What's in a Logo? The Impact of Complex Visual Cues in Equity Crowdfunding

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Abstract

Visual cues are pervasive on crowdfunding platforms. However, whether and how low validity visual cues can impact the behavior of backers remains largely unknown. In this article, we propose a disfluency-based heuristic framework for understanding the influence of low validity visual cues on equity crowdfunding platforms. Drawing on processing fluency theory and visual heuristics, we propose that backers often automatically process visual cues, and that the subjective experience of ease/difficulty with which backers perceptually process low validity visual cues serves as a heuristic and informs their perceptions of early-stage entrepreneurial ventures. We test our propositions focusing on logos (low validity visual cues that are particularly salient and ubiquitous on equity crowdfunding platforms) and logo complexity (a fundamental characteristic of logo design and established antecedent of processing disfluency). We contend that logo complexity can be interpreted by backers as a signal of venture innovativeness because more (vs. less) complex logos are more difficult to process, and thus, feel less familiar and more unique, original, and novel to backers. Since backers often value innovativeness, we further contend that logo complexity can positively impact backers' funding decisions. We find support for our framework and propositions using a multimethod approach comprising three studies: one survey, one field study, and one experiment. Theoretical contributions and managerial implications are also discussed.

Keywords: Crowdfunding; Heuristics; Logo design; Processing fluency; Visual complexity; Visual cues.

JEL classification: L26; M13; M3.

1. Executive summary

Prior equity crowdfunding research has mainly focused on exploring the effects of cues that are deemed economically relevant signals of venture quality because of their perceived, strong associations with venture survival and profitability (i.e., high validity cues). These cues include, for example, patent ownership, the amount of equity offered, and entrepreneurs' level of education. Whether and how cues that have little or no correlation with venture survival and profitability (i.e., low validity cues) can influence backers (i.e., crowdfunding investors) remains largely unknown. Yet, low validity visual cues, such as logos, photos, and images are pervasive on equity crowdfunding platforms.

In the present research, we build on processing fluency theory and visual heuristics to propose a processing-disfluency-based heuristic framework for understanding the influence of low validity visual cues on equity crowdfunding platforms. We contend that backers often automatically process visual cues, and that the subjective experience of ease or difficulty with which backers perceptually process low validity visual cues serves as a heuristic (i.e., mental shortcut) and informs their perceptions of early-stage entrepreneurial ventures. We test our propositions focusing on logos (low validity visual cues that are particularly salient and ubiquitous on equity crowdfunding platforms) and logo complexity (a fundamental characteristic of logo design and established antecedent of processing disfluency). We argue that more (vs. less) complex logos can positively influence backers' perceptions of venture innovativeness and, in turn, the amount of funds backers invest in crowdfunding campaigns. We further propose that these effects occur because more complex logos are perceptually more difficult to process and, thus, perceived as less familiar and more unique, original, and novel by backers who often value innovativeness.

We find support for our conceptual framework and propositions using a multimethod approach, which helps establish the generalizability, reliability, and validity of our findings. Study 1 uses a survey-based approach to demonstrate the impact of logo complexity on perceived venture innovativeness, while Study 2 uses field data to demonstrate the impact of logo complexity on backers' funding decisions. Study 3 replicates the findings of Studies 1 and 2 in a controlled experimental setting and documents the processing-disfluency-based mechanism underlying the effects of logo complexity on backers' perceptions and funding decisions.

Our work makes several important contributions. For example, we contribute to the crowdfunding literature by showing that low validity visual cues, and more particularly logos, can influence backers on equity crowdfunding platforms. To the best of our knowledge, our work is the first to explore the effect of logo design on the funding of entrepreneurial ventures. Thus, our work extends the marketing and crowdfunding literatures by showing that logos can influence funding prospects of early-stage brands. The framework we propose also complements and diverges from the signaling perspective often used in crowdfunding research. It shows that even though logos are cues that often do not communicate private information, are not costly to produce, and are easily imitated by other ventures, the subjective experience of ease/difficulty with which backers perceptually process logos can be interpreted as signals by backers and inform their perceptions of ventures and funding decisions. Further, by providing evidence for the cognitive foundation of investors' decision making, our work adds to extant research suggesting that investors use heuristics to speed up and facilitate their evaluations of ventures.

Our research also yields practical insights that might help entrepreneurs raise funds on crowdfunding platforms albeit with certain qualifications which we discuss. We demonstrate that entrepreneurs should favor using more, rather than less complex logos. Interestingly, however, the results of an exploratory study show that entrepreneurs actually prefer using less complex logos, indicating that they might not fully leverage the benefits of more complex logos.

2. Introduction

Raising capital is critical for entrepreneurial ventures. In recent years, online crowdfunding has become a popular and viable means for entrepreneurs to secure funds (Bruton et al., 2015; Mollick, 2014; Short et al., 2017). Consequently, a growing body of crowdfunding research examines the influence of cues that are deemed economically relevant signals of venture quality because of their perceived, strong associations with venture survival and profitability (i.e., high validity cues; Kirsch et al., 2009). These cues include, for example, patent ownership, the funding target, the amount of equity offered, and the level of education and network size of entrepreneurs (Ahlers et al., 2015; Colombo et al., 2015; Lukkarinen et al., 2016; Mollick, 2014).

In contrast, visual cues such as logos, illustrations, photos, and images tend to be considered low validity cues, as they are perceived to have low or no association with venture survival and profitability. Although, research in other investment contexts shows that low validity visual cues can influence investors' funding decisions (Chan and Park, 2015; Townsend and Shu, 2010), relatively less is known about whether and how low validity visual cues can impact the perceptions and funding decisions of backers (i.e., crowdfunding investors). This represents an important gap in the entrepreneurial finance literature because there exist key differences between digital crowdfunding platforms and traditional sources of finance (for discussions, see Agrawal et al., 2014; Burtch et al., 2015). For instance, the digital, dynamic, and information-rich environment of crowdfunding platforms makes low validity visual cues more pervasive and salient than they typically are in more traditional sources of finance that rely on personal interactions. Equity crowdfunding platforms also tend to attract diverse investors, including backers who typically invest small, rather than large, amounts of money. Further, backers often lack experience and resources to comprehensively evaluate the ventures they invest in (Ahlers et al., 2015), potentially increasing their reliance on low validity cues, compared to more sophisticated investors such as business angels. These differences warrant an examination of how low validity visual cues can impact backers' decisions.

Our article adds to existing knowledge about the effects of visual cues in financial decision-making (Chan and Park, 2015; Townsend and Shu, 2010) and to knowledge about the factors that can influence backers' decisions on crowdfunding platforms by exploring the influence of visual cues that appear on crowdfunding platforms. Specifically, we propose a disfluency-based heuristic account for the effect of low validity visual cues on equity crowdfunding platforms. Building on insights from a visual heuristic perspective (for a discussion, see Chan and Park, 2015) and processing fluency theory (for discussions, see Alter and Oppenheimer, 2009; Oppenheimer, 2008; Reber et al., 2004), we theorize that backers often automatically process visual cues, and that the subjective experience of ease or difficulty with which backers perceptually process low validity visual cues serves as a heuristic (i.e., mental shortcut) and informs their perceptions of the innovativeness of ventures and, in

turn, their funding decisions. We test our propositions focusing on a specific characteristic of the design of visual cues: complexity—the subjective level of elaborateness and intricacy of visual cues. We do so because visual complexity is a key antecedent of processing disfluency (Miceli et al., 2014; Reber et al., 2004). Moreover, prior research in the fields of marketing and psychology shows that visual complexity is a particularly important design characteristic that can substantially impact individuals' perceptions and responses to visual stimuli (Henderson and Cote, 1998; Pieters et al., 2010; van der Lans et al., 2009).

We predict that because visually complex cues are perceptually more difficult to process (i.e., more disfluent), they are likely to be perceived as less familiar and thus more unique, original, and novel by backers. As such, they positively impact backers' perceptions of venture innovativeness. Since backers often value innovativeness in entrepreneurial ventures (Chan et al., 2018; Chan and Parhankangas, 2017; Davis et al., 2017), we further expect the visual complexity of low validity visual cues to positively impact backers' funding decisions. We operationalize visual cues as logos—cues that entrepreneurial ventures use to identify themselves and the products and services they market. We focus on logos (vs. other low validity visual cues) because logos are routinely used by entrepreneurs and ubiquitous on the landing pages of crowdfunding platforms and campaigns (for examples, see Appendix A). Moreover, while research in marketing shows the potential impact of logos on consumer perceptions and behavior (Luffarelli et al., 2018; Stamatogiannakis et al., 2015), relatively little is known about the effects logos can have on the behavior of backers. Logos could for instance, facilitate the identification of ventures and differentiation from competitors (Henderson and Cote, 1998; Zaichkowsky, 2010), which is crucial on crowdfunding platforms where numerous ventures compete for backers' attention. Visual cues such as logos are also processed quickly and automatically, and often enjoy primacy over other types of cues (e.g., textual cues) in affecting individuals' perceptions and judgements (Pieters and Wedel, 2004; Posner et al., 1976; Tsay, 2014). Thus, backers might use logos as mental shortcuts to facilitate their evaluations of ventures, as they

often lack the time, means, or ability to extensively analyze the ventures in which they want to invest (Ahlers et al., 2015).

Figure 1 depicts our conceptual framework and predictions. We use a multimethod approach comprising a survey (Study 1), a field study (Study 2), and an experiment (Study 3) to validate our disfluency-based framework and triangulate our results.

——————Insert Figure 1 about here——————

3. Prior literature and hypotheses development

3.1. High and low validity cues

Despite providing dynamic digital environments for entrepreneurs to display campaign information and signal venture quality, information asymmetry still presents a challenge on crowdfunding platforms (Ahlers et al., 2015). Hence, signaling theory (for a review, see Connelly et al., 2011) has often been used as a theoretical lens for understanding the effects of cues that provide substantial information about a venture's underlying quality and have a strong correlation with venture survival and profitability; that is, high validity cues (Kirsch et al., 2009). For instance, prior crowdfunding research shows that backers' funding decisions can be considerably influenced by signals from high validity cues such as patent ownership (Ahlers et al., 2015), funding targets, campaigns' duration, the amount of equity offered (Agrawal et al., 2016; Lukkarinen et al., 2016), and entrepreneurs' education and networks (Colombo et al., 2015).

However, crowdfunding campaign pages also include numerous low validity cues, which provide limited or no information about a venture's underlying quality and have little or no association with venture survival and profitability. While signaling theory suggests that such cues should not influence funding decisions, an emerging body of reward-based crowdfunding research has used insights from theories other than signaling theory. For example, Parhankangas and Renko (2017) use language expectancy theory to explain the effects of the linguistic style of crowdfunding pitches, Davis et al. (2017) use affective events theory to explain the effects of perceived product

creativity and entrepreneurial passion, and Allison et al. (2017) use the elaboration likelihood model to explain the effects of entrepreneurial narratives. There is also evidence that low validity visual cues can impact the perceptions and funding decisions of investors (Chan and Park, 2015; Chan et al., 2018; Scheaf et al., 2018; Townsend and Shu, 2010). We add to this growing body of research by developing and testing a disfluency-based heuristic account for understanding the influence of low validity cues on equity-based crowdfunding platforms.

3.2. Low validity visual cues, heuristics, and processing fluency

In uncertain situations and when facing complex tasks, individuals (including investors) are known to use mental shortcuts (i.e. heuristics), rather than extensive, rational algorithmic processing to form judgements and make decisions (Baker and Nofsinger, 2002; Gilovich et al., 2002; Hirshleifer, 2001). Heuristics typically involve concentrating on one aspect of a decision task and ignoring others to facilitate decision making. For instance, a well-documented heuristic is the "diversification heuristic:" when faced with complex and uncertain investment decisions, some investors ignore task-relevant information and concentrate instead on diversifying their portfolios, investing 1/*n* in each of the *n* available investment options (Benartzi and Thaler, 2001).

Investing in early-stage entrepreneurial ventures on crowdfunding platforms is often an uncertain undertaking (Strausz, 2017). Moreover, backers often lack experience and resources to systematically evaluate numerous, different investment opportunities on equity crowdfunding platforms (Ahlers et al., 2015), making it a complex task. Hence, backers are likely to use heuristics to speed up and facilitate their evaluations of ventures. According to Chan and Park (2015), investors often automatically attend to and rely on easy-to-process visual cues to avoid information overload. They note, for example, that "people […] process images more easily than written information" (p. 732) and that "visual images are easier to access and remember" (p. 735). Building on Chan and Park's (2015) visual heuristic perspective and research suggesting that processing fluency is an influential heuristic (Hertwig et al., 2008), we propose a disfluency-based heuristic account for understanding the influence of low validity visual cues on backers' perceptions and investment decisions.

Processing fluency theory (for discussions, see Alter and Oppenheimer, 2009; Oppenheimer, 2008; Reber et al., 2004) states that the subjective experience of ease or difficulty with which individuals process a stimulus affects the perceptions and responses of individuals to that stimulus. Processing fluency has been found to impact the way investors assess investment alternatives (Alter and Oppenheimer, 2006; Shah and Oppenheimer, 2007). For example, Chan et al. (2018) show that the ease or difficulty with which a venture's name can be linguistically and phonetically processed affects the investment decisions of both sophisticated and unsophisticated investors. Similarly, Green and Jame (2013) find that a change in the fluency of a firm's name can impact investors' behavior and thus firm value. While these studies concentrate on linguistic and phonetic fluency, our conceptual framework focusses on perceptual fluency—the subjective experience of ease or difficulty with which individuals can cognitively process the visual characteristics of a stimulus.

Applied to our research context, perceptual fluency theory would predict that visual cues can influence backers' perceptions because backers draw on their subjective experience of (dis)fluency when making venture evaluations, even if these cues have no or low correlations with venture survival and profitability. These predictions are in line with recent research that shows that low validity cues can impact investors' decisions in various investment contexts (Chan and Park, 2015; Chan et al., 2018; Mollick, 2014; Scheaf et al., 2018; Townsend and Shu, 2010). Before further describing our conceptual framework, we discuss the importance of logos and reiterate our choice of investigating the impact of logos, as opposed to that of other types of low validity visual cues.

3.3. A disfluency-based heuristic account for the influence of logos

A logo is a pervasive visual cue and one of the most important elements constituting a brand. It is well-established in the marketing literature that logos are influential visual cues, which can, for example, improve brand image and lead to more favorable brand attitudes (for discussions, see Stamatogiannakis et al., 2015; Zaichkowsky, 2010). Further, logo design characteristics such as color (Labrecque and Milne, 2012) and symmetry (Luffarelli et al., 2018) can greatly influence consumer brand perceptions. It is also well-documented that logos convey meaningful signals to consumers,

which primarily stem from their design characteristics. For instance, green (Sundar and Kellaris, 2017) and dynamic (Cian et al., 2014) logos can be interpreted by consumers as signals of social responsibility and modernity, respectively.

Even though virtually every early-stage entrepreneurial venture has a logo and investors have been found to react to visual cues (Chan and Park, 2015; Scheaf et al., 2018; Townsend and Shu, 2010), an important question that remains unanswered is whether logos can influence the perceptions and funding decisions of backers. In the context of crowdfunding, logos are low validity cues because their design does not provide information about a venture's underlying quality and has low or no perceived association with venture survival and profitability. Yet, the perceptions and funding decisions of backers might be considerably influenced by logos because logos are particularly salient and ubiquitous on the landing pages of crowdfunding platforms and campaigns (as shown in Appendix A). Furthermore, logos are processed quickly and automatically, could facilitate the identification and differentiation of ventures (Henderson and Cote, 1998; Zaichkowsky, 2010), and might enjoy primacy over other types of cues (e.g., textual cues) in affecting individuals' judgements (Pieters and Wedel, 2004; Posner et al., 1976; Tsay, 2014). Therefore, in light of the aforementioned studies and prior evidence suggesting that investors rely on heuristics (Chan and Park, 2013; 2015; Chan et al., 2018), it is likely that backers use logo design as a heuristic to facilitate venture evaluations.

Prior research in the fields of marketing and psychology shows that visual complexity is a key design characteristic that can considerably influence individuals' perceptions and responses to visual stimuli, including logos (Henderson and Cote, 1998; van der Lans et al., 2009). Logo complexity refers to the subjective level of elaborateness and intricacy of a logo design and can arise from different design characteristics (Henderson and Cote, 1998). For example, compared to logos consisting of fewer or similar elements, logos consisting of more or dissimilar elements are perceived to be more complex (Henderson and Cote, 1998; Pieters et al., 2010). Prior research also shows that more (vs. less) complex stimuli are more disfluent (Miceli et al., 2014; Reber et al., 2004). For

instance, geometrical shapes with more sides are more disfluent than shapes with fewer sides (Locher and Simmons, 1978) and more intricate product images are more disfluent than less intricate images (Orth and Crouch, 2014). According to this literature, more visually complex logos should thus be more disfluent than visually less complex logos.

Processing disfluency has been found to have both positive and negative effects. For example, visual stimuli that are more disfluent tend to be liked relatively less and perceived to be less aesthetically pleasing than more fluent stimuli (Alter and Oppenheimer, 2009; Reber et al., 2004; Song and Schwarz, 2008). On the other hand, disfluency can increase product interest (Labroo and Pocheptsova, 2016) and perceived service value prior to consumption (Thompson and Ince, 2013). Processing disfluency typically results in positive, rather than negative, outcomes when a stimulus is perceived as an instrumental means to fulfil a specific goal (Labroo and Kim, 2009). In the context of crowdfunding, logo disfluency is thus likely to have a positive impact on backers' perceptions and funding decisions because backers, who are time constrained and overloaded with information, might rely on logos as a means to fulfil their specific goal of finding a suitable venture to invest in. Of particular interest to us is the potential existence of a positive link between processing disfluency and innovativeness. Processing fluency is known to be strongly associated with a feeling of familiarity, while processing disfluency is associated with a feeling of unfamiliarity (Alter and Oppenheimer, 2009; Oppenheimer, 2008; Reber et al., 2004; Schwarz, 2004). Stimuli that feel unfamiliar because they are disfluent, in turn, are perceived to be more unique, original, and novel (Cho, 2013; Labroo and Pocheptsova, 2016; Schwarz, 2004; Sung et al., 2015). Since, uniqueness, newness, and originality are concepts strongly associated with innovativeness (Garcia and Calantone, 2002), stimuli that feel unfamiliar because they are disfluent are perceived to be more innovative. For instance, Cho and Schwarz (2006) show that consumers perceive products as more innovative when information pertaining to these products is printed in difficult-to-read (i.e., disfluent) font rather than easy-to-read font. Building on this literature and the preceding discussion, we propose that since more (vs. less) complex logos are more disfluent, more complex logos could be interpreted by

backers as signals of venture innovativeness. As such, logo complexity positively impacts backers' perceptions of venture innovativeness.

Hypothesis 1: (a) Compared to less complex logos, more complex logos positively impact backers' perceptions of venture innovativeness. (b) This effect is mediated by logo disfluency.

Innovativeness plays a central role in entrepreneurship. It is generally accepted that ventures often seek to be innovative and that innovation is an important contributing factor to the success of entrepreneurial ventures (Drucker, 1985a; Szirmai et al., 2011). For instance, Drucker (1985b; p. 18), note that "innovation is the specific tool of entrepreneurs." There is also evidence that more innovative ventures often perform better than their less innovative counterparts (Rosenbusch et al., 2011). Investors might thus expect better performance and higher returns from innovative ventures. For instance, prior research shows that venture capitalists prefer ventures with well-developed innovation strategies, due to their potential of quickly taking products to market (Bottazzi and Da Rin, 2002; Hellmann and Puri, 2000). As such, investors often evaluate innovative firms more favorably (Hellmann and Puri, 2000; Kortum and Lerner, 2001) and prefer getting involved in unique and innovative ventures (Chan et al., 2018). In fact, certain investors push ventures to pursue more innovative strategies and get more involved in a given venture, as the venture becomes more innovative (Sapienza, 1992). These studies clearly demonstrate the importance and value of innovation for investors in early-stage ventures. In this regard, backers are probably not very different from other investors. Research in the context of crowdfunding shows that backers too tend to have more favorable perceptions and positive affective reactions to more innovative and creative entrepreneurial pitches (Davis et al., 2017). Moreover, one of backers' primary motivations is to support innovative and creative entrepreneurial ideas (Agrawal et al., 2014). Likewise, ventures that appear less innovative are less likely to gain backer interest and funding, while ventures that are perceived to be more innovative tend to receive more interest and funding (Chan and Parhankangas, 2017; Davis et al., 2017).

Taken together, the aforementioned studies strongly suggest that backers value innovativeness and are more likely to invest in more innovative ventures than in less innovative ventures. Building on this literature and the preceding discussion regarding the potential positive association between logo complexity and backers' perceptions of venture innovativeness (H1), we expect that the increased perceptions of venture innovativeness created by the subjective experience of difficulty with which backers perceptually process more complex logos are likely to positively impact backers' funding decisions. We thus propose that more (vs. less) complex logos positively impact backers' decisions to fund ventures on equity crowdfunding platforms.

Hypothesis 2: (a) Compared to less complex logos, more complex logos positively impact backers' funding decisions. (b) This effect is mediated by backers' perceptions of venture innovativeness.

Next, we report three studies that test our proposed framework (see Figure 1). Study 1 tests H1a, Study 2 tests H2a, and Study 3 tests both hypotheses, as well as H1b and H2b. Across these studies, we use different research methods, logo-level and individual-level analyses, ventures spanning multiple industries, real and hypothetical ventures, different logos, and several operationalizations of logo complexity to establish the validity, reliability, and generalizability of our findings.

4. Study 1: logo complexity and backers' perceptions of venture innovativeness

Study 1, which is a survey, aims to show that more (vs. less) complex logos can positively impact perceived venture innovativeness (H1a).

4.1. Respondents

Two thousand six hundred and thirty respondents ($x\square_{age}$ = 35; 53% female) were recruited on Amazon Mechanical Turk (MTurk)—an online participant pool. The reliability and validity of the data obtained from MTurk samples is well-established and MTurk samples tend to be representative of the general U.S. population (for discussions, see Berinsky et al., 2012; Buhrmester et al., 2011;

Goodman and Paolacci, 2017; Paolacci et al., 2010). Since crowdfunding platforms were created to encourage non-professional investors from the general population to make investments, MTurk samples have been used in prior crowdfunding studies (Allison et al., 2017; Chan and Parhankangas, 2017; Johnson et al., 2018; Stevenson et al., 2018). These studies indicate that MTurk samples seem to be representative of the type of individuals who might fund projects on crowdfunding platforms. For instance, Chan and Parhankangas (2017; p.11) report that among a sample of 245 respondents recruited on MTurk, 186 had visited a crowdfunding platform and 34% had invested in new ventures. While in this study, we cannot determine whether the respondents had previously invested on a crowdfunding platform, our sample likely consists of respondents who, on average, are representative of the general population that might invest on crowdfunding platforms. We do recognize this as a limitation, which we address in subsequent studies by using samples of individuals who had invested in an actual crowdfunding campaign.

4.2. Stimuli, method, and measures

Stimuli and method. Respondents rated the logos of 174 actual ventures raising funds on two leading equity crowdfunding platforms. These logos are comprised of a wide array of different design characteristics (e.g., different shapes and colors). Following an established method in the logo design literature (Henderson and Cote, 1998; Henderson et al., 2004; Luffarelli et al., 2018; van der Lans et al., 2009) and to avoid respondent fatigue, we asked each of the respondents to evaluate two logos, randomly selected from our sample of 174 logos. Each logo was presented with the description of the product/service posted by the ventures on the crowdfunding platforms.

Dependent and independent measures. A major cause of common method variance is obtaining measures from the same raters. Thus, obtaining the dependent and independent measures from different samples helps controlling for common method bias (see Podsakoff et al., 2003). Our dependent measure (*Perceived venture innovativeness*) was obtained by surveying half of the respondent, while our independent measure (*Logo complexity*) was obtained by surveying the other half. Specifically, half of the 2,630 respondents (n = 1,327) were asked to rate how innovative they

perceived the venture to be on three 9-point scales presented in a random order (1 = not innovative at all/not different at all/not unique at all; 9 = very innovative/very different/very unique; adapted from Moreau et al., 2001), which we averaged into a single measure (α = .93).[1] Ratings were obtained directly after each of the two logos and product/service description were shown to the respondents. The other half of the respondents (n = 1,303) were asked to rate the complexity of each of the two logos they were shown on two 9-point scales presented in a random order (1 = not complex at all/few distinct elements, 9 = very complex/many distinct elements; adapted from Henderson and Cote, 1998; Pieters et al., 2010). These two scales were also averaged into a single measure ($r_{\text{Spearman-Brown corrected}}$ = .67).

Control measures. To ensure that the effect of logo complexity on perceived venture innovativeness was not confounded by the effects of other logo design characteristics, we controlled for fifteen design characteristics. We obtained eight of these design characteristics by asking the respondents, who provided ratings of *Logo complexity* to also rate their two assigned logos on the following characteristics using 9-point scales: *Symmetry, Roundedness, Dynamism, Descriptiveness, Depth, Repetition, Orientation,* and *Liking*. A research assistant blind to the purpose of this research coded seven other logo design characteristics that could be coded objectively: *Color saturation*, *Color lightness*, *Color hue*, *Naturalness, Proportion*, *Shape,* and *Type*. Appendix B describes these control variables in detail.

4.3. Analyses, results, and discussion

Analyses and results. We conducted a regression analysis with *Perceived venture innovativeness* as the dependent variable, *Logo complexity* as the independent variable, and the fifteen logo design characteristics as control variables. Supporting H1a, the results of this analysis (see Table 1 – Model 2) showed that logo complexity was positively associated with perceived venture innovativeness (β = .25; t(145) = 3.51; p = .001). We also checked for the possibility of a diminishing effect of logo

[1] As this survey is part of a larger research project on the impact of logos, other dependent variables were also measured (e.g., perceived authenticity).

complexity by adding the quadratic specification of *Logo complexity*, which was not a significant predictor of *Perceived venture innovativeness* (β = -.02; t(144) = -.62; p > .50).

Discussion. Study 1 tested the link between logo complexity and perceptions of innovativeness using logo-level measures and provided support for H1a. A potential concern with the results of Study 1 is that they do not shed light on the within-person perceptions of logo complexity and venture innovativeness, as these perceptions were collected from independent samples. Study 3 addresses this potential concern by obtaining measures of logo disfluency, perceived venture innovativeness, and willingness to invest from the same individual backers in a controlled experimental setting. Another potential concern with the results of Study 1 is that logo complexity might be associated with perceived venture innovativeness because more innovative ventures design more complex logos, and not because logo complexity is interpreted as a signal of venture innovativeness. Study 3 also addresses this potential concern by manipulating logo complexity while holding the description of hypothetical ventures constant across experimental conditions. As noted earlier, another potential concern is the representativeness of the sample we used. Study 2 addresses this potential concern by using data on individual backers who invested in a subset of the 174 actual ventures included in the sample of Study 1.

——————Insert Table 1 about here——————

5. Study 2: logo complexity and backers' funding decisions

In Study 2, we use field data from a leading equity crowdfunding platform to demonstrate that logo complexity can increase the amount of funds backers invest in ventures (H2a). We also explore how the magnitude of the impact of logo complexity compares to that of variables that are known to be important explanatory variables for backers' funding decisions (e.g., venture valuation and equity offered).

5.1. Data and sample

We used a unique dataset created by combining data on individual backers, equity crowdfunding campaigns, entrepreneurs, and logo design characteristics. Our sample consisted of 10,611 actual investments made by 5,427 backers across 62 crowdfunding campaigns during the period April 2015 – January 2016. These 62 campaigns were from the same equity crowdfunding platform[2] and represented a subset of the sample of 174 campaigns used in Study 1 (data for the other 112 campaigns was not made available to us by the other platform). Our detailed individual-backer-level panel dataset allowed us to observe the investment frequency and campaign choices of each of the 5,427 backers in our sample. For each of the 62 campaigns in our dataset, supplementary data on entrepreneurs was manually collected from the LinkedIn profiles of entrepreneurs and data about logo design characteristics was obtained from the survey reported earlier (see Study 1). Our backer-level panel dataset, which included a time series of backers' investments and a cross-section of crowdfunding campaigns, also allowed us to explore the impact of *Logo complexity* on the investment behavior of heterogeneous backers, while accounting for the effects of key characteristics of backers, campaigns, ventures, entrepreneurs, and logo design.

5.2. Model specification

Our dataset allowed us to observe multiple investments by an individual backer across multiple campaigns and over time. Hence, investment behavior could have been correlated across the investments made by the same backer, violating the assumption of independence across investments. Further, the campaigns spanned across multiple industries, creating a problem of nested data. We addressed these issues by explicitly modeling the multilevel structure of our data via a mixed model with individual-specific random effects and industry dummies.[3] The use of mixed effects allowed us to account for unobserved individual-level heterogeneity using individual-specific random intercepts.

[2] A non-disclosure agreement prevents us from disclosing information about this platform.

[3] We also estimated a model with observations nested at the backer level and industry level. The results of this model were similar to those of the model we estimated. However, nesting observations at both levels resulted in a deterioration of model fit (AIC = 34,572.26), compared to the multi-level model with random intercepts for backers (AIC = 34,477.50). Therefore, we estimated a mixed model with random intercepts for backers and accounted for industries using industry dummies.

We further included time-invariant variables to capture observed heterogeneity in backers and use industry fixed effects. Formally, we estimated the following model:

$$\text{Amount invested}_{ijt} = \alpha + \beta\text{Logo Complexity}_j + \Theta_1\text{Campaign Controls}_{jt} + \Theta_2\text{Venture Controls}_j + \Theta_3\text{Backer Controls}_{it} + \Theta_4\text{Entrepreneur Controls}_j + \Theta_5\text{Logo Controls}_j + \mu_{0i} + \epsilon_{ijt}$$

where *i* denotes a backer, *j* denotes a campaign, *t* denotes any point in time at which an investment is made during our sample period, α is the intercept, β captures the impact of logo complexity on amount invested, Θ_{1-5} are vectors of coefficients for the various controls included in the model, μ_{0i} is the backer-specific random effect, and ϵ_{ijt} is the error term, which varies over backers, campaigns, and times of investment.

5.3. Variables

Dependent and independent variables. Our dependent variable (*Amount invested*) was the natural logarithm of the amount of funds invested by an individual backer in a campaign at any given point in time. Our independent variable (*Logo complexity*) was obtained from the survey reported earlier and by asking respondents to rate the complexity of the ventures' logos on two 9-point scales, which we averaged into a single variable (see Study 1).

Control variables. In line with prior equity crowdfunding research (Ahlers et al., 2015; Block et al., 2018; Lukkarinen et al., 2016; Vismara, 2018; Vulkan et al., 2016), we controlled for factors that could influence a backer's funding decisions namely, campaign-related, venture-related, backer-related, and entrepreneur-related factors. Specifically, we controlled for pre-money valuation (*Venture valuation*), the amount of capital entrepreneurs seek to raise (*Funding goal*), the number of existing investments made in a campaign at any point in time (*Number of investments*),[4] the percentage of ownership stake offered (*Equity offered*), the number of days remaining before the campaign expires (*Campaign expiration*), the net worth of a backer (*High net worth backer*), the level of experience of a backer (*Experienced backer*), whether a backer had ever launched a

[4] We also tested for the cumulative amount raised by the campaign as a measure of fundraising progress and observed similar results to those we report.

crowdfunding campaign (*Entrepreneur backer*), the ratio of successful campaigns in which a backer had previously invested (*Backer prior success*), the size of the venture team (*Venture team size*), the gender composition of the venture team (*% of male entrepreneurs*), the level of education of entrepreneurs (*% of MBA entrepreneurs; % qualified entrepreneurs*), and the industry in which a campaign is categorized (*Industry dummies*). We also controlled for the fifteen logo design characteristics used in Study 1 and described in Section 4.2. The operationalization and descriptive statistics of all of the variables used in our model are presented in Table 2. The pairwise correlations are presented in Table 3.

5.4. Analyses, results, and discussion

Model fit. Table 4 reports alternate models specifications that we estimated. We computed the Akaike Information Criterion (AIC) to determine model fit. We found that adding *Logo complexity* to Model 1 (a model with no logo-related controls) improved the AIC from 34,579.40 to 34,571.94, while adding *Logo complexity* to Model 3 (a full control model with logo design controls and other controls) improved the AIC from 34,480.41 to 34,477.50.

Results. Supporting H2a, we found a positive and significant association between *Logo complexity* and *Amount invested* ($\beta_{\text{logo complexity}} = .08$; $z(10{,}562) = 2.22$; $p = .03$; see Table 4 – Model 4).[5] Based on our results, we estimated that a one unit increase in logo complexity ratings resulted in an 8% increase in amount invested, which corresponds to approximately a GBP 113 increase in the average amount invested by backers in a crowdfunding campaign (i.e., .08 × GBP 1,416; see Tables 2 and 4). This effect is comparable in magnitude to the effect of high validity cues such as venture team size and number of previous pledges (a one unit increase in team size resulted in a 10% increase amount invested; a one unit increase in the number of previous pledges resulted in a 7% decrease in amount invested; see Tables 2 and 4).

Effect size. Since our dataset had multiple variables that were scaled differently, we followed

[5] We also explored the quadratic relationship between *Logo complexity* and *Amount invested* and found the squared term of *Logo complexity* to be statistically insignificant ($\beta_{\text{logo complexity}^2} = -.01$; $p > .55$).

Allison et al. (2015) and computed the standardized coefficients to examine the effect size of *Logo complexity*. These coefficients are reported in Table 4 – Model 4. The standardized estimate for *Logo complexity* ($\beta^{standardized}_{complexity}$ = .04; z(10,562) = 2.22; p = .03) was significant at the 5% level. Moreover, we found that the effect of *Logo complexity* was more than twice as strong as that of *Funding goal* ($\beta^{standardized}_{funding\ goal}$ = .02; z(10,562) = .34; p = .73), equivalent to the effect of *Number of pledges* ($\beta^{standardized}_{number\ of\ pledges}$ = -.04; z(10,562) = -5.81; p < .001), and similar to the effect of *Equity offered* ($\beta^{standardized}_{equity\ offered}$ = .05; z(10,562) = 1.06; p = .04). The standardized coefficients reported in Table 4 – Model 4 show that the effect size of *Logo complexity* was stronger than the effect size of eight of the campaign-related, venture-related, backer-related, and entrepreneur-related controls included in our model. These results are important because they demonstrate that the magnitude of the effect of *Logo complexity* is larger or comparable to that of variables known to be important explanatory variables for backers' funding decisions (Ahlers et al., 2015; Block et al., 2018; Lukkarinen et al., 2016; Vismara, 2018; Vulkan et al., 2016). We also computed the percentage reduction in variance (PVR) following the inclusion of *Logo complexity* as an explanatory variable for *Amount invested*. We found that including *Logo complexity* as an explanatory variable in Model 2 reduced the variance by .1% compared to Model 1 and adding *Logo complexity* to Model 4 reduced variance by .2% compared to Model 3.

————Insert Table 4 about here————

Discussion. Study 2 extended the findings of Study 1 by providing evidence for the positive effect of logo complexity on the amount of funds backers invest in a crowdfunding campaign. We showed that despite controlling for high validity cues (e.g., venture valuation, equity offered, funding goal, and entrepreneurs' education level), logo complexity exerts a positive effect on the amount of funds backers invest in ventures. The significant effect of logo design on investor decisions complements existing evidence in the field of marketing, which suggests that logos are an influential brand element (Stamatogiannakis et al., 2015; Zaichkowsky, 2010). In addition, Study 2 used

detailed backer-level data and accounts for both observed and unobserved heterogeneity in investment behavior. An aggregate campaign-level study would not have been able to capture such individual-level variability in investment behavior. Importantly, we showed that the effect of logo complexity is significant across a wide range of industries. However, the data used in this study is not without limitations. For instance, our data emanates from a single platform and pertains only to campaigns that have successfully reached their funding goals, thus limiting our ability to infer whether logo complexity can play a role in driving the success or failure of crowdfunding campaigns. Moreover, while the data for logo design characteristics was collected at the aggregate logo level (from an independent set of respondents), the investment decisions were observed at the backer level. Our multi-level modeling approach attempted to mitigate this problem. However, the effect sizes might have been more substantial if all data had been collected for the same cohort of investors. To address this concern, we conducted a controlled experimental study (Study 3), where logo evaluations and investment decisions were made by the same backers.

6. Study 3: the mechanism underlying the effects of logo complexity

The aim of Study 3 is to replicate the findings of Studies 1 and 2, test H1b and H2b, and show the disfluency-based mechanism underlying the effect of logo complexity in a controlled setting.

6.1. Stimuli

We created two stimulus replicates. Specifically, we created two different descriptions of ventures in dissimilar industries as well as a unique set of logos for each venture (see Appendix C). One venture was specialized in manufacturing smart suitcases and the other in toy rental. Each logo pair included a more complex version of a logo and a similar, less complex version. Increasing the number of elements and the color dissimilarity of elements forming a visual stimulus are well-recognized manipulations of visual complexity (see Henderson and Cote, 1998; Pieters et al., 2010). Hence, for the toy rental venture, the less complex logo version was formed of three elements (a circular logo frame, an image of a bear, and the name of the venture), while the more complex logo

version was formed of eleven elements (the same three elements forming the less complex logo plus eight images of toys positioned inside the logo frame). For the smart suitcases venture, the less complex logo version was composed of four black circles, while the more complex logo version was composed of a red, a black, a blue and a green circle. Pretests confirmed that, for each pair, the more complex logo was perceived to be significantly more complex than its less complex counterpart (all p's < .05). Pretests also confirmed that the two logos of each pair did not significantly differ along other key design characteristics (e.g., dynamism, symmetry; all p's > .15), allowing us to control for the potential confounding effects of these characteristics. The aforementioned stimulus replicates and the detailed results of the pretests are reported in Appendix C.

6.2. Participants, method, and measures

Two hundred individuals ($x\square_{age}$ = 34; 37% female) recruited on MTurk participated in this study. Screening questions ensured that only individuals with experience investing on crowdfunding platforms could participate in our study. On average, participants had invested in 3.58 entrepreneurial ventures on a crowdfunding platform in the past two years and invested USD 442 in each venture. Participants were told they would evaluate a venture trying to raise funds to grow its business. They were then randomly assigned to one of the four conditions of a 2 (*Logo complexity*: less vs. more) × 2 (*Stimulus replicate*: smart suitcases vs. toy rental venture) between-participant experiment. Participants were either told that they would evaluate an entrepreneurial venture specialized in manufacturing smart suitcases or a venture specialized in toy rental. They were then shown the corresponding venture description, along with either the more or the less complex logo designed for that specific venture. While our interest lies principally in the effect of *Logo complexity*, stimulus replicates were used to increase confidence in the reliability and validity of our findings.

Our measures were displayed below participants' assigned logo and venture description. *Logo disfluency* was measured by asking participants how disfluent they perceived the logo to be on three 9-point slider scales presented in a random order (1 = very fluent/easy to process/very eye-catching, 9 = not at all fluent/difficult to process/not at all eye-catching; adapted from Labroo et al., 2008), which

we averaged into a single variable (α = .81). *Perceived venture innovativeness* was measured on three 9-point Likert scales similar to those used in Study 1 and presented in a random order, which we averaged into a single measure (α = .92). *Perceived venture preparedness* was measured by asking participants to indicate on a 9-point Likert scale how prepared they perceived the venture to be (1 = not prepared at all, 9 = very prepared; Chan and Park, 2015). *Willingness to invest* was measured on three 9-point differential items presented in a random order (improbable/probable, impossible/possible, unlikely/likely), which we averaged into a single measure (α = .95). We counterbalanced the order in which we measured these variables. For half of the participants, we measured the dependent variable before the mediators, while for the other half of the participants, we measured the dependent variable after the mediators. Analyses revealed no effects of measurement order on the results reported later, suggesting that potential biases resulting from item context effects are unlikely to pose a major threat to the validity of our findings (see Podsakoff et al., 2003).

6.3. Analyses, results, and discussion

We first present evidence for the direct effects of *Logo complexity* on *Willingness to invest*, *Perceived venture innovativeness*, and *Logo disfluency*. We then report evidence for the following serial mediation: *Logo complexity* → *Logo disfluency* → *Perceived venture innovativeness* → *Willingness to invest*. Finally, we address potential issues related to discriminant validity and common method biases, and test an alternative explanation based on perceived venture preparedness.

Direct effects. We conducted a 2 × 2 between-participant ANOVA with *Logo complexity* (less vs. more) and *Stimulus replicate* (smart suitcases vs. toy rental) as fixed factors, and *Willingness to invest* as the dependent variable. Supporting H2a, we found a significant main effect of *Logo complexity*: the more complex logos ($\bar{x}$ = 5.37) resulted in higher willingness to invest than the less complex logos ($\bar{x}$ = 4.31; F(1, 196) = 12.23; p = .001). Unrelated to our hypotheses, participants' willingness to invest was higher for the smart suitcases than the toy rental venture, resulting in a significant main effect of *Stimulus replicate* ($\bar{x}_{\text{smart suitcases}}$ = 5.19 vs. $\bar{x}_{\text{toy rental}}$ = 4.49; F(1, 196) = 5.25; p = .023). The *Logo complexity* × *Stimulus replicate* interaction was not significant (F(1, 196) =

.00; p > .95), showing that the effect of logo complexity on willingness to invest was similar across the replicates. We conducted a second ANOVA, similar to the one discussed earlier, but with *Perceived venture innovativeness* as the dependent variable. Supporting H1a, the more complex logos ($\bar{x}$ = 6.61) resulted in higher perceived venture innovativeness than the less complex logos, leading to a significant main effect of *Logo complexity* ($\bar{x}$ = 5.75; F(1, 196) = 11.80; p = .001). Neither the main effect of *Stimulus replicate* (F(1, 196) = .23; p > .60) nor the *Logo complexity* × *Stimulus replicate* interaction (F(1, 196) = .44; p > .50) were significant. We conducted a third ANOVA, similar to the one discussed earlier, but with *Logo disfluency* as the dependent variable. Supporting our proposed mechanism, we found a significant main effect of *Logo complexity*: more complex logos ($\bar{x}$ = 5.92) were perceived to be significantly more disfluent than less complex logos ($\bar{x}$ = 4.92; F(1, 196) = 17.25; p < .001). Unrelated to our hypotheses, the logo pair of the toy rental venture was rated as marginally more disfluent than the logo pair of the smart suitcases venture, resulting in a marginally significant main effect of *Stimulus replicate* ($\bar{x}_{\text{smart suitcases}}$ = 5.22 vs. $\bar{x}_{\text{toy rental}}$ = 5.62; F(1, 196) = 2.79; p = .097). The *Logo complexity* × *Stimulus replicate* interaction was not significant (F(1, 196) = .81; p > .35). The contrasts analyses for these three ANOVA's are presented in Figure 2.

——————Insert Figure 2 here——————

Indirect effect in a serial mediation. As reported earlier, the direct effects of *Logo complexity* were similar across the two replicates (i.e., none of the three *Logo complexity* × *Stimulus replicate* interactions were statistically significant). Hence, following a standard practice, we collapsed the data across the two replicates to conduct a serial mediation analysis with *Logo complexity* (less vs. more) as the independent variable, *Logo disfluency* as the first mediator, *Perceived venture innovativeness* as the second mediator, and *Willingness to invest* as the dependent variable. The results of this analysis are presented in Figure 3. We used the well-established PROCESS method (see Hayes 2017) to analyze the indirect effect of *Logo complexity* on *Willingness to invest* through *Logo disfluency*

and, in turn, through *Perceived venture innovativeness*. PROCESS is a regression-based path analysis method grounded in the product-of-coefficients approach, which is often used in the marketing (Cian et al., 2014; Luffarelli et al., 2018) and entrepreneurship (Johnson et al., 2018; Stevenson et al., 2018; Vandor and Franke, 2016; Wiklund et al., 2017) literature, and has several advantages over the causal steps method of Baron and Kenny (1986; for discussions, see Chapter 4 of Hayes, 2017; Zhao et al., 2010). We estimated the indirect effect of *Logo complexity* using a bias-corrected confidence interval based on 5,000 bootstrap samples. We used this method for all the mediation analyses reported in this article. Supporting our proposed conceptual framework and H1b and H2b, our analysis showed that higher logo complexity was associated with higher logo disfluency ($\beta = 1.00$; $t(198) = 4.14$; $p < .001$), which in turn was associated with higher perceived venture innovativeness ($\beta = .32$; $t(197) = 4.60$; $p < .001$), which in turn was associated with higher willingness to invest ($\beta = .49$; $t(196) = 5.97$; $p < .001$). The confidence interval of the indirect effect of *Logo complexity* on *Willingness to invest* through *Logo disfluency* and, in turn, through *Perceived venture innovativeness* excluded zero (95% CI: .08, .31), indicating a significant serial mediation.

——————Insert Figure 3 here——————

Discriminant validity. The average variance extracted (AVE) for the first mediator (*Logo disfluency*; AVE = .70), second mediator (*Perceived venture innovativeness*; AVE = .78), and dependent variable (*Willingness to invest*; AVE = .85) exceeded the squared correlations among these three constructs ($r^2_{\text{first mediator–second mediator}} = .13$; $r^2_{\text{first mediator–dependent variable}} = .08$; $r^2_{\text{second mediator–dependent variable}} = .22$), which shows discriminant validity (see Fornell and Larcker, 1981).

Common method biases. Our experiment was designed following procedural remedies for controlling common method biases (see Podsakoff et al., 2003). Specifically, we used different response formats (e.g., slider and Likert scales). We also carefully constructed the items measuring the mediators and dependent variable (e.g., avoided double-barreled questions) and, as noted earlier, randomized their presentation order. We also counterbalanced the order in which the mediators and

the dependent variable were measured and, as stated earlier, found no effects of measurement order. Finally, we informed participants that participation in our experiment was anonymous and that there were no right or wrong answers to our questions. Although these remedies should minimize method variance, we conducted two tests (see Podsakoff et al., 2003) to assess the extent to which our results might be affected by common method biases. First, we conducted Harman's one-factor test. The unrotated factor solution resulting from this test did not yield one factor accounting for most of the variance. Instead, it yielded three factors with eigenvalues greater than one, none of which explained more than fifty percent of the variance. Second, we followed the general factor covariate procedure. Adding the factor score of the first unrotated factor (which is typically assumed to contain the best approximation of common method variance) as a control variable in the mediation analysis reported earlier did not substantially change our results. Specifically, the confidence interval of the indirect effect of *Logo complexity* still excluded zero (95% CI: .01, .24). These tests suggest that common method bias is not likely to be a threat to the validity of the findings of this study.

Alternative explanation. An alternative explanation to our findings might be that more elaborate and intricate logos signal preparedness, which in turn positively affects backers' willingness to invest. We conducted two mediation analyses to examine this possibility. The first mediation analysis was similar to the one presented in Figure 3, but with *Perceived venture preparedness* as the second mediator. Replicating prior work (Chan and Park, 2015), we found that *Perceived venture preparedness* was associated with significantly higher *Willingness to invest* (β =.20; $t(196) = 2.14$; $p = .034$). Yet, *Logo complexity* did not significantly impact *Perceived venture preparedness* (β =.19; $t(197) = .81$; $p > .40$) and the confidence interval of the indirect effect of *Logo complexity* included zero (95% CI: -.04, .15), showing that preparedness did not mediate the effect of *Logo complexity* on *Willingness to invest*. In the second mediation analysis, we conducted a parallel serial mediation analysis, with *Logo disfluency* as the first mediator, and *Perceived venture preparedness* and *Perceived venture innovativeness* as parallel, second mediators. The results of this analysis mirror those reported earlier. Specifically, when simultaneously accounting for the effects of both *Perceived*

venture preparedness and *Perceived venture innovativeness*, only *Perceived venture innovativeness* significantly mediated the effect of *Logo complexity* on *Willingness to invest*: the indirect effect *Logo complexity* through *Logo disfluency* and, in turn, through *Perceived venture innovativeness* excluded zero (95% CI: .06, .28), while the indirect effect of *Logo complexity* through *Logo disfluency* and, in turn, through *Perceived venture preparedness* included zero (95% CI: -.10, .05).

Discussion. Study 3 provided support for our entire conceptual framework and hypotheses. It showed that more complex logos are more disfluent and, thus, positively influence backers' perceptions of venture innovativeness, which in turn positively impacts backers' willingness to invest. The controlled experimental setting of Study 3, whereby *Logo complexity* was manipulated while holding the description of hypothetical ventures constant across conditions, allowed us to address key limitations of Studies 1 and 2, providing evidence for the validity and reliability of the effects we document. For example, the results of Study 3 showed that these effects hold when logo evaluations and investment decisions are made by the same backers. Further, they confirmed that logo complexity can be associated with perceptions of innovativeness because it can be interpreted as a signal of venture innovativeness, not because more innovative ventures design more complex logos.

7. General discussion

We proposed a disfluency-based heuristic framework for understanding the influence of low validity visual cues on equity crowdfunding platforms. We contended that backers often automatically process visual cues, and that the subjective experience of ease or difficulty with which backers perceptually process low validity visual cues serves as a heuristic and informs their perceptions of early-stage entrepreneurial ventures. We tested our propositions focusing on logos (low validity visual cues that are particularly salient and ubiquitous on equity crowdfunding platforms; see Appendix A) and logo complexity (a fundamental characteristic of logo design and established antecedent of processing disfluency). We argued that more (vs. less) complex logos can positively influence backers' perceptions of venture innovativeness and, in turn, the amount of funds

backers invest in crowdfunding campaigns. We further proposed that these effects occur because more complex logos are perceptually more difficult to process and thus, perceived as less familiar and more unique, original, and novel by backers who often value innovativeness. We found support for our conceptual framework and propositions (see Figure 1) using a multistudy/multimethod approach. Specifically, Study 1 used a survey-based approach to demonstrate the impact of logo complexity on perceived venture innovativeness, while Study 2 used field data to show the impact of logo complexity on backers' funding decisions. Study 3 replicated the findings of Studies 1 and 2 in a controlled experimental setting and documented the disfluency-based mechanism underlying the effects of logo complexity on backers' perceptions and funding decisions. Our multistudy/multimethod approach helped establish the generalizability, reliability, and validity of our findings. In using such an approach, our work followed in the footsteps of recent research in entrepreneurship and crowdfunding that have employed a multistudy/multimethod approach to triangulate and demonstrate the robustness of their findings (Chan and Park, 2015; Johnson et al., 2018; Stevenson et al., 2018).

7.1. Contributions and Implications

By combining insights from the marketing, psychology, crowdfunding, and entrepreneurship literature to shed light on the impact of low validity visual cues on equity crowdfunding platforms, our work addresses the call for multidisciplinary crowdfunding research (McKenny et al., 2017). This is an important contribution, because while a large body of equity crowdfunding literature has explored the effects of high validity cues on backers' behavior (Agrawal et al., 2016; Ahlers et al., 2015; Lukkarinen et al., 2016; Vismara, 2018), relatively less is known about whether and how low validity visual cues can impact the perceptions and funding decisions of backers. A growing body of rewards-based crowdfunding research has begun to examine the impact of low validity cues on backers' perceptions and funding decisions (Chan et al., 2018; Courtney et. al., 2017; Scheaf et al., 2018). However, the rewards-based crowdfunding context differs considerably from the equity crowdfunding context (Frydrych et al., 2014). Our findings contribute to the crowdfunding literature

by showing that low validity visual cues, and more particularly logos, can influence backers on equity crowdfunding platforms.

Our disfluency-based heuristic framework both complements and diverges from the signaling perspective often used in crowdfunding research. According to signaling theory, visual cues such as logos are not likely to impact backers' funding decisions, as they provide limited or no information about a venture's underlying quality and have little or no association with venture survival and profitability. However, our work provides evidence that the subjective experience of disfluency caused by the design characteristics of low validity cues might be interpreted by backers as signals of innovativeness and impact their funding decisions. Specifically, even though logos are cues that often do not communicate private information, are not costly to produce, and are easily imitated by other ventures, we show that the subjective experience of ease/difficulty with which backers perceptually process logos can be interpreted as signals by backers and inform their perceptions of ventures and funding decisions. By providing additional evidence for the cognitive foundation of investors' decision making (Chan and Park, 2015; Chan et al., 2018), our work helps explain how the processing of low validity cues can be interpreted as signals and thus complements the signaling perspective used in crowdfunding research.

Our framework relies on heuristics and processing fluency theory to demonstrate a mechanism through which visual cues can impact investor perceptions. As such, our work adds to the growing evidence from various investment contexts that low validity visual cues can impact investors' perceptions and funding decisions (Chan and Park, 2015; Chan et al., 2018; Scheaf et al., 2018; Townsend and Shu, 2010). It also adds to prior crowdfunding studies that focus on the role of investors' perceptions in driving investment decisions (Allison et al., 2017; Davis et al., 2017; Parhankangas and Renko, 2017). Adding to prior work suggesting that investors can be affected by heuristics (Baker and Nofsinger, 2002; Benartzi and Thaler 2001; Gilovich et al., 2002; Hirshleifer, 2001), our work also demonstrates that backers on equity crowdfunding platforms are likely to use heuristics to speed up and facilitate their evaluations of ventures.

Furthermore, by demonstrating the importance of logos in affecting backers' behavior, our work complements research showing that visual cues are processed quickly and automatically, and often enjoy primacy over other types of cues (e.g., textual cues) in affecting individuals' perceptions and judgements (Pieters and Wedel, 2004; Posner et al., 1976; Tsay, 2014). In particular, our work builds on the visual-heuristics-based perspective of Chan and Park (2015), which shows that the presence of images in business plans facilitates processing of ventures and results in more positive venture evaluations compared to business plans without images. Our conceptual framework extends their framework by showing that while backers might automatically process visual cues, the subjective ease/difficulty of processing a visual cue has an impact on backers' perceptions. In this respect, our work combines a visual heuristic perspective with processing fluency theory (Alter and Oppenheimer, 2009; Oppenheimer 2008) to explain the effects of more versus less disfluent logos on backer behavior, rather than the presence or absence of logos.

Our work also adds to a growing stream of research on the role of processing fluency in investment decisions (Alter and Oppenheimer, 2006; Chan et al., 2018; Green and Jame, 2013; Shah and Oppenheimer, 2007) by demonstrating that processing disfluency can positively impact the way individuals evaluate investment alternatives. In particular, we show that the perceptual disfluency experienced by processing more complex logos is likely to generate perceptions of venture innovativeness amongst backers, which result in more favorable venture evaluations. While processing disfluency can have both positive and negative effects (Alter and Oppenheimer, 2009; Oppenheimer, 2008; Reber et al., 2004), it results in positive outcomes in our research context because backers who are time constrained and overloaded with information probably rely on logos as a means to fulfil the goal of finding a suitable venture to invest in (see Labroo and Kim, 2009). Our work thus complements previous research showing that processing disfluency can, in specific situations, lead to positive outcomes (Labroo and Percheptsova, 2016).

By showing that logo design and, in particular, complexity can be interpreted by backers as signals of venture innovativeness, our findings also contribute to existing knowledge of the

antecedents of backers' perceptions of venture innovativeness and of the role of backers' perceptions in driving funding decisions (Davis et al., 2017). Further, by demonstrating a positive relationship between perceived venture innovativeness and both backers' willingness to invest and the amount of money they invest in crowdfunding campaigns, our findings support the view that backers value innovativeness (Agrawal et al. 2014; Chan and Parhankangas, 2017; Davis et al., 2017).

While the effects of logos on consumer behavior are well documented (Stamatogiannakis et al., 2015; Henderson and Cote, 1998; Zaichkowsky, 2010), relatively little is known about the effects logos can have on the behavior of investors. This is because logos have been overlooked by extant research in entrepreneurial finance. Yet, logos are pervasive on crowdfunding platforms and virtually every entrepreneurial venture has a logo. To our knowledge, our study is the first to explore the effect of logo design on the funding of entrepreneurial ventures. Our work extends the marketing literature by demonstrating that logos can influence the behavior of investors and the funding prospects of early-stage brands. Our findings, in the context of entrepreneurial ventures, are thus in line with prior work in the context of consumer behavior, which shows that logos can influence consumer behavior and brand performance (Luffarelli et al., 2018; Stamatogiannakis et al., 2015; Zaichkowsky, 2010).

Our findings also provide practical insights that might help entrepreneurs raise funds on equity crowdfunding platforms. They show, albeit with certain qualifications discussed later, that entrepreneurs should favor using more, rather than less complex logos. Interestingly, however, the results of an exploratory study we conducted (for detail, see Appendix D) indicated that entrepreneurs actually favor using less (vs. more) complex logos. Specifically, when asked to choose between a less and a more complex logo for a venture, 87.5% of the entrepreneurs who participated in this study opted for the less complex logo. In contrast to entrepreneurs' intuition, our findings suggest that logo complexity can positively impact the perceptions and funding decisions of backers. In fact, in Study 2, we estimated that a one unit increase in logo complexity ratings resulted in an 8% increase in amount invested, which corresponds to an average increase in amount invested of approximately GBP 113. We also showed that this effect is comparable in magnitude to the effect of

important high validity cues, such as entrepreneur's team size and the number of previous pledges. More generally, our findings suggest that entrepreneurs should carefully consider the design of low validity visual cues and, in particular, that of logos.

7.2. Limitations and directions for future research

Our work has certain limitations, which provide directions for future research. To start with, we focus on one type of low validity visual cue: logos. However, our proposed disfluency-based heuristic framework could be generalizable to other low validity visual cues such as the images or illustrations used on crowdfunding campaign pages. Future research is thus needed to explore the applicability of our framework to other low validity visual cues. Our work is also confined to the context of equity crowdfunding. Future research could thus explore whether our disfluency-based heuristic account can be generalized to other funding contexts. For instance, in the context of rewards-based crowdfunding, project supporters are often customers interested in pre-financing the production of a product or service they might want (Frydrych et al., 2014). These supporters might be more influenced by product/service-based heuristics (e.g., whether they like the product/service or not) than logo-based heuristics, attenuating the effects we documented. While some equity crowdfunding backers are professional investors, most backers are causal, inexperienced investors. Hence, it would also be interesting to explore whether the magnitude of the effects we demonstrated is greater or smaller in investment contexts where investors are typically more sophisticated. For instance, venture capitalists might react more strongly to visual cues such as logos as they are more involved in the ventures they invest in (Hellman and Puri, 2000; Lerner, 1995). On the other hand, their extensive experience might lead them to focus more on cues they consider more economically relevant. Thus, research is needed to explore how differences in investors' expertise can lead to different reactions to visual cues. Another research direction is exploring whether our disfluency-based heuristic framework can explain the effect of non-visual low validity cues.

Although our work shows a positive, linear effect of logo complexity on the perceptions and funding decisions of backers, one should not conclude that entrepreneurial ventures should use

exceedingly complex logos. Using such logos might have negative outcomes because extremely complex logos might be too confusing and difficult for investors to process. Even though we found insignificant quadratic effects of logo complexity in both Studies 1 and 2, it is likely that after a point, a higher level of logo complexity negatively influences backers' perceptions and decisions. Future work could seek to explore the optimal level of logo complexity. We also caution that the results of Study 2 should not be interpreted as implying that logo complexity is a predictor of the success or failure of crowdfunding campaigns. In this study, our sample consisted only of successful campaigns that achieved their funding goals. Hence, future research could add to ours by examining the effect of logo complexity (or other logo design characteristics) on campaign success/failure.

Our work shows that more complex logos can impact the perceptions and decisions of backers because logo complexity can be interpreted as a signal of venture innovativeness. However, it is unclear whether logo complexity is truly indicative of the level of innovativeness of a venture. Future research could thus explore whether ventures with more complex logos are actually more innovative than those with simpler logos. Moreover, since heuristics might sometime lead to biased decisions (Baker and Nofsinger, 2002; Gilovich et al., 2002; Hirshleifer, 2001), it would be interesting to explore whether ventures with more complex logos outperform those with simpler logos.

The results of Studies 1 and 2 provide some evidence that logo design characteristics other than complexity can also significantly influence backers. Future research could thus seek to develop a better understanding of these characteristics' influence. More broadly, since logos have remained largely unexplored in the entrepreneurial finance literature, future work could seek to understand how entrepreneurs approach logo design choices. We hope that our work will encourage future multidisciplinary research to advance the understanding of the impact of logos and other visual cues on the funding decisions of individuals who invest in entrepreneurial ventures. We also hope that our work will encourage more multimethod studies.

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Figure 1: conceptual framework overview

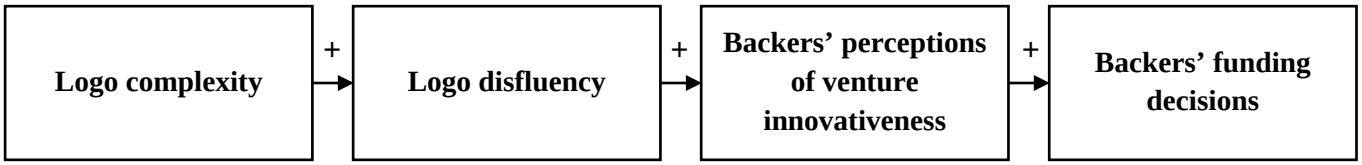


Figure 2: study 3 — contrasts analyses for the direct effects of logo complexity

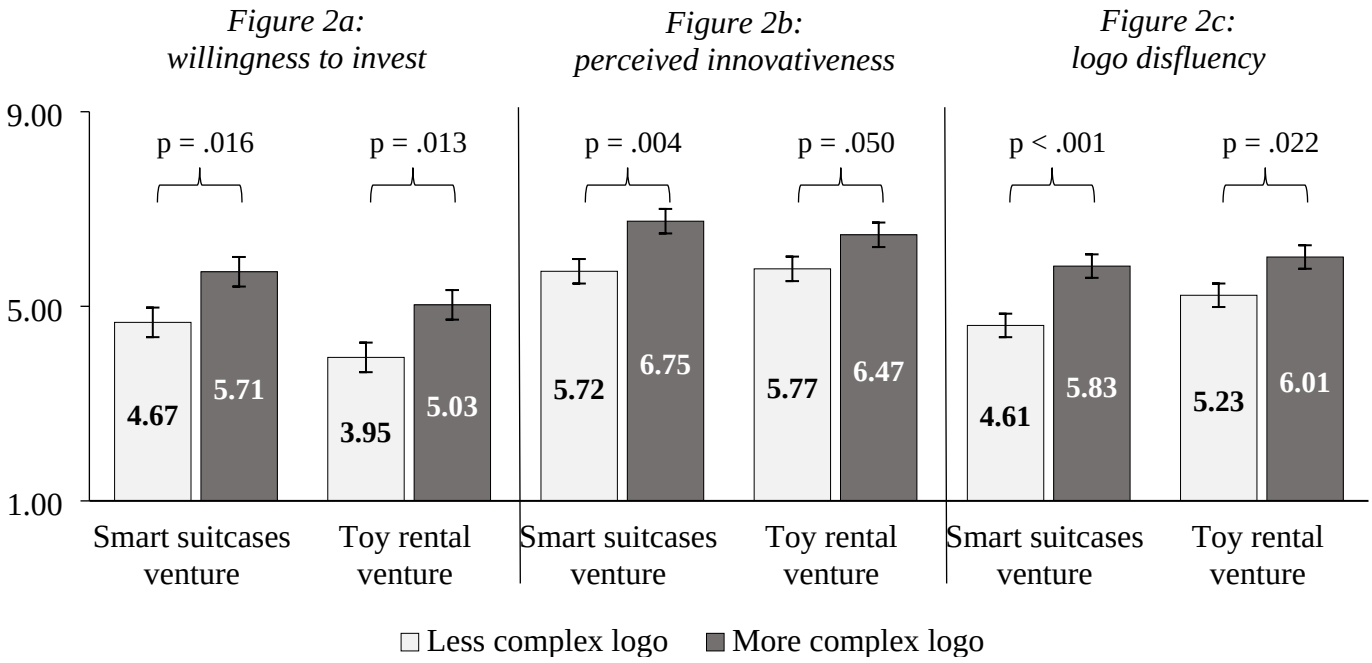
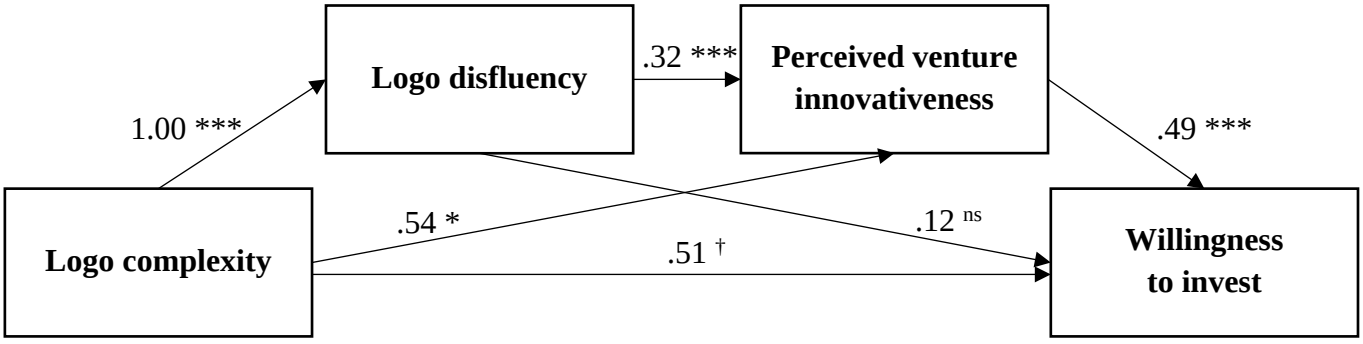


Figure 3: study 3 — indirect effect of logo complexity in a serial mediation



ns $p > .10$; † $p < .10$; * $p < .05$; *** $p < .001$

n = 200; 95% confidence interval for the indirect effect of *Logo complexity*: .08, .31

Table 1: study 1 — the effect of logo complexity on perceived venture innovativeness

	Model 1			Model 2		
Variables	Coeff.		SE	Coeff.		SE
Intercept	4.57	***	.70	3.76	***	.72
Descriptiveness	.04		.05	.02		.05
Symmetry	-.01		.04	.00		.04
Roundedness	-.01		.03	.00		.03
Depth	.00		.05	-.06		.05
Dynamism	.11	†	.06	-.02		.07
Repetition	-.08		.06	-.05		.06
Orientation	-.12	†	.07	-.09		.07
Proportion	.09		.20	.09		.20
Naturalness	.03		.11	-.04		.11
Lightness	.01	†	.00	.01	*	.00
Saturation	.00		.00	.00		.00
Liking	.25	***	.08	.32	***	.08
Shape dummies	Included			Included		
Hue dummies	Included			Included		
Logo type dummies	Included			Included		
Complexity				**.25**	***	**.07**
Adjusted R^2	.11			.17		

Notes. † $p < .10$; * $p < .05$, *** $p \leq .001$. n = 174. The dependent variable is *Perceived venture innovativeness*. The bolded variable is our variable of interest. Details about these variables can be found in Section 4.2 and Appendix B. In the interest of brevity, estimates for the dummy variables are not reported in this table, but available upon request.

Table 2: study 2 — variables, operationalization, and descriptive statistics

Variables	Operationalization	Descriptive Statistics			
		Mean	SD	Min	Max
Dependent variable					
Amount invested	Natural logarithm of the amount invested* by a backer *i*, in a campaign *j*, at any investment occasion *t*. **Amount invested (in GBP) by a backer i, in a campaign j, at any investment occasion t.*	5.06 *1,416*	1.87 *12,112*	.04 *1.04*	13.82 *100,000*
Independent variables					
Logo complexity	Participants of Study 1 were asked to rate logo complexity on two 9-point scales, which we averaged into a single variable. See Study 1 for more details.	3.87	1.05	1.53	6.25
Control variables					
Venture valuation	Natural logarithm of the pre-money valuation of a campaign *j*, as listed on a campaign *j*'s page.	19.27	1.18	17.19	21.83
Funding goal	Natural logarithm of the amount entrepreneurs seek to raise, as listed on a campaign *j*'s page.	12.30	1.10	9.74	13.82
Number of investments	Natural logarithm of the number of investments made in a campaign *j* at any investment occasion *t*.	4.95	1.21	.00	7.07
Equity offered	Percentage of equity that entrepreneurs offer, as listed on a campaign *j*'s page.	1.37	7.35	1.52	31.03
Campaign expiration	Natural logarithm of the number of days remaining at time *t* till a campaign *j* can no longer accept funding. The platform allows any backer *i* to raise funds for 60 days during the public launch period. However, backers can also invest prior to the public launch.	2.51	.92	.00	3.43
High net worth backer	Dummy variable = 1 if a backer *i* self-certifies as a high net worth backer with annual earnings in excess of GBP 100,000 or net assets in excess of GBP 250,000. Dummy variable = 0, if otherwise.	.15	.36	.00	1.00
Experienced backer	Dummy variable = 1 if a backer *i* self-certifies as an experienced backer who has invested in the last six months, and/or has made at least one investment in an unlisted company in the last two years, and/or has worked in private equity or corporate finance, and/or has been a director of a company with an annual turnover of at least GBP 1 million. Dummy variable = 0, if otherwise.	.11	.32	.00	1.00
Entrepreneur backer	Dummy variable = 1 if a backer *i* has ever launched a campaign on the crowdfunding platform since its inception. Dummy variable = 0, if otherwise.	.02	.13	.00	1.00
Backer prior success	The ratio between previous successful campaigns in which a backer *i* had invested and the total number of previous campaigns (successful or not) in which a backer *i* had invested. When a backer *i* had not yet made an investment, this ratio takes the value zero.	.89	.17	.00	1.00
Venture team size	Natural logarithm of the number of entrepreneurs listed on a campaign *j*'s page as founders.	.43	.42	.00	1.39
% of male entrepreneurs	Percentage of male entrepreneurs listed on a campaign *j*'s page as being part of the entrepreneurial team; identified based on the pictures and profiles of entrepreneurs on a campaign *j*'s page.	.93	.21	.00	1.00
% of MBA entrepreneurs	Percentage of entrepreneurs with an MBA, as listed on their LinkedIn profiles.	.05	.17	.00	1.00
% qualified entrepreneurs	Percentage of entrepreneurs with other degrees, as listed on their LinkedIn profiles.	.17	.30	.00	1.00
Industry dummies	Campaigns are grouped by the platform into a number of categories, which we used to create 7 industry dummies: consumer products, entertainment, fashion & arts, finance, food & drink, social & collaborative, and technology.				
Logo controls	We controlled for fifteen logo design characteristics: symmetry, roundedness, depth, descriptiveness, dynamism, repetition, orientation, liking, color saturation, color lightness, color hue, naturalness, proportion, shape, and logo type. These variables are the same as those used in Study 1 and thus described in this study.				

Table 3: study 2 — correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Dependent variable																														
1	Amount invested																													
Independent variable																														
2	Logo complexity	.11																												
Control variables																														
3	Venture valuation	.11	.10																											
4	Funding goal	.15	.21	.73																										
5	Number of investments	.07	.19	.37	.51																									
6	Equity offered	.07	.24	-.36	.28	.17																								
7	Campaign expiration					.15	.05																							
8	High net worth backer	.27					.05																							
9	Experienced backer								-.15																					
10	Entrepreneur backer			-.04	-.04					.04																				
11	Backer prior success	.25	.07	.11	.16	.19	.07		.06		-.05																				
12	Venture team size	-.07		.07		-.07	-.12		-.05			-.05																		
13	% of male entrepreneurs	.06	.05	.24	.29	.18	.12					.17																		
14	% of MBA entrepreneurs			-.05		-.09	.13						.15	.08																
15	% qualified entrepreneurs	-.06	-.26	-.35	-.33	-.22							.09		.28															
16	Logo descriptiveness		.24	.28		-.05	-.39					.05	.40		-.05															
17	Logo symmetry		-.26	.10		-.05	-.19						-.11	-.10	-.23	-.20														
18	Logo proportion		.15	.07			-.25	-.08				-.07		-.11	-.11			-.15												
19	Logo roundedness	.09	.08	.10	.25	.21	.18	.07	.05			.14	-.14	.19		-.14	-.26	.14	-.20											
20	Logo depth	.05	.71		.04	.13	.15	.04			.04		-.10	.06		-.24	.07	-.14	.16	.10										
21	Logo dynamism	.10	.75	.15	.11	.14	-.04					.09	.07	.09	.04	-.21	.34	-.19	.07	.14	.73									
22	Logo repetition			-.12	.05	.10	.19	.09				.06	-.11	.17	.15	-.15	-.39	.08	-.22	.18	.17	.19								
23	Logo orientation		-.12	.17			-.19					.04	.08	-.12	-.16	-.10	.25	.05	-.20	-.09	-.08	.10	-.07							
24	Logo naturalness		.31	.18	.06	.07	-.24		-.04			.10	.09	.17		-.05	.45	-.06	.34	-.09	.33	.40	-.19	-.19						
25	Logo lightness	.06	.33	.16	.28	.16	.26	-.04				.11		.16	.06	-.10	.11	-.22	.13	-.07	.25	.11	-.19	-.34	.24					
26	Logo saturation	.10	.45	.23	.38	.26	.31				-.04	.14	.05	.16	.20	-.15	.12	-.30	.11		.32	.29	-.16	-.23	.31	.85				
27	Logo liking	-.04	.08	.05	-.10	-.06	-.26		-.04				.45	-.10		-.10	.52	-.06		-.16	.15	.32	-.08	.16	.32	.12	.08			
28	Logo shape		.21	.11			-.19		-.05			-.04	.06	-.07		.08	.29	-.10	.39	-.50	.21	.14	-.35	-.18	.59	.34	.3	.24		
29	Logo hue	.11	.46	.04	.16	.18	.26					.08	-.13	-.15	.08	-.28	-.05	-.11	.10	-.06	.32	.22	-.28	.07	.16	.41	.54		.33		
30	Logo type		.14	.08	-.05		-.26	-.06				-.08	.21	-.08	.07	-.05	.32	.08	.39	-.33	.04	.05	-.36	-.04	.21		.09	.22	.29	.31

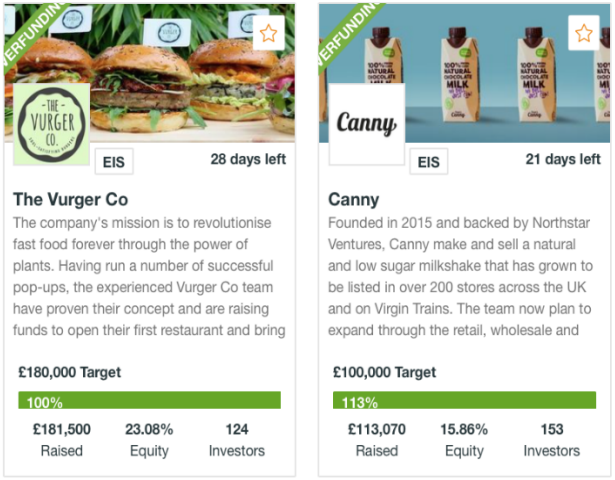
Notes. All reported pairwise correlations are significant at the 5% level or below.

Table 4: study 2 — the effect of logo complexity on backers' funding decisions

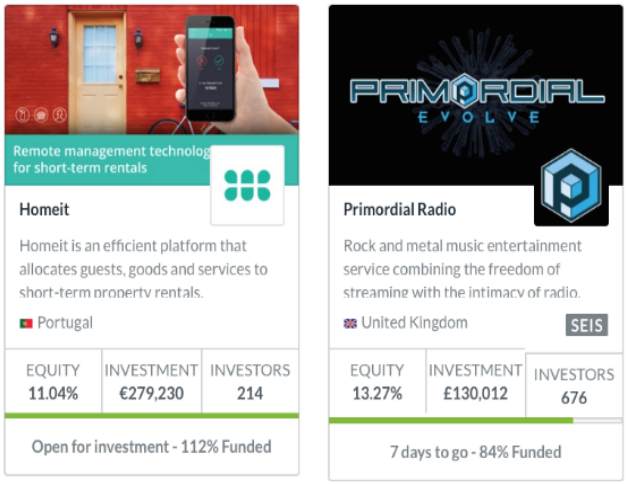
	Model 1			Model 2			Model 3			Model 4				
Variables	Coeff.		SE	Coeff.		SE	Coeff.		SE	Coeff.		SE	$\beta^{Standardized}$	
Intercept	2.58	***	.45	2.26	***	.46	1.05	***	.88	.49		.92	-.15	
Venture valuation	.04		.05	.05		.05	.14		.09	.19	*	.09	.12	*
Funding goal	.09	†	.05	.08	†	.05	.08		.08	.03		.09	.02	
Number of investments	-.05	***	.01	-.05	***	.01	-.07	***	.01	-.07	***	.01	-.04	***
Equity offered	.00		.00	.00		.01	.01		.01	.01		.01	.05	
Campaign expiration	.00		.01	.00		.01	.00		.01	.00		.01	.00	
High net worth backer	1.53	***	.07	1.54	***	.07	1.53	***	.07	1.53	***	.07	.30	***
Experienced backer	.43	***	.09	.44	***	.08	.44	***	.08	.44	***	.08	.07	***
Entrepreneur backer	-.18		.21	-.17		.21	-.16		.21	-.16		.21	-.01	
Backer prior success	.96	***	.11	.96	***	.11	.94	***	.12	.95	***	.12	.09	***
Venture team size	-.05	†	.03	-.06	*	.03	.13	**	.04	.10	*	.04	.02	*
% of male entrepreneurs	.09	†	.05	.08		.05	.20	*	.09	.25	*	.09	.03	***
% of MBA entrepreneurs	.01		.07	.00		.07	-.16		.11	.02		.14	.00	*
% qualified entrepreneurs	-.09	*	.04	-.06		.04	.15	*	.06	.14	*	.06	.02	*
Industry dummies	Included			Included			Included			Included			Included	
Logo descriptiveness							-.19	***	.03	-.23	***	.03	-.15	***
Logo symmetry							-.02		.02	-.02		.02	-.01	
Logo proportion							-.53	***	.10	-.63	***	.11	-.10	***
Logo roundedness							-.01		.02	-.02		.02	-.02	
Logo depth							.04	†	.02	.04		.02	.02	
Logo dynamism							.05	*	.03	.02		.03	.01	
Logo repetition							-.05	*	.02	-.06	**	.02	-.03	*
Logo orientation							-.01		.03	.04		.04	.02	
Logo naturalness							-.03		.04	.01		.05	.00	
Logo lightness							-.01	***	.00	-.01	***	.00	-.20	***
Logo saturation							.00		.00	.00		.00	-.04	
Logo liking							.18	***	.04	.23	***	.05	.09	***
Logo type, shape, and hue dummies							Included			Included			Included	
Logo complexity				**.04**	****	**.01**				**.08**	****	**.04**	**.04**	****
Log Likelihood	-17,268.70			-17,263.97			-17,194.20			-17,191.75				
AIC	34,579.40			34,571.94			34,480.41			34,477.50				
Residual Variance σ^2_ϵ	.510			.510			.504			.503				

Notes. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. n = 10,611. The dependent variable is *Amount invested*. The bolded variable is our variable of interest. In the interest of brevity, estimates for the dummy variables and standard errors for the standardized model are not reported in this table, but available upon request.

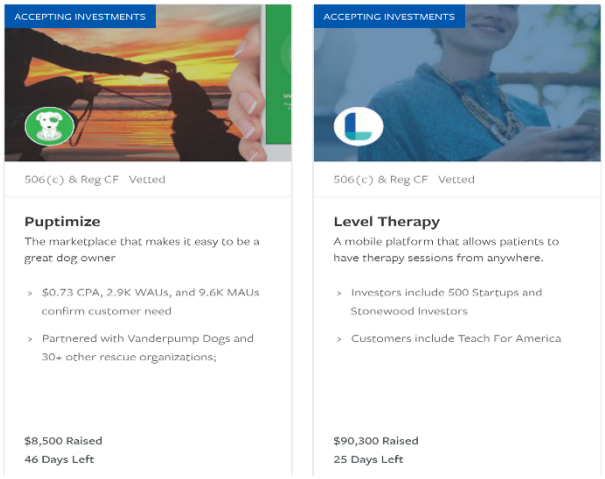
Appendix A: examples of logos on the landing pages of crowdfunding platforms and campaigns



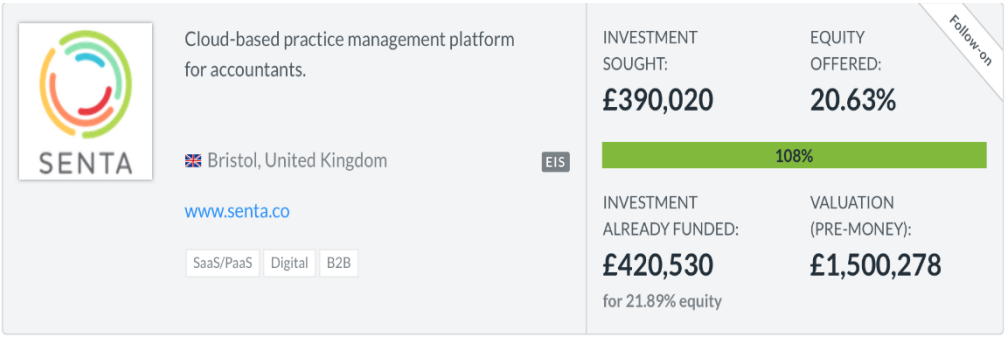
Landing Page of Crowdcube



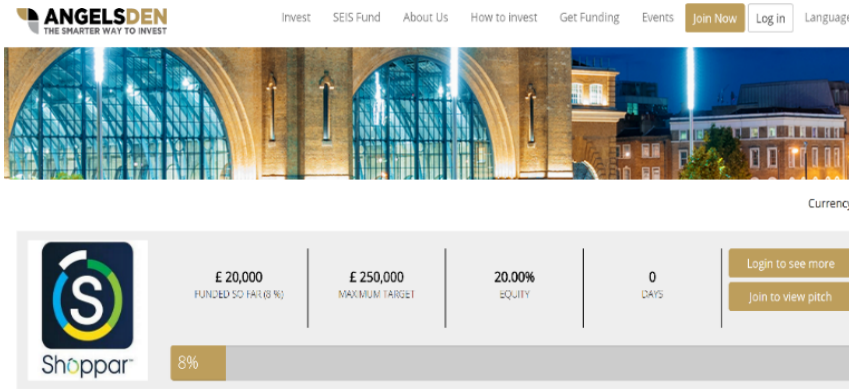
Landing Page of Seedrs



Landing Page of SeedInvest



Landing Page of Senta on Crowdcube



Landing Page of Shoppar on Angel's Den

Appendix B: study 1 — scales used to measure the control variables

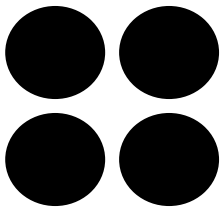
In Study 1, we controlled for fifteen characteristics of logo design. Ratings for eight of these design characteristics were obtained by asking the respondents of Study 1 to rate their two assigned logos on the following characteristics: *Symmetry* (1 = not symmetrical at all, 9 = very symmetrical), *Roundedness* (1 = not round at all/very angular, 9 = very round/not angular at all; $r_{\text{Spearman-Brown corrected}}$ = .64), *Descriptiveness* (1 = not descriptive at all, 9 = very descriptive), *Depth* (1 = to no extent at all, 9 = to a very large extent), *Dynamism* (1 = no movement at all/not dynamic at all, 9 = a lot of movement/very dynamic; $r_{\text{Spearman-Brown corrected}}$ = .64), *Repetition* (1 = to no extent at all, 9 = to a very large extent), *Orientation* (1 = moves clearly from right to left, 9 = moves clearly from left to right), and *Liking* (1 = not like at all/not attractive at all/not aesthetically pleasing at all, 9 = like a lot/very attractive/very aesthetically pleasing; α = .88). We randomized the order in which the scales used to measure these characteristics were presented to participants.

Ratings for seven of these design characteristics were obtained by asking a research assistant blind to the purpose of our research to code the logos on the following characteristics: *Color saturation*, *Color lightness* (both measured using Adobe Photoshop; values range from 0 to +100; higher values indicate higher levels of saturation and lightness), *Color* hue (0 = black, 1 = blue, 2 = green, 3 = grey, 4 = orange, 5 = pink, 6 = red, 7 = yellow, 8 = violet, 9 = brown, 10 = others), *naturalness* (0 = absence of natural elements, 1 = presence of natural elements), *proportion* (height over width; in cm), *shape* (0 = circle, 1 = rectangle, 2 = square, 3 = others), and *Logo type* (0 = wordmark, 1 = icon-only logo, 2 = mixed logo—those consisting of a wordmark and an icon). We measured the saturation, lightness, and hue of the most ubiquitous color in the logo. For our analyses, we transformed shape, hue, and logo type into dummy variables.

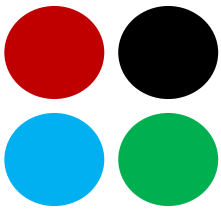
Appendix C: study 3 — experimental stimuli and pretests results

Notes. The less complex logo versions are presented on the left of the more complex versions. The descriptions of the ventures are presented below the logos.

Replicate 1. Smart suitcases venture



Noxu



Noxu

Noxu is a luggage and travel accessories manufacturer, which has created TravelSmart™. TravelSmart™ is the first fully autonomous smart suitcase, at the cutting edge of A.I. and autonomous movement technology. It integrates with travelers' smartphone and moves with them as they walk, making traveling much easier. In addition, thanks to a unique GPS technology, travelers can know the location of their TravelSmart™ at all times. TravelSmart™ includes numerous other technological features, such as a touch-enabled lock system that uses fingerprints, a built-in scale that accurately measures the weight of the suitcase, and a standard electrical outlet and a USB port to charge electronics.

Replicate 2. Toy rental venture

CyBea is the first toy rental service based in Atlanta, Georgia. It offers and delivers toys appropriate for children aged 1 to 12. For a monthly subscription service that costs $25, customers can choose up to four toys every month from a wide selection of toys. Once a toy is ordered, it is delivered within 24 hours right to the consumer's doorstep. Once a toy is received, it can be used for up to 30 days. After 30 days, the toy must be returned (free of charge) to CyBea and another toy can be ordered. To guarantee the safety of children, every toy is cleaned and sanitized before being shipped to consumers.
Pretests of the logos used as stimuli

	(1) Less complex logo version	(2) More complex logo version	(3) p-value for difference
Pretest Results for Noxu's logo (n = 52)			
Complexity	2.78	4.07	.030
Symmetry	7.26	6.69	.302
Liking	5.04	5.41	.465
Dynamism	2.87	3.45	.434
Roundedness	5.44	5.24	.783
Incompleteness	2.87	3.52	.232
Familiarity	1.30	1.93	.171
Pretest Results for CyBea's logo (n = 80)			
Complexity	3.29	5.55	< .001
Symmetry	6.81	6.11	.169
Liking	5.38	4.76	.228
Dynamism	2.83	2.26	.284
Roundedness	8.14	8.50	.251
Incompleteness	3.26	3.55	.562
Familiarity	1.97	1.79	.677

Notes. In our pretests, participants were asked to rate the logos we used as experimental stimuli on 9-point scales. Column (1) and (2) display the mean ratings for the less and more complex logo versions. Column (3) shows the p-value for the difference between the means in columns (1) and (2). Briefly, the results of the pretests show that, for each logo pair, the more complex logo was perceived to be significantly more complex than its less complex counterpart, but not significantly different along other key design characteristics. This allowed us to be confident that the effect of our manipulations of logo complexity was not confounded by the effects of other logo design characteristics.

Appendix D: exploratory study

Our work shows that logo complexity can positively impact the perceptions and funding decisions of backers. In this exploratory, we seek to answer the following question: Do entrepreneurs tend to favor using more or less complex logos?

Stimuli, participants, method, and measure

We used the description of an entrepreneurial venture specialized in toy rental, as well as the more and less complex version of the logo we created for that venture. These stimuli were also employed in Study 3 and are presented in Appendix C. Thirty-two entrepreneurs participated in this study. They were recruited via the business incubators of two universities, one located in Canada (n = 19) and the other in England (n = 13). They were shown the description of the aforementioned venture and asked to imagine that they had founded it. After reading the description, they were shown the two versions of the logo mentioned earlier and asked to pick the logo they would use, if they were the founder of this venture. Both logos were shown next to each other on the same page. Our measure of interest is entrepreneurs' logo choice (*Logo choice*).

Analyses, results, and discussion

We conducted a chi-squared test with *Logo choice* as the test variable. We found that significantly more entrepreneurs chose the less complex logo (n = 28) than the more complex one (n = 4; $\chi^2(1, N = 32) = 18.00$, $p < .001$). These results suggest that entrepreneurs tend to prefer using less (vs. more) complex logos and might not take advantage of the potential benefits of logo complexity. The findings of our main studies contrast with entrepreneurs' conventional wisdom and thus yield actionable insights. Note that since a pretest confirmed that the two logos were equally liked (see Appendix C), these results cannot be explained by accounts based on differences in logo liking.