

Article

The Pervasive Role of Campaign and Product-Related Uncertainties in Inhibiting Crowdfunding Success

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Abstract: In this research, we study the funding decision in crowdfunding from the perspective of potential backers. We assess whether perceived uncertainty affects the decision to contribute to crowdfunding campaigns. For this purpose, we conduct a 2 × 2 between-subjects experiment with different stages of product development and the perceived innovativeness of products depicted in campaigns. Our findings show that an early development stage positively affects perceived uncertainty, adversely affecting the willingness to contribute. Simultaneously, higher perceived innovativeness elicits higher uncertainty perceptions, negatively influencing the willingness to contribute. Our research furthers an understanding of entrepreneur perspective taking to overcome uncertainty perceptions from the indeterminacy of crowdfunding campaigns.

Keywords: crowdfunding; new product development; entrepreneurial financing; uncertainty; psychology of innovation; experimentation

JEL Classification: G24; G32; G41



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1. Introduction

In this research study, we investigate if and how structural characteristics of a crowdfunding campaign may elicit feelings of uncertainty on the side of potential supporters and how these perceptions of uncertainty inhibit supporters' willingness to back a crowdfunding campaign.

Crowdfunding has emerged as an attractive possibility for entrepreneurs to receive funding for their ventures, and its economic impact has been remarkable. Since the founding of Kickstarter, one of the most successful crowdfunding platforms worldwide, around 21 million individuals have contributed to the realization of more than 220,000 projects launched through the platform, pledging a total sum of USD 6.6 billion (Kickstarter 2022). Crowdfunding allows entrepreneurs to seek financial support for their product ideas by addressing the general public. In this funding context, entrepreneurs can bypass traditional methods of capital procurement such as bank loans, business angels, or venture capitalists, by acquiring funds directly from many individuals without further intermediation (Belleflamme et al. 2013).

To date, research on reward-based crowdfunding has primarily focused on understanding the link between campaign-level characteristics and project success, including the effects of signals of project quality and founder credibility (Courtney et al. 2017; Mollick 2014), funding status (Kuppuswamy and Bayus 2017), communication content and linguistic style (Anglin et al. 2018a, 2018b; Parhankangas and Renko 2017; Allison et al. 2017), and the innovativeness and creativity of the proposed outcome (Parhankangas and Renko 2017;

Davis et al. 2017). Another stream of research has examined the effects of individual-level characteristics of the entrepreneur in the form of internal social capital (Colombo et al. 2015; Skirnevskiy et al. 2017), signals of perceived entrepreneurial competence (Scheaf et al. 2018; Frydrych et al. 2014), and entrepreneurial passion (Davis et al. 2017; Oo et al. 2019).

Notwithstanding the merits of these studies, research that addresses crowdfunding as a pre-purchase commitment to new product ideas is scarce (for a notable exception, see Chan and Parhankangas 2017). One may argue, however, that reward-based campaigns can only be successful if entrepreneurs accurately understand the psychological mechanisms underlying the decision process of their prospective customers, who act similar to retail investors in selecting promising product ideas (Mollick and Nanda 2016), and consider these mechanisms in the design of their campaigns. Put differently, it is paramount for entrepreneurs to engage in perspective taking and to look at their ventures as well as the funding decision from the perspective of their supporters (Prandelli et al. 2016).

While crowdfunding campaigns are important approaches to foster new venture development, they come with a very serious caveat: uncertainty stemming from business-opportunity indeterminacy. Those pitching their crowdfunding campaigns can learn about uncertain market demands, verify their concepts, and update their beliefs about future consumer preferences (Chemla and Tinn 2020; Strausz 2017). Yet, with novel but unfinished new products being pitched and developed, entrepreneurs only reduce the uncertainty about their own market beliefs but not the uncertainty surrounding the product-development process. Product-development uncertainty still exists, it is just someone else, the potential customer, who is bearing it (Blaseg et al. 2020a; Chemla and Tinn 2020).

In crowdfunding as a product-development process, the uncertainty shifts from the producers to the funders. Potential supporters may not only be uncertain whether the product will be realized but also be unsure whether the proposed product will live up to its promise and deliver the acclaimed benefits.

Against this background, we ask this research question: if and how uncertainty perceptions may act as an inhibiting factor in crowdfunding. In the present study, we rely on an experimental research design to demonstrate that campaigns, which differ in terms of (a) how advanced the development stage of a product that promises this outcome is and (b) how novel the promised product is, will evoke different uncertainty perceptions by potential supporters. The choice of an experimental design enables us to create a controlled decision environment, in which the structural characteristics of crowdfunding campaigns can be systematically manipulated. This helps to generate conclusions about causal relationships between these characteristics and campaign evaluations (Falk and Heckman 2009).

Our study makes several significant contributions to the literature. While prior investigations have revealed patterns and phenomena about contribution behavior and the antecedents to and inhibitors of campaign success, the underlying psychological mechanisms on the individual level that influence these behaviors remain largely understudied (McKenny et al. 2017; Short et al. 2017).

As Reinhardt and Gurtner (2015, p. 137) noted, “[t]he process of understanding why consumers become customers of a firm becomes particularly important when firms develop new products and services”. One may argue that reward-based campaigns can only be successful if entrepreneurs accurately understand the psychological mechanisms underlying the decision process of their prospective customers (i.e., the funders) and consider these mechanisms in designing their campaigns. We particularly link the reluctance to support a campaign to the perception of uncertainty that negatively sways the decision of potential supporters. Therefore, we believe that our research provides grounds to extend work in crowdfunding, particularly focusing on consumer behavior to understand better when and if perceptions of uncertainty impede market acceptance of novel and hitherto unfinished products.

Against this backdrop, our findings also challenge the prevailing notion that crowdfunding is a universally effective strategy for entrepreneurs seeking funds for products

that are in an early development phase and where the novel character of the product is at the heart of their campaign to raise funds. While these entrepreneurs may find it challenging to convince profit-oriented, formal investors to invest in such proposed new venture ideas (Chen et al. 2009; Cosh et al. 2009), they may find it equally challenging to persuade potential consumers (i.e., the backers) to “buy” into their vision and to pledge their money to a still-to-be-realized product (Zhang and Chen 2019; Blaseg et al. 2020b).

To overcome uncertainty, our work provides a theoretical explanation as to why specific signals and cues could be more beneficial when pitching crowdfunding campaigns. Prior work has shown the positive effects of signals and cues such as project quality and founder credibility (Courtney et al. 2017; Mollick 2014), signals of perceived entrepreneurial competence (Scheaf et al. 2018; Frydrych et al. 2014), and entrepreneurial passion (Davis et al. 2017; Oo et al. 2019). At the same time, other work has reported counterintuitive findings related to the innovativeness and creativity of the proposed outcome (Parhankangas and Renko 2017; Davis et al. 2017). Our work reconciles these prior works by introducing perceived uncertainty in crowdfunding campaigns as an inhibiting factor that needs to be overcome through various signaling mechanisms. Hence, we contextualize the previous work and link the effectiveness of campaign depiction to a common source: uncertainty perceptions stemming from the indeterminacy of crowdfunding campaigns.

2. Theoretical Background and Hypotheses

2.1. Crowdfunding and the Uncertainty of Business Opportunities

“New ventures call for a company to envision what is unknown, uncertain, and not yet obvious to the competition” (McGrath and MacMillan 1995, p. 44). As a case in point, Steve Jobs envisioned that “he could create and promote a product that consumers did not even realize they wanted” (Suddaby et al. 2015, p. 3). Entrepreneurial opportunities are, therefore, propensities residing outside of the consciousness of a prospective entrepreneur (Ramoglou and Tsang 2016; Ramoglou and Tsang 2017a, 2017b). They exist as a latent market demand that can be accessed through the imagination of an entrepreneur and can be “objectified” through a process of consensus building (Ramoglou and Tsang 2016; Strausz 2017; Wood and McKinley 2020).

Reward-based crowdfunding is an exemplary environment to study the acceptance of entrepreneurial opportunities in the marketplace. Crowdfunding operates in disequilibrium conditions, as it is an open entity where entrepreneurs depart from the accepted status quo, which is to provide the status quo post what is possible (Ardichvili et al. 2003; Mollick 2014). It exemplifies Simon’s (1969) notion of the science of artificial and design activities, where entrepreneurs change existing situations into desired ones (Ding 2019). Underlying each of the future opportunities presented in the campaigns is the possibility of uncovering a real business opportunity.

It is, however, essential to note that reward-based crowdfunding differs from conventional entrepreneurship scenarios in several aspects. While in the ordinary course of events, the product under consideration is already fully developed and ready to be used, supporters of a reward-based crowdfunding campaign pay for a product that the entrepreneur will still have to realize. Before crowdfunding campaigns go live, the entrepreneurial opportunity exists primarily in the entrepreneur’s mind. Yet, in crowdfunding, by definition, future financial resources are essential for realizing a new idea.

When crowdfunding entrepreneurs begin their entrepreneurial endeavor, indeterminacy remains even after an idea has been developed. Some information might be fully developed at the outset, some exists only on drawing boards, and some may come into existence during the organizing process. Entrepreneurs essentially test on crowdfunding platforms for a product’s viability in a subjective world and, hence, employ crowdfunding as an informational mechanism (Da Cruz 2018). An ideal presentation, thus, aims to develop this very future with financial resources and information provided by the crowd. The opportunity emerges in tandem with the environment in which the product is used. If a market-product fit can be achieved, the idea can be turned into a real business opportunity,

and profits will be actualized (Ramoglou and Tsang 2016). Consequently, the blueprint product to be sold needs to interact with the external environment in which the product is to be applied, generally on a need-to-have or nice-to-have basis (Ding 2019; Davis et al. 2017). In fact, the imagined product may or may not convince the outside audience of its merit.

The crowd provides a market validation process that will eventually distinguish between an opportunity and a non-opportunity. It is, therefore, an important gateway for market validation due to the subjective nature of the opportunity, which multiple outside observers assess at once. Potential supporters, therefore, may experience an uncertainty about their crowdfunding decision, because the products proposed in such campaigns typically refer to new consumption experiences that are not yet available in the marketplace.

The concept of perceived uncertainty was first introduced by Bauer (1960) and has since stimulated the development of an extensive field of study (Mitchell 1999; Taylor 1974; Stone and Grønhaug 1993). Research in marketing has repeatedly shown that perceived uncertainty is associated with reduced purchase intentions, reduced product evaluations, and consumption deferral (e.g., Biswas and Biswas 2004; Cox and Rich 1964; Spence et al. 1970; Wood 2001). Consumer decision-making is influenced by several uncertainties that relate to the expected utility of a product (performance uncertainty), the associated learning costs (switching cost uncertainty) (Hoeffler 2003), the psychological uncertainty associated with the rejection of established products to which one feels emotionally attached (Castaño et al. 2008), and the symbolic uncertainty about how the adoption of innovation will be perceived by relevant others (Castaño et al. 2008).

Since potential funders may not have well-formed preferences regarding the attributes of the proposed product and cannot try the product beforehand, they may feel uncertain as to whether the product will satisfy their consumption needs (Cox 1967; Cunningham 1967; Simonson 1989). Prior work has identified this uncertainty as one of the most critical impediments to new product adoption (Alexander et al. 2008; Castaño et al. 2008; Hoeffler 2003; Moreau et al. 2001).

2.2. Perceived Uncertainty as a Reflection of Business Opportunity Indeterminacy

In reward-based crowdfunding consumption, motives seem to trump other types of potential returns, such as exerting impact on a personally relevant goal or philanthropic behavior that has often been reported in other areas of the crowdfunding (Steigenberger 2017). Gerber and Hui (2013) found that a significant motivation to support a crowdfunding project was the desire to receive the proposed product. Consistent with this view, funders typically characterize their contribution not as funding or financing but as “buying” and “getting” (Gerber and Hui 2013).

Yet, in reward-based crowdfunding, potential funders may experience consumption uncertainty when pondering whether to back a campaign, because they may be unsure as to whether the product will deliver the intended benefits. In a consumption context, uncertainty perceptions related to product innovations arise from the consumers’ subjective feelings that the purchase decision of a novel product will have unfavorable consequences in terms of their consumption goals (Cox 1967; Cunningham 1967). Consumers perceive different uncertainty levels when exposed to familiar, novel, or innovative products (Castaño et al. 2008; Hoeffler 2003; Ram and Sheth 1989).

Uncertainty about the successful realization of the product may exacerbate potential funders’ uncertainty about the likelihood of actually receiving the product. Evidently, this may endanger the funding of the opportunity itself. Potential consumers receive the new product only after the entrepreneur has finalized developing and manufacturing the proposed product. As the time increases, until one obtains a particular outcome, so do the number of contingencies that could potentially prevent the attainment of that outcome (Benzion et al. 1989; Bixter and Luhmann 2015; Dasgupta and Maskin 2005). In reward-based crowdfunding, in particular, potential funders may find it difficult to predict when—if at all—they will receive the product proposed in the campaign. Mollick (2014)

finds that more than 75% of successfully funded Kickstarter projects deliver products later than expected (i.e., only 23–25% are on time).

In summary, crowdfunding decisions are generally characterized by higher perceived uncertainty than conventional buying decisions. The degree of uncertainty perception is conditional on the product and its depiction in the campaign in question. Consequently, potential funders of reward-based crowdfunding campaigns have to explicitly trade off their financial contribution against obtaining a novel and hitherto unseen product, which will be prone to performance-related uncertainties and for which they are uncertain whether the entrepreneur can deliver the product eventually. We, therefore, formulate the following hypotheses:

Hypothesis 1 (H1). *Crowdfunding campaigns that feature products with higher levels of development incompleteness and higher degrees of product novelty are less likely to be financially supported by the crowd.*

Hypothesis 2 (H2). *The effect of product development incompleteness and product novelty on willingness to support is mediated by backers' perceived uncertainty.*

3. Empirical Analysis and Results

In our analysis, we developed complex 2×2 experiments to test our hypotheses. While experiments are by design helpful to infer causal effects, it is very difficult to control (and manipulate) many variables simultaneously. To ensure that we do not pick an effect that might be driven by correlated, similar, and related factors, we operationalize the product depiction along two dimensions.

Since product depictions in crowdfunding campaigns involve various textual and visual elements, we focus on the following determinants that might affect the perception of uncertainty perceived by potential supporters. First, [Stanko and Henard \(2017\)](#) report that campaigns that apply for funding through the crowd have, on average, completed about 60% of new product-development activities (including activities such as developing the product's feature set, conducting business analysis, prototyping, engineering/design/coding, etc.). Second, [Rose et al. \(2021\)](#) contrast early vs. market-ready product-development stages in crowdfunding and find the former negatively influences campaign success. Therefore, we test how the product-development stage affects the uncertainty backers experience.

As a related factor that could contribute to uncertainty, we identified the perceived novelty of the product. On the one hand, radically new products often provide new benefits that enable consumers to do things that were not possible before the introduction of the product ([Chandy and Tellis 1998](#)), while, on the other hand, the realization of such products poses a significant challenge for the entrepreneur ([Chan and Parhankangas 2017](#)). [Shepherd et al. \(2021, p. 15\)](#) note that "innovativeness raises the liabilities of newness, which increases the likelihood of failure". Subsequently, we introduce the product's perceived novelty as another experimental manipulation.

3.1. Description of Experimental Procedure

3.1.1. Design, Participants, and Procedure

We conceptualized this study as a laboratory experiment. In our experiment, we analyze two sources of uncertainty: the development stage of the venture and the perceived innovativeness of the product depicted in the campaign. For this purpose, we conducted a randomized 2 (product maturity: early-stage vs. market ready) \times 2 (innovativeness: high vs. low) between-subjects experiment. In total, 128 students ($M_{age} = 23.1$, 33% female) from a German university were recruited to complete the study.

Student samples are considered very suitable for entrepreneurship research and have found wide acceptance in crowdfunding and entrepreneurial finance research (e.g., [Davis et al. 2017](#); [Gaglio and Katz 2001](#); [Rose et al. 2021](#); [Prandelli et al. 2016](#)). Backers

on crowdfunding platforms are typically younger and less-experienced than professional investors. On average, backers are between 24 and 35 years old (Fundable 2014), and, according to Kickstarter, 67% of all backers are first-time funders (Kickstarter 2022). In the interest of validity, we also asked our participants to indicate their experience with crowdfunding on a seven-point scale, with endpoints labeled 1 = “no experience at all” and 7 = “very experienced”. In our sample, 98% of participants were between 18 and 32 years of age, and 63% indicated that they have practically no experience with crowdfunding (selecting the scale points 1 or 2). Hence, the characteristics of our sample match those of typical crowdfunding supporters.

Participants were invited to a behavioral lab, where they were seated individually at a computer workplace. First, participants were provided with general explanations about the principles of reward-based crowdfunding and were then exposed to a reward-based crowdfunding campaign. After reading through the campaign materials at their own pace, participants responded to the dependent measures and were debriefed.

3.1.2. Independent Variables

To operationalize our product-stage manipulation, we relied on an actual Kickstarter campaign: innovative earphones called M4. The earphones were equipped with new technology to provide a frequency spectrum that enables the listener to experience life-like instrument separation. The first key manipulation of our study—the venture’s product-development stage—was inserted in the campaign’s description.

In the *early-stage condition*, the product was described as being in an early development phase. Specifically, we included a visual timeline in the description that indicated that the team had completed the first step of the product-development process (i.e., concept development and technical specification) and was seeking funds to proceed to the following steps (e.g., prototype development, pre-series production, and beta testing). In addition, the campaign ended with a paragraph that discussed the present challenges and the remaining milestones, in case of successful funding. Furthermore, we extracted the original product images from the campaign and modified them with image-processing software to appear as conceptual sketches.

The product was described as being in a very advanced development stage and in a market-ready condition. In this condition, the timeline indicated that the team had successfully completed the product development and was seeking funds to move to the final step of the process, that is, to realize large-scale production. Again, the description ended with a paragraph about the present challenges, but this time this information was adapted to the advanced stage of the product. Moreover, we used the original product images without any modification. Apart from these changes, all product- and campaign-related descriptions were identical in the early-stage and market-ready conditions. Excerpts of the different campaigns are provided in Figures 1 and 2.

To operationalize product novelty, we introduced the maker arm: a complete digital fabrication system in the form of a robotic arm. The product is a robotic 3D printer combining laser cutting, drawing, ink printing, and assembling. Despite the ubiquity of 3D printing on Kickstarter, the maker arm is essentially a novel and innovative product in its own respect and, especially, should be recognized as such in comparison to the earphones. To allow comparisons across different dimensions, we also operationalize the maker arm, as an early and later product-development stage campaign, using the timeline depiction. Again, we used the altered images for the early-stage depictions and the original product images without any modification for the later-development-stage depictions.

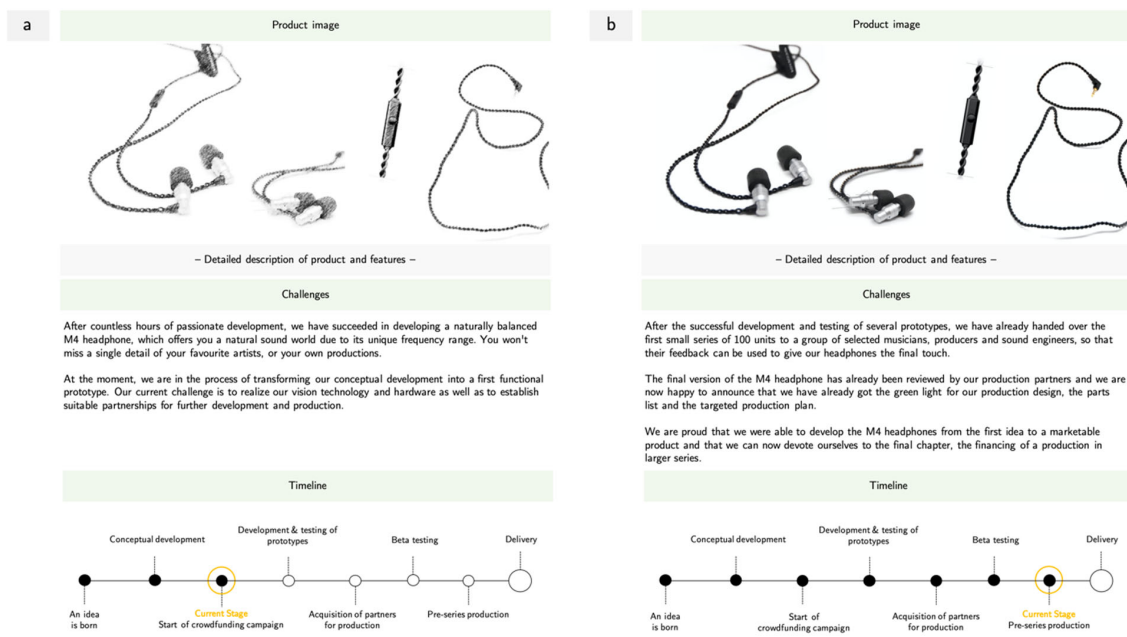


Figure 1. Campaign descriptions of M4 in (a) early and (b) late product-development stages.

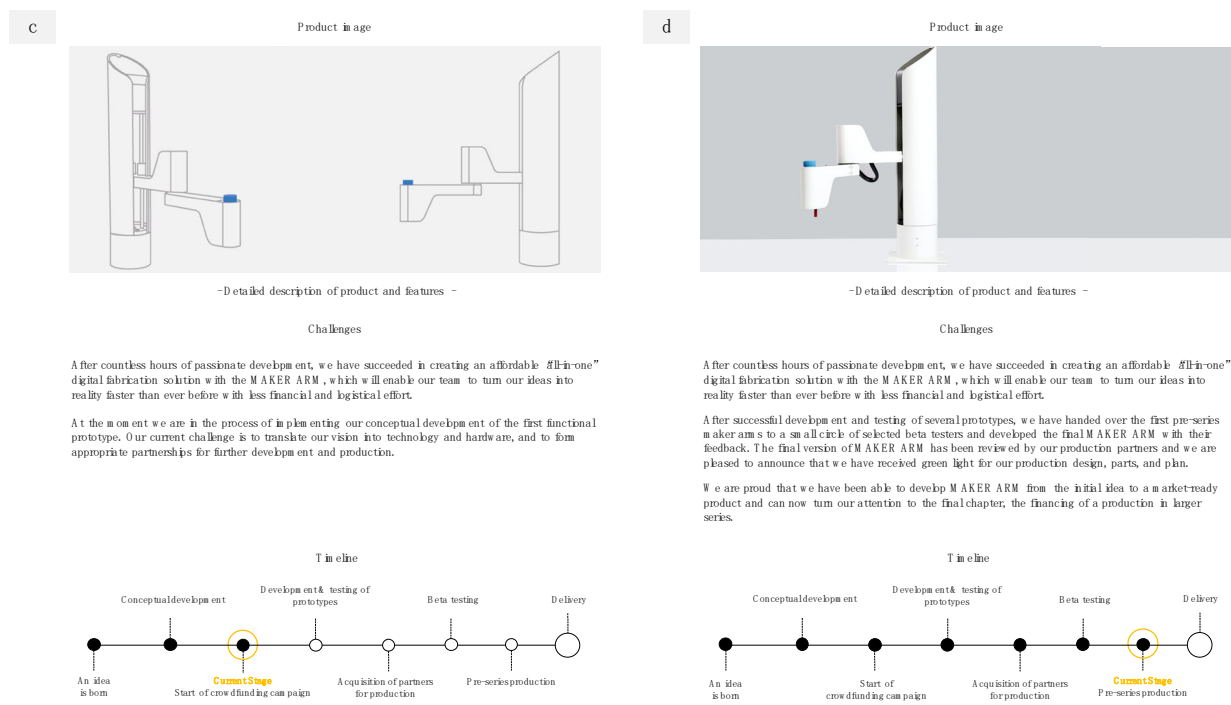


Figure 2. Campaign descriptions of maker arm in (c) early and (d) late product-development stages.

3.1.3. Measures

Willingness to support. Willingness to support the campaign was measured with three items adapted from Ciuchta et al. (2016) (“How likely would you support the presented campaign?”; “I would be willing to support this campaign”; “It is likely that I would make a contribution to support this campaign”; with the scale anchored at 1 = “Not at all” and 7 = “Definitely”; $\alpha = 0.92$).

Uncertainty. To measure perceived uncertainty, we relied on three items adapted from Cox et al. (2006) (“A financial support of this campaign is risky”, “A financial support of this campaign will have negative consequences”, “Supporting this campaign will have an uncertain outcome”, $\alpha = 0.85$).

Manipulation check. Manipulation checks were performed to test whether the product-development stage and innovativeness were manipulated successfully. To assess innovativeness, we used the five-item measure from Stock et al. (2015) and asked whether the solution is ‘out of the ordinary, revolutionary, stimulating, radical or unconventional’, with anchors 1 = ‘strongly disagree’ to 7 = ‘strongly agree’ ($\alpha = 0.88$). To assess the product-development stage, we asked participants to indicate the development stage of the product on one item with the endpoints labeled 1 = “Very early stage” and 7 = “Market-ready stage”.

Independent sample t-tests revealed that participants in the highly innovative condition indeed perceived the proposed product as notably higher in innovativeness compared to participants in the low innovativeness condition ($M_{low\ innovativeness} = 2.85$, $M_{high\ innovativeness} = 4.58$, $p < 0.001$). Participants in the early-product-stage condition perceived the product as notably less developed than participants in the market-ready condition ($M_{early\ stage} = 2.59$, $M_{market\ ready} = 6.24$, $p < 0.001$).

4. Results

We first tested whether there are differences in the willingness to contribute across the different manipulations. The data reveal that the intention to contribute does not vary across the early- and late-stage groups but varies between the low- and high-innovation groups ($M_{early} = 2.68$, $M_{market\ ready} = 2.88$, $p > 0.1$; $M_{low\ innovation} = 2.56$, $M_{high\ innovation} = 3.05$, $p < 0.05$). We, therefore, continue under the assumption of competitive or complementary mediation in the presence of a mixed zero-order effect (Zhao et al. 2010; Rucker et al. 2011).

Noticeably, in both manipulation conditions, participants exhibit differences in perceived uncertainty ($M_{early} = 4.02$, $M_{market\ ready} = 3.11$, $p > 0.001$; $M_{low\ innovation} = 3.27$, $M_{high\ innovation} = 3.88$, $p < 0.001$). As such, uncertainty is perceived to be much higher if the product is in an early stage of product development and when the product is associated with higher levels of innovation. We also tested whether these differences persist when we compare differences in innovation within early- or later-stage campaigns (early stage: $M_{low\ innovation} = 3.65$, $M_{high\ innovation} = 4.37$, $p < 0.05$; later stage: $M_{low\ innovation} = 2.88$, $M_{high\ innovation} = 3.35$, $p < 0.1$). Differences in the perception of uncertainty persisted across these comparisons.

Subsequently, we assessed whether differences in uncertainty related to the product-development stage exist when comparing low- and high-innovation campaigns (low: $M_{early} = 3.65$, $M_{market\ ready} = 2.88$, $p < 0.05$; high: $M_{early} = 4.37$, $M_{market\ ready} = 3.35$, $p < 0.001$). Again, statistically significant differences in uncertainty perceptions can be corroborated using these subgroup comparisons. As such, we can conclude that uncertainty perceptions are affected by the product-development stage as well as the perceived novelty of the depicted product.

Subsequently, we conducted a mediation analysis (Hayes 2013; Preacher et al. 2007) using the effects of product stage and product novelty on the willingness to contribute. We depict the different models tested in Figure 3.

In Table 1 (Model 1), we find that the product-development stage negatively affects the perception of uncertainty ($\beta = -0.895$, $p < 0.01$), indicating that earlier product-development stages are associated with higher perceptions of uncertainty than later product-development-stage depictions. Product novelty has a positive and significant effect on uncertainty ($\beta = 0.595$, $p < 0.01$). Subsequently, the elicited uncertainty impacts negatively on the intention to contribute to the campaign ($\beta = -0.280$, $p < 0.05$). Neither the product-development stage nor the interaction between the product-development stage and uncertainty are significant at conventional levels. However, product novelty has a positive and significant effect on uncertainty and the intention to contribute ($\beta = 0.649$, $p < 0.01$).

In Table 1 (Model 2), we employ product novelty as the main variable of interest, which we interact subsequently with the mediator. We find that the degree of novelty associated with the product depicted in the campaign has a positive effect on the uncertainty perceived ($\beta = 0.617$, $p < 0.01$), indicating that campaigns perceived as more innovative are also perceived as more uncertain. Product-development stage has a negative effect on uncertainty ($\beta = -0.895$, $p < 0.01$). Uncertainty again influences the willingness to

contribute negatively ($\beta = -0.360, p < 0.01$). There is no further significant effect of an interaction between product novelty and uncertainty on the willingness to contribute.

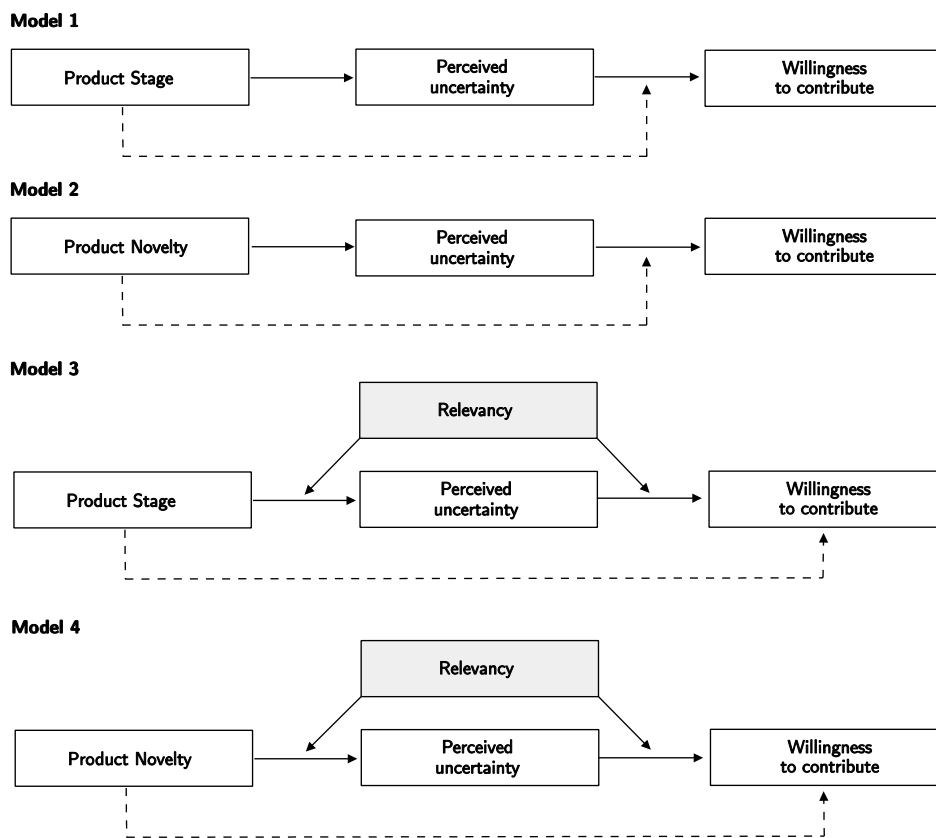


Figure 3. Graphical depiction of estimation models.

Table 1. Product stage and novelty mediated by uncertainty.

Dependent Variable: Uncertainty		
Independent Variables	Model 1	Model 2
Product Novelty		0.595 *** (0.220)
Product-Development Stage	-0.895 *** (0.220)	-0.895 *** (0.220)
Constant	3.718 *** (0.190)	3.718 *** (0.190)
Dependent Variable: Intention to Contribute		
Uncertainty	-0.280 ** (0.124)	-0.360 *** (0.118)
Product Novelty	0.650 *** (0.233)	0.617 (0.669)
Product-Development Stage	0.463 (0.674)	-0.103 (0.242)
Product Development/Novelty * Uncertainty	-0.160 (0.178)	0.011 (0.174)
Constant	3.476 *** (0.514)	3.793 *** (0.457)
Observations	128	128
Chi ² (1)	79.16	65.93
p-value Chi ²	0.000	0.000

Table 1 depicts the two manipulations of product stage and product novelty as explanatory variables. The dependent variable is the intention to contribute with uncertainty as a mediator. The figures stated represent the coefficient values with standard errors reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

We also estimated more complex, moderated mediation models in which we let the effect of product-development stage on uncertainty be moderated by the indicated relevancy of the depicted product. This moderated mediation follows prior work in the crowdfunding context, suggesting that people process information differently following low and high states of elaboration likelihood (Allison et al. 2017). As such, when products appear more relevant, uncertainty might be more salient because (a) individuals process campaign information differently and (b) they subsequently pay more attention to the perception of uncertainty.

In Table 2, Model 1 indicates that when the personal relevance of the campaign is introduced as a moderator of the relationship between the product-development stage and uncertainty, the stage still ($\beta = -0.848, p < 0.10$) affected the perceived uncertainty negatively. Product novelty has a positive and significant effect on uncertainty ($\beta = 0.643, p < 0.01$) and the intention to contribute ($\beta = 0.490, p < 0.01$). Interestingly, personal relevancy has a moderating effect on the relationship between uncertainty and the willingness to contribute ($\beta = -0.126, p < 0.05$). The negative relation between uncertainty and the willingness to contribute is strengthened in direction.

Table 2. Product stage and novelty mediated by uncertainty and moderated by relevancy.

Dependent Variable: Uncertainty		
Independent Variables	Model 1	Model 2
Product-Development Stage	-0.848 (0.493)	-0.875 *** (0.216)
Relevancy	-0.130 (0.107)	-0.219 ** (0.105)
Development Stage/Novelty * Relevancy	-0.015 (0.152)	0.168 (0.152)
Product Novelty	0.643 *** (0.219)	0.153 (0.496)
Constant	4.075 *** (0.351)	4.309 *** (0.339)
Dependent Variable: Intention to Contribute		
Uncertainty	0.059 (0.147)	-0.008 (0.142)
Product-Development Stage	0.202 (0.441)	-0.072 (0.189)
Relevancy	1.026 *** (0.224)	0.916 *** (0.164)
Development Stage/Novelty * Relevancy	-0.097 (0.141)	-0.071 (0.140)
Product Novelty	0.490 *** (0.187)	0.683 (0.429)
Uncertainty * Relevancy	-0.126 ** (0.052)	-0.097 * (0.051)
Constant	0.658 (0.676)	0.933 * (0.540)
Observations	128	128
Chi ² (1)	183.4	173.91
p-value Chi ²	0.000	0.000

Table 2 depicts the two manipulations of product stage and product novelty as explanatory variables. The dependent variable is the intention to contribute with uncertainty as a mediator. The variable Relevancy is a moderator. The figures stated represent the coefficient values with standard errors reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

In Table 2 Model 2, we lastly estimated a model in which personal relevancy is allowed to moderate both the relationship between product novelty and uncertainty and the relationship between uncertainty and the willingness to contribute. The product-development stage still ($\beta = -0.875, p < 0.01$) affected the perceived uncertainty negatively,

while the product novelty variable is insignificant at conventional levels. Yet, one should be cautious in interpreting the main effects of product novelty here, because of the additional included interaction term between product novelty and relevancy ($\beta = -0.071, p > 0.10$; insignificant).

Again, we can corroborate the interaction effect between uncertainty and personal relevancy. In the model with product novelty as the main predictor variable, we again find a significant interaction that affects the relation between uncertainty and the willingness to contribute ($\beta = -0.097, p < 0.10$). As such, we can conclude that the negative main effect of uncertainty on the willingness to contribute is even stronger (more negative) when personal relevancy of the product depicted in the campaign is high.

5. Discussion

This research analyzed how product-related uncertainties affect the performance of crowdfunding campaigns. We conducted a 2×2 experiment using actual but slightly altered and manipulated campaigns from Kickstarter.

The results of our experiments show that both campaign manipulations conducted affected the perception of uncertainty elicited from the campaigns. We found that the product-development stage and the degree of novelty depicted in a crowdfunding campaign both invoke higher levels of perceived uncertainty. Moreover, both sources of uncertainty are consequential, as they reduce an individual's willingness to contribute to a campaign. Noticeably, the effect of uncertainty on the willingness to contribute is highest when individuals indicate a higher personal relevance to the product depicted in the campaign.

5.1. Theoretical Implications

With our findings, we make several contributions to the literature. First, while prior research has investigated mainly antecedents of campaign success on the project level (e.g., [Agrawal et al. 2015](#); [Mollick 2014](#)), research from a consumer-behavior perspective on reward-based crowdfunding is surprisingly lacking. [Felin et al. \(2019, p. 3\)](#) urged researchers to fill the “gap in whatever informational signals and validation that might be available from interacting with and surveying customers—and the future”.

We extend this line of inquiry by adding the empirical observations that uncertainty inhibits purchase decisions in crowdfunding, when product possession is not immediate and when potential supporters cannot experience the products directly. Against this backdrop, our research provides evidence that consumers' perceptions of uncertainty in the context of reward-based crowdfunding are influenced decisively by the degree of product maturity and the degree of innovativeness of a campaign's proposed product.

Our research, therefore, adds to a growing body of work showing that evaluations and purchase intentions for highly innovative products are negatively affected by consumers' perceived uncertainty (e.g., [Ram and Sheth 1989](#); [Hoeffler 2003](#); [Dahl and Hoeffler 2004](#); [Castaño et al. 2008](#)). This might inform our understanding of product adoption processes of entrepreneurial ideas. Some of these product deliberations might be aborted before they even begin, without potential consumers ever considering the potential that the idea might have had ([Talke and Heidenreich 2014](#); [Heidenreich and Kraemer 2016](#); [Reinhardt et al. 2019](#)).

Second, our study fills a void in the literature by analyzing the root causes of uncertainty perceptions in a unique purchase and decision-making scenario. Research on crowdfunding has, hitherto, given limited attention to conditions under which uncertainty arises and is detrimental to crowdfunding outcomes. Our research, therefore, takes an important step forward in explaining how campaign characteristics influence crowdfunding-campaign outcomes through the uncertainty that potential backers experience. Since products differ in their development status and the novelty attributed to the new product, uncertainty perceptions will vary. This inhibiting effect of uncertainty is more consequential when backers consider the product as more relevant to them.

Lastly, our research emphasizes that crowdfunding campaigns involve multiple sources of uncertainty, and it, therefore, is particularly important to tie visual and textual information to the nature of uncertainty that might inhibit support decisions. We, therefore, add to the prior work that emphasized that crowdfunding entrepreneurs need to effectively communicate information about their product and that highlighted the importance of an ability to depict the promised, new venture idea orally and textually (Scheaf et al. 2018). Our work suggests that such communication needs to be tied to the causes of uncertainty to better understand when and how information conveyed in crowdfunding campaigns are effective and when signals fail to convince potential supporters. In fact, different types of cues and signals might reduce uncertainty, depending on the background risk that early product development or types of innovation pose. Consequently, failing to realize when specific types of signals and cues are most effective in reducing uncertainty is important, so to not discombobulate the various occasions when they can be applied effectively and when they might fail to reduce uncertainty.

5.2. Practical Implications

Our study also has important practical implications. As such, our findings demonstrate that entrepreneurs that seek to obtain funds through crowdfunding campaigns need to realize that the ventures they propose—especially if these are in an early phase—may trigger uncertainty, and this uncertainty negatively affects funding decisions. In other words, campaigns that propose products that are still in an early-development phase may be at a significant disadvantage in a competitive crowdfunding environment.

One straightforward conclusion to follow from these findings is that entrepreneurs may be well-advised to launch crowdfunding campaigns only after they have finalized the development process. A more interesting possibility would be, however, to directly address the uncertainty that potential funders experience in response to early-stage campaigns.

Our work, therefore, stresses the caveats underlying the practical role of experimentation with unfinished prototypes (Shepherd and Gruber 2020; Kerr et al. 2014) and the importance of opportunities for learning in experimentation scenarios (Chemla and Tinn 2020). The stylized facts from the crowdfunding setting may be informative for the learning processes of aspiring entrepreneurs. Importantly, our results highlight the need for entrepreneurs to persuade potential consumers to look beyond the current state of product development; rather, “[s]tartup founders need to, in some sense, look beyond the present and into some unknown future—beyond existing products and realities” (Felin et al. 2019, p. 3). This might be informative to better understand the intermediate steps of the resource-mobilization process that determine whether or not entrepreneurs searching for resources are actually granted access to said resources (Clough et al. 2019). Experimenting entrepreneurs, therefore, have to shift between actions (shaping the resource-acquisition process; e.g., creating prototypes of products or developing crowdfunding campaigns) and cognition and perspective taking (developing an understanding of their resource environment; making it easier for resource providers to understand their new venture idea) to be successfully granted access to resources.

5.3. Limitations and Avenues for Future Research

While the study presented in this research enhances our understanding of crowdfunding, it also suffers from limitations that call for future research. First, our conceptualization of uncertainty was mainly based on development-related (i.e., funders being unsure as to when they will receive the outcome due to the early-stage nature of the product) and benefit-related (i.e., funders being unsure as to whether the outcome will satisfy their consumption goals due to the novelty of the product) uncertainty. While these types of uncertainty are typical of crowdfunding decisions, related research has also identified other types of uncertainty that may negatively affect buying decisions, such as social or financial uncertainty (Stone and Grønhaug 1993). Hence, future research may want to examine if

other dimensions of uncertainty also affect funders' decisions and, if so, how entrepreneurs may best address these dimensions in the presentation of their campaigns.

Second, our work showed that the product-development stage and the innovative character of the product depicted in the campaign induce uncertainty that inhibits campaign performance. While our results did not support an interaction effect, such an effect is not inconceivable. For instance, potential funders may feel that campaigns that propose radically different solutions may need more time to be realized and may be unsure about the benefits provided by such solutions. Hence, the radicalness of a product may add similar effects as the ones reported in this research (Chan and Parhankangas 2017). To analyze these potentially complementary effects, experiments might focus on hitherto unseen products that propose completely novel and new value propositions to the potential supporters.

Third, in terms of generalizability, our research setting is limited to the context of reward-based crowdfunding, where the funders' primary motivation to commit financial means is the pre-purchase and receipt of a still-to-be-finalized product (Steigenberger 2017; Gerber and Hui 2013). This limitation raises the question of whether our findings are generalizable to other types of crowdfunding. While the degree of product advancement and product novelty represent structural campaign characteristics that trigger feelings of uncertainty in a pre-purchase scenario, this might be distinctive when supporters' motivation to provide financial means are different. For instance, in social crowdfunding, the primary motivation is the desire to fund a worthy cause rather than the reception of a concrete physical outcome (Berns et al. 2018).

While our results point out the inhibiting character of uncertainty, it might be worthwhile to test for signals and cues that explicitly reduce the negative consequences on support decisions. Our findings may point to an inherent advantage of campaigns featuring more advanced outcomes. As the central tenet of reward-based crowdfunding is the procurement of early-stage financial assistance for the development of new product ideas (Belleflamme et al. 2014; Davis et al. 2017), our findings indicate an analogous challenge for entrepreneurs that addresses the crowd, as in the case of traditional methods such as bank loans, business angels or venture capitalists. We certainly can envision research using our theoretical lens to study peer-to-peer lending platforms, where social networks and perceptions of trustworthiness play a crucial role (Hasan et al. 2022).

Yet, this is not to say that future studies may not be able to uncover means that may improve entrepreneurs' perspective taking, when proposing less developed and more innovative campaigns via reward-based crowdfunding. For instance, prior research has found that analogies are useful for enhancing consumers' understanding of new products (Feiereisen et al. 2008; Goode et al. 2010; Gregan-Paxton 2001; Gregan-Paxton and John 1997). Analogies rely on specific knowledge structures acquired previously and transfer this knowledge to a new product currently under evaluation (Gregan-Paxton and John 1997). As outlined above, funders that evaluate campaigns proposing more innovative and less developed outcomes may face particular difficulties when envisioning these products' benefits and usage process. Arguably, activating prior knowledge structures about the usage process may attenuate uncertainty and may, thus, further improve responses to campaigns featuring advanced outcomes.

6. Conclusions

In our study, we analyzed the consequences of campaign characteristics on the uncertainty elicited by potential supporters. By examining reward-based crowdfunding from a consumer-level perspective, our research demonstrates that crowdfunding decisions are associated with uncertainty on the side of the potential funders and that this uncertainty is notably higher when the product promoted in the campaign is in an early-development stage and when the product is perceived as more innovative. By laying out the performance-inhibiting character of uncertainty, our research lays the groundwork to enable entrepreneurs' perspective taking, to consider their crowdfunding endeavors

from the perspective of their potential supporters (Prandelli et al. 2016). In doing so, entrepreneurs can ensure that their campaigns will live up to their full potential, regardless of the development stage and innovation perception elicited by the product depicted in their campaigns.

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