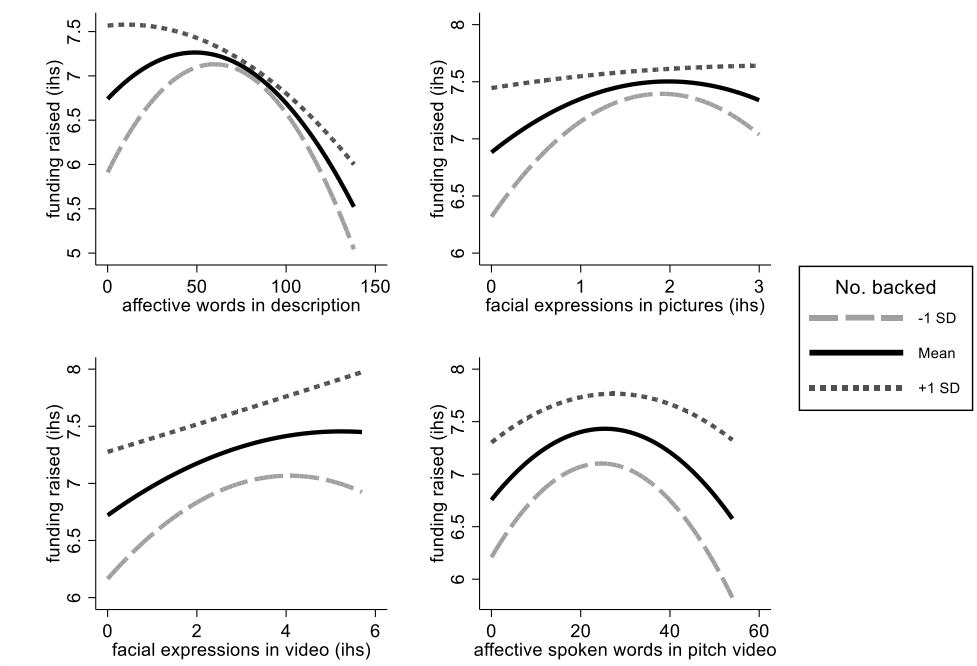
Figure 14.5 Non-linear effect of affective cues on funding performance moderated by "no. backed"
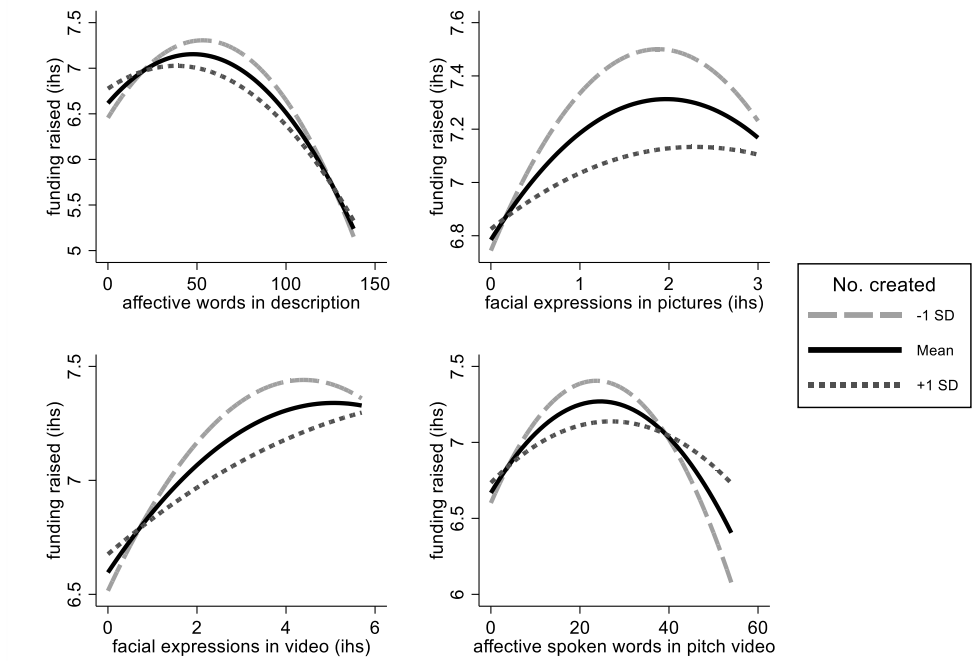
Figure 14.6 Non-linear effect of affective cues on funding performance moderated by "no. created"
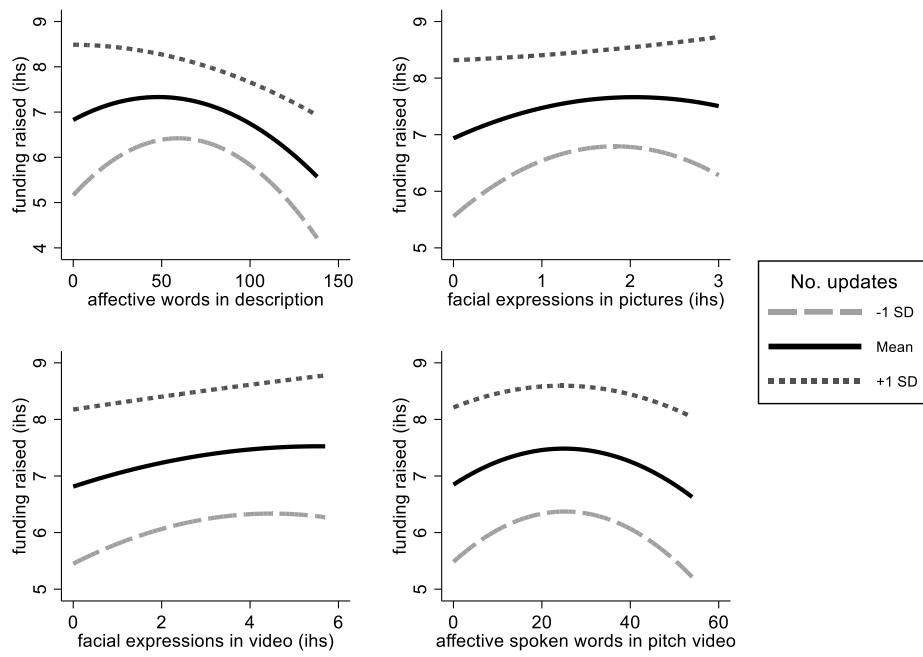
Figure 14.7   Non-linear effect of affective cues on funding performance moderated by "no. updates"
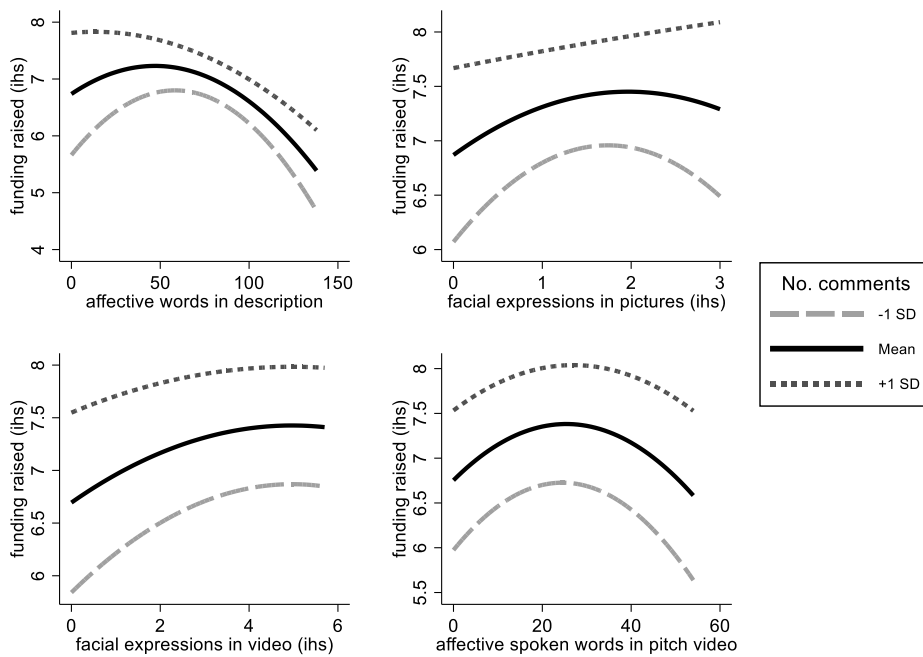
Figure 14.8   Non-linear effect of affective cues on funding performance moderated by "no. comments"

Table 14.4 Robustness test | control variable "no. spoken words" excluded

	(1) Funding raised [a]	(2) Funding raised [a] U-test		(3) Funding raised [a] Z = No. backed [a]
Control variables				
Category dummy	included	included		included
No. words	0.170*** (0.02)	0.213*** (0.04)		0.201*** (0.04)
No. pictures	0.481*** (0.03)	0.388*** (0.03)		0.376*** (0.03)
Video duration	0.460*** (0.02)	0.106*** (0.03)		0.056 (0.03)
~~No. spoken words~~	–	–		–
Duration	-0.146*** (0.02)	-0.118*** (0.02)		-0.109*** (0.02)
Moderator variables				
Pledge goal [a]	0.179*** (0.02)	0.096*** (0.02)		0.121*** (0.02)
No. backed [a]	0.424*** (0.02)	0.346*** (0.02)		0.129*** (0.04)
No. created [a]	-0.041 (0.02)	0.002 (0.02)		-0.034 (0.02)
No. updates [a]	1.344*** (0.02)	1.211*** (0.02)		1.180*** (0.02)
No. comments [a]	0.456*** (0.03)	0.512*** (0.03)		0.547*** (0.02)
Main effects				
Affect. words		0.237*** (0.05)	t=9.10***	0.231*** (0.05)
Affect. words ^{2}		-0.167*** (0.01)		-0.154*** (0.01)
Affect. pictures [a]		0.321*** (0.04)	t=2.26*	0.377*** (0.04)
Affect. pictures [a] ^{2}		-0.077*** (0.02)		-0.090*** (0.02)
Affect. video [a]		0.369*** (0.03)	t=0.06	0.369*** (0.03)
Affect. video [a] ^{2}		-0.090** (0.03)		-0.099*** (0.03)
Affect. speech		0.424*** (0.04)	t=8.34***	0.448*** (0.04)
Affect. speech ^{2}		-0.166*** (0.02)		-0.166*** (0.02)
*Moderation effects	Z = moderator*				
Affect. words × Z				-0.330*** (0.03)
Affect. words ^{2} × Z				0.086*** (0.01)
Affect. pictures [a] × Z				-0.297*** (0.04)
Affect. pictures [a] ^{2} × Z				0.079*** (0.02)
Affect. video [a] × Z				-0.135*** (0.03)
Affect. video [a] ^{2} × Z				0.103*** (0.03)
Affect. speech × Z				-0.136*** (0.03)
Affect. speech ^{2} × Z				0.067*** (0.02)
Adjusted R^2	0.524	0.551		0.564

Table 14.4   Robustness test | control variable "no. spoken words" excluded (continued)

	(4) Funding raised [a] Z = No. updates [a]		(5) Funding raised [a] Z = No. comments [a]		(6) Funding raised [a] Z = No. created [a]		(7) Funding raised [a] Z = Pledge goal [a]	
Control variables								
Category dummy	included		included				included	
No. words	0.212***	(0.04)	0.217***	(0.04)	0.217***	(0.04)	0.188***	(0.04)
No. pictures	0.384***	(0.03)	0.402***	(0.03)	0.368***	(0.03)	0.360***	(0.03)
Video duration	0.047	(0.03)	0.062*	(0.03)	0.091**	(0.03)	0.117***	(0.03)
~~No. spoken words~~	–		–		–		–	
Duration	-0.122***	(0.02)	-0.112***	(0.02)	-0.109***	(0.02)	-0.116***	(0.02)
Moderator variables								
Pledge goal [a]	0.121***	(0.02)	0.134***	(0.02)	0.102***	(0.02)	0.108***	(0.02)
No. backed [a]	0.129***	(0.04)	0.350***	(0.02)	0.334***	(0.02)	0.361***	(0.02)
No. created [a]	-0.034	(0.02)	-0.034	(0.02)	-0.021	(0.02)	-0.239***	(0.04)
No. updates [a]	1.180***	(0.02)	0.921***	(0.04)	1.169***	(0.02)	1.188***	(0.02)
No. comments [a]	0.547***	(0.02)	0.577***	(0.03)	0.484***	(0.04)	0.544***	(0.03)
Main effects								
Affect. words	0.231***	(0.05)	0.215***	(0.05)	0.210***	(0.05)	0.233***	(0.05)
Affect. words ^{2}	-0.154***	(0.01)	-0.153***	(0.01)	-0.156***	(0.01)	-0.165***	(0.01)
Affect. pictures [a]	0.377***	(0.04)	0.430***	(0.04)	0.355***	(0.04)	0.322***	(0.04)
Affect. pictures [a] ^{2}	-0.090***	(0.02)	-0.098***	(0.02)	-0.085***	(0.02)	-0.077***	(0.02)
Affect. video [a]	0.369***	(.03)	0.347***	(0.03)	0.378***	(0.03)	0.380***	(0.03)
Affect. video [a] ^{2}	-0.099***	(.03)	-0.083**	(0.03)	-0.109***	(0.03)	-0.106***	(0.03)
Affect. speech	0.448***	(0.04)	0.455***	(0.04)	0.434***	(0.04)	0.416***	(0.04)
Affect. speech ^{2}	-0.166***	(0.02)	-0.163***	(0.02)	-0.156***	(0.02)	-0.159***	(0.02)
*Moderation effects	Z = moderator*							
Affect. words × Z	-0.330***	(0.03)	-0.357***	(0.03)	-0.311***	(0.03)	-0.153***	(0.03)
Affect. words ^{2} × Z	0.086***	(0.01)	0.097***	(0.01)	0.078***	(0.01)	0.045***	(0.01)
Affect. pictures [a] × Z	-0.297***	(0.04)	-0.368***	(0.04)	-0.239***	(0.03)	-0.155***	(0.04)
Affect. pictures [a] ^{2} × Z	0.079***	(0.02)	0.112***	(0.02)	0.082***	(0.01)	0.044*	(0.02)
Affect. video [a] × Z	-0.135***	(0.03)	-0.130***	(0.03)	-0.152***	(0.03)	-0.124***	(0.03)
Affect. video [a] ^{2} × Z	0.103***	(0.03)	0.077**	(0.03)	0.045	(0.03)	0.071*	(0.03)
Affect. speech × Z	-0.136***	(0.03)	-0.152***	(0.03)	-0.081*	(0.03)	-0.128***	(0.04)
Affect. speech ^{2} × Z	0.067***	(0.02)	0.059***	(0.01)	0.043**	(0.01)	0.069***	(0.02)
Adjusted R^2	0.564		0.566		0.560		0.556	

Notes: ○ p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001; n = 16,967; [a] inverse hyperbolic sine transformation (ihs); standard error in parentheses

Table 14.5   Robustness test | winsorization at the 2nd and 98th percentile

	(1) Funding raised [a]	(2) Funding raised [a] U-test		(3) Funding raised [a] Z = No. backed [a]
Control variables				
Category dummy	included	included		included
No. words	0.237 *** (0.02)	0.262 *** (0.05)		0.241 *** (0.05)
No. pictures	0.565 *** (0.03)	0.439 *** (0.03)		0.421 *** (0.03)
Video duration	0.205 *** (0.03)	0.116 *** (0.03)		0.061 ○ (0.03)
No. spoken words	0.451 *** (0.03)	0.059 (0.06)		0.043 (0.06)
Duration	-0.148 *** (0.02)	-0.125 *** (0.02)		-0.116 *** (0.02)
Moderator variables				
Pledge goal [a]	0.063 ** (0.02)	0.003 (0.02)		0.036 (0.02)
No. backed [a]	0.581 *** (0.02)	0.492 *** (0.02)		0.220 *** (0.04)
No. created [a]	-0.042 (0.02)	-0.011 (0.02)		-0.048 * (0.02)
No. updates [a]	0.800 *** (0.03)	0.735 *** (0.02)		0.754 *** (0.02)
No. comments [a]	0.556 *** (0.03)	0.610 *** (0.03)		0.630 *** (0.03)
Main effects				
Affect. words		0.350 *** (0.05)	t=12.52 ***	0.320 *** (0.05)
Affect. words ^{2}		-0.251 *** (0.01)		-0.215 *** (0.01)
Affect. pictures [a]		0.383 *** (0.04)	t=2.58 **	0.443 *** (0.05)
Affect. pictures [a] ^{2}		-0.100 *** (0.02)		-0.114 *** (0.02)
Affect. video [a]		0.407 *** (0.03)	-/-	0.404 *** (0.03)
Affect. video [a] ^{2}		-0.072 * (0.03)		-0.083 ** (0.03)
Affect. speech		0.450 *** (0.06)	t=8.93 ***	0.488 *** (0.06)
Affect. speech ^{2}		-0.215 *** (0.02)		-0.217 *** (0.02)
*Moderation effects	Z = moderator*				
Affect. words × Z				-0.382 *** (0.03)
Affect. words ^{2} × Z				0.102 *** (0.01)
Affect. pictures [a] × Z				-0.342 *** (0.04)
Affect. pictures [a] ^{2} × Z				0.093 *** (0.02)
Affect. video [a] × Z				-0.131 *** (0.03)
Affect. video [a] ^{2} × Z				0.112 *** (0.03)
Affect. speech × Z				-0.163 *** (0.04)
Affect. speech ^{2} × Z				0.088 *** (0.02)
Adjusted R^2	0.472	0.505		0.523

Table 14.5 Robustness test | winsorization at the 2nd and 98th percentile (continued)

	(4) Funding raised [a] Z = No. updates [a]		(5) Funding raised [a] Z = No. comments [a]		(6) Funding raised [a] Z = No. created [a]		(7) Funding raised [a] Z = Pledge goal [a]	
Control variables								
Category dummy	included		included				included	
No. words	0.254 ***	(0.05)	0.256 ***	(0.05)	0.263 ***	(0.05)	0.243 ***	(0.05)
No. pictures	0.428 ***	(0.03)	0.451 ***	(0.03)	0.412 ***	(0.03)	0.408 ***	(0.03)
Video duration	0.055	(0.03)	0.059 ○	(0.03)	0.097 **	(0.03)	0.136 ***	(0.03)
No. spoken words	0.075	(0.06)	0.068	(0.06)	0.054	(0.06)	0.015	(0.06)
Duration	-0.131 ***	(0.02)	-0.117 ***	(0.02)	-0.114 ***	(0.02)	-0.123 ***	(0.02)
Moderator variables								
Pledge goal [a]	0.036	(0.02)	0.043 *	(0.02)	0.016	(0.02)	0.019	(0.02)
No. backed [a]	0.220 ***	(0.04)	0.471 ***	(0.02)	0.467 ***	(0.02)	0.502 ***	(0.02)
No. created [a]	-0.048 *	(0.02)	-0.039 ○	(0.02)	-0.037 ○	(0.02)	-0.293 ***	(0.04)
No. updates [a]	0.754 ***	(0.02)	0.606 ***	(0.04)	0.731 ***	(0.02)	0.728 ***	(0.02)
No. comments [a]	0.630 ***	(0.03)	0.641 ***	(0.03)	0.558 ***	(0.04)	0.640 ***	(0.03)
Main effects								
Affect. words	0.320 ***	(0.05)	0.265 ***	(0.05)	0.291 ***	(0.05)	0.341 ***	(0.05)
Affect. words ^{2}	-0.215 ***	(0.01)	-0.187 ***	(0.02)	-0.212 ***	(0.01)	-0.245 ***	(0.01)
Affect. pictures [a]	0.443 ***	(0.05)	0.450 ***	(0.05)	0.417 ***	(0.05)	0.384 ***	(0.04)
Affect. pictures [a] ^{2}	-0.114 ***	(0.02)	-0.109 ***	(0.02)	-0.107 ***	(0.02)	-0.101 ***	(0.02)
Affect. video [a]	0.404 ***	(0.03)	0.376 ***	(0.03)	0.413 ***	(0.03)	0.419 ***	(0.03)
Affect. video [a] ^{2}	-0.083 **	(0.03)	-0.071 *	(0.03)	-0.098 **	(0.03)	-0.091 **	(0.03)
Affect. speech	0.488 ***	(0.06)	0.447 ***	(0.06)	0.452 ***	(0.06)	0.445 ***	(0.06)
Affect. speech ^{2}	-0.217 ***	(0.02)	-0.204 ***	(0.02)	-0.201 ***	(0.02)	-0.207 ***	(0.02)
*Moderation effects	Z = moderator*							
Affect. words × Z	-0.382 ***	(0.03)	-0.498 ***	(0.03)	-0.389 ***	(0.03)	-0.184 ***	(0.03)
Affect. words ^{2} × Z	0.102 ***	(0.01)	0.130 ***	(0.01)	0.103 ***	(0.01)	0.058 ***	(0.01)
Affect. pictures [a] × Z	-0.342 ***	(0.04)	-0.367 ***	(0.04)	-0.282 ***	(0.04)	-0.190 ***	(0.04)
Affect. pictures [a] ^{2} × Z	0.093 ***	(0.02)	0.117 ***	(0.02)	0.097 ***	(0.02)	0.049 *	(0.02)
Affect. video [a] × Z	-0.131 ***	(0.03)	-0.100 **	(0.03)	-0.169 ***	(0.03)	-0.121 ***	(0.03)
Affect. video [a] ^{2} × Z	0.112 ***	(0.03)	0.087 **	(0.03)	0.050 ○	(0.03)	0.076 *	(0.03)
Affect. speech × Z	-0.163 ***	(0.04)	-0.178 ***	(0.03)	-0.113 ***	(0.03)	-0.162 ***	(0.04)
Affect. speech ^{2} × Z	0.088 ***	(0.02)	0.074 ***	(0.02)	0.061 ***	(0.02)	0.093 ***	(0.02)
Adjusted R^2	0.523		0.525		0.519		0.512	

Notes: ○ p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001; n = 16,967; [a] inverse hyperbolic sine transformation (ihs); standard error in parentheses

Table 14.6 Robustness test | winsorization at the 3rd and 97th percentile

	(1) Funding raised [a]	(2) Funding raised [a] U-test		(3) Funding raised [a] Z = No. backed [a]
Control variables				
Category dummy	included	included		included
No. words	0.236*** (0.02)	0.257*** (0.05)		0.236*** (0.05)
No. pictures	0.569*** (0.03)	0.456*** (0.03)		0.434*** (0.03)
Video duration	0.210*** (0.03)	0.116*** (0.03)		0.062○ (0.03)
No. spoken words	0.445*** (0.03)	0.079 (0.06)		0.062 (0.06)
Duration	-0.149*** (0.02)	-0.127*** (0.02)		-0.119*** (0.02)
Moderator variables				
Pledge goal [a]	0.048* (0.02)	-0.002 (0.02)		0.030 (0.02)
No. backed [a]	0.557*** (0.02)	0.479*** (0.02)		0.194*** (0.04)
No. created [a]	-0.039 (0.02)	-0.015 (0.02)		-0.050* (0.02)
No. updates [a]	0.849*** (0.03)	0.784*** (0.02)		0.801*** (0.02)
No. comments [a]	0.508*** (0.03)	0.561*** (0.03)		0.581*** (0.03)
Main effects				
Affect. words		0.341*** (0.05)	t=12.84***	0.304*** (0.05)
Affect. words ^{2}		-0.273*** (0.01)		-0.228*** (0.02)
Affect. pictures [a]		0.372*** (0.05)	t=2.55**	0.432*** (0.05)
Affect. pictures [a] ^{2}		-0.104*** (0.02)		-0.118*** (0.02)
Affect. video [a]		0.384*** (0.03)	-/-	0.383*** (0.03)
Affect. video [a] ^{2}		-0.059○ (0.03)		-0.070* (0.03)
Affect. speech		0.423*** (0.06)	t=8.56***	0.463*** (0.06)
Affect. speech ^{2}		-0.227*** (0.02)		-0.229*** (0.02)
*Moderation effects	Z = moderator*				
Affect. words × Z				-0.364*** (0.03)
Affect. words ^{2} × Z				0.105*** (0.01)
Affect. pictures [a] × Z				-0.331*** (0.04)
Affect. pictures [a] ^{2} × Z				0.092*** (0.02)
Affect. video [a] × Z				-0.132*** (0.03)
Affect. video [a] ^{2} × Z				0.113*** (0.03)
Affect. speech × Z				-0.167*** (0.04)
Affect. speech ^{2} × Z				0.095*** (0.02)
Adjusted R^2	0.477	0.507		0.524

Table 14.6 Robustness test | winsorization at the 3rd and 97th percentile (continued)

	(4) Funding raised [a] Z = No. updates [a]		(5) Funding raised [a] Z = No. comments [a]		(6) Funding raised [a] Z = No. created [a]		(7) Funding raised [a] Z = Pledge goal [a]	
Control variables								
Category dummy	included		included				included	
No. words	0.247***	(0.05)	0.249***	(0.05)	0.258***	(0.05)	0.239***	(0.05)
No. pictures	0.440***	(0.03)	0.461***	(0.03)	0.429***	(0.03)	0.425***	(0.03)
Video duration	0.053	(0.03)	0.059○	(0.03)	0.097**	(0.03)	0.136***	(0.03)
No. spoken words	0.100○	(0.06)	0.089	(0.06)	0.071	(0.06)	0.031	(0.06)
Duration	-0.132***	(0.02)	-0.119***	(0.02)	-0.117***	(0.02)	-0.126***	(0.02)
Moderator variables								
Pledge goal [a]	0.039○	(0.02)	0.011	(0.02)	0.013	(0.02)	0.283***	(0.05)
No. backed [a]	0.461***	(0.02)	0.456***	(0.02)	0.489***	(0.02)	0.486***	(0.02)
No. created [a]	-0.043*	(0.02)	-0.041○	(0.02)	-0.303***	(0.04)	-0.005	(0.02)
No. updates [a]	0.615***	(0.04)	0.777***	(0.02)	0.776***	(0.02)	0.777***	(0.02)
No. comments [a]	0.593***	(0.03)	0.496***	(0.04)	0.590***	(0.03)	0.541***	(0.03)
Main effects								
Affect. words	0.250***	(0.05)	0.277***	(0.05)	0.332***	(0.05)	0.361***	(0.05)
Affect. words ^{2}	-0.199***	(0.02)	-0.225***	(0.02)	-0.266***	(0.01)	-0.288***	(0.02)
Affect. pictures [a]	0.440***	(0.05)	0.404***	(0.05)	0.375***	(0.05)	0.343***	(0.05)
Affect. pictures [a] ^{2}	-0.110***	(0.02)	-0.107***	(0.02)	-0.105***	(0.02)	-0.106***	(0.02)
Affect. video [a]	0.356***	(0.03)	0.392***	(0.03)	0.396***	(0.03)	0.402***	(0.03)
Affect. video [a] ^{2}	-0.059○	(0.03)	-0.087**	(0.03)	-0.077*	(0.03)	-0.062*	(0.03)
Affect. speech	0.418***	(0.06)	0.424***	(0.06)	0.424***	(0.06)	0.425***	(0.06)
Affect. speech ^{2}	-0.215***	(0.02)	-0.211***	(0.02)	-0.219***	(0.02)	-0.231***	(0.02)
*Moderation effects	Z = moderator*							
Affect. words × Z	-0.465***	(0.03)	-0.366***	(0.03)	-0.177***	(0.03)	0.177***	(0.03)
Affect. words ^{2} × Z	0.134***	(0.01)	0.105***	(0.01)	0.062***	(0.01)	-0.045**	(0.02)
Affect. pictures [a] × Z	-0.364***	(0.04)	-0.273***	(0.04)	-0.177***	(0.04)	0.169***	(0.05)
Affect. pictures [a] ^{2} × Z	0.115***	(0.02)	0.092***	(0.02)	0.045*	(0.02)	-0.058*	(0.02)
Affect. video [a] × Z	-0.113***	(0.03)	-0.174***	(0.03)	-0.118***	(0.03)	0.058	(0.03)
Affect. video [a] ^{2} × Z	0.091**	(0.03)	0.055○	(0.03)	0.078*	(0.03)	-0.051	(0.03)
Affect. speech × Z	-0.182***	(0.03)	-0.119***	(0.03)	-0.162***	(0.04)	0.204***	(0.04)
Affect. speech ^{2} × Z	0.083***	(0.02)	0.064***	(0.02)	0.101***	(0.02)	-0.062**	(0.02)
Adjusted R^2	0.527		0.520		0.515		0.513	

Notes: ○ p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001; n = 16,967; [a] inverse hyperbolic sine transformation (ihs); standard error in parentheses

Table 14.7 Number of backers as the dependent variable

	(1) No. backers	(2) No. backers U-test		(3) No. backers Z = No. backed [a]
Control variables				
Category dummy	included	included		included
No. words	0.009 (0.00)	-0.000 (0.01)		-0.001 (0.01)
No. pictures	0.062*** (0.01)	0.046*** (0.01)		0.044*** (0.01)
Video duration	0.024** (0.01)	0.022** (0.01)		0.009 (0.01)
No. spoken words	0.066*** (0.01)	0.022 (0.01)		0.018 (0.01)
Duration	-0.034*** (0.00)	-0.030*** (0.00)		-0.026*** (0.00)
Moderator variables				
Pledge goal [a]	0.006 (0.01)	-0.009 (0.01)		-0.003 (0.01)
No. backed [a]	0.084*** (0.00)	0.073*** (0.00)		0.044*** (0.01)
No. created [a]	0.002 (0.00)	0.007 (0.00)		-0.001 (0.00)
No. updates [a]	0.270*** (0.01)	0.247*** (0.01)		0.234*** (0.01)
No. comments [a]	0.079*** (0.01)	0.088*** (0.01)		0.094*** (0.01)
Main effects				
Affect. words		0.075*** (0.01)	t=9.21***	0.092*** (0.01)
Affect. words ^{2}		-0.030*** (0.00)		-0.032*** (0.00)
Affect. pictures [a]		0.055*** (0.01)	t=2.23*	0.076*** (0.01)
Affect. pictures [a] ^{2}		-0.014*** (0.00)		-0.020*** (0.00)
Affect. video [a]		0.062*** (0.01)	t=0.11	0.070*** (0.01)
Affect. video [a] ^{2}		-0.015* (0.01)		-0.023*** (0.01)
Affect. speech		0.054*** (0.01)	t=5.88***	0.074*** (0.01)
Affect. speech ^{2}		-0.030*** (0.00)		-0.034*** (0.00)
Moderation effects | Z = moderator				
Affect. words × Z				-0.073*** (0.01)
Affect. words ^{2} × Z				0.018*** (0.00)
Affect. pictures [a] × Z				-0.054*** (0.01)
Affect. pictures [a] ^{2} × Z				0.015*** (0.00)
Affect. video [a] × Z				-0.026*** (0.01)
Affect. video [a] ^{2} × Z				0.022*** (0.01)
Affect. speech × Z				-0.040*** (0.01)
Affect. speech ^{2} × Z				0.015*** (0.00)
Pseudo R^2	0.166	0.173		0.180

Table 14.7   Number of backers as the dependent variable (continued)

	(4) No. backers Z = No. updates [a]		(5) No. backers Z = No. comments [a]		(6) No. backers Z = No. created [a]		(7) No. backers Z = Pledge goal [a]	
Control variables								
Category dummy	included		included				included	
No. words	-0.001	(0.01)	0.001	(0.01)	0.002	(0.01)	-0.001	(0.01)
No. pictures	0.044 ***	(0.01)	0.048 ***	(0.01)	0.042 ***	(0.01)	0.043 ***	(0.01)
Video duration	0.001	(0.01)	0.008	(0.01)	0.019 *	(0.01)	0.027 **	(0.01)
No. spoken words	0.029 *	(0.01)	0.023	(0.01)	0.020	(0.01)	0.016	(0.01)
Duration	-0.030 ***	(0.00)	-0.028 ***	(0.00)	-0.027 ***	(0.00)	-0.029 ***	(0.00)
Moderator variables								
Pledge goal [a]	0.001	(0.01)	-0.008	(0.01)	-0.006	(0.01)	0.012	(0.01)
No. backed [a]	0.072 ***	(0.00)	0.070 ***	(0.00)	0.075 ***	(0.00)	0.075 ***	(0.00)
No. created [a]	-0.001	(0.00)	0.002	(0.00)	-0.026 **	(0.01)	0.007	(0.00)
No. updates [a]	0.187 ***	(0.01)	0.232 ***	(0.01)	0.240 ***	(0.01)	0.246 ***	(0.01)
No. comments [a]	0.100 ***	(0.01)	0.092 ***	(0.01)	0.094 ***	(0.01)	0.086 ***	(0.01)
Main effects								
Affect. words	0.103 ***	(0.01)	0.088 ***	(0.01)	0.078 ***	(0.01)	0.077 ***	(0.01)
Affect. words ^{2}	-0.036 ***	(0.00)	-0.032 ***	(0.00)	-0.030 ***	(0.00)	-0.031 ***	(0.00)
Affect. pictures [a]	0.099 ***	(0.01)	0.072 ***	(0.01)	0.058 ***	(0.01)	0.052 ***	(0.01)
Affect. pictures [a] ^{2}	-0.024 ***	(0.00)	-0.019 ***	(0.00)	-0.015 ***	(0.00)	-0.015 ***	(0.00)
Affect. video [a]	0.068 ***	(0.01)	0.073 ***	(0.01)	0.068 ***	(0.01)	0.064 ***	(0.01)
Affect. video [a] ^{2}	-0.022 **	(0.01)	-0.025 ***	(0.01)	-0.021 **	(0.01)	-0.016 *	(0.01)
Affect. speech	0.076 ***	(0.01)	0.066 ***	(0.01)	0.059 ***	(0.01)	0.054 ***	(0.01)
Affect. speech ^{2}	-0.035 ***	(0.00)	-0.031 ***	(0.00)	-0.031 ***	(0.00)	-0.031 ***	(0.00)
Moderation effects | Z = moderator								
Affect. words × Z	-0.089 ***	(0.01)	-0.060 ***	(0.01)	-0.034 ***	(0.01)	0.012	(0.01)
Affect. words ^{2} × Z	0.024 ***	(0.00)	0.015 ***	(0.00)	0.009 ***	(0.00)	-0.007	(0.00)
Affect. pictures [a] × Z	-0.076 ***	(0.01)	-0.040 ***	(0.01)	-0.025 **	(0.01)	0.016 ○	(0.01)
Affect. pictures [a] ^{2} × Z	0.022 ***	(0.00)	0.013 ***	(0.00)	0.007 ○	(0.00)	-0.005	(0.00)
Affect. video [a] × Z	-0.034 ***	(0.01)	-0.027 ***	(0.01)	-0.023 ***	(0.01)	0.017 *	(0.01)
Affect. video [a] ^{2} × Z	0.021 ***	(0.01)	0.011 *	(0.01)	0.016 *	(0.01)	-0.010	(0.01)
Affect. speech × Z	-0.052 ***	(0.01)	-0.026 ***	(0.01)	-0.030 ***	(0.01)	0.026 **	(0.01)
Affect. speech ^{2} × Z	0.020 ***	(0.00)	0.010 ***	(0.00)	0.013 ***	(0.00)	-0.007 ○	(0.00)
Pseudo R^2	0.183		0.178		0.176		0.174	

Notes: ○ p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001; n = 16,967; [a] inverse hyperbolic sine transformation (ihs); standard error in parentheses

Table 14.8 Pledge per backer as the dependent variable

	(1) Backer pledged [a]	(2) Backer pledged [a]	U-test	(3) Pledge p. backer [a] Z = No. backed [a]
Control variables				
Category dummy	included	included		included
No. words	0.104 *** (0.01)	0.211 *** (0.03)		0.205 *** (0.03)
No. pictures	0.245 *** (0.02)	0.205 *** (0.02)		0.198 *** (0.02)
Video duration	0.118 *** (0.02)	0.089 *** (0.02)		0.063 ** (0.02)
No. spoken words	0.142 *** (0.02)	-0.033 (0.04)		-0.041 (0.04)
Duration	-0.047 *** (0.01)	-0.038 ** (0.01)		-0.033 ** (0.01)
Moderator variables				
Pledge goal [a]	0.090 *** (0.01)	0.057 *** (0.01)		0.071 *** (0.01)
No. backed [a]	0.073 *** (0.01)	0.044 ** (0.01)		-0.071 ** (0.02)
No. created [a]	-0.008 (0.01)	0.003 (0.01)		-0.017 (0.01)
No. updates [a]	0.461 *** (0.02)	0.407 *** (0.02)		0.391 *** (0.02)
No. comments [a]	-0.062 *** (0.02)	-0.039 * (0.02)		-0.022 (0.02)
Main effects				
Affect. words		0.035 (0.03)	t=4.99 ***	0.032 (0.03)
Affect. words ^{2}		-0.084 *** (0.01)		-0.078 *** (0.01)
Affect. pictures [a]		0.129 *** (0.03)	t=2.11 *	0.161 *** (0.03)
Affect. pictures [a] ^{2}		-0.037 ** (0.01)		-0.045 *** (0.01)
Affect. video [a]		0.194 *** (0.02)	t=1.58 ○	0.195 *** (0.02)
Affect. video [a] ^{2}		-0.072 *** (0.02)		-0.075 *** (0.02)
Affect. speech		0.198 *** (0.04)	t=5.05 ***	0.216 *** (0.04)
Affect. speech ^{2}		-0.072 *** (0.01)		-0.072 *** (0.01)
*Moderation effects	Z = moderator*				
Affect. words × Z				-0.174 *** (0.02)
Affect. words ^{2} × Z				0.047 *** (0.01)
Affect. pictures [a] × Z				-0.160 *** (0.02)
Affect. pictures [a] ^{2} × Z				0.045 *** (0.01)
Affect. video [a] × Z				-0.094 *** (0.02)
Affect. video [a] ^{2} × Z				0.044 * (0.02)
Affect. speech × Z				-0.073 ** (0.02)
Affect. speech ^{2} × Z				0.042 *** (0.01)
Adjusted R^2	0.229	0.250		0.266

Table 14.8   Pledge per backer as the dependent variable (continued)

	(4) Pledge p. backer [a] Z = No. updates [a]		(5) Pledge p. backer [a] Z = No. comments [a]		(6) Pledge p. backer [a] Z = No. created [a]		(7) Pledge p. backer [a] Z = Pledge goal [a]	
Control variables								
Category dummy	included		included				included	
No. words	0.207***	(0.03)	0.212***	(0.03)	0.213***	(0.03)	0.201***	(0.03)
No. pictures	0.202***	(0.02)	0.211***	(0.02)	0.194***	(0.02)	0.191***	(0.02)
Video duration	0.044*	(0.02)	0.062**	(0.02)	0.081***	(0.02)	0.099***	(0.02)
No. spoken words	-0.018	(0.04)	-0.029	(0.04)	-0.034	(0.04)	-0.049	(0.04)
Duration	-0.040***	(0.01)	-0.034**	(0.01)	-0.033**	(0.01)	-0.037**	(0.01)
Moderator variables								
Pledge goal [a]	0.082***	(0.01)	0.060***	(0.01)	0.064***	(0.01)	0.221***	(0.03)
No. backed [a]	0.047**	(0.01)	0.038**	(0.01)	0.053***	(0.01)	0.049**	(0.01)
No. created [a]	-0.020	(0.01)	-0.010	(0.01)	-0.118***	(0.03)	0.008	(0.01)
No. updates [a]	0.239***	(0.03)	0.384***	(0.02)	0.396***	(0.02)	0.405***	(0.02)
No. comments [a]	-0.000	(0.02)	-0.065**	(0.02)	-0.024	(0.02)	-0.050**	(0.02)
Main effects								
Affect. words	0.024	(0.03)	0.023	(0.03)	0.033	(0.03)	0.038	(0.03)
Affect. words ^{2}	-0.072***	(0.01)	-0.079***	(0.01)	-0.083***	(0.01)	-0.083***	(0.01)
Affect. pictures [a]	0.192***	(0.03)	0.150***	(0.03)	0.130***	(0.03)	0.113***	(0.03)
Affect. pictures [a] ^{2}	-0.049***	(0.01)	-0.043***	(0.01)	-0.037**	(0.01)	-0.035**	(0.01)
Affect. video [a]	0.180***	(0.02)	0.199***	(0.02)	0.199***	(0.02)	0.203***	(0.02)
Affect. video [a] ^{2}	-0.064***	(0.02)	-0.083***	(0.02)	-0.083***	(0.02)	-0.069***	(0.02)
Affect. speech	0.207***	(0.04)	0.201***	(0.04)	0.194***	(0.04)	0.185***	(0.04)
Affect. speech ^{2}	-0.069***	(0.01)	-0.066***	(0.01)	-0.068***	(0.01)	-0.069***	(0.01)
*Moderation effects	Z = moderator*								
Affect. words × Z	-0.225***	(0.02)	-0.165***	(0.02)	-0.083***	(0.02)	0.093***	(0.02)
Affect. words ^{2} × Z	0.058***	(0.01)	0.043***	(0.01)	0.028***	(0.01)	-0.026***	(0.01)
Affect. pictures [a] × Z	-0.210***	(0.03)	-0.131***	(0.02)	-0.084***	(0.03)	0.068*	(0.03)
Affect. pictures [a] ^{2} × Z	0.065***	(0.01)	0.048***	(0.01)	0.027*	(0.01)	-0.024○	(0.01)
Affect. video [a] × Z	-0.103***	(0.02)	-0.095***	(0.02)	-0.072***	(0.02)	0.029	(0.02)
Affect. video [a] ^{2} × Z	0.044*	(0.02)	0.026	(0.02)	0.027	(0.02)	-0.055**	(0.02)
Affect. speech × Z	-0.103***	(0.02)	-0.054**	(0.02)	-0.063**	(0.02)	0.104***	(0.03)
Affect. speech ^{2} × Z	0.039***	(0.01)	0.027**	(0.01)	0.032**	(0.01)	-0.027*	(0.01)
Adjusted R^2	0.275		0.261		0.256		0.255	

Notes: ○ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; n = 16,967; [a] inverse hyperbolic sine transformation (ihs); standard error in parentheses

Table 14.9 Positive verbal and nonverbal affective cues as the main effects

	(1) Funding raised [a]	(2) Funding raised [a] U-test		(3) Funding raised [a] Z = No. backed [a]
Control variables				
Category dummy	included	included		included
No. words	0.153*** (.02)	0.128** (0.04)		0.123** (0.04)
No. pictures	0.498*** (.03)	0.390*** (0.03)		0.380*** (0.03)
Video duration	0.142*** (.03)	0.093** (0.03)		0.049 (0.03)
No. spoken words	0.391*** (.03)	0.024 (0.05)		0.025 (0.05)
Duration	-0.137*** (.02)	-0.120*** (0.02)		-0.110*** (0.02)
Moderator variables				
Pledge goal [a]	0.164*** (.02)	0.100*** (0.02)		0.125*** (0.02)
No. backed [a]	0.409*** (.02)	0.346*** (0.02)		0.151*** (0.04)
No. created [a]	-0.028 (.02)	0.008 (0.02)		-0.032 (0.02)
No. updates [a]	1.325*** (.02)	1.215*** (0.02)		1.185*** (0.02)
No. comments [a]	0.455*** (.03)	0.513*** (0.03)		0.545*** (0.03)
Main effects				
Positive words		0.321*** (0.05)	t=10.91***	0.309*** (0.05)
Positive words ^{2}		-0.167*** (0.01)		-0.150*** (0.01)
Happiness in pic [a]		0.309*** (0.04)	t=1.62○	0.362*** (0.04)
Happiness in pic [a] ^{2}		-0.063*** (0.02)		-0.078*** (0.02)
Happiness in video [a]		0.398*** (0.04)	t=0.64	0.392*** (0.03)
Happiness in video [a] ^{2}		-0.099*** (0.03)		-0.104*** (0.03)
Positive speech		0.423*** (0.06)	t=8.02***	0.447*** (0.06)
Positive speech ^{2}		-0.163*** (0.02)		-0.165*** (0.02)
Moderation effects | Z = moderator				
Positive words × Z				-0.329*** (0.03)
Positive words ^{2} × Z				0.083*** (0.01)
Happiness in pic [a] × Z				-0.289*** (0.04)
Happiness in pic [a] ^{2} × Z				0.078*** (0.02)
Happiness in video [a] × Z				-0.115*** (0.03)
Happiness in video [a] ^{2} × Z				0.069** (0.03)
Positive speech × Z				-0.163*** (0.03)
Positive speech ^{2} × Z				0.073*** (0.02)
Adjusted R^2	0.524	0.550		0.563

Table 14.9   Positive verbal and nonverbal affective cues as the main effects (continued)

	(4) Funding raised [a] Z = No. updates [a]		(5) Funding raised [a] Z = No. comments [a]		(6) Funding raised [a] Z = No. created [a]		(7) Funding raised [a] Z = Pledge goal [a]	
Control variables								
Category dummy	included		included				included	
No. words	0.121**	(0.04)	0.129**	(0.04)	0.134**	(0.04)	0.115**	(0.04)
No. pictures	0.387***	(0.03)	0.407***	(0.03)	0.374***	(0.03)	0.363***	(0.03)
Video duration	0.027	(0.03)	0.052	(0.03)	0.079*	(0.03)	0.114***	(0.03)
No. spoken words	0.057	(0.05)	0.040	(0.05)	0.024	(0.05)	-0.014	(0.05)
Duration	-0.124***	(0.02)	-0.112***	(0.02)	-0.111***	(0.02)	-0.118***	(0.02)
Moderator variables								
Pledge goal [a]	0.136***	(0.02)	0.105***	(0.02)	0.112***	(0.02)	0.331***	(0.04)
No. backed [a]	0.348***	(0.02)	0.335***	(0.02)	0.359***	(0.02)	0.354***	(0.02)
No. created [a]	-0.027	(0.02)	-0.016	(0.02)	-0.233***	(0.04)	0.016	(0.02)
No. updates [a]	0.936***	(0.04)	1.175***	(0.02)	1.194***	(0.02)	1.208***	(0.02)
No. comments [a]	0.574***	(0.03)	0.471***	(0.04)	0.541***	(0.03)	0.495***	(0.03)
Main effects								
Positive words	0.300***	(0.05)	0.292***	(0.05)	0.317***	(0.05)	0.328***	(0.05)
Positive words ^{2}	-0.143***	(0.01)	-0.151***	(0.01)	-0.165***	(0.01)	-0.178***	(0.01)
Happiness in pic [a]	0.435***	(0.05)	0.351***	(0.04)	0.304***	(0.04)	0.275***	(0.05)
Happiness in pic [a] ^{2}	-0.095***	(0.02)	-0.076***	(0.02)	-0.063***	(0.02)	-0.062**	(0.02)
Happiness in video [a]	0.380***	(0.03)	0.405***	(0.03)	0.400***	(0.03)	0.407***	(0.04)
Happiness in video [a] ^{2}	-0.094***	(0.03)	-0.113***	(0.03)	-0.111***	(0.03)	-0.100***	(0.03)
Positive speech	0.425***	(0.06)	0.417***	(0.06)	0.421***	(0.06)	0.418***	(0.06)
Positive speech ^{2}	-0.159***	(0.02)	-0.155***	(0.02)	-0.158***	(0.02)	-0.164***	(0.02)
*Moderation effects	Z = moderator*							
Positive words × Z	-0.334***	(0.03)	-0.294***	(0.03)	-0.140***	(0.03)	0.159***	(0.03)
Positive words ^{2} × Z	0.086***	(0.01)	0.072***	(0.01)	0.039***	(0.01)	-0.027*	(0.01)
Happiness in pic [a] × Z	-0.361***	(0.04)	-0.233***	(0.03)	-0.183***	(0.04)	0.119*	(0.05)
Happiness in pic [a] ^{2} × Z	0.110***	(0.02)	0.078***	(0.01)	0.056**	(0.02)	-0.034○	(0.02)
Happiness in video [a] × Z	-0.121***	(0.03)	-0.157***	(0.03)	-0.110**	(0.03)	0.065○	(0.04)
Happiness in video [a] ^{2} × Z	0.066**	(0.03)	0.054*	(0.03)	0.050○	(0.03)	-0.050○	(0.03)
Positive speech × Z	-0.186***	(0.03)	-0.093**	(0.03)	-0.154***	(0.03)	0.200***	(0.04)
Positive speech ^{2} × Z	0.068***	(0.01)	0.044**	(0.01)	0.078***	(0.02)	-0.054**	(0.02)
Adjusted R^2	0.564		0.559		0.555		0.555	

Notes: ○ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; n = 16,967; [a] inverse hyperbolic sine transformation (ihs); standard error in parentheses

14.9 References

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Part 3:

Effects of Multi-Modal Emotion Expression on Funding Performance

15 Paper V: Multi-Modal Perspective on Effective Use of Verbal and Nonverbal Affective Cues

Table 15.1 Fact sheet Paper V

Fact	Description
Title	I've Got a Feeling - A Multi-Modal Perspective on how Emotional Expressions Affect Investment Decisions in Reward-Based Crowdfunding
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I've Got a Feeling - A Multi-Modal Perspective on how Emotional Expressions Affect Investment Decisions in Reward-Based Crowdfunding

Abstract. *Investment decisions in reward-based crowdfunding are often shaped by intuitive impressions like the emotional appeal of the campaign presentation. Insights into how the intensity of emotional expressions modulates this impact are still limited, however. Extant research also neglects the interplay of emotional expressions that are transmitted concurrently via multiple modalities. Building upon the Emotion as Social Information Model (EASI), we therefore applied regression and fuzzy-set qualitative comparative analyses (fsQCA) to examine the effects of emotional expressions in the text, pictures, and pitch videos of 16,967 campaign presentations from Kickstarter. We observed a non-linear relationship between emotional expressions and funding performance, suggesting that intensive emotional expressions are perceived as inappropriate. The fsQCA yielded three multi-modal configurations of emotional expressions that support an optimized funding performance. We suggest that emotional expressions in different modalities can substitute but also reinforce each other, since utilizing all modalities is not necessary, but none alone suffices to achieve an optimal effect.*

Plain English Summary. *Funding decisions in reward-based crowdfunding often rely on gut feelings, which are influenced by the emotional appeal of campaign presentations. However, it is still largely unclear how the intensity of expressed emotions affects funding decisions, especially when multiple modalities are used to convey emotions. Drawing on the Emotion as Social Information Model, we examine the effects of emotional expressions in text, pictures, and pitch videos on funding performance. We found that the display of emotional expressions has a non-linear impact on funding performance, meaning that displaying too many emotional expressions in each modality negatively affects funding performance. We also discovered three combinations of emotional expressions that work best to achieve higher funding. Our findings inform the debate on how the intensity of emotional expressions in multiple modalities affects funding decisions. The study also suggests strategies for entrepreneurs on how to display emotional expressions to increase funding performance in reward-based crowdfunding.*

Keywords: Reward-based crowdfunding, non-linear regression analyses, fsQCA, affective cues, multi-modal emotional expressions, EASI model

15.1 Introduction

Reward-based crowdfunding platforms such as Kickstarter give entrepreneurs an increasingly popular opportunity to raise capital directly from the crowd to realize novel business ideas in exchange for non-financial rewards (Mollick, 2014). Typically, entrepreneurs ask for the funding of innovative products that are still in the prototype stage or not ready for the market yet. To decide whether and to what extent such a project should be funded, potential investors are given access to the campaign presentation as the main source of information. The presentation allows entrepreneurs to communicate the project's idea by transmitting both detailed information and implicit cues (e.g., Bollaert et al., 2019; Kaminski and Hopp, 2020; Lin and Boh, 2021). The decision to fund the project is hence based on the content of the campaign presentation, which is usually composed of a written narrative, pictures, and a pitch video (Mollick, 2014; Yang et al., 2020; Zhou et al., 2016). Knowledge of how to use these communication modalities to present campaigns in a way that encourages funding decisions accordingly becomes a critical success factor for entrepreneurs in convincing investors (e.g., Cappa et al., 2020; Letwin et al., 2024; Wang et al., 2023).

Research has shown that perceived emotions can influence decision-making processes, especially when decisions are made with a degree of uncertainty. In such scenarios, emotional expressions can provide a substitute for missing information and help to further shape a decision-maker's appraisal of a situation or product (Achar et al., 2016; Li et al., 2017; van Kleef, 2014). Given that potential investors are usually not provided with detailed business plans and lack the expertise to conduct serious due-diligence, prior research found that investment decisions in reward-based crowdfunding likewise are influenced by more intuitive impressions like the emotional appeal of a campaign's presentation (Xiang et al., 2019). Prior studies specifically showed that the transmission of emotional expressions as cues via the available communication modalities can impact the funding decision (e.g., Koch and Siering, 2019; Letwin et al., 2024; Li et al., 2017).

Yet, there is still limited understanding of how emotional expressions should be used as cues in campaign presentations to effectively motivate investors to fund a project. On the one hand, it is unclear how the effect on the funding decision is modulated by the intensity of emotional expressions. While extant research mostly assumes that higher intensities of emotional expressions have a stronger impact on funding performance (e.g., Koch and Siering, 2019; Li et al., 2017; Tafesse, 2021), a few studies observed saturation or even adverse effects of high intensities of emotional expressions (Chan et al., 2020; Costello and Lee, 2022; Wang et al., 2016; Younkin and Kuppuswamy, 2018). On the other hand,

prior studies largely ignore that crowdfunding platforms support multi-modal emotional expressions by combining affective words in the text with affective speech in the pitch video, and/or facial emotion expressions in the pictures and video. So far, research in the reward-based crowdfunding domain has mostly examined the effects of emotional expressions that are conveyed via a single modality (e.g., Koch and Siering, 2019; Li et al., 2021; Parhankangas and Renko, 2017; Wang et al., 2016). It has hardly been examined if emotional expressions in different modalities can substitute, reinforce, or even weaken each other when multiple modalities are used together. It thus remains unclear if all modalities should be used to convey emotional expressions and how the modalities should be combined to effectively promote the success of crowdfunding campaigns.

To contribute to the closure of this literature gap, we present the results of a study in which we systematically examined the impacts of multi-modal emotional expressions in reward-based crowdfunding. We analyze the following research questions: *How do emotional expressions in campaign presentations influence the funding decision of investors in reward-based crowdfunding? How should different modalities to express emotions be combined to optimize funding behavior?* Thereby, we consider all main modalities to express emotions in campaign presentations and examine the impact of affective words (in the text), affective speech (in the pitch video), and facial emotional expressions (in the pictures and the pitch video).

As theoretical base, we build on the Emotions as Social Information (EASI) Model. It posits that emotional expressions can trigger affective reactions and/or inferential processes in observers depending on socio-relational factors that affect their perceived appropriateness. Against this background, we propose that there exists a peak intensity of emotional expressions that should be conveyed using the different modalities to effectively influence funding decisions. In addition, we assume that the available modalities can be filled with emotional expressions in different configurations to effectively convey emotion expressions, thus proposing that emotional expressions in different modalities can substitute each other.

To test these propositions and answer our research questions, we analyze the emotional expressions contained in the text, pictures, and pitch videos of 16,967 campaign presentations that we gathered from Kickstarter, a leading reward-based crowdfunding platform. The emotional expressions contained in the text and speech were identified using a dictionary approach (LIWC (Pennebaker et al., 2015)). Facial emotional expressions shown in pictures and videos were recognized using a machine-learning algorithm (Microsoft Emotion API (Microsoft, 2023)). To examine potential non-linear effects, we conducted

multiple regression analyses (MRA). As "reality usually includes more than one combination of conditions that lead to high values in an outcome" (Woodside, 2013, p. 464), we moreover performed a fuzzy-set qualitative comparative analysis (fsQCA) to identify effective combinations of emotional expressions in the available modalities. An fsQCA yields so-called "causal recipes" (Ragin, 2008), which are combinatory statements of conditions (i.e., intensity of emotional expressions across the different modalities) that are associated with an outcome of interest (i.e., optimal funding behavior) (Pappas and Woodside, 2021). Using a fsQCA hence allows us to derive insights how emotional expressions can work across different modalities to impact the funding decision in reward-based crowdfunding.

The results of our study provide new insights into the effect of emotional expressions on investment decisions in reward-based crowdfunding. First, we provide a new, multi-modal perspective on the effectiveness of emotional expressions in reward-based crowdfunding, which encompasses the main modalities available to create campaign presentations. The MRA results show that, if all modalities are analyzed, emotional expressions have a non-linear impact on funding performance. Other than most studies in the reward-based crowdfunding domain, we hence suggest that there exists a peak intensity of emotional expressions that should not be exceeded. Second, our results advance the understanding of how the combination of emotional expressions across different modalities affects the funding decision. The fsQCA results highlight three different combinations of emotional expressions that support an optimized funding performance in a comparable manner. Thereby, the results indicate that different combinations of modalities can achieve a similar impact, thus indicating that emotional expressions in different modalities can substitute each other to some extent. Yet, no modality alone seems to be sufficient to produce an optimal effect, suggesting that there also exist reinforcement effects between emotional expressions in different modalities, at least until a certain intensity level is reached. With respect to the reward-based crowdfunding domain, we show how emotional expressions can concretely be weighed and orchestrated through different modalities to achieve an optimal effect, a topic that has rarely been studied in general so far (van Kleef and Côté, 2022). Generally, insights into the comparative effects of emotional expressions in different modalities have so far mostly been derived by comparing the results of studies that each examined emotional expressions in a single modality (van Kleef and Côté, 2022). While these rather derivative insights suggest that the effects of emotions are functionally equivalent regardless of the chosen modality (van Kleef, 2016; van Kleef and Côté, 2022), our results indicate that they might be more effective if they are expressed and transmitted concurrently through several modalities. The results hence also

have a potential to advance the knowledge base of how emotional expressions work in professional contexts and in interactions in general, which is still premature (van Kleef and Côté, 2022).

From a methodological perspective, we finally show how the combination of MRA and fsQCA can lead to richer, complementary insights as claimed in literature (Pappas and Woodside, 2021). We thereby used the results of the non-linear regression analysis to adjust the fsQCA calibration process.

The remainder of the manuscript is organized as follows: next, we discuss theoretical foundations and relevant literature streams. Against this background, we develop the propositions underlying our study. After describing the research approach, we present and discuss the results of our study in detail. The manuscript is concluded with a summary of the central findings and an outlook on future research.

15.2 Theoretical Background

15.2.1 The Influence of Affective Cues on Decision-Making

Reward-based crowdfunding campaigns are typically presented using a written description of the project that is accompanied by pictures. In addition, a video with a spoken voice-over can be provided. Entrepreneurs can use these modalities to communicate the project's idea by transmitting both detailed information and more implicit cues to persuade investors. Cues are information snippets that support the recipient's learning about a specific context (Jiang and Benbasat, 2007). In campaign presentations, both verbal and non-verbal cues can be transmitted. Verbal cues are expressed using written or spoken words, while nonverbal cues are communicated through means other than words, for instance, using facial expressions, gestures, or body language (Jacob et al., 2014). If cues contain emotional expressions, they are called affective cues.

Research has shown that especially affective cues such as affective words in the written and spoken narration as well as facial emotional expressions in pictures and the pitch video can have an effect on the funding behavior (e.g., Allison et al., 2022; Koch and Siering, 2019; Lin and Boh, 2021; Raab et al., 2020). To explain this effect, extant studies in the reward-based crowdfunding domain often refer to the theoretical notion of primitive emotional contagion. It explains the spreading of affective cues from the sender to the recipients as a natural, subconscious affective reaction, in which the recipient catches the displayed emotion from the sender (Hatfield et al., 1993). Emotional expressions can

thus unfold a contagious effect and evoke an emotional state similar to that of the sender in the recipients (van Kleef, 2009), which affects their funding decisions.

While the concept of primitive emotional contagion (Hatfield et al., 1993) is widely acknowledged today, it is not able to explain empirical findings, which indicate that the effect of emotional expressions is not always the same, but appears to depend on the context in which the communication occurs and socio-relational factors such as context-specific display rules and social norms (van Kleef and Côté, 2022). To better understand how and why affective cues can influence investors' attitudes and decision-making behavior, we therefore build upon the Emotion as Social Information (EASI) Model (van Kleef, 2014) and the related research stream. The EASI Model suggests that emotional expressions can trigger both affective reactions and inferential processes in the recipient. In analogy to the conception of primitive emotional contagion, it assumes that emotional expressions can elicit affective reactions in others who experience them, and thus affect their emotional state (Cheshin et al., 2018; van Kleef, 2014). For example, expressed joy can elicit reciprocal feelings of joy and affect the recipient's emotional state. The perceived joy can alter first impressions, influence interpersonal liking, and affect economic decisions (Achar et al., 2016; Loewenstein and Lerner, 2003; van Kleef et al., 2015).

However, the EASI model also suggests that emotional expressions can trigger inferential processes, for instance when recipients makes conclusions about the senders' feelings and attitudes by interpreting their expressed emotions (van Kleef, 2009; van Kleef, 2014). Affective cues can thus provide hints that help recipients to better understand the sender's appraisal of a situation or product, especially when recipients have limited insights into the senders' motivations (van Kleef, 2009; van Kleef et al., 2015). For instance, when confronted with someone's happiness, recipients may conclude that things are going well. Affective cues hence inform recipients about the senders' appraisal of the situation (Achar et al., 2016; van Kleef, 2014), let them infer the senders' personality and how they might behave (van Kleef, 2009), which in turn can also have an influence economic decisions (Loewenstein and Lerner, 2003; Peace et al., 2006).

While the EASI Model hence suggests that the effects of emotional expressions on recipients' behaviors are mediated by both affective reactions and the triggered inferential processes, the related research strand found that their relative effects depend on the perceived appropriateness of the emotional expressions. Generally, emotional expressions can be considered appropriate if they are "correct for the situation and in correct proportion to the evoking circumstances" (Shields, 2005, p. 7). Whether emotional expressions are perceived as appropriate particularly seems to be contingent on social-relational factors such

as display rules, personality, or culture, which shape context-dependent norms and expectations regarding emotional expressions (van Kleef and Côté, 2022). Other than the theoretical concept of primitive emotional contagion, the EASI Model hence proposes a significantly context-dependent social effect of emotional expressions. It thus provides a more detailed theoretical framework of how to put emotional expressions into practical use and to develop persuasive campaign presentations with affective cues.

15.2.2 Related Work Regarding Affective Cues in Reward-Based Crowdfunding

Prior studies have identified several affective cues in different modalities of a campaign presentation, which can affect the investment decision in reward-based crowdfunding. Extant studies for instance reported that the accuracy of identifying fraudulent projects (Siering et al., 2016) and the prediction of funding success increases when accounting for written and spoken affective words (Kaminski and Hopp, 2020; Mitra and Gilbert, 2014). While a few studies observed no significant effects regarding written (Allison et al., 2017; Tafesse, 2021) or spoken affective words (Parhankangas and Renko, 2017), many even found that the number of written affective words or a positive tone is positively related to funding performance (Costello and Lee, 2022; Franzoni and Tenca, 2023; Koch and Siering, 2019; Moradi and Badrinarayanan, 2021; Wang et al., 2017; Younkin and Kuppuswamy, 2018; Yuan et al., 2021). Besides Zhou et al. (2016), these studies have assumed linear effects of verbal emotional expression intensities. Prior research furthermore reported that nonverbal affective cues such as facial emotional expressions in pictures and videos can have positive effects on funding performance (Jiang et al., 2020b; Lin and Boh, 2021). While one study observed no significant effects of facial expressions in videos (Li et al., 2021), others even found negative effects of high intensities of nonverbal emotional expressions in pictures or videos (Jiang et al., 2020b; Wang et al., 2016; Warnick et al., 2021).

Especially with respect to the effects of higher intensities of emotional expressions, extant studies hence report mixed findings. The existing studies have furthermore mainly analyzed emotional expressions that were transmitted via a single modality, thereby ignoring the multi-modal nature of campaign presentations that supports a concurrent transmission of affective cues via several modalities. The combined effect of multi-modal emotional expressions consequently remains unclear.

Insights into the combined effect of multi-modal emotional expressions can potentially be derived from studies that have analyzed the emotional appeal of campaign presentations as a whole. Such studies have found that campaign presentations with higher emotional appeal exert less persuasive influence (Xiang et al., 2019) and perceived pathos has a positive moderating impact (Steigenberger and Wilhelm, 2018). Other studies observed that perceived passion, which was measured as an aggregated perception of affective cues with no differentiation of the used modalities, positively affects decision-making (Davis et al., 2017; Letwin et al., 2024; Li et al., 2017). Some studies found no such significant effect (Chan et al., 2020; Oo et al., 2019), however.

Aside from the still inconsistent results, studies that examine higher-order constructs such as the presentations' emotional appeal or perceived passion cannot examine the distinct effects of verbal and nonverbal emotional expressions. Potential reinforcement or substitution effects that might exist between emotional expressions in different modalities consequently remain unexplored. It hence remains unclear if one or all modalities should be used to convey emotional expressions and how emotional expressions should be distributed across the available modalities to promote the success of crowdfunding campaigns.

Studies that compare the social effects of emotional expressions across expressive modalities generally are still rare (van Kleef and Côté, 2022). By analyzing the effect of multi-modal affective cues on investment decisions in reward-based crowdfunding, we hence focus on a mostly unexplored but potentially impactful research area.

Table 15.2 Research on affective cues in reward-based crowdfunding

Affective cues analyzed in	Text	Speech	Picture	Video
Mitra and Gilbert (2014), Siering et al. (2016)	P			
Kaminski and Hopp (2020)	P	P		
Allison et al. (2017), Costello and Lee (2022), Franzoni and Tenca (2023), Koch and Siering (2019), Moradi and Badrinarayanan (2021), Moradi et al. (2024) Tafesse (2021), Wang et al. (2017), Younkin and Kuppuswamy (2018), Yuan et al. (2021)	L			
Wang et al. (2016)			L	
Li et al. (2021), Lin and Boh (2021)				L
Allison et al. (2022), Parhankangas and Renko (2017)		L		
Zhou et al. (2016)	N			
Raab et al. (2020)			N	
Jiang et al. (2020b), Warnick et al. (2021)				N
Our study	**N+Q**	**N+Q**	**N+Q**	**N+Q**

Notes: article considered P = prediction accuracy, L = linear effect, N = non-linear effect, Q = fsQCA; Steigenberger and Wilhelm (2018), Xiang et al. (2019) = no differentiation of modalities (L); Chan et al. (2020), Davis et al. (2017), Jiang et al. (2023), Jin et al. (2024), Letwin et al. (2024), Li et al. (2017), Oo et al. (2019) = pitch video with no differentiation of video content and speech (L)

15.2.3 Non-linear Effect of Affective Cues on Funding Behavior

Previous studies in the reward-based crowdfunding domain have shown that the display of affective cues in the campaign presentation can positively influence the funding decision of potential investors (e.g., Davis et al., 2017; Li et al., 2017; Lin and Boh, 2021; Warnick et al., 2021). Based on the notion of primitive emotional contagion, which basically states that every emotional expression can unfold a contagious effect, many studies have proposed - and oftentimes observed - that the transmission of higher amounts of emotional expressions via the available modalities further increases the funding performance (Allison et al., 2022; Li et al., 2017; Lin and Boh, 2021). While it seems thus reasonable to generally assume a linear or at least monotonous effect of the intensity of emotional expressions on the funding performance, this argument ignores that the appraisal of affective cues is shaped by their perceived appropriateness. According to the research stream related to the EASI Model, the perceived appropriateness can vary depending on socio-relational factors such as the display rules prevailing in a certain context (van Kleef and Côté, 2022).

Research has recently begun to investigate the effects of the intensity of emotional expressions on perceived appropriateness and the resulting behavior in more depth. Studies that were conducted in other professional communication contexts have found non-linear effects of the intensity of emotional expressions on perceived appropriateness. A study that was conducted in a customer service context found that intense (other than moderate) displays of emotional expressions by service providers were interpreted by customers as inauthentic and inappropriate, leading to reduced trust into the service provider and lower satisfaction with the product (Cheshin et al., 2018). Another study that was conducted in a negotiation context observed that high intensities of emotional expressions (in contrast to moderate intensities) led to smaller concessions because the expressions were perceived as inappropriate (Adam and Brett, 2018).

We assume that a similar perception of emotional expressions exists in the reward-based crowdfunding domain. For instance, while entrepreneurial enthusiasm apparently is positively perceived (Li et al., 2017), expressing high intensities of positive affect may be perceived as overly confident (Shipman and Mumford, 2011). Overconfidence has been linked to various issues, including failing to recognize problems and having a weak ability to observe changes and make necessary adjustments (Shipman and Mumford, 2011). High intensities of verbal and nonverbal affective cues might be interpreted as less authentic and naïve, thus, less competent, since the rationality of the sender is found to be reduced (Cheshin et al., 2018; Wang et al., 2016). Such inferences conflict with investors'

expectation that entrepreneurs should demonstrate competence (Wang et al., 2016). Also, investors might suspect impression management motives behind the display of high amounts of emotional expression. They might lead to an impression of a manipulative attempt that uses affective cues merely as strategical means (Jiang et al., 2020b; Jiang et al., 2023; Siering et al., 2016). We therefore assume that high intensities of affective cues may make the investor feel uncomfortable and resistant (Jiang et al., 2020b). We propose that the display of verbal and nonverbal affective cues will have positive effects only until overly high intensities, i.e., too much of a good thing, begin to trigger counteracting effects. Altogether, we hence suggest a curvilinear, inverted U-shaped relationship:

Proposition 1: Affective cues in the project presentation have an inverted U-shaped effect on funding performance.

15.2.4 Combined Effect of Multi-Modal Affective Cues

The social effects of emotions that are expressed concurrently via multiple modalities generally are still subject to ongoing research (van Kleef and Côté, 2022). Current evidence gathered from studies related to the EASI Model suggests that emotional expressions are functionally equivalent with respect to their effects across expressive modalities. This means that they will elicit comparable responses in observers regardless of the utilized modality, i.e., words, face, or voice (van Kleef and Côté, 2022). The emotional expressions transmitted via different modalities might, hence, substitute each other if multiple modalities are available at the same time. The findings are premature, however, as the effects of emotional expressions have hardly been compared across different modalities within studies so far (van Kleef and Côté, 2022). Instead, the described findings have been mainly derived by comparing the results of studies that have examined emotional expressions, which were transmitted via single modalities. So far, it has hardly been examined if emotional expressions in multiple modalities might complement or substitute each other when perceived in combination. Thus, further investigating whether the social effects of emotions are functionally equivalent across expressive modalities is recommended in literature (van Kleef and Côté, 2022).

Further assumptions on the social effects of multi-modal emotional expressions can be derived from research that investigates the perception of emotional expressions. This research strand argues that verbal and non-verbal affective cues are perceived via multiple sensory channels and processed by two distinct but interconnected memory systems. Current evidence therefore suggests that the perception of multi-modal affective cues supports a more accurate recognition and understanding of the expressed emotion as it is signaled by both memory systems (Gerdes et al., 2014; Paulmann and Pell, 2011). With

respect to the recognition of emotions, it is thus suggested that affective cues might have an additive effect when they are expressed simultaneously via different modalities (Klasen et al., 2012; Paulmann and Pell, 2011). However, whether such additive effects also have an impact on the resulting behavior and whether comparable effects on behavior are elicited regardless of the utilized combination of affective cues still remains to be uncovered (van Kleef and Côté, 2022).

Reward-based crowdfunding provides flexibility regarding the design of campaign presentations (Yang et al., 2020), such that various combinations of different modalities can be used to convey varying amounts of affective cues. Thus, it is vital to adopt a multi-modal perspective on the effects of affective cues to understand how emotional expressions can be concretely orchestrated through different modalities to achieve an optimal impact on the funding performance. As multi-modal emotional expressions may be subject to substitutive and reinforcing effects, we assume that there exist multiple combinations of modalities and affective cues that might be equally effective in influencing the investors' decision-making. This is in line with the equifinality principle, which says that in complex environments, oftentimes different means exist that lead to the same result (De Crescenzo et al., 2020; Pappas and Woodside, 2021). We hence assume:

Proposition 2: Distinct configurations of verbal and nonverbal affective cues of various modalities are associated with high funding performance.

15.3 Data and Research Approach

We evaluated our propositions with a data-driven research approach (Mollick, 2014) and collected the analyzed data from the reward-based crowdfunding platform Kickstarter. We gathered publicly available information related to entrepreneurs and projects from all successful and unsuccessful projects between September 2016 and May 2017. To limit the effects of extreme values we excluded projects with a targeted pledge goal exceeding $200,000. We also excluded projects with a duration of less than seven days and a description of fewer than 100 words, as they typically indicate a lack of serious fundraising effort (Bollaert et al., 2019; Mollick, 2014). To ensure that the analysis of verbal cues is comparable, we removed all projects that used a different language than English. The final data set contained 16,967 projects.

15.3.1 Variable Description

15.3.1.1 Dependent Variable

To assess the effect of affective cues embedded in the verbal and nonverbal modalities on the funding performance, our dependent variable is the total amount of funding raised at the end of the campaign. Irrespective of whether the campaign reached its intended pledge goal, the dependent variable *funding raised* reflects the outcome of the entrepreneurs' abilities to create a persuasive project presentation that affects the decision-making process. Also, the variable funding raised represents the investors' decisions to financially support the entrepreneurs' ideas (Jiang et al., 2020b; Li et al., 2017).

15.3.1.2 Independent Variables

We operationalized our independent variables based on the amount of affective cues embedded in each modality. Specifically, we investigated affective cues embedded in textual descriptions (affective written words), speech (affective spoken words), pictures (facial emotional expressions), and the pitch video (facial emotional expressions), the main modalities that are typically used to present the campaign (Mollick, 2014).

To quantitatively measure the amount of affective cues in the project description and the speech of the transcribed pitch video, we are using the Linguistic Inquiry Word Count software (LIWC, Version 2015) (Pennebaker et al., 2015). LIWC evaluates the psychological and structural components of text samples and tracks stylistic aspects of language use. It is widely adopted in psychology, entrepreneurship, and information systems to quantify linguistic constructs (e.g., Lin and Boh, 2021; Parhankangas and Renko, 2017). In particular, LIWC contains a validated dictionary that classifies each word and word steam into one or more linguistic categories (Pennebaker et al., 2015). To measure the emotional aspects of written and spoken language, we utilized the LIWC category *"affect"*. This category accounts for all words that have an emotional appeal and trigger affective responses in the recipients, e.g., "happy", "love", "ugly", or "cried" (Pennebaker et al., 2015). The amount of written and spoken affective words is the sum of *affect*-labeled words found in the written description and spoken pitch, respectively. As a robustness check, we account for the valence of written and spoken words, differentiating between positive and negative affect utilizing the LIWC category *"posemo"* and *"negemo"*.

To quantitatively measure the embedded affective cues in pictures and the pitch video, we calculated the amounts of facial emotional expressions displayed. We utilized the

"Emotion API", a machine learning algorithm from Microsoft's Cognitive Services (Microsoft, 2023), to identify the facial emotional expressions depicted within the pictures. The algorithm identifies human faces in pictures and characterizes their emotional expression using a vector of confidence scores for seven basic emotions: anger, contempt, disgust, fear, happiness, sadness, and surprise (Ekman, 1992). The affect scores are calculated and normalized to values between zero and one for each face. Values closer to "one" indicate a more dominantly expressed emotion. For example, a displayed face is likely to have a broad smile if the algorithm returns a value of "one" for happiness. If the algorithm detected more than one face in a picture, we added up all the individual affect scores within the picture. In so doing, we factored in that more faces can display a higher bandwidth of affective expressions. Likewise, we added up all the aggregated affect scores for all the pictures to obtain the total score for each project. To achieve consistency, we followed the same approach for the pitch video using the same algorithm to recognize facial expressions in each frame of the video. Likewise, in case the algorithm detected more than one face in a frame, we added up all the individual affect scores within the frame. Finally, we added up the aggregated affect scores of all frames to obtain the total score for the full video divided by the number of frames per second to account for different frame rates. For example, if the algorithm returns the score "ten", the video shows highly emotional facial expressions for ten seconds. As a robustness check, we account for the valence of facial expression in pictures and videos and differentiate between positive (happiness) and negative (sum of sadness, anger, and fear) affect (Warnick et al., 2021).

15.3.1.3 Control Variables

Based Based on previous research, we included founder- and presentation-related control variables that influence the funding performance. To control for variables characterizing the entrepreneur, we considered the number of team members, as larger teams signals effectiveness (Bollaert et al., 2019; Weber et al., 2023). Also, since preparing frequently asked questions sends a positive signal of preparedness (Li et al., 2017), we controlled for the number of FAQ items provided. We also considered the entrepreneurs' experience as the number of previously created projects (Cappa et al., 2020) and valued the reciprocity effect as the number of previously backed projects (Jiang et al., 2020a). Next, we controlled for presentation variables such as the project duration (Cappa et al., 2020), the pledge goal (Letwin et al., 2024), and the number of rewards (Bollaert et al., 2019; Jiang et al., 2020a). In addition, we controlled for the utilization of modalities, i.e., the number

of words in the project description (Cappa et al., 2020; Koch and Siering, 2019), the number of pictures (Wang et al., 2023), the pitch video's duration (Mitra and Gilbert, 2014), and the video's number of spoken words (Parhankangas and Renko, 2017). Table 15.3 shows the researched variables together with descriptive statistics. Table 15.4 shows the correlation matrix for the dependent and main independent variables of interest, i.e., affective cues and modalities.

Table 15.3 Variable descriptions and descriptive statistics

Variable	Description	Mean	SD	Min	Max
Dependent variable					
Funding raised	Funding raised at the end of project duration	9,235	26,390	0	190,832
Independent variables					
Affect. words	Number of affective words in project description	28.25	26.48	0	139
Affect. pictures	Number of expressed emotions in pictures	0.75	1.78	0	10.02
Affect. video	Number of expressed emotions in video	15.29	29.44	0	153.37
Affect. speech	Number of spoken affective words in pitch video	9.91	12.51	0	54
Control variables					
Team members	Number of team members	1.31	0.75	1	5
FAQ items	Number of FAQ items	0.64	1.98	0	12
Backed	Number of previously backed projects	6.14	17.24	0	117
Created	Number of previously created projects	0.83	2.15	0	14
No. of rewards	Number of rewards	7.57	5.19	1	27
Project duration	Number of days a project accepts funds	31.77	10.55	7	60
Pledge goal	Funding target aimed to raise	13,865	21,834	77	200,000
No. words	Number of project presentation words	676.83	533.47	114	2801
No. pictures	Number of project presentation pictures	8.67	11.97	0	57
Video duration	Duration of the pitch video in seconds	104.66	101.77	0	474
No. spoken words	Number of spoken words in the pitch video	188.52	235.91	0	1,043

Notes: n = 16,967; all variables are winsorized at the 1st and 99th percentiles

Table 15.4 Correlation matrix (Pearson)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Funding raised								
(2) Affect. words	0.29^{***}							
(3) Affect. pictures	0.26^{***}	0.35^{***}						
(4) Affect. video	0.06^{***}	0.15^{***}	0.20^{***}					
(5) Affect. speech	0.19^{***}	0.30^{***}	0.23^{***}	0.59^{***}				
(6) No. words	0.33^{***}	0.91^{***}	0.33^{***}	0.13^{***}	0.28^{***}			
(7) No. pictures	0.47^{***}	0.51^{***}	0.41^{***}	0.01	0.17^{***}	0.56^{***}		
(8) Video duration	0.17^{***}	0.26^{***}	0.19^{***}	0.54^{***}	0.79^{***}	0.29^{***}	0.18^{***}	
(9) No. spoken words	0.18^{***}	0.26^{***}	0.21^{***}	0.59^{***}	0.93^{***}	0.28^{***}	0.15^{***}	0.84^{***}

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; n = 16,967; all variables are winsorized at the 1st and 99th percentiles

15.3.2 Data Analysis Approach

To answer our research questions, we apply a combination of multiple regression analyses (MRA) and fuzzy-set qualitative comparative analysis (fsQCA). As recommended, we sequentially conducted the MRA followed by the fsQCA. We thereby used the results of

the non-linear regression analysis to adjust the fsQCA calibration process (Dusa, 2019). While the regression analysis highlights the net effects and symmetric relationships between affective cues and funding performance by identifying the 'optimal' amount of each affective cue to reach the highest funding possible (inverted U-shape), the fsQCA performs a configurational approach as a complement to the regression analysis results (Pappas and Woodside, 2021; Woodside, 2013). Grounded in set theory and Boolean algebra, fsQCA enables us to study the complex and asymmetric relationship between conditions (i.e., affective cues in each modality) and an outcome (i.e., high funding raised). Thereby, fsQCA identifies distinct combinations of affective cues that are effective in raising high funding. In line with other researchers, we argue that fsQCA complements MRA well as it sheds light into a distinct but different perspective, i.e. if a combination of conditions is necessary or sufficient for a given outcome. In our case, we moreover argue that using multiple higher-order interaction terms in a MRA would be much harder to interpret than the fsQCA results. Moreover, fsQCA can also provide results explained by infrequent, often smaller parts of the dataset that are typically not captured by the MRA, which can result in additional insights (Pappas and Woodside, 2021; Ragin, 2008).

15.3.2.1 Non-linear Multiple Regression Analysis

Regarding the net effects of affective cues, we employed ordinary least squares regressions with funding raised as the dependent variable to answer the first research question, which tests for an inverted U-shaped relationship. To mitigate the influence of outliers, we winsorized the variables at the 1st and 99th percentile (Haans et al., 2016; Piva and Rossi-Lamastra, 2017). As some variables had a right-skewed distribution but meaningful zero values, we normalized them by conducting an inverse hyperbolic sine transformation (transformed) for variables with skewness greater than two: $\sinh^{-1}(y) = \log(y_i + (y_i^2 + 1)^{1/2})$ (e.g., Raab et al., 2020). We decided on this kind of transformation to preserve the interpretation of the zero values. Model 1 accounts for the control variables. Model 2 accounts for the linear effects of all affective cues. Model 3 added their squared terms. The full model's results (Model 3) are applied to identify the 'optimal' and 'adverse' amount of an affective cue that correlates to high funding.

15.3.2.2 Fuzzy-Set Qualitative Comparative Analysis

To answer which configurations of affective cues and respective modality lead to high funding performance, we took a configurational approach. The fsQCA analysis consists of three steps: calibration, testing for necessary conditions, and analysis of sufficient configuration (Ragin, 2008). First, we transformed each modality variable, i.e., the no. words,

no. pictures, video duration, and no. spoken words, into fuzzy-set scores, which range from 0 to 1, using a direct method. We applied the "S-Shape" function to account for a linear relationship. To do so, we followed De Crescenzo et al. (2020), using the 10th percentile for full non-membership, the 50th percentile for the crossover point, and the 90th percentile for full membership. Then, we transformed each affective cue variable into fuzzy-set scores using the "Bell-Shape" function to account for the non-linear relationship. We utilized the non-linear regression results as an input to adjust the fsQCA calibration process, adopting explicit calibration points (Dusa, 2019). Based on the non-linear regression results, each affective cue has an 'optimal' ('adverse') range in which the amount of affective cues correlates to the highest (lowest) funding performance. While the affective cue's 'optimal' impact is reached near the turning point, the 'adverse' impact is near each end of the inverted U-shape curve. Likewise, the "Bell-Shape" function implies two upper breakpoints, two lower breakpoints, and two crossover points that reflect the inverted U-shape. Starting from the display of zero affective cues, displaying zero affective cues reflects the point for the lowest funding performance, and the turning point reflects the point for the highest funding performance. Thus, the values between the two upper breakpoints (near the turning point) are the amount of affective cues that correlate to the 90th percent highest funding performance. These values have a fuzzy-set score of 1 (i.e., full membership) and reflect the 'optimal' amount of affective cues to raise the highest funding. The values between zero affective cues and the first lower breakpoint and between the second lower breakpoint and maximum amounts of affective cues (each breakpoint is near the end of the inverted U-shape curve) correlate to the 10th percent lowest funding performance. These values have fuzzy-set scores of 0 (i.e., full non-membership) and reflect the 'adverse' amount that raises the lowest funding. Finally, the two crossover points are the respective midpoints. Thus, we set the crossover points at 50th percent funding performance. To avoid fuzzy-set scores of 0.5 at the crossover points, we replaced these with 0.499 following previous research (De Crescenzo et al., 2020).

Second, we tested whether any of the affective cues or modalities is necessary. Necessary means that an affective cue or modality needs to exist in all configurations to reach high funding. It is recommended that those factors need to exceed a consistency threshold of 0.90 and a coverage threshold of 0.60 (De Crescenzo et al., 2020; Dusa, 2019). Third, we analyze for sufficient configurations (Fiss, 2011; Ragin, 2008). A sufficient configuration is a combination of conditions that work together and lead to a desired outcome, i.e., high funding raised. That said, a sufficient configuration is a specific combination of presence and absence of modalities and use of 'optimal' and/or 'adverse' amounts of affective cues. To reduce the constructed truth table to sufficient configurations, we apply an often used

consistency threshold of 0.80, which is above the recommended threshold of 0.75 (Fiss, 2011; Pappas and Woodside, 2021). We apply a frequency threshold of 170, which equals 1% of our sample size (n=16,947) (Maggetti and Levi-Faur, 2013). To remove configurations that account for both high and low levels of funding, thus are ambiguous, we set a proportional reduction in inconsistency threshold of 0.75 (Pappas and Woodside, 2021). We applied the Quine-McCluskey algorithm to simplify the sufficient configurations (Dusa, 2019).

15.4 Results

15.4.1 Regression Analysis Results

Table 15.5 presents the findings of our regression analyses. The outcomes of Model 1, which includes only the control variables, are in line to prior research investigating founder- and presentation-related factors (e.g., Jiang et al., 2020a; Koch and Siering, 2019; Li et al., 2017; Mollick, 2014). Model 2 accounts for the linear effects of all affective cues. To test whether the model fit improved after adding their squared terms, we conducted an F-test comparing Model 2 with Model 3 (F-Test χ^2 (4, $N = 16,947) = 117.81$, $p <.001$). The result indicates that the addition of the squared terms increased the model fitness.

Our first proposition assumes an inverted U-shaped relationship between affective cues and the total funding raised. Following Lind and Mehlum (2010) recommendations, we used a three-step procedure to formally establish this relationship: First, the squared term has to be negative and significant. Second, the slopes at the end of each data range must be sufficiently steep. Third, the turning point must fall within the data range. To test steps two and three, it is recommended to conduct an appropriate U-test (Haans et al., 2016; Lind and Mehlum, 2010). Our results in Model 3 show a positive and significant impact of affective words ($\beta = 0.180$, p<0.001) and a negative and significant impact of its squared term ($\beta = -0.164$, p<0.001). The turning point is 42.79 and its 95% confidence interval is within the observed range. The U-test results moreover confirm the inverted U-shape ($t = 7.49$, p<.001). The amount of facial expressions in pictures has a positive and significant impact on the total funding raised ($\beta = 0.288$, p<0.001), its squared term is negative and significant ($\beta = -0.107$, p<0.001). The turning point is 1.41 and its 95% confidence interval is within the observed range. The U-test results moreover confirm the inverted U-shape ($t = 4.49$, p<.001). The amount of facial expression in the pitch video has a positive and significant impact ($\beta = 0.394$, p<0.001). Although its squared term is

negative and significant (β = -0.092, p<0.01), the corresponding U-test could not confirm an inverted U-shaped relationship as the turning point is outside the observed range. Our results in Model 3 show a positive and significant impact of affective spoken words (β = 0.529, p<0.001) and a negative and significant impact of its squared term (β = -0.212, p<0.001). The turning point is 25.51 and its 95% confidence interval is within the observed range. The U-test results moreover confirm the inverted U-shape (t = 9.59, p<.001). To conclude, our results confirm an inverted U-shape relationship for affective cues in all main modalities besides emotional facial expressions in the pitch video. Those non-verbal affective cues in the pitch video have a non-linear, saturation effect (Lind and Mehlum, 2010). That said, affective written words are most beneficial when a value of 42.79 affective words is used, reflecting the turning point. With respect to spoken words, the most profound influence can be achieved at 25.51 spoken affective words in a pitch video. Emotional facial expressions in pictures are most beneficial at a value of 1.94, which closely translates to two people expressing an intense emotional expression. As facial emotional expressions in the pitch video have a saturation effect, the most profound influence could be reported at 153.37, our upper end of the data range, which closely translates to one person displaying emotional expressions for ~153 seconds. Figure 15.1 shows the non-linear relationship of each affective cue on funding raised to support the interpretation of the results

Table 15.5 Regression results with *funding raised* as the dependent variable

	(1) Funding raised [a]		(2) Funding raised [a]		(3) Funding raised [a]		U-test	VIF
Affect. words			-0.219 ***	(0.047)	0.180 ***	(0.054)	t=7.49 ***	8.547
Affect. words ^{2}					-0.164 ***	(0.012)		2.545
Affect. pictures [a]			0.094 ***	(0.022)	0.288 ***	(0.044)	t=4.49 ***	5.778
Affect. pictures [a] ^{2}					-0.107 ***	(0.020)		5.036
Affect. video [a]			0.480 ***	(0.027)	0.394 ***	(0.035)	-/- ns	3.551
Affect. video [a] ^{2}					-0.092 **	(0.030)		2.133
Affect. speech			0.094	(0.055)	0.529 ***	(0.065)	t=9.59 ***	12.241
Affect. speech ^{2}					-0.212 ***	(0.017)		2.877
Team members [a]	0.385 ***	(0.021)	0.358 ***	(0.020)	0.339 ***	(0.020)		1.197
FAQ items [a]	0.364 ***	(0.021)	0.369 ***	(0.021)	0.365 ***	(0.020)		1.213
Backed [a]	0.715 ***	(0.024)	0.677 ***	(0.023)	0.640 ***	(0.023)		1.588
Created [a]	0.077 ***	(0.023)	0.108 ***	(0.022)	0.115 ***	(0.022)		1.440
No. rewards	0.782 ***	(0.022)	0.728 ***	(0.022)	0.688 ***	(0.022)		1.441
Project duration	-0.113 ***	(0.020)	-0.100 ***	(0.019)	-0.095 ***	(0.019)		1.080
Pledge goal [a]	-0.012	(0.021)	-0.030	(0.021)	-0.061 **	(0.021)		1.285
No. words	0.170 ***	(0.024)	0.359 ***	(0.048)	0.292 ***	(0.048)		6.773
No. pictures	0.625 ***	(0.025)	0.633 ***	(0.026)	0.590 ***	(0.026)		1.939
Video duration	0.181 ***	(0.035)	0.085 *	(0.035)	0.119 ***	(0.035)		3.548
No. spoken words	0.363 ***	(0.035)	0.040	(0.061)	-0.051	(0.061)		10.805
Adjusted R^2	0.452		0.464		0.478			

Notes: * p < 0.05; ** p < 0.01; *** p < 0.001; n = 16,967; [a] inverse hyperbolic sine transformation (transformed); standard error in parentheses, VIF = variance inflation factor
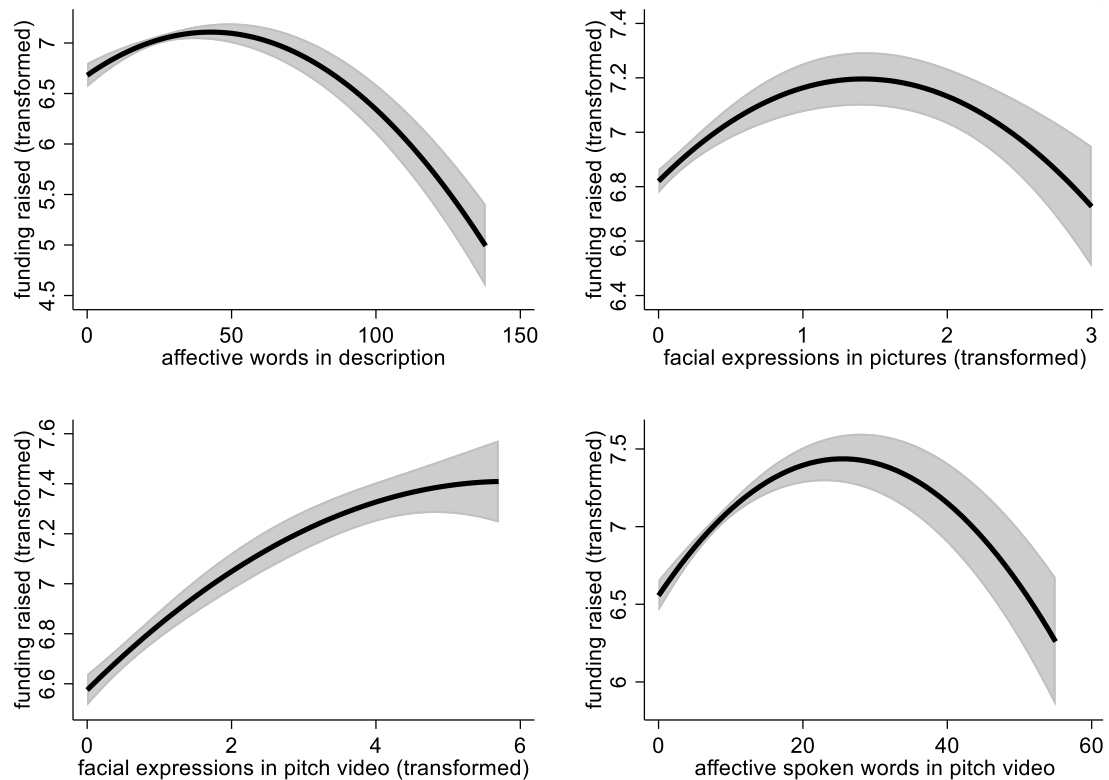
Figure 15.1 Effects of affective cues on funding raised (including 95 percent interval)

15.4.2 Regression Analysis Robustness Checks

We calculated the variance inflation factors (VIFs) of Model 3 to check for multicollinearity among the independent variables. The VIFs are reported next to the regression results of Model 3 in Table 15.5. Our results indicated that all VIFs are below the commonly recommended threshold of 10 except for *no. spoken words* and *affective speech*. Multicollinearity is not likely to be a concern, as *affective speech* is mutually dependent on *no. spoken words* (Neter et al., 1990). Excluding *no. spoken words*, all VIFs are below the recommended threshold and the results are in line with the main results. Also, the model fit did not change after removing *no. spoken words* (F-Test χ^2 (1, 16,947) = 0.70, p = 0.404). We refer readers to Table 15.7 in Appendix 15.7.

We evaluated the robustness of our findings with different operationalizations of our dependent and independent variables to verify the stability of our regression analysis and to rule out alternative reasons for the observed effects. First, we operationalized the effect on the funding decision by considering the success of the project, specifically whether it reached its targeted pledge goal. A value of one represents a successful project, while a value of zero signifies an unsuccessful one. The accumulated funds are only transferred if the pledge goal is reached, portraying Kickstarter's "all-or-nothing" approach and is often used in crowdfunding research (Mollick, 2014). Model 15.8-1 (Appendix 15.7 –

Table 15.8), applying a binary logistic regression due to the dichotomous dependent variable, shows that the results are consistent with those of our full model (Model 3 – Table 15.5). Second, we operationalized the impact of affective cues on funding decisions by accounting for how many people have been persuaded to support the project (*no. of backers*). Model 15.8-2 (Appendix 15.7 – Table 15.8), applying a negative binomial regression due to the non-negative count variable, indicates that the findings are consistent with our previous outcomes.

While our independent affect variable reflects the emotional appeal of a modality, the valence has not been considered. To incorporate the valence of emotions, we differentiate and account for positive and negative written and spoken words as well as positive and negative facial expressions. All verbal and nonverbal positive and negative affect variables report a non-linear effect. The previous reported saturation effect of affect in pitch videos is mirrored by positive facial expressions in pitch videos. Negative facial expressions in pitch videos as well as affect in text, pictures, and speech, regardless of the valence, show an inverted U-shape effect (see Appendix 15.7 – Table 15.9). To further understand the saturation effect of facial expressions in pitch videos, we tested all combinations of affective cues and their impact on the significance of the U-test. Regression analyses without affective speech reveal an inverted U-shape relationship for facial expressions in pitch videos. This result is in line with previously conducted research accounting for facial expressions in videos in isolation (Warnick et al., 2021) (see Appendix 15.7 – Table 15.10). We surmise that affective spoken words and facial expressions in pitch videos have an interdependent impact.

Finally, we analyzed our results with respect to the project category. Previous studies have demonstrated that the project presentation and the resulting relationship between the entrepreneur and potential backers may vary depending on the project type (Gafni et al., 2019). Therefore, we distinguished between hedonistic, *artistically* related projects and utilitarian, *technology* related projects. A binary variable was constructed to split the data set into two different subsamples (Gafni et al., 2019). With regard to artistically related and technology related projects, the results do not substantially differ from the full model (Model 3), emphasizing the non-linear impact of affective cues on funding performance (see Appendix 15.7 – Table 15.11).

15.4.3 fsQCA Results

The analysis of necessary conditions reveals no influencing factor as a mandatory condition (consistency < 0.90). Thus, no single affective cue or main modality is needed to achieve high funding. Instead, the results reveal three configurations that are sufficient

for achieving high funding. The reported solution coverage of 0.349 describes the extent to which the outcome is explained by the three configurations and is in line with other data-driven research articles that employ fsQCA to predict investment decisions (De Crescenzo et al., 2020). The solution consistency is 0.928, and all three configurations are above the minimum required consistency threshold of 0.75 (Fiss, 2011; Pappas and Woodside, 2021).

The first configuration (C1) shows that campaign presentations achieve high funding when the use of all modalities (i.e., many written words, many pictures, long videos, many spoken words) is combined with an optimal amount of written and spoken affective words (presence of the condition) regardless of the amount of emotional facial expressions in pictures and the pitch video (don't care conditions). Thus, we label it the *affective verbal* configuration. According to the second configuration (C2), campaign presentations achieve high funding when the use of all modalities is combined with an optimal amount of emotional facial expressions in the pitch video and affective spoken words (presence of the condition) regardless of emotional facial expressions in pictures and affective written words (don't care condition). We label it the *affective video* configuration. The third configuration (C3) shows that campaign presentations can achieve high funding when pitch videos and respective affective cues, i.e., emotional facial expressions and affective spoken words, are absent or have a low utilization (absence of the condition). Yet, an information rich description (many written words and pictures) is utilized with an optimal amount of affective written words and emotional facial expressions in pictures (presence of the condition). We label it the *affective non-video* configuration.

Table 15.6 Analysis of sufficient conditions for high and low funding performance

Configuration	High funding			Low funding
	C1 *affective verbal*	C2 *affective video*	C3 *affective non-video*	C4 *non-affective presentation*
Affect words	●		●	
Affect pictures			●	○
Affect video		●	○	○
Affect speech	●	●	○	○
No. words	●	●	●	○
No. pictures	●	●	●	○
Video duration	●	●	○	○
No. spoken words	●	●	○	○
Raw coverage	0.267	0.257	0.056	0.459
Unique coverage	0.048	0.044	0.038	-
Consistency	0.937	0.941	0.897	0.869
Solution coverage		0.349		0.459
Solution consistency		0.928		0.869

Notes: Notion based on Fiss (2011), the symbol ○ indicates the absence and ● indicates the presence of the condition. Blank cells indicate a "don't care" situation. In this case, the affective cue plays a subordinate role and may be either present or absent.

15.4.4 fsQCA Sensitivity Analyses and Post-hoc Analyses

Since fsQCA is sensitive to the selected thresholds, specifically the frequency and raw consistency, we conducted several robustness tests. The results are stable in between a minimum frequency threshold of 151 and a maximum frequency threshold of 258. The results are robust up to a raw consistency of 0.897. The fsQCA results also can be sensitive to the chosen calibration breakpoints. Thus, we specify full non-membership at 5th percent and 15th percent and full membership at 85th percent and 95th percent breakpoints, respectively (Table 15.12 and Table 15.13). The results are robust to the use of these alternative calibrations points. Also, the results are robust when adding 0.001 to 0.50 fuzzy values (Table 15.14). We refer readers to Table 15.12 to Table 15.14 in Appendix 15.7.

As a post-hoc analysis, we also ran a fsQCA with the same factors but considered low funding performance as the outcome. No factor is a mandatory condition. The analysis of sufficient configurations revealed one configuration (Table 15.6) in which no or few affective cues in pictures, pitch videos, and speech and low usage of the main modalities together result in low funding performance. Affective written words are a "don't care" condition. We label it the *non-affective configuration* (C4) resulting in low funding performance.

15.5 Discussion

15.5.1 Key Findings

The results suggest that investment decisions in reward-based crowdfunding are significantly influenced by the emotional appeal of campaign presentations, specifically affective written words in project descriptions, affective spoken words in pitch videos, and emotional facial expressions in pictures and pitch videos. As the funding decision must be made with uncertainty, the perception and evaluation of emotional expressions obviously help to clarify the situation and better comprehend the entrepreneur's intentions as suggested in literature (Achar et al., 2016; Li et al., 2017; van Kleef, 2014).

The regression results show that the impact of affective cues conveyed in each analyzed verbal and nonverbal modality is non-linear. We provide empirical evidence that after exceeding a certain threshold, the positive effect of displaying affective cues diminishes and, in most cases, even becomes negative. Since the relationship between entrepreneurs and investors is mostly professional, we surmise that higher intensities of affective cues

can be perceived as inappropriate and violate display rules of acceptable behavior, thus triggering counteracting effects. The negative impact shows that investors may become cautious about the excessive influence and dismiss the display of affective cues as an impression management motive to manipulate the decision-making process. These results corroborate the findings of studies that recently examined the effects of the intensity of emotional expressions in other professional interaction contexts such as customer service or negotiation scenarios (Adam and Brett, 2018; Cheshin et al., 2018). Admittedly, we have observed a saturation effect rather than a tipping point for facial emotional expressions in pitch videos. While we can only speculate if the observation is caused by the interaction with other emotional expressions in a multi-modal communication context, it does not change the observation that high intensities of facial emotional expressions in videos have diminishing effects.

The conducted configurational analysis further details our multi-modal perspective on the effectiveness of emotion expressions. The fsQCA results yield three configurations of synergistic multi-modal emotional expressions that support an optimized funding performance in a comparable manner: *affective verbal (C1)*, *affective video (C2)*, and *affective non-video (C3)*. The identified configurations show that it is not mandatory to express emotions in *all* modalities to achieve an optimal impact. *Yet,* while no modality and particular form of emotional expression is a necessary factor, none alone is sufficient to achieve an optimal impact. The identified configurations moreover suggest that it is not a drawback if all modalities express emotions at their 'optimal' level, as the reported "don't care" conditions are irrelevant. Since the impact of affective cues on funding performance is non-linear, it is most effective to convey an 'optimal' level of affective cues in each modality until the positive effect diminishes or even becomes negative. Moreover, conveying such an 'optimal' level of emotions through two modalities is the most efficient, optimized way, as all configurations show that it is sufficient to express affective cues across two different modalities.

The three reported configurations indicate the existence of reinforcement effects between emotion expressions in different modalities, which jointly shape the social effects of emotions and eventually influence funding decisions in reward-based crowdfunding. First, we discovered that multi-modal emotion expressions optimize impact when presentations express a distinct combination of affective cues across verbal and nonverbal modalities (C2 and C3). In this context, C2 features combined face-voice stimuli that convey facial expressions and affective speech in pitch videos. Given that those emotional expressions are likewise expressed in face-to-face communication, we conclude that similar synergistic effects can be realized. Since two interconnected memory systems are involved into

the processing (Joffe, 2008), the audiovisual integration of verbal and nonverbal affective cues seems to complement and reinforce each other. It has been observed that the audiovisual integration reduces the uncertainty of ambiguous stimuli and supports an improved identification of affective cues (Gerdes et al., 2014; Klasen et al., 2012; Paulmann and Pell, 2011). Besides facilitating the recognition of emotion expression, our results indicate that this audiovisual integration can also affect the resulting (funding) behavior significantly.

Second, C3 also features a combination of verbal and nonverbal affective cues, i.e., affective words in textual descriptions and facial expressions in pictures. Since the same interconnected memory systems to process verbal and nonverbal cues are involved (Paivio, 1991), we assume that synergistic effects similar to face-to-face communication and pitch videos can be realized. Achieving high funding with a combination of affective words in textual descriptions and facial expressions in pictures suggests that this integration of verbal and nonverbal affective cues also facilitates both the recognition of the emotional expressions and the resulting (funding) behavior.

Third, we provide evidence for a synergistic confluence of emotional expressions through a combination of two verbal modalities. C1 features a combination of written and spoken affective cues conveyed in both the textual descriptions and speech, which also support an optimized funding performance. Research indicates that processing verbal modalities leads recipients down a rational and logical path (Joffe, 2008). Since information conveyed through verbal modalities can be more precise and explicit, verbal stimuli can have a stronger impact on decision-making in situations with uncertainty (Smith, 1991). Given that the verbal emotional expressions are information snippets and incorporated into decision-making processes (van Kleef, 2009), we suggest similar effects for the combination of verbal affective cues on funding decisions in crowdfunding.

The study results further suggest that high funding performance can be achieved not only with the presence (C1 and C2) but also with the absence of a pitch video (C3). C3 challenges the widely held assumption that a comprehensive pitch video is a mandatory success factor (e.g., Mollick, 2014; Yang et al., 2020). Based on how the remaining modalities should convey emotional expressions according C3, we rather suggest that the absence of a pitch video must be substituted by an 'optimal' use of affective cues in text and pictures to optimize the funding behavior. The absence of a pitch video thus limits the options of how to convey emotional expressions.

Based on our valence-based post-hoc analyses, we suggest that emotional punctuation, i.e., using a corresponding, optimal level of positive and negative affective cues to support

the message, could enhance the persuasiveness of the presentation. It seems that emotional cues of varying valence likewise impact funding decisions. For instance, expressing negative affect emphasizes the seriousness of a problem, and positive affect can be expressed when highlighting the solution to the problem (Warnick et al., 2021). Thus, not the valence alone but the context in which an affective cue is expressed and how it is perceived should impact the decision-making. We call for further research to analyze the impact of valence.

We complement our findings with the *non-affective* presentation (C4) that is associated with low funding. This configuration suggests that low use of a single modality or an 'adverse' intensity of an affective cue alone does not cause low funding, but the combination of low use of modalities and low use of affective cues in pictures, videos, and speech does. Since such presentations lack almost any emotional appeal and, thus, fail to achieve funding, we further emphasize that the reported combinations of affective cues of C1, C2, and C3 jointly shape the emotional experience and influence funding decisions in reward-based crowdfunding.

15.5.2 Implications for Academia

The results of our research contribute to a better understanding of the factors that impact investment decisions in reward-based crowdfunding. This far, research focusing on how different affective cues affect funding performance has mainly assumed an underlying emotional contagion process (e.g., Davis et al., 2017; Li et al., 2017) and rather hypothesized linear effects of emotional expression intensities (e.g., Koch and Siering, 2019; Li et al., 2021; Parhankangas and Renko, 2017). In comparison, the non-linear effects of affective cues conveyed for each modality (Jiang et al., 2020b; Raab et al., 2020; Warnick et al., 2021; Zhou et al., 2016), as well as the potential interplay of affective cues between modalities, have not been researched in detail. Our study is among the first to follow the recent call by van Kleef and Côté (2022) to compare the social effects of emotional expressions across expressive modalities within one study. Thereby, we challenge the current assumption that the social effects of emotions (EASI) are functionally equivalent across each expressive modality, i.e., face, voice, and words, such that comparable responses in observers are elicited (van Kleef and Côté, 2022).

Especially the applied qualitative comparative analysis (fsQCA) provides a novel, more nuanced take on this assumption. In comparison to previous regression-based research (e.g., Mollick, 2014; Yang et al., 2020), our configurational approach is the first to show that it is not mandatory to express emotions in all modalities to achieve an optimal impact, yet no expressive modality alone is sufficient or necessary. Instead, the results indicate

that distinct configurations of affective cues at an 'optimal' level, which seem to complement each other, can achieve an optimal impact. As we found multiple configurations with an optimal effect, we assume that emotional expressions are functionally equivalent across expressive modalities and can substitute each other at least to some extent. While these findings seem to corroborate predictions that were made in studies related to the EASI Model (van Kleef and Côté, 2022), we also found that emotional expressions can reinforce each other across modalities, since no modality alone suffices to achieve an optimal effect. In this regard, our study adds to the body of research that explores the perception and processing of multi-modal emotion expressions, which has highlighted that emotion detection and recognition are facilitated when observers have concurrent access to expressive modalities (e.g., Gerdes et al., 2014; Klasen et al., 2012; Paulmann and Pell, 2011). The observed configurations suggest that the integration of affective cues across modalities can not only facilitate emotion detection but also presumably also trigger affective reactions and inferences more effectively. The multi-modal expression of emotions, therefore, also seems to significantly impact behavior such as funding decisions.

Besides the audiovisual integration of affective cues in videos (C2), our results also suggest that affective cues in textual descriptions and pictures (C3) as well as in textual descriptions and speech (C1) can reinforce each other. One the one hand, the observed configurations indicate that verbal affective cues can complement nonverbal cues for optimal impact (C2 and C3), thus adding to the discussion if a combination of verbal or nonverbal cues exert greater influence (Jacob et al., 2014; Kim and Lennon, 2008). On the other hand, our results also emphasize the significance of multi-modal emotional expressions as verbal cues, which can be an effective combination to achieve optimal effects (C1). This suggests that a nuanced understanding of the interplay between verbal and nonverbal cues is crucial for comprehending the social effects of emotions.

That said, we add to the EASI Model and the related research strand by introducing a multi-modal perspective and challenging the current assumption of functional equivalence. We rather suggest that the integration of multi-modal emotion expression not only facilitates emotion perception but reinforces the social effects of emotions. This integration appears to be particularly effective and eventually affects the investor's funding behavior. Since multi-sided platforms typically utilize similar expressive modalities and, thus, convey combinations of emotional expressions, we encourage researchers to analyze the social effects of emotions by accounting for a multi-modal perspective in donation, lending, and equity-based crowdfunding, as well as crowdsourcing and e-commerce platforms.

Our findings also indicate that the effect of affective cues in each modality follows a non-linear path. Building upon the EASI model, which posits that emotional expressions affect the observer's behavior by triggering affective reactions and/or inferential processes, we contribute to a more complete understanding of factors that account for the non-linear impact of affective cues in professional settings. We suggest that an intense display of affective cues in crowdfunding may violate social norms of appropriateness, which leads to negative interference. In this regard, our results corroborate the findings of recent studies in other professional settings that expressing emotions too frequently in interpersonal communication can violate display rules of appropriate expression (Cheshin et al., 2018; van Kleef and Côté, 2022). The decision-making process, hence, appears to be significantly influenced by socio-relational factors, such as social norms and expectations regarding emotional expression in professional settings, concerning the influence of emotional display rules and perceived appropriateness in information systems and entrepreneurship research.

Finally, our work extends prior studies by following calls in research to not solely rely on MRA or fsQCA (Pappas and Woodside, 2021). Our results indicate that a single best solution explaining the largest percentage of variance alone cannot explain the diverse characteristics of campaign presentations, which lead to high funding. In accordance with a principle called equifinality we show that in complex, multi-modal environments different means exist that lead to the same outcome. Methodologically, we demonstrate that a combination of MRA and fsQCA can produce comprehensive and complementary findings (Pappas and Woodside, 2021). As far as we know, our study is the first to utilize the results of non-linear regression analyses to adjust the fsQCA calibration process. Thereby, we use explicit calibration points to reflect the non-linear impact of affective cues. Knowledge about this non-linear impact supports interpretations of the fsQCA results. Regarding future research, we call for the investigation of (previously analyzed) factors that can be conveyed through multiple communication modalities, e.g., perceived entrepreneurs' characteristics. Especially when a non-linear effect is assumed, a combined approach could be advantageous. Since almost all multi-sided information system platforms support a multi-modal communication, our study offers a comprehensive approach to gain a profound understanding of the relationship among different factors.

15.5.3 Implications for Practice

Based on the insights into how the intensity and configurations of verbal and nonverbal affective cues relate to funding performance, we can derive suggestions for practice. We

inform entrepreneurs about the limitations of expressing affective cues in textual descriptions, speech, and pictures, as these affective cues follow an inverted U-shaped effect. Thus, entrepreneurs should be aware that the positive effects of emotional expressions seem to reverse with rising intensity levels because higher levels of affective cues may violate display rules in crowdfunding. After reaching higher levels, the display of additional facial expressions in pitch videos also has diminishing returns. Thus, entrepreneurs should consider whether to invest additional effort and resources, after reaching higher levels, in exchange for a minor effect.

The results of our study also signal that the campaign presentation requires a certain level of emotional appeal to have an impact on decision-making. As it is not mandatory to express emotions across all modalities, our findings inform crowdfunding entrepreneurs how high impact can be achieved in an optimized, efficient manner. Thereby, it is sufficient to convey an 'optimal' level of emotions across two modalities based on three distinct configurations of multi-modal emotion expression. First, similar to a traditional pitch presentation, entrepreneurs can persuade potential investors with an *affective video* (C2) *presentation*. In this case, the campaign is featured by an energetic and emotional pitch video. Affective cues in the written description and pictures are less relevant. Second, conversely, when an entrepreneur cannot provide a pitch video (C3, *affective non-video*), the presentation should include a combination of an 'optimal' level of verbal and nonverbal affective cues within the textual description and pictures to substitute for a lacking pitch video. Third, entrepreneurs can achieve high funding with an *affective verbal (C1) presentation,* which displays an 'optimal' level of verbal affective cues through textual descriptions and speech. Since nonverbal affective cues are "don't care" conditions, entrepreneurs can focus on emphasizing the product and its features across the nonverbal modalities.

The implications of our study may also be of interest to entrepreneurs in different types of crowdfunding, including donation-based, loan-based, and equity-based crowdfunding. Additionally, platform operators can provide entrepreneurs with guidance on how to emotionally appeal to investors with their project presentations. Similarly, multi-sided platforms such as crowdsourcing or e-commerce might consider a multi-modal perspective concerning the effectiveness of emotion expressions.

15.5.4 Limitations and Future Research

Several limitations should be considered when interpreting the results. We acknowledge that this study uses only Kickstarter as a single data source. In addition, the analysis of affective cues in speech and text and facial emotional expressions was performed using

only LIWC (Pennebaker et al., 2015) and the Microsoft Emotion API (Microsoft, 2023), respectively. Accordingly, our results are dependent on the utilized tools and algorithms to measure the emotional content. Although LIWC is often applied (e.g., Lin and Boh, 2021; Moradi and Badrinarayanan, 2021) and the Microsoft Emotion API performs similarly to humans (e.g., Gleasure, 2023; Kuntzler et al., 2021), research is recommended to verify the validity of the findings by analyzing additional platforms and using different approaches to measure the emotional appeal of the campaign. In addition, research can consider emotional cues that can be conveyed and inferred through, for example, body movements, postures, and gestures. Although providing initial results, research should further account for the valence of affective cues and shed light on specific combinations of positive and negative emotions. We must also acknowledge that our focus was solely on affective cues and did not address non-affective cues, which were examined in other recent studies (e.g., Bollaert et al., 2019; Bürger and Kleinert, 2020; Huang et al., 2021; Wang et al., 2023). Potential interrelationships between different cues should be investigated in future research.

15.6 Conclusion

Our results corroborate the findings of studies, which observed that investment decisions in reward-based crowdfunding are significantly influenced by rather intuitive impressions, such as the emotional appeal of campaign presentations (e.g., Jiang et al., 2020b; Li et al., 2017). Yet, we further contribute to a more complete understanding of how affective words in text, affective speech in videos, and facial emotional expressions in pictures and videos impact behavior. First, our multi-modal, configurational approach is the first to show that it is not mandatory to express emotions in all modalities to achieve an optimal impact, yet no expressive modality alone is sufficient or necessary. Instead, we can show that three distinct configurations of affective cues at an 'optimal' level, namely *affective verbal*, *affective video*, and *affective non-video*, complement each other and achieve an optimal impact. Thereby, we suggest that the integration of multi-modal emotional expressions not only facilitates emotion perception, but the integration of multiple affective cues reinforces the social effects of emotions (i.e., is vital to affect behavior). In addition to the verbal and nonverbal integration of affective cues, a combination of affective cues via verbal modalities contributes to persuasive communication. Second, our findings also indicate that the effect of affective cues in each modality follows a nonlinear path. Thereby, we suggest that an intense display of affective cues in crowdfunding depends on socio-relational factors like social norms. Expressing emotions too frequently

in interpersonal communication may violate display rules of appropriate expression, resulting in negative outcomes. Finally, we demonstrate that a combination of MRA and fsQCA can produce comprehensive and complementary findings. Overall, we show that in complex, multi-modal environments, different means exist that lead to the same outcome. With the presented results, we aim to offer a novel, multi-modal perspective on the social effects of emotional expressions and provide a foundation for related endeavors.

15.7 Appendix

Table 15.7   Regression results VIF robustness test without "No. spoken words"

	Funding raised [a]		U-test	VIF
Affect. words	0.189 ***	(0.053)	t=7.71 ***	8.205
Affect. words ^{2}	-0.164 ***	(0.012)		2.545
Affect. pictures [a]	0.289 ***	(0.044)	t=4.51 ***	5.775
Affect. pictures [a] ^{2}	-0.107 ***	(0.020)		5.034
Affect. video [a]	0.393 ***	(0.035)	-/- ns	3.550
Affect. video [a] ^{2}	-0.093 **	(0.030)		2.124
Affect. speech	0.489 ***	(0.044)	t=10.33 ***	5.585
Affect. speech ^{2}	-0.210 ***	(0.017)		2.819
Team members [a]	0.339 ***	(0.020)		1.197
FAQ items [a]	0.365 ***	(0.020)		1.213
Backed [a]	0.641 ***	(0.023)		1.587
Created [a]	0.115 ***	(0.022)		1.440
No. rewards	0.688 ***	(0.022)		1.441
Project duration	-0.095 ***	(0.019)		1.079
Pledge goal [a]	-0.061 **	(0.021)		1.285
No. words	0.283 ***	(0.047)		6.438
No. pictures	0.592 ***	(0.026)		1.929
Video duration	0.106 ***	(0.031)		2.916
No. spoken words	–	–	–	–
Adjusted R^2	0.478			

Notes: * p < 0.05; ** p < 0.01; *** p < 0.001; n = 16,967;
[a] inverse hyperbolic sine transformation; standard error in parentheses;
– = variable "no. spoken words" has been excluded from regression analysis;
VIF = variance inflation factor

Table 15.8 Regression results of affective cues and their impact on the dependent variables success and number of backers

	(15.8-1) - Success		U-test	(15.8-2) - No. of backers		U-test
Affect. words	0.147 **	(0.057)	t=4.46 ***	0.079 ***	(0.011)	t=10.01 ***
Affect. words ^{2}	-0.087 ***	(0.013)		-0.033 ***	(0.002)	
Affect. pictures ^{a}	0.186 ***	(0.045)	t=1.66 *	0.056 ***	(0.009)	t=5.35 ***
Affect. pictures ^{a} ^{2}	-0.052 *	(0.020)		-0.023 ***	(0.004)	
Affect. video ^{a}	0.374 ***	(0.036)	-/- ns	0.062 ***	(0.008)	t=0.07 ns
Affect. video ^{a} ^{2}	-0.034	(0.031)		-0.015 *	(0.006)	
Affect. speech	0.240 ***	(0.066)	t=5.50 ***	0.095 ***	(0.013)	t=9.41 ***
Affect. speech ^{2}	-0.140 ***	(0.017)		-0.042 ***	(0.004)	
Team members ^{a}	0.281 ***	(0.021)		0.058 ***	(0.004)	
FAQ items ^{a}	0.308 ***	(0.022)		0.063 ***	(0.004)	
Backed ^{a}	0.555 ***	(0.024)		0.139 ***	(0.005)	
Created ^{a}	0.175 ***	(0.024)		0.031 ***	(0.004)	
No. rewards	0.512 ***	(0.025)		0.109 ***	(0.004)	
Project duration	-0.134 ***	(0.021)		-0.024 ***	(0.005)	
Pledge goal ^{a}	-1.111 ***	(0.027)		-0.037 ***	(0.005)	
No. words	0.110 *	(0.051)		0.019 *	(0.010)	
No. pictures	0.316 ***	(0.027)		0.090 ***	(0.005)	
Video duration	0.067	(0.037)		0.034 ***	(0.008)	
No. spoken words	0.019	(0.062)		-0.007	(0.013)	
Pseudo R^2 (Cragg & Uhler)	0.469			0.465		

Notes: * p < 0.05; ** p < 0.01; *** p < 0.001; n = 16,967; ^{a} inverse hyperbolic sine transformation; standard error in parentheses

Table 15.9 Regression results differentiating between positive and negative affective cues

	Funding raised [a]		U-test
Pos. words	0.248 ***	(0.050)	t=8.42 ***
Pos. words [2]	-0.155 ***	(0.013)	
Pos. pictures [a]	0.275 ***	(0.048)	t=2.99 ***
Pos. pictures [a] [2]	-0.078 ***	(0.019)	
Pos. video [a]	0.276 ***	(0.051)	-/- ns
Pos. video [a] [2]	-0.048	(0.030)	
Pos. speech	0.506 ***	(0.063)	t=7.93 ***
Pos. speech [2]	-0.189 ***	(0.019)	
Neg. words [a]	0.004	(0.026)	t=5.04 ***
Neg. words [a] [2]	-0.107 ***	(0.020)	
Neg. pictures [a]	0.097	(0.053)	t=2.13 *
Neg. pictures [a] [2]	-0.047 ***	(0.012)	
Neg. video [a]	0.201 ***	(0.059)	t=2.56 **
Neg. video [a] [2]	-0.084 **	(0.027)	
Neg. speech [a]	0.056	(0.042)	t=2.32 *
Neg. speech [a] [2]	-0.078 **	(0.027)	
Team members [a]	0.338 ***	(0.020)	
FAQ items [a]	0.355 ***	(0.020)	
Backed [a]	0.651 ***	(0.023)	
Created [a]	0.126 ***	(0.022)	
No. rewards	0.685 ***	(0.022)	
Project duration	-0.095 ***	(0.019)	
Pledge goal [a]	-0.060 **	(0.021)	
No. words	0.248 ***	(0.048)	
No. pictures	0.599 ***	(0.026)	
Video duration	0.123 ***	(0.035)	
No. spoken words	-0.042	(0.060)	
Adjusted R^2	0.481		

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$;
n = 16,967; [a] inverse hyperbolic sine transformation; standard error
in parentheses; pos = positive affective; neg = negative affective

Table 15.10 Regression results of affective cues and their impact on the significance of the U-test by comparing the full model with "affect video" only

	Funding raised [a]		U-test	Funding raised [a]		U-test
Model	Full model (Model 3)			"Affect video" only		
Affect. words	0.180 ***	(0.054)	t=7.49 ***			
Affect. words [2]	-0.164 ***	(0.012)				
Affect. pictures [a]	0.288 ***	(0.044)	t=4.49 ***			
Affect. pictures [a] [2]	-0.107 ***	(0.020)				
Affect. video [a]	0.394 ***	(0.035)	-/- ns	0.633 ***	(0.031)	t=3.10 ***
Affect. video [a] [2]	-0.092 **	(0.030)		-0.231 ***	(0.029)	
Affect. speech	0.529 ***	(0.065)	t=9.59 ***			
Affect. speech [2]	-0.212 ***	(0.017)				
Control variables	included			included		
Adjusted R^2	0.478			0.465		

Notes: Accounting for "affect video" only is in line with previously conducted research accounting for facial expressions in videos in isolation; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; [a] inverse hyperbolic sine transformation; standard error in parentheses

Table 15.11 Regression results of affective cues by utilizing subsamples distinguishing between artistically related (15.11-1) and technology-related (15.11-2) projects

	(15.11-1) - Funding raised [a]		U-test	(15.11-2) - Funding raised [a]		U-test
Affect. words	0.259 ***	(0.072)	t=7.50 ***	0.039	(0.080)	t=3.02 ***
Affect. words ^{2}	-0.190 ***	(0.017)		-0.130 ***	(0.017)	
Affect. pictures [a]	0.316 ***	(0.057)	t=3.33 ***	0.283 ***	(0.069)	t=2.12 *
Affect. pictures [a] ^{2}	-0.108 ***	(0.025)		-0.089 **	(0.031)	
Affect. video [a]	0.528 ***	(0.046)	t=0.48 ns	0.204 ***	(0.052)	t=1.75 *
Affect. video [a] ^{2}	-0.142 ***	(0.037)		-0.132 *	(0.053)	
Affect. speech	0.423 ***	(0.084)	t=6.67 ***	0.637 ***	(0.099)	t=5.85 ***
Affect. speech ^{2}	-0.187 ***	(0.022)		-0.228 ***	(0.028)	
Team members [a]	0.383 ***	(0.028)		0.259 ***	(0.028)	
FAQ items [a]	0.306 ***	(0.033)		0.413 ***	(0.026)	
Backed [a]	0.666 ***	(0.031)		0.609 ***	(0.034)	
Created [a]	-0.049	(0.030)		0.295 ***	(0.032)	
No. rewards	0.779 ***	(0.029)		0.589 ***	(0.037)	
Project duration	-0.135 ***	(0.024)		-0.019	(0.031)	
Pledge goal [a]	-0.131 ***	(0.027)		0.016	(0.033)	
No. words	0.317 ***	(0.067)		0.306 ***	(0.067)	
No. pictures	0.277 ***	(0.042)		0.757 ***	(0.033)	
Video duration	0.079	(0.044)		0.093	(0.055)	
No. spoken words	0.024	(0.078)		-0.102	(0.095)	
Adjusted R^2	0.432			0.550		

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; Model 15.11-1 n = 10,977 (artistically related); Model 15.11-2 n = 5,990 (technology related); [a] inverse hyperbolic sine transformation; standard error in parentheses

Table 15.12 Analysis of sufficient conditions for high funding performance (5th percent and 95th percent breakpoints for full non-membership and full membership, respectively)

Configuration	C1 *affective verbal*	C2 *affective video*	C3 *affective non-video*
Affect words	●		●
Affect pictures			●
Affect video		●	○
Affect speech	●	●	○
No. words	●	●	●
No. pictures	●	●	●
Video duration	●	●	○
No. spoken words	●	●	○
Raw coverage	0.270	0.260	0.070
Unique coverage	0.046	0.041	0.042
Consistency	0.948	0.951	0.922
Solution coverage		0.353	
Solution consistency		0.939	

Note: The symbol ○ indicates the absence and ● indicates the presence of the condition. Blank cells indicate a "don't care" situation.

Table 15.13 Analysis of sufficient conditions for high funding performance (15th percent 85th percent breakpoints for full non-membership and full membership, respectively)

Configuration	C1 affective verbal	C2 affective video	C3 affective non-video
Affect words	●		●
Affect pictures			●
Affect video		●	○
Affect speech	●	●	○
No. words	●	●	●
No. pictures	●	●	●
Video duration	●	●	○
No. spoken words	●	●	○
Raw coverage	0.271	0.262	0.048
Unique coverage	0.052	0.048	0.036
Consistency	0.915	0.921	0.848
Solution coverage		0.354	
Solution consistency		0.904	

Note: The symbol ○ indicates the absence and ● indicates the presence of the condition. Blank cells indicate a "don't care" situation.

Table 15.14 Analysis of sufficient conditions for high funding performance (adding 0.001 to 0.50 fuzzy values)

Configuration	C1 affective verbal	C2 affective video	C3 affective non-video
Affect words	●		●
Affect pictures			●
Affect video		●	○
Affect speech	●	●	○
No. words	●	●	●
No. pictures	●	●	●
Video duration	●	●	○
No. spoken words	●	●	○
Raw coverage	0.267	0.257	0.056
Unique coverage	0.048	0.044	0.038
Consistency	0.937	0.941	0.897
Solution coverage		0.349	
Solution consistency		0.928	

Note: The symbol ○ indicates the absence and ● indicates the presence of the condition. Blank cells indicate a "don't care" situation.

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