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How crowdfunders are influenced by entrepreneurial passion: A dual information-processing perspective

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Abstract. We incorporate entrepreneurial passion into a dual theory of information-processing, theorizing that *passion* can be used as *information* in analytical thinking, and as a *heuristic* in intuitive thinking. We find that passion is generally associated with an increase in crowdfunding success rates (+1%). Its effect becomes more powerful (+16% increase in success) when exhibited in conditions of coherence/fluency, i.e. with high levels of preparedness; while it disappears in conditions of incoherence/disfluency and when the judgment is important. This conceptual framework reconciles contradictory findings of previous studies, suggesting that affective cues have the power to influence decisions in contexts characterized by large numbers of non-professional investors.

Keywords: entrepreneurial passion; affect; preparedness; crowdfunding; crowd wisdom

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1. Introduction

The role of affect has been studied with increasing attention in the context of entrepreneurial projects. Seminal works by Chen, Yao and Kotha (2009) and by Cardon and colleagues (2009a) have developed the concept of ‘entrepreneurial passion’ to describe the emotional attachment that entrepreneurs feel for their projects, and they have theoretically and empirically analyzed the manifestations (Cardon, Sudek, and Mitteness 2009b; Pollack, Rutherford, and Nagy 2012), the types (Drnovsek, Cardon, and Patel 2016; Ho and Pollack 2014; Murnieks et al. 2016), the goals (Cardon and Kirk 2015; Warnick et al. 2018), and the organizational influence (Cardon 2008; Murnieks et al. 2016) of passion in entrepreneurial projects.

One hypothesis is that the entrepreneurs that display passion when pitching their projects to potential investors make these latter more inclined to support their projects. Several empirical analyses have been conducted to test this hypothesis, but they have so far provided contradictory evidence. In this paper, we contribute to the prior literature in three important ways.

First, we develop a dual information processing theory of entrepreneurial passion which posits that passion can influence judgment via two mechanisms of information processing: *intuitive thinking* and *analytic thinking*. This conceptualization deviates from the *unimodel* of persuasion adopted by

Chen, Yao and Kotha (2009), and it is based on the widely-accepted *dual processing* theory of human judgment (Epstein 1994; Kahneman 2011; Sloman 1996) and on studies of the *affect heuristic* in intuitive thinking (Finucane et al. 2000; Schwarz and Clore 2007; Slovic et al. 2005a, 2002). The theory assumes that affect can be processed only by means of *intuitive thinking* or by both *intuitive and analytic thinking*. The processing mode is affected by the context in which judgments are made. This conceptualization induces us to predict that passion can exert more or less influence on judgments depending on the contextual factors. Taking a step forward in the passion literature, we identify two contextual factors that influence which processing mode is used and thereby moderate the role of passion in judgments. The first is the *coherence/incoherence* that the observer faces when processing the information, i.e. whether the information appears consistent/inconsistent with other pertinent information (Greifeneder et al. 2011; Thompson and Morsanyi 2012). The second is the *high/low importance* for the observer of making a correct judgment. We predict that, although the display of passion generally induces more positive judgments, situations of incoherence/disfluency and high perceived importance trigger more scrutiny of passion via analytic thinking and so they negatively moderate the positive influence of passion on judgments. This is an important theoretical contribution of the paper. We discuss how this makes substantive steps forward in reconciling the contradictory findings of previous empirical analyses.

Second, we test the predictions of the theory on an original sample of almost 3,000 crowdfunding entrepreneurial campaigns. In order to measure displayed passion, we apply Computer Aided Language Analysis (CATA) to written project descriptions, after developing a new dictionary that captures entrepreneurial passion from the choice of verbal language. We perform extensive testing to validate our CATA-based measure with respect to alternative measures of verbal and non-verbal communication used in videos. The resulting dictionary is made available for replication studies

and future investigations. This is a methodological contribution of the paper which will make it possible to study the role of passion in phenomena, such as web-based fundraising, that generate large amounts of data.

Third, we contribute to the stream of research on entrepreneurial passion in a new context. Whereas the previous literature has primarily considered judgments made by experts, like venture capitalists and business angels, we focus on crowdfunding, i.e. a situation characterized by non-professional decision-makers. This is an important area of investigation, because crowdfunding is becoming a stable source of seed capital able to influence subsequent rounds of fundraising (Roma et al., 2017; Buttice et al., 2020; Buttice et al., 2021). Furthermore, previous studies have evidenced that professional and non-professional subjects respond differently to affective stimuli (Kahneman and Klein 2009; Lord and Maher 1990). Therefore, findings within professional contexts may not be generalizable to unprofessional settings. Indeed, affective stimuli are likely to exert stronger persuasive power on non-professional subjects because they lack financial competences. We elaborate on this point in light of our theory framework, and we discuss hypotheses useful for future theorizing.

The paper is organized as follows. In Section 2, we summarize the previous literature, highlight the gaps, and propose a reconceptualization of entrepreneurial passion in the dual information processing theory of judgment. This leads us to devise a set of three testable hypotheses. In Section 3 we describe the methodology for measuring passion based on CATA and our samples. In Section 4 we present the econometric estimates and the robustness tests. Section 5 discusses the results in light of previous work, points out a number of limitations, and suggests several directions for future research.

2. Theoretical framework and hypotheses development

2.1 A critical review of entrepreneurial passion and its role in judgments on entrepreneurial

ventures

Entrepreneurial passion is “an entrepreneur’s intense affective state accompanied by cognitive and behavioral manifestations of high personal value” (Chen et al. 2009:201). Studies on entrepreneurial finance have considered passion in the context of entrepreneurial pitches, these being the short presentations that entrepreneurs make to audiences of potential investors in order to excite their interest (e.g., Cardon et al. 2017; Galbraith et al. 2013; Mitteness, Sudek, and Cardon 2012; Parhankangas and Ehrlich 2014; Pollack et al. 2012). The hypothesis put forward in these studies is that entrepreneurs who stand out for their passion and enthusiasm are more likely to persuade potential funders, because passion is processed in the brain together with other information by a single information processing mode (Chen et al. 2009). Displayed passion then triggers an *emotional contagion* in the observer, provoking feelings of shared identity and optimism, and ultimately inducing individuals to judge a project more favorably (Bono and Ilies 2006; Cardon 2008; M. S. Cardon, Sudek, and Mitteness 2009a). Passion can also be a signal of strong commitment (Cardon and Kirk 2015; Chen et al. 2009; Drnovsek et al. 2016; Vallerand et al. 2003), and boost personal productivity and problem solving (Baron 2008; Baron and Markman 2000; Ho and Pollack 2014), especially when it is well-balanced/harmonious (Cardon et al. 2009a; Vallerand et al. 2003). However, the literature’s interest in passion is primarily related to the emotional contagion hypothesis, because it underpins the role played by affect and intuition, rather than rationality, in economic decisions (Ashkanasy, Humphrey, and Huy 2017; Baron 2008; Dane and Pratt 2007).

The idea that passionate entrepreneurs elicit more favorable judgments in financial contexts was originally formulated by practitioners (Cardon 2008; Sudek 2006; Vallerand et al. 2003), but the empirical tests performed by scholars have been inconclusive. Table 1 provides a comprehensive

review of the empirical tests published to date.¹ The table reports the independent variable used for passion, the related metric, the dependent variable, with measure and decision-maker, and the effect found: e.g., none, positive, or negative.

[Insert Table 1 about here]

In our summary of the findings, two groups of studies are distinguished according to the basic methodology that they have adopted. The first group of studies have conducted cross-sectional econometric analyses in which displayed passion is an explanatory variable of positive judgments. The works based on this methodology are reported at the top of the table in chronological order. The results are markedly inconsistent: seven studies found no correlation, three found a negative correlation, and three found a positive correlation. The second group of studies use conjoint analyses. These works are reported in the lower part of the table in chronological order. All results indicate a positive correlation of passion with funding. It should be stressed, however, that in conjoint analyses, respondents are asked to choose between two *stated* alternatives. For example, in the study conducted by Hsu and colleagues (2014) the respondents chose between: “The entrepreneur is committed to the venture and also highly passionate about the proposed opportunity” or “The entrepreneur is committed to the venture but not highly passionate about the proposed opportunity”. Consequently, conjoint analysis can only tell us about the *deliberate* beliefs or *conscious* preferences of respondents, while it cannot investigate, by its very nature, the – largely *unconscious* – implications of passion in judgments.

Several of the analyses reported in Table 1 also measure the degree of ‘preparedness’ of the entrepreneur, i.e. the display of deep understanding concerning the project and the situation

¹ We included studies published until 2020 which were explicitly centered on the relationship between passion and funding outcomes.

(Cardon et al. 2009b; Chen et al. 2009). These results are not reported in the table for the sake of brevity. With few exceptions (Chan and Parhankangas 2017), all studies find that preparedness correlates positively with success (Cardon et al. 2017; Cardon et al. 2009b; Chen et al. 2009; Davis et al. 2017; Pollack et al. 2012). Although some initial works presented preparedness as one behavioral manifestation of passion (Chen et al. 2009), the most recent analyses agree that preparedness is a separate construct that is not necessarily dependent on passion (Cardon et al. 2017). We will return to this issue later.

Overall, the empirical evidence on the role of passion is contradictory. The conflicting results seem to suggest that passion may or may not play a role in judgments, depending on factors not presently conceptualized. However, the seminal work by Chen and colleagues (Chen et al. 2009) stated that all information (rational or affective) is treated by a single mechanism of information processing, the so-called *unimodel* (Kruglanski and Thompson 1999). As such, the theory is unable to explain why passion seems to play a role in some cases and not in others. Moreover, the *unimodel* is widely disregarded by scholars of decision sciences (Kahneman 2011), and it has been contradicted by findings of neuroscience research (Cohen 2005).

To conclude, the foregoing review of the literature highlights inconsistent results that call for improvement in the theorizing of entrepreneurial passion. In the next sections, we propose a new and more comprehensive theoretical framework for entrepreneurial passion which is able to account for the above shortcomings.

2.2 Rebuilding entrepreneurial passion in cognitive psychology and decision sciences

Our theoretical re-conceptualization of entrepreneurial passion is rooted in the studies of cognitive psychology and decision sciences that concern the processing of affective cues in human judgments. Entrepreneurial passion is a manifestation of the affective/emotional attachment that an entrepreneur feels for his/her project. In order to understand how the display of affect by a subject

(the entrepreneur) can provoke a response in the observer (the potential funder), we need to embed passion in the broader theory of *affect as information* developed within cognitive psychology. This is a large corpus of psychology research that began investigating the human reaction to affective stimuli in the 1980s (Schwarz and Clore 1988; Zajonc 1980). Providing an overview of this broad field of investigation is beyond the scope of this paper. For our purposes here, it suffices to summarize two main tenets. The first is that, every stimulus, such as an item of information or a situation, prompts in the observer an instantaneous, automatic and unstoppable reaction in the human brain that is affectively connoted (Damasio 1994; Zajonc 1980). The affective reaction to a stimulus is pulled from prior experience memorized by the observers and serves to inform them about the potential implications, like pleasure or displeasure, of their choice (Loewenstein et al. 2001). Once the affective reaction has been retrieved, it becomes one piece of information that the observers appraise during decision-making together with other pieces of information (Finucane et al. 2000; Schwarz and Clore 1988, 2007). This use of *affect as information* (Loewenstein et al. 2001) tells us that emotional reactions are processed by the brain as information usable in judgments.

A second tenet of cognitive psychology is that humans do not just use affect as one piece of information. They also place this information at the center of specific cognitive strategies, called ‘heuristics’, which are used to simplify judgment and save on mental effort. The *affect heuristic* is “a cognitive process in which people rely implicitly on their positive and negative feelings as a guide to their evaluation of an activity’s risks and benefits” (Slovic 2010:ix). Studies on the affect heuristic have shown that appraisals of affect can replace complex judgments (Finucane et al. 2000; Schwarz and Clore 1988). For example, a person being asked to judge “is this a good car?” can unconsciously replace the question with a simpler one: “do I like this car?”. Kahnemann (2003:710) states that ‘affect’ is a general-purpose heuristic because the affective response to a stimulus is

universal and automatic.²

The role played by the affect heuristic has been tested by a number of experiments (Schwarz and Clore 2007). Some of them have focused on the role of affect in managerial decisions, like the assessment of an industry's economic performance, the evaluation of the costs and benefits of a new technology, or the choice of an insurance policy (Hsee and Kunreuther 2000; Slovic et al. 2002). In sum, prior research has determined that affect can be used in decision-making in two ways: it can be appraised as one piece of information (*affect as information*), and it can be used as a mental shortcut (*affect heuristic*).

2.3 Hypotheses

2.3.1 Passion in the *dual processing* of human judgment

We shall now explain how the two uses of affective stimuli take place in the human mind. In order to do so, we need to introduce the *dual processing* theory (Epstein 1994; Evans 2007; Evans and Frankish 2009; Sloman 1996). This theory is undoubtedly prominent in social and cognitive psychology (for reviews see, e.g., Chen and Chaiken 1999; Evans and Frankish 2009; for a response to critics, see Evans and Stanovich 2013), and it is increasingly acknowledged as the standard in management studies (see Allison et al. 2017; Dane and Pratt 2007; Drover, Wood, and Corbett 2018; Laureiro-Martínez and Brusoni 2018).³ The *dual processing* theory states that the human mind processes information and forms judgments by means of two different systems

² Other commonly-used heuristics are 'representativeness' and 'availability'. See Kahnemann (2003) for a comprehensive discussion.

³ The literature agrees about the basic features of the two systems, although different authors have labeled the two systems differently (see Dane and Pratt 2007:36 for an overview). Drover and colleagues (2018) adopt the formulation of Chen and Chaiken (1999) and call the first system 'heuristics' and the second 'systematic'. Allison and colleagues (2017) use the Elaboration Likelihood Model (Petty et al. 1983). In the original formulation of this theory (Cacioppo et al., 1981), the two systems were not clearly associated with high-effort/intuitive versus low-effort/judgmental processing, while they are clearly presented as such in recent reformulations (Cacioppo et al. 2018:156).

(Epstein 1994; Evans 2007; Evans and Frankish 2009; Sloman 1996).⁴ The first system, hereafter called ‘System 1’, is *intuitive thinking*, a low-effort mode of information processing which relies on heuristics to make rapid judgments. System 1 is unconscious, automatic and unstoppable. It is not capable of logical reasoning, and instead works simply with intuitive associations (Evans 2007:14). If the affective stimulus has a positive valence (e.g., joy), System 1 prompts a favorable judgment; if the affective stimulus has a negative valence (e.g., fear), System 1 prompts an unfavorable judgment. The intuitions of System 1 are rather crude and simplistic. However, they are extremely useful in everyday life, because the human mind is overloaded with stimuli and is required to take countless small decisions. Kahneman (2011: Ch. 5) calls System 1 ‘a machine for jumping to conclusions’.

The second system, hereafter called ‘System 2’, is *analytic thinking*. This is a high-effort mode of information-processing which relies on logical reasoning and thorough scrutiny to make thoughtful systematic judgements. System 2 is able to process information by using hypothetic-deductive reasoning, calculations, and abstract thought (Evans 2007:15). It is also able to gauge the validity of any given piece of information, so that it can give credit to or disregard specific information. To some extent, it is conscious and responsive to deliberate control. The operations of System 2 require considerable mental effort, compared to those of intuitive thinking (Evans 2007).

System 1 and System 2 coexist in the human mind and work simultaneously to produce judgments. When a stimulus occurs, System 1, which is always at work, instantly provides an intuitive response. System 2, which is active in vigilant mode, may simply let the intuitive response pass or decide to intervene with more elaborate examination. If it does intervene, the analytic thinking of System 2

⁴ The two systems are called in different ways by different authors (Dane and Pratt 2007). Here we chose the terms ‘system 1’ and ‘system 2’ proposed by Stanovich and West (2000), and later adopted by Kahneman (2003) and Evans (2007).

would override the intuition of System 1. The two systems interact and work simultaneously, producing a judgment in the space of a few fractions of a second (Cohen 2005; Evans 2007; Lieberman 2000).

Let us now consider the dual processing that takes place in the mind of an observer who sees a passionate entrepreneur. Both systems have a role in decoding the affective stimulus conveyed by the entrepreneur's enthusiasm/passion. System 1 associates the affective stimulus to a positive valence, via the *affect heuristic* (Finucane et al. 2000; Schwarz and Clore 1988; Slovic et al. 2002), providing immediately a favorable tentative judgment. System 2 can let the intuition pass or scrutinize the judgment more extensively (Evans 2007; Evans and Frankish 2009). If System 2 intervenes, it still uses the affective stimulus delivered by passion, but it uses it *as an information* in a logical and deductive reasoning. Passion, indeed, may be the consequential behavior of the entrepreneur's strong motivation to pursue the goal. This is tentatively good for the project. However, System 2 does not use *only* the emotional information; it uses the emotional information and *also* other information that is available and relevant to the decision. Moreover, System 2 can further examine the information with logical and deductive thinking, for example wondering if the display of passion is adequate or cogent, in light of the rest of the information at hand (Alter and Oppenheimer 2007; Evans and Stanovich 2013; Thompson and Morsanyi 2012). Therefore, the affective stimulus may contribute to the formation of a favorable judgment, along with other information, but it may also be ignored, letting other information to determine the final judgment. As a result, the influence of the affective stimulus on the final judgment is straightforward and positive if only System 1 operates. It is less straightforward and positive or null, when System 2 intervenes.

Before discussing what triggers the intervention of System 2, we stop for a moment and formulate the first of our research hypotheses. We do so by applying our theory framework to the context of

crowdfunding, where the entrepreneurial ideas of project proponents are presented in a platform and evaluated by an audience (the crowd). Our theory predicts that the entrepreneurs who display passion in presenting their projects, all else being equal, will prompt a more favorable judgment in the audience than those who do not. This is because, although in some cases the affective stimulus is ignored by System 2, in at least some cases, the affective stimulus prompts a positive evaluation through System 1 (via *affect heuristic: passion has a positive valence*), and through System 2 (via *affect as information: passion is an indicator of a single-minded goal pursuit*). Our first hypothesis is:

H1. The display of passion in a crowdfunding campaign is positively associated with success.

2.3.2 Moderators of passion

We have stated that the influence of passion on judgements is tentatively positive or null. The influence is strongest when System 2 does not intervene and the judgment is made solely on the basis of System 1. It is somewhat weaker or null when System 2 intervenes, because other information is also considered and because passion can be ignored, if found to be inconsistent with other content-related information. Thus, the potential intervention of System 2 should in some instances go in the direction to lower or even cancel the positive influence of passion on judgments. It is therefore important to discuss under what circumstances System 2 is more likely to be engaged. Exactly what triggers the intervention of System 2 is still in part an open research question (Thompson and Morsanyi 2012). In general, the literature agrees that humans economize on cognitive effort and thus tend to save on the use of System 2 whenever possible (Evans and Stanovich 2013). Several empirical investigations have demonstrated that humans tend to rely on intuitions instead of analytic thinking in situations of physical distress, like multi-tasking

(Cacioppo et al. 1986) or time-pressure (Finucane et al. 2000). Other studies have emphasized the existence of individual preferences or inclinations that make some people systematically more prone to use intuitive thinking and others to use analytic thinking (Petty, Cacioppo, and Schumann 1983). Greater reliance on analytic thinking has been found to correlate with individual preference for clarity (Cacioppo et al. 1986) and with intelligence (Stanovich and West 2000).

Besides contingencies and individual preferences –that tend to be randomly distributed in large audiences– our review of the literature identifies two factors that play a role in triggering System 2. They are: i) incoherence/disfluency, and ii) importance. The former stresses that System 2 is alerted when it perceives a disfluency, such as a lack of logical coherence in the information, for example when some information appears grossly inconsistent with other information pertinent to the context (Greifeneder et al. 2011; Thompson and Morsanyi 2012). An information is deemed relevant if it contributes to forming a cogent understanding of the situation and less relevant if it appears inconsistent, superficial, or unsupported by other elements.

In what circumstances would passion be deemed non-cogent and thus be disregarded in the judgment? The previous literature has maintained that the display of passion, which normally indicates a strong motivation of the entrepreneur to pursue the goals (Chen et al., 2009), appears unmotivated or superficial, if it is not based on a *thoughtful* and *in-depth analysis* of the business environment. A solid business analysis and planning implies that the entrepreneur is able to explain *logically* and *coherently* how the new venture is a solution to the market needs. An entrepreneur who cannot justify the enthusiasm with a deep understanding of the business and with carefully crafted plans generates an impression of incoherence and disfluency. Recalling from the entrepreneurial passion literature that the display of a deep understanding concerning the project and the situation (Cardon et al. 2009b; Chen et al. 2009) is called *preparedness* (Cardon et al. 2009b; Chen et al. 2009), we thus posit that passion is deemed cogent if it is displayed in

combination with preparedness. Conversely, a failure to display preparedness in the presence of passion provides a cue of incoherence/disfluency, prompting System 2 to disregard the positive valence of passion. This underlines a moderation role of preparedness over the correlation between passion and success. We can therefore state the second hypothesis as follows:

H2. The positive correlation of displayed passion with success is moderated by situations of coherence/incoherence, i.e. when the entrepreneur shows a lack of preparedness the correlation of displayed passion with success will decrease.

The second factor that triggers the intervention of System 2 relates to the perceived importance of the judgment (Petty et al. 1986, 1983). Humans tend to spend more time and effort when they take decisions that they see as important, in the sense that the consequences of the decisions may be serious or closely relevant to themselves (Cacioppo, Cacioppo, and Petty 2018). Decisions deemed highly important are those that can have significant consequences for the person's life (Petty et al. 1986), such as those that have financial implications (Stone and Ziebart 1995) or entail conditions of personal accountability (Lerner and Tetlock 1999).

In the context of crowdfunding, the amount of money at stake is the most obvious indicator of a decision's importance. In reward-based crowdfunding, the sums of money pledged are usually not very high, but there are nuances. Small pledges of pocket money (e.g., \$1 or \$5) are commonly given by a backer that wants to encourage a project with no strings attached (Colombo, Franzoni, and Rossi-Lamastra 2014).⁵ We assume that these small sums can be given easily and do not imply that the subject deems the decision important. Larger sums are usually given in exchange for

⁵ Based on the statistics disclosed in the Kickstarter blog, these two amounts account for about 9% of the pledges and the \$5 pledge is the third most-common amount pledged. <https://www.kickstarter.com/blog/trends-in-pricing-and-duration>. Accessed November 18, 2021.

purchase of a good (Colombo, Franzoni, and Rossi-Lamastra 2014). The amounts involved may vary according to the intrinsic value of the good. In technology-related projects, some goods are quite expensive (e.g. priced between \$100 and \$500) (Colombo et al. 2014).⁶ A plausible assumption, in the price-range of crowdfunding, is that decisions which involve the pledging of high amounts are taken in a more vigilant mode, and thus with the analytic thinking of System 2, compared to those that involve the pledging of small amounts. Accordingly, we formulate our third hypothesis as follows:

H3. The positive correlation of displayed passion with success is moderated by the high/low importance of the decision, i.e. when the amount of money pledged is high, the correlation of displayed passion with success will decrease.

3. Methods

3.1 Research design and sample

Crowdfunding is an ideal test bed for our theory. It provides a large amount of information on the choices of non-professional investors and on how these react to entrepreneurial presentations with different degrees of displayed passion. We draw our samples from Kickstarter, one of the largest and most prominent crowdfunding platforms at the time of the data collection. Kickstarter is a reward-based, all-or-nothing platform, which means that the funders pledge in exchange for rewards and that the money pledged is cashed-in only if it reaches the target amount asked by the creator at the start of the campaign. Each project on Kickstarter has a campaign webpage containing a verbal description of the project and a video presentation. We started from the universe of projects (successful and unsuccessful) posted and completed between January 2016 and September 2017.

⁶ Based on the statistics disclosed in the Kickstarter blog, these two amounts account for about 11% of the pledges and the \$100 pledge is the most-common amount pledged. <https://www.kickstarter.com/blog/trends-in-pricing-and-duration>. Accessed November 18, 2021.

We subsequently refined the sample as follows. First, since passion is a personal feature and one strictly linked to the identity of the entrepreneur (Cardon et al., 2009; Cardon et al., 2013), we restricted the sample to the campaigns that were presented in the form of entrepreneurial pitches. We did so by selecting only those projects narrated in the first person (i.e., using “I” or “we”). We did not consider projects presented in impersonal terms, on behalf of a legal entity, to which the construct of entrepreneurial passion would be inapplicable. Second, we restricted the sample to projects in the *technology* category with a minimum funding goal of \$25,000. By so doing, we avoided the inclusion of heterogeneous projects and projects with a clearly amatorial intention. \$25,000 is a reasonable seed-stage amount, and it has been used by previous studies (e.g., Steigenberger & Wilhelm 2018). Finally, we restricted the sample to projects with a sufficiently detailed description, excluding those explained with fewer than 100 words.⁷

The final sample consisted of 2,988 projects. In section 4.2, we present the robustness tests performed with respect to the choices of sample, including a replication test on a data sample from 2019-2020.

3.2 Variables and measures

To test our hypotheses, we operationalized project success with the variable *D_success*, a dichotomous variable equal to 1 if the amount raised meets or exceeds the funding goal. This variable well captures the all-or-nothing funding mechanism of Kickstarter. It is the standard variable used in studies on crowdfunding (see Butticiè et al., 2018) and it is preferable to the amount or percentage of capital collected, because the latter has typically a bi-modal distribution.

Our main explanatory variable is *passion* (*PASSION*). As Table 1 evidenced, the vast majority of

⁷ This cutoff corresponds to the 10th percentile of the distribution of project length. We test the robustness of the results to this choice by running supplemental analyses with all project, regardless of their length, and obtained consistent results.

previous studies have measured passion by means of human coding (Cardon et al. 2009b; Chen et al. 2009). This approach is impractical in the case of crowdfunding, given the large number of campaigns. For this reason, two recent studies on crowdfunding have relied on language analysis, i.e. on the analysis of verbal cues used in the texts of crowdfunding campaigns (Allison et al. 2017; Parhankangas and Renko 2017). In this paper, we take a similar approach, with two important improvements. First, whereas previous studies only considered words expressing a positive tone (Allison et al. 2017; Parhankangas and Renko 2017), using standard dictionaries of positive valence, we developed a full-fledged dictionary of passion in the context of crowdfunding pitches. Second, whereas previous studies analyzed all crowdfunding campaigns, we restricted the sample to comprise only those crowdfunding campaigns that assume the form of entrepreneurial pitches. The construction of our language-based measures of passion is explained step-by-step in the Appendix, where we also set out the methods used and the many tests performed to measure its validity. Here, we discuss a potential limitation of language analysis, i.e. the omission of non-verbal communication, such as the facial expressions and body language visible in the videos of the campaigns, and we explain what we did to ensure that this did not bias our estimates to an important extent. First, we checked that the language used in the video-pitches was not systematically different from the language contained in the textual descriptions of the campaigns. To this end, we transcribed a sample of videos and tested the *consistency* of our measure of passion computed on the verbal descriptions with the same measure computed on video transcripts, finding an acceptable level of correlation (41%) between the two measures of passion. Then we tested the *concurrent validity* of our language-based measure of passion with the passion expressed with non-verbal communication as in Chen et al. (2009). For this purpose, we randomly sampled 100 projects where the entrepreneurs appeared in person in the video pitches and had them manually coded by

two independent human raters using the scales of Chen et al. (2009).⁸ The human-rated measure of non-verbal passion obtained was correlated (40%) with our language-based measure of passion, suggesting the presence of *concurrent validity*, i.e. that our verbal-based measure of passion correlated well with the non-verbal measure of passion validated by Chen et al. (2009). Interviews with platform managers reported by previous studies (Defazio et al., 2021) revealed that a common users' behavior in crowdfunding is to look first at the title, blurb and/or the initial words of project descriptions, then start the video, watch it for a few seconds, and then scroll down to read more items of project description, while leaving the video on. This suggested that, in the crowdfunding context, verbal communication – the talking of the video and the textual description – has a non-secondary role with respect to the non-verbal communication potentially contained in the video. In conclusion, the screenings that we performed did not evidence systematic biases between verbal language used in project description and verbal language used in videos or between verbal and non-verbal language, suggesting that our language-based measure of passion is consistent with the construct of passion used in the previous literature. We refer the reader to the Appendix for further details.

Hypothesis 2 requires a measure of *preparedness (PREP)*. We built this measure using a language analysis that is germane to that of *PASSION*, and is also presented in the Appendix. To test hypothesis 3, we used a dummy equal to 1 if the minimum pledge available to backers was substantially high, i.e. more than \$100 (*D_minimum pledge*). The minimum pledge is, in fact, a good proxy for the importance that backers attach to their decision when evaluating a project. When the amount of money pledged is substantial, it is logical to assume that backers will pay closer

⁸ Inter-rater reliability was high (Krippendorff's alpha = 0.80). Cronbach's alpha was acceptable (0.89). We find a correlation of about 40% between perceived passion displayed in non-verbal language of videos and our dictionary-based measure of passion on project descriptions.

attention to the project, compared to cases in which the pledges are of a small amount. Obviously, what may constitute a substantial amount of money is difficult to determine, and it may vary from one person to another (Dehaene 1997; Monroe 2003). We here take advantage of the insights furnished by the literature on human cognition and biases in the perception of magnitude, which demonstrate that price sensitivity varies by the range set (Janiszewski and Lichtenstein 1999) and that humans are especially attentive to left-digits and to the rounding that affects the left-most digits, like e.g., from \$0.99 to \$1.00 or from \$99.99 to \$100.00 (Hinrichs, Yurko, and Hu 1981; Thomas and Morwitz 2005). We thus set the target at \$100.⁹ We then accounted for a set of control variables identified by previous studies as the determinants of crowdfunding success (e.g., Buttice et al. 2018). These are: the project funding goal (*Goal*), the project duration in days (*Duration*), the number of images and videos displayed on the project's webpage (*Visuals*), whether or not the project is shortlisted by the platform under the category "Projects we love" (*D_staff picked*), and the length of the project description expressed as the number of unique words (*Words*). The summary statistics and descriptions of all the variables are provided in Table 2. Table 3 reports the variable correlation matrix.

[Insert Table 2 and Table 3 about here]

For variables that had highly skewed distributions, we applied in our estimates the natural logarithmic transformation. We also standardized all continuous variables to obtain comparable coefficients in model estimates with variables with different distributions. Finally, we included in all models a set of dummy variables for different project sub-categories, and quarters of the years. The Variance Inflation Factors of the relevant variables were all below 2, indicating that multicollinearity was not a problem in our estimates.

⁹ Alternative thresholds are discussed in the robustness tests.

4. Results

4.1 Main model

To test our research hypotheses, we used a series of logit regression models where the dependent variable was *D_success*. Tables 4 reports the coefficient estimates computed with robust standard errors, clustered by country of the project. The constant term, a set of 15 dummies for project sub-categories, and 7 dummies for quarters were included in all estimates, although the coefficients are not reported for brevity.

[Insert Table 4 about here]

Model 1 of Table 4 reports the estimates of the baseline model, with only the control variables. The results are consistent with those of previous crowdfunding research. Specifically, we find a significant positive correlation of the number of *Words* contained in the project description, and the project *Duration* ($p < 0.01$), whereas the funding *Goal* of the project is negatively and significantly associated with project success ($p < 0.01$). Projects with a higher number of *Visuals* and projects that are featured as Kickstarter “staff picks” are also strongly positively associated with project success ($p < 0.01$).

Hypothesis 1 predicts a positive correlation between the display of *passion* and the success of a project. We tested H1 in Model 2, by including the variable *PASSION* (in logarithmic form) to the baseline model. The results supported the hypothesis, as indicated by the positive and significant coefficient of *PASSION* ($b = 0.141, p < 0.01$). The average marginal effects indicate that an increase of one standard deviation in the level of *passion* displayed in the project’s description is associated with a 1.04% increase in the probability of success (*D_success*). The estimates are consistent with H1, i.e. that at least some backers are responsive to the display of passion, which in turn marginally improves the success rate.

In model 3, we add our two moderator variables, *PREP* and the dummy *D_Minimum pledge*, in a step-wise logic. Model 3 shows that *PREP* is uncorrelated to project success, while *D_Minimum pledge* has a positive association ($p < 0.01$), but does not alter the estimates of passion, which remains positive and highly significant ($b = 0.138, p < 0.01$). Next, we test in Model 4 the interaction effects related to hypothesis 2 that the correlation of *passion* and success will be lower when it is displayed in the presence of low levels of *preparedness*, i.e. in a condition of incoherence/disfluency. The coefficient of the interaction of *PREP* and *PASSION* indicates an average positive and weakly significant association ($b = 0.101, p < 0.1$). However, the interaction cannot be directly interpreted from the coefficient, given the non-linear nature of the logit regression. To investigate further, we looked at the marginal effect of *PASSION* on the probability of success at different values of the variable *PREP*. The results are reported in Figure 1.

[Insert Figure 1 about here]

The figure indicates that, at very low levels of *preparedness*, *PASSION* is not correlated to *D_success* (95% confidence bars are above and below zero). At levels of *preparedness* approximately equal to -0.1 or higher (equivalent to the 25th percentile of the distribution), the correlation becomes positive and significant. The magnitude of the *PASSION* coefficient at high levels (approximately equal to 1.5, equivalent to the 95th percentile) of *preparedness* corresponds to an increase of approximately +2% in the probability of success (see Figure 1) for one standard deviation increase of *PASSION*. This means an increase of 16.5%¹⁰ in the average probability of success at high levels of *PREP*. Overall, the results appear consistent with H2, i.e., that *passion* has a stronger positive correlation with *success* when it is displayed in situations of high coherence,

¹⁰ From a positive association of *PASSION* with success equal to 0.121 when *PREP* is null, to 0.141 when *PREP* is high.

while it does not correlate with success if it is displayed in situations of *incoherence/disfluency*, i.e. at low levels of *preparedness*.

Finally, model 5 investigates our hypothesis 3, which expected a decrease in the correlation of *PASSION* on project success when the decision is important for the backer. In order to test it, we must compare the correlation of passion and *success* when the minimum pledge is high (above \$100) as opposed to when it is low (below \$100). The bottom rows of Model 5 in Table 1 reports the average marginal effects of *PASSION* at the two different values of the dummy *D_Minimum pledge* for model 5. When the decision is of *high importance*, (minimum pledge \geq \$100), we do not find any significant correlation between *PASSION* and the probability of success. When, instead, the decision is of *low importance* (minimum pledge below \$100), the coefficient of *PASSION* is positive and significant ($p < 0.05$). Thus, we find support for H3.

In section 5, we discuss the implications of these results.

4.2 Robustness tests

We performed several additional tests to check the robustness of our estimates. They generally confirmed the results of our original estimates. We report selected results of these robustness tests in Table A.1¹¹ in the Appendix.

First, because passion may be displayed and depicted differently among different cultures, we restricted the sample to projects launched only in the USA (83% of our sample), finding results consistent with our main models (Table A.1, models 1-3). Additionally, we controlled for proponents' location fixed effects, by retrieving project creators' locations from their profile pages. This information was available for only 61% of the projects in our original sample. Two countries accounted for the vast majority of the projects (77% of the creators were in the USA and 11% in

¹¹ We report, for brevity, the results of our full model (Col. 3, Table 1) and the interactions of *PASSION* with *PREP* and *D_Minimum pledge* respectively.

the UK), whereas the rest of the project proponents were spread among other countries. When we add to our models two dummy variables identifying creators' nationality (d_{US} and d_{UK}), we obtained results consistent with our original estimates (Table A.1, models 4-6).

Second, we tested whether the results were robust to the specific period of observation used. Consequently, we self-replicated the study on a sample of Kickstarter projects in the same Technology category and launched in the period 2019-2020 (i.e. prior to the onset of the Covid-19 pandemic in the Western countries). This robustness test confirmed our main results (Table A.1, models 7-9), providing evidence that they were invariant to the choice of time frame.

Third, we tested whether the results were robust to our choice of limiting the analysis to projects with target amounts of at least \$25,000. We did so by re-running the estimates with alternative cut-off points at \$20,000 and \$30,000, obtaining similar results.

Fourth, we tested the robustness of the results to our choice of considering pledges of \$100 or more as highly important. We re-ran the regressions using as alternative cutoff points the minimum pledges of \$50, \$150, and \$200, obtaining similar results.

Lastly, we tested the robustness of the estimates to the choice of excluding from our original sample those projects with short project descriptions (fewer than 100 words). By re-including projects with fewer than 100 words in the analysis, we obtained results similar to our main estimates. The results of the last three sets of robustness tests are not reported for the sake of brevity, but are available upon request from the authors.

5. Discussion and conclusion

5.1 Overview

In this paper, we have presented a new theory framework explaining the role of displayed passion in the evaluation of entrepreneurial projects. We performed a theoretical integration (Nadkarni et

al. 2018) between the theory of *entrepreneurial passion* and the *dual information processing theory* of human judgment (Epstein 1994; Kahneman 2011; Sloman 1996). Moving away from the *unimodel* of passion (Chen et al., 2009), we theorized that *passion* is processed in the observer's mind along two possible routes. It is processed as an *information* item in analytical thinking (System 2), and as a *heuristic* in intuitive thinking (System 1) (Finucane et al. 2000; Schwarz and Clore 2007; Slovic et al. 2005a, 2002). This enabled us to theorize on the context conditions under which entrepreneurial passion can influence human judgments. Specifically, we predicted that passion would on average increase project success, but its effect would be stronger if displayed in conditions of high coherence/fluency and of low importance. It would conversely be weaker or vanish in conditions of incoherence/disfluency or when the decision is highly important.

We tested these contentions in the context of crowdfunding, an important research setting for studying non-professional funders who are exposed to entrepreneurial pitches with various degrees of displayed passion. In order to do so, we built an original sample of nearly three thousand crowdfunding campaigns posted in Kickstarter, and we measured passion through CATA on verbal project descriptions. This is an important methodological contribution of the paper, since CATA enables the study of passion in large-scale phenomena, such as the increasing usage of web-based fundraising. We proved the validity of our CATA measures with the language used in videos and with the non-verbal language displayed by entrepreneurs in video pitches, coded according to the scale devised by Chen et al. (2009).

The results of the empirical analyses performed are correlational (not strictly causal), but they all corroborate the predictions of the theory testing. Firstly, we found that passion is associated with a positive, albeit small (+1%), increase in funding success (H1).

Secondly, we found evidence corroborating our predictions that the correlation of passion and success is moderated by two contextual factors: i) incoherence/disfluency vs. coherence/fluency

and ii) high vs. low importance of the decision. We found that, when entrepreneurs send incoherent information (preparedness is low) and when the decision is very important (minimum pledges of money are large), the positive correlation between passion and funding success disappears (H2 and H3). Instead, the correlation between passion and success increases from 1% to 16% when passion is displayed in conditions of high coherence/fluency (preparedness is high). Finally, the correlation of passion with fundraising success remains moderate when the decision is unimportant (minimum pledges of money are small), corresponding to a 1.1% increase in the probability of success.

5.2 Theoretical implications

Our study makes two distinct contributions to the academic literature on entrepreneurial passion and crowdfunding. First, it contributes to the stream of research on entrepreneurial passion by providing a fundamental and much needed re-conceptualization of passion within the *dual theory* of information processing (M. Cardon et al. 2009; M. S. Cardon et al. 2009a; Chen et al. 2009). According to this theoretical framework, passion prompts a tentative positive judgment that can be used in the decisions to fund or not to fund an entrepreneurial project. This judgment can be prompted through the *affect heuristic* processed by *intuitive thinking* (System 1) and through *affect as information* processed by *analytic thinking* (System 2). However, *analytic thinking* (System 2) is not always active. When it is so, it has the power to revise and override the tentative judgments of System 1, resulting in either a positive or null appraisal of passion. The framework, furthermore, identified the contextual factors that concur to determine if and when System 2 will be active in the decision. The insights furnished by the new theory framework reconcile several of the inconsistencies that have emerged in previous empirical analyses, which we reviewed in Section 2.1. To illustrate, prior empirical studies based on conjoint analyses have reported a positive influence of passion. Our conceptualization does not contradict them, but they are consistent, for instance, with the use of passion in deliberate analytical reasoning by System 2. Moreover, several

works have investigated both passion and preparedness, finding that preparedness has a positive influence, but passion does not (e.g. Chen et al. 2009). However, with only one exception (Cardon et al., 2017), these works did not consider the moderating role of preparedness on passion that has been theorized in this paper. The moderating role has important scholarly implications because it can be used to re-test the results of previous analyses, as well as to inform the design of future ones. Furthermore, the prediction that passion plays a greater role in decisions that are not greatly important supports previous finding which indicated that passion was influential when the investors were providing non-decisive opinions, but it was not influential in deal closures (Cardon et al. 2009b).

Second, while previous studies of passion have primarily considered professional investors, like venture capitalists (Chen et al. 2009), business angels (Cardon, Mitteness, and Sudek 2017; Cardon et al. 2009b; Murnieks et al. 2016; Pollack et al. 2012), or both (Warnick et al. 2018), we have instead considered crowdfunding, a phenomenon characterized by non-professional investors and not widely investigated by scholars of passion (see Chan and Parhankangas 2017, and Li et al., 2017 for exceptions). Moreover, studying entrepreneurial passion in crowdfunding is important for two reasons. First, crowdfunding serves increasingly as a seed and early-stage source of finance (Colombo, Franzoni, and Rossi-Lamastra 2015; Mollick 2014), which is often the antecedent of investments by professionals (Roma, Messeni Petruzzelli, and Perrone 2017; Steigenberger and Wilhelm 2018; Buttice et al. 2020). Second, previous research has highlighted that experts and non-experts process information in different ways (Dane and Pratt 2007; Kahneman and Klein 2009). In our study, we found a positive correlation between passion and funding success in crowdfunding. A similar result has not been obtained by other studies involving experts, with the sole exception of the work by Mitteness and colleagues (Mitteness et al. 2012). Indeed, the dual information processing theory of affect helps us to explain this difference theoretically. Experts

cumulate information with repeated exposure¹², and each new experience produces information that updates the valence of prior affective stimuli (Kahneman and Klein 2009; Lord and Maher 1990). Negative experiences, for example, have a particularly strong impact and are able to provoke immediate alarm in people when similar situations arise (Kahneman 2011:237). It follows that the heuristics of experts are based on a larger and more comprehensive pool of information compared to the heuristics of non-experts in their specific domain of expertise (Kahneman and Klein 2009; Lord and Maher 1990). Thus, expert heuristics, although not exempt from biases, tend to be more accurate and valid than those of non-experts,¹³ and consequently less influenced by displayed passion than those of the crowd. It is therefore wrong to generalize findings on passion from expert audiences to non-professional ones. Our paper contributes to the understanding of passion in the funding decisions of non-experts.

5.3 Practical implications

Our findings also have several practical implications for entrepreneurs, crowdfunders, and platform managers. We found that passion has a positive influence on funding success, especially when displayed with high levels of entrepreneur preparedness. Our study also suggests that affective stimuli may be more important for funding decisions made by the crowd than for those made by traditional providers of seed finance, such as venture capitalists and business angels. Hence, we suggest that entrepreneurs launching a crowdfunding project should invest time and effort in crafting their project descriptions in a way that clearly conveys both their passion for the project and their preparation and ability to develop their businesses. They should also allow small pledges of money, as the displaying of passion may especially attract small sums (i.e., below \$100).

¹² Note that ‘experts’ in this literature are people with e.g. 10 years of experience (Lord and Maher 1990:15).

¹³ One caveat is that useful expert intuition can only be formed in reasonably predictable/regular environments that provide valid, not random, cues (Kahneman and Klein 2009).

This research is also a warning to potential contributors to crowdfunding campaigns, as it suggests that they should be aware of the risk of being blinkered by passion, even when wiser scrutiny may advise otherwise. Indeed, many projects fail to deliver what they promised because the proponents were overly optimistic about what they could achieve (Tenca and Franzoni, 2019). The caution applies also to angel investors and venture capitalists for the financing of crowd-funded ventures. Crowdfunding support is often seen as a proof of market viability (Roma, Messeni Petruzzelli, and Perrone 2017; Steigenberger and Wilhelm 2018; Buttice et al. 2020; Buttivè et al, 2021). Our results suggest instead that it may be also due to other factors, not necessarily indicative of market potential.

Finally, platform managers should advise entrepreneurs interested in launching projects on their websites to carefully design their project narratives in addition to campaign videos. These narratives should be long enough and display not only affective cues but also careful business planning (i.e., preparedness), since both are factors important for increasing campaign success.

5.4 Limitations and future research

The paper has some limitations that call for future improvements and further analyses. First, whilst our theory has several hypotheses that relate to the reasoning and decision-making of funders, our empirical investigation could only observe the decisions and not their mechanisms. Future studies could investigate the decision-making processes by examining mental processes more directly with experiments or by employing MRI and/or biometric analyses. Second, although we used a large number of observations that should have cancelled out random errors, we have ran a replication study and many validity checks on the measures (see Appendix), it nonetheless seems important to conduct future analyses with complementary metrics of non-verbal communication. Third, while we were able to capture with CATA measures of passion the intense positive feelings shown by the entrepreneur (one fundamental dimension of passion), we were not able to capture the identity

centrality dimension of passion, i.e., positive emotions felt by the entrepreneur in regard to activities that are essential to his/her self-identity (Cardon et al., 2013). Further studies could design experiments to capture the identity dimension of passion in crowdfunding and/or study the body language of video pitches in crowdfunding. Although we checked the concurrent validity of our measure of passion and the measure of Chen et al. (2009), which considers body language and facial expressions, future research can replicate our models on different measures or focus on different ways to express passion. Fourth, we have identified the display/lack of preparedness as a condition underlying coherence/fluency or incoherence/disfluency. Other such conditions might be relevant in different contexts, such as the commitment of personal finances on behalf of the entrepreneur (Cardon et al., 2017). We call for future work to investigate other factors in pertinent contexts. Finally, our study is based on a sample of projects retrieved from the US-based Kickstarter platform in two randomly chosen consecutive years (2016-2017) and self-replicated on two more consecutive years (2019-2020). Future studies could replicate our analysis with other samples (e.g., in different countries, cultures, etc..) and in different time periods in order to understand if/how the correlation of passion on crowdfunding varies and, therefore, test the generalizability of our results.

Future works may also want to investigate the generalizability of our findings to other entrepreneurial finance contexts besides reward-based crowdfunding. We speculate that the role of passion may be stronger especially in reward-based crowdfunding on the basis of dual processing theory. Crowdfunding is an environment characterized by non-experts investors, fast fundraising, limited disclosure of technical and financial information and no or few interactions between the investors and the entrepreneurs. In such a context, one may hypothesize a larger role of affect and intuitive thinking (System 1), and less opportunities to trigger the analytical thinking (System 2). For this reason, the moderation role of preparedness in reward-based crowdfunding may be weaker

than in other forms of crowdfunding (e.g., equity crowdfunding) and/or business angel/venture capital investing. Future research could further investigate these hypotheses.

Finally, one area in which future replication studies are especially welcome relates to testing the role of passion and, more generally, affect, in funding decisions during and after the COVID-19 pandemic. This study was performed before the end of the pandemic, banning this possibility. The pandemic years have reduced the number of crowdfunding proposals, and created restrictions and economic stagnation. Future studies could test the generalizability of our results in years of crisis and/or explore how *analytic* and *intuitive* thinking work in times of crisis. Emotional cues may be intuitively expected to have a bigger influence on people's information processing when they perceive themselves to be more vulnerable, such as during a pandemic. Furthermore, in times of economic crisis, even small pledges may become relatively more important for individuals. Economic turmoil, such as the one created by COVID-19, may prompt more screening of projects in all crowdfunding. These are only some examples of the predictions that may be made using the dual information processing theory of passion that we offered in this paper. We leave these speculations open to be tested by future research.

5.5 Conclusion

This paper has investigated the role of passion in crowdfunding by incorporating entrepreneurial passion into a *dual theory* of information processing. We have explored both theoretically and empirically the context factors that moderate the influence of displayed passion on funding success, i.e. incoherence/disfluency and the importance of the judgment for the decision-maker. The theory also helps reconcile the contradictory findings of previous studies and contributes to the broader ongoing debate in management studies concerning the role of affect in decisions of economic and managerial value (Ashkanasy et al. 2017; Baron 2008; Dane and Pratt 2007). Despite the limitations of the study, we are confident that its theoretical and practical discussion offer important

insights with which to advance understanding of the role of passion in funding decisions.

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Table 1. Review of results from empirical studies

Method	Article	Independent Variable: Passion	Measure of Affective Manifestation	Dependent Variable: Metric/ Decision maker	Effect found in empirical estimates
Cross-section	Chen et al. 2009	<i>Affective Passion</i>	6-items perceived passion scale	Investment decision / VCs	none
	Cardon et al., 2009b	<i>Affective Passion</i> <i>Affective Passion</i>	7-items perceived passion scale 7-items perceived passion scale	Interest during screening/ BAs Investment decision/ BAs	negative none
	Mittiness et al., 2012	<i>Perceived Passion</i>	2-items perceived passion scale	Assessment of funding potential/ BAs	positive
	Cardon et al., 2017	<i>Enthusiasm</i>	Chen et al. (2009) scale	Assessment of funding potential/ BAs	none
	Davis et al., 2017	<i>Affective Passion</i>	Chen et al. (2009) scale	Investment and predicted success/ Lab participants	negative
	Chan and Parhankangas, 2017	<i>Affective Passion</i>	Chen et al. (2009) scale	Average funding amount/ Crowdfunders	none
	Allison et al., 2017	<i>Positive Affective Tone</i>	positive tone dictionary Loughran and McDonald (2011)	Campaign success/ Crowdfunders	none
	Parhankangas and Renko, 2017	<i>Positive Affect Cues</i>	positive emotion words	Campaign success/ Crowdfunders	none
	Li et al., 2017	<i>Entrepreneurial passion</i>	6-items scale modified from Chen et al. (2009) & Vallerand et al. (2003)	Funding amount/ Crowdfunders	positive
	Oo. et al., 2019	<i>Perceived entrepreneurial passion</i>	Chen et al. (2009) scale	Campaign success/ Crowdfunders	positive
de Mol et al., 2020	<i>Average team passion, passion diversity among team members</i>	13-item scale developed by Cardon et al. (2013) (i.e. passion for inventing, developing and founding)	Quality of business plan; Type of funding and funding amount/ VCs, BAs	none/negative	
Conjoint	Hsu et al., 2014	<i>Entrepreneurial Passion</i>	HIGH passion vs. LOW passion	Assessment of funding potential/ VCs, BAs	positive, more important for angels
	Murnieks et al., 2016	<i>Entrepreneurial Passion</i>	OBSESSIVE passion vs. BALANCED passion	Assessment of funding potential/ BAs	positive
	Warnick et al., 2018	<i>Start-up passion</i>	HIGH passion vs. LOW passion	Probability of investment/ VCs, BAs	positive
	Shane et al., 2020	<i>Entrepreneurial Passion</i>	HIGH enthusiasm vs. LOW enthusiasm	Investor's interest/ Informal investors (i.e. family & friends, BAs)	positive

Table 2. Description of variables and summary statistics

Variable	N Obs	Mean	Std Dev	Min	Max	Description
D_success	2,988	0.19	0.39	0	1	Dummy=1 if the total amount raised is above or equal to the project funding goal, 0 otherwise
Backers	2,988	317	1,590	0	35,550	Number of backers that pledged to the project
PASSION	2,988	1.95	2.02	0	9.09	CATA metric computed with Diction 7 and custom-made dictionary of words denoting affective passion
PREP	2,988	3.39	2.80	0	12.58	CATA metric computed with Diction 7 and custom-made dictionary of words denoting preparedness
D_Minimum pledge	2,988	0.09	0.29	0	1	Dummy=1 if the minimum pledge is equal or above \$100
Words	2,988	320	201	43	1309	Number of unique words included in the project description
Duration	2,988	3.57	0.30	1.95	4.16	Project duration (days)
Goal	2,988	88,041	91,172	25,000	400,000	Project funding goal (USD)
D_staff picked	2,988	0.101	0.301	0	1	Dummy=1 if the project is featured as a Kickstarter “Project we love” project, 0 otherwise
Visuals	2,988	16.02	19.18	1	124	Number of pictures plus number of videos present in the project webpage
D_US	2,988	0.83	0.38	0	1	Dummy=1 if the project is located in the US, 0 otherwise

Table 3. Correlation matrix

	D_Success	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) PASSION	0.1469*	1							
(2) PREP	0.0454	-0.0054	1						
(3) D_Minimum pledge	-0.0309	-0.0534*	-0.0196	1					
(4) Words	0.4065*	0.2537*	0.1726*	-0.1257*	1				
(5) Duration	0.0361	-0.0378	0.0197	0.0219	-0.0054	1			
(6) Goal	-0.1475*	-0.0302	0.0087	0.0894*	-0.0484*	0.1274*	1		
(7) D_staff picked	0.4922*	0.1285*	0.0208	-0.0125	0.3162*	0.0172	-0.0109	1	
(8) Visuals	0.5663*	0.2085*	0.0835*	-0.1455*	0.6556*	0.0423	-0.1515*	0.3807*	1
(9) D US	0.0771*	0.0239	-0.0078	0.0143	0.0086	0.0088	-0.023	0.0425	0.0429

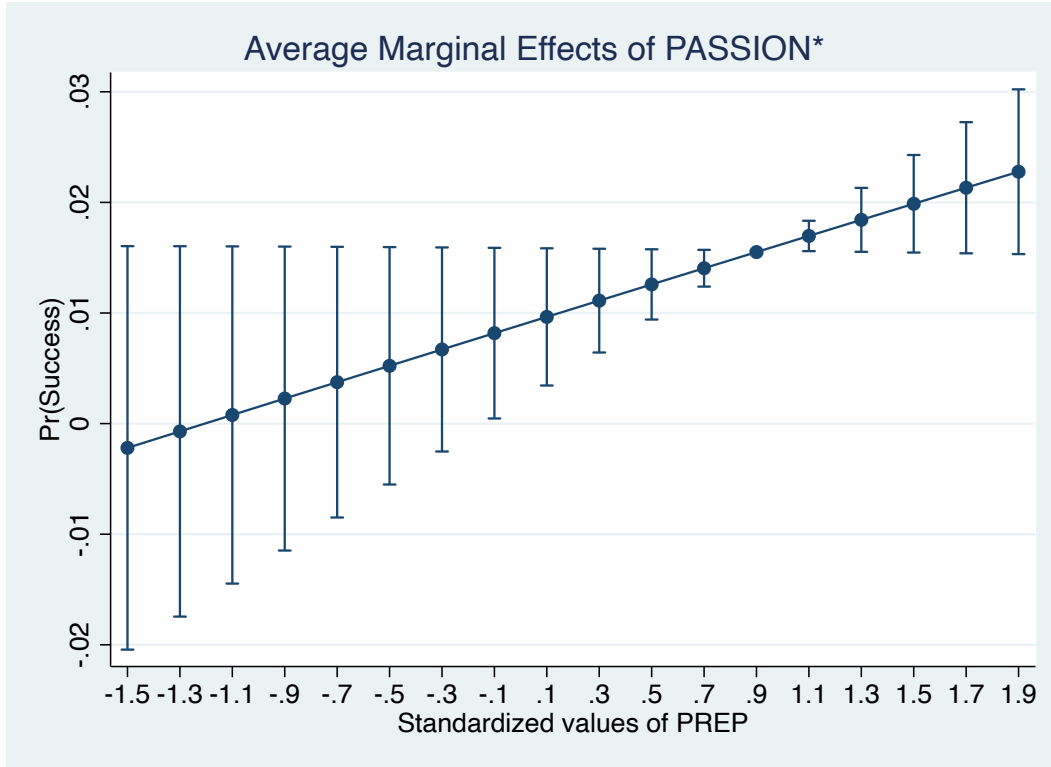
Significance level: * $p < 0.01$.

Table 4. Estimates results

	(1)	(2)	(3)	(4)	(5)
Words	0.783*** (0.164)	0.752*** (0.146)	0.766*** (0.146)	0.768*** (0.144)	0.766*** (0.145)
Duration	0.525*** (0.059)	0.544*** (0.080)	0.469*** (0.131)	0.462*** (0.118)	0.466*** (0.137)
Goal	-1.522*** (0.033)	-1.524*** (0.033)	-1.543*** (0.027)	-1.547*** (0.024)	-1.545*** (0.033)
D_staff picked	2.123*** (0.099)	2.101*** (0.100)	2.100*** (0.090)	2.094*** (0.093)	2.095*** (0.077)
Visuals	1.797*** (0.182)	1.789*** (0.180)	1.789*** (0.179)	1.794*** (0.182)	1.791*** (0.174)
D_US	0.590*** (0.037)	0.578*** (0.036)	0.576*** (0.036)	0.582*** (0.032)	0.575*** (0.035)
D_Minimum pledge			0.443*** (0.095)	0.450*** (0.097)	0.492*** (0.006)
PREP			-0.005 (0.033)	-0.026 (0.020)	-0.006 (0.036)
PASSION		0.141*** (0.036)	0.138*** (0.036)	0.121*** (0.047)	0.148** (0.057)
PASSION x PREP				0.101* (0.053)	
PASSION x D_Minimum pledge					-0.153 (0.331)
dummies of subcategory	yes	yes	yes	yes	yes
dummies of quarter	yes	yes	yes	yes	yes
Log-Likelihood	-700.750	-699.535	-698.530	-698.082	-698.449
Pseudo R-squared	51.290	51.375	51.445	51.476	51.451
No.	2,988	2,988	2,988	2,988	2,988
Marginal effects of PASSION at D_Minimum pledge=0 (<\$100)					0.011** (0.004)
D_Minimum pledge=1 (>=\$100)					-0.000 (0.022)

Models 1-5: coefficient estimates of logistic regression for the dependent variable D_success. Robust standard errors, clustered by D_US reported in parentheses. Average marginal effects of PASSION at low/high minimum pledge reported for model 5. Significance levels: *p<0.1, **p<0.05, *** p<0.01.

Figure 1. Average marginal effects of PASSION at different values of PREP



*95% Confidence Intervals

APPENDIX: METRICS OF AFFECTIVE PASSION AND PREPAREDNESS

In this appendix we: I) present, justify and test the choice of language-based measures of entrepreneurial affect; II) describe the generation of word lists of *affective passion* and *preparedness*, III) describe the content analysis algorithm used and IV) explain checks of measure validity.

I) Language-based measures. According to prior studies, entrepreneurial passion is conveyed by a mix of verbal communication (what the person says), and body language (gestures, and tune of voice) (Chen et al. 2009). Studies that looked at entrepreneurial pitches have typically used a mix of both, employing manual scorers with item scales (Cardon et al. 2009b; Chen et al. 2009). Studies that looked at crowdfunding have used only verbal communication conveyed by the proponent in the project description (Allison et al. 2017; Parhankangas and Renko 2017). In this study we follow the latter approach, albeit with substantial improvements compared to prior works. Compared to scores with item scales, the approach has three advantages: i) Avoiding human scorers biases, such as inter-rater agreement and transient errors (McKenny et al. 2018); ii) Enabling the use of large samples that cancel-out random errors; and iii) Avoiding problems of subjective weights to different items. The approach has the disadvantage of not using the videos of the campaigns as a source of information, potentially introducing two errors: i) omitting measures of non-verbal communication conveyed e.g., by gestures and tune of voice, and ii) potential discrepancy between language used in project description and screenplay of videos. The large sample used in the study would make the analyses robust to the presence of omitted variables or measurement errors, as long as these are randomly distributed. It would conversely be biased if the information contained in videos, which we omitted, differs *systematically* from the one contained in the project description. We consequently performed a number of checks to investigate whether or not this is the case. First, we

interviewed platform managers of crowdfunding. They revealed that the commonly observed behavior of users is to first look at the top part of a project page, reading the title, blurb or initial words, then start the video, watch it for about 10-15 seconds, then begin to scroll down and read pieces of project description, while simultaneously leaving the video on, without watching it. This suggests a primary role of language, as opposed to visuals, from videos (Defazio et al., 2021). Second, and consequently, we tested if verbal language used in project description is similar to that used in the video screenplays. To do so, we sampled 207 projects from the entire population, unwind the transcript of the screenplay, run measures of passion and test the consistency with correlation tests. The measures are correlated (41%), suggesting that the measurement error that we potentially include by looking at the project description and not at the video transcript is random and not a concern. Third, we measure perceived passion using the scale developed by Chen et al. (2009) on a sample of 100 project videos (this is a test of *concurrent validity* of our new verbal measure passion with the non-verbal measure of passion validated by Chen et al. 2009). This analysis was performed by two different raters. Cronbach's alpha was acceptable (0.89), compared to Chen and colleagues' 0.95. Inter-rater reliability was high (Krippendorff's alpha = 0.80). We find a correlation of about 40% (i.e. Krippendorff's Alpha = 0.36) between perceived passion displayed in videos and our dictionary-based measure of passion on project descriptions. The results are again correlated, suggesting that valence of verbal and non-verbal communication is similar.

Overall, we conclude that verbal communication can be used to measure passion, and there are no specific reasons to believe that the measurement error from omitting non-verbal communication introduces systematic biases.

II) Word lists of affective passion and preparedness. To conduct verbal analysis, we developed customized lists of word that express *affective passion* and *preparedness* in the context of

crowdfunding. This is a major improvement compared to prior studies, which have simply used measures of words expressing a positive tone (Allison et al. 2017; Parhankangas and Renko 2017). We did so following the methodology suggested by Short and colleagues (2010), which is presently considered the state-of-art approach, and adapted it to fit the context of crowdfunding. First, we generated inductively two separate word lists for *affective passion* and *preparedness*, starting from the definition of the two constructs given by Chen and colleagues (2009) and the passion scales of Cardon and colleagues (2009a) and Chen and colleagues (2009) and widely used by experimental studies of entrepreneurial passion. We expanded the two lists in several ways, with the aim of reaching a list of words as comprehensive as possible. We added to the *affective passion* word list the terms denoting “positive emotions” and “achievement” in the dictionaries of the software LIWC¹⁴ and the terms denoting “overstatement” (i.e., words indicating emphasis) from the Harvard-IV dictionary. We added to the *preparedness* word list terms denoting “insight” and “causation” (i.e., cognitive processes) and “quantifiers, numbers and money” (i.e., concrete language) from LIWC. Next, we used the Rodale’s synonym finder dictionary to expand each word list with synonyms (Rodale 1978, latest edition). Second, we used a deductive approach to enrich the lists. Specifically, we examined the descriptions of a large set of Kickstarter projects and added any terms denoting *affective passion* or *preparedness* that did not result already in our list. We continued iteratively, until the search reached saturation, i.e., when further searching resulted in no new words. For testing the validity of the word lists, we asked to two independent coders (one of the authors and a post-doc expert on entrepreneurial passion) to assess each word for coherence with the construct. Words disregarded by either one of the two coders were excluded from the final

¹⁴ The Linguistic Inquiry and Word Count (LIWC) program is a software used to identify in a text the percentage of words that reflect different emotions, thinking styles, social concerns, and parts of speech. LIWC was specifically developed by researchers in social, clinical, health, and cognitive psychology to capture people’s social and psychological states (<http://liwc.wpengine.com>).

lists. This independent coding resulted in an inter-rater agreement, corrected for the random chance of agreement (Krippendorff, 2004), equal to 0.93 for *affective passion* and 0.80 for *preparedness*, at least equal to the conventionally accepted threshold of agreement of 0.8 (Krippendorff 2004; McKenny et al. 2018).

III) Computer Aided Textual Analysis (CATA) of Entrepreneurial Passion. To compute the metrics in our sample, we run a CATA with the software Diction 7. The measure used by the software is based on the frequency of terms appearing in each text and belonging to the word list. A common problem of term-frequency measures is to account for and normalize documents of different lengths. Intuitively, longer documents have more chances to contain terms in word lists, but they are also less likely to be read entirely. This is particularly true for web-based content, such as the one examined here, because long texts require scrolling down. The appeal of Diction 7 is that it runs an iterative normalization algorithm particularly suitable to treat such case.¹⁵ Intuitively, the software computes first a term frequency of the initial segment of 500 words in each document, then adds the next 500 words and re-computes term frequency on the initial 500+500 words, then continues iteratively until the end of the document. The final score is computed as the rolling average of the scores in each iteration, such that each sequence of 500 words has decreasing weights as it appears in blocks towards the bottom of the page.

IV) Metrics validity. Following Short and colleagues (2010), we refined and tested the CATA measures in several ways. First, we tested a sample of software-generated metrics against human assessment. This screening suggested eliminating a number of words with ambivalent meanings that caused biases in the software measures. The final word lists include 465 terms for *affective passion* and 409 terms for *preparedness*. Sample words included in the *affective passion* word list

¹⁵ See the [Diction 7 Manual](#): Unsegmented Average option for long files.

are: ‘achieve, amaze, committed, enthusiastic, inspired, tenacious. Samples of words included in the *preparedness* word list are: ‘analyze, certify, evaluate, examine, plan, test’. The full lists are available upon request by the authors.

Second, we tested the concurrent validity of our metrics by computing the correlation against other constructs that should be logically related to affective passion and preparedness and for which a dictionary is already provided in Diction 7.¹⁶ Specifically, we expected *affective passion* to be positively correlated with “Satisfaction” (i.e., language highlighting positive affective states, pleasurable diversion, and moments of triumph), “Optimism” (i.e., language denoting positive entailments of a person, a group, a concept or an event) and “Tenacity” (i.e., language expressing confidence and totality), while we expected *preparedness* to be positively correlated with “Cognitive Terms” (i.e., language highlighting cerebral processes, both functional and imaginative, such as modes of discovery, mental challenges, and institutional learning practices, as well as the following three forms of intellection: intuitional, rationalistic, and calculative), “Accomplishment” (i.e., language expressing task-completion and organized human behavior) and “Activity” (i.e., language featuring action and change, the implementation of ideas and the avoidance of inertia). The results indicated strong correlation and reassured us about the concurrent validity of the measures.

¹⁶ We tested the affective passion and preparedness word lists using Diction 7 (instead of LIWC) dictionaries since we partially used LIWC dictionaries to generate the lists in the preliminary phase, thus such a test would have simply resulted in a straightforward positive correlation. Moreover, in this way, we prove the validity of the word lists across different validated measures.

APPENDIX: ROBUSTNESS TESTS

Table A.1 Robustness tests

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Sample US only			Creators' location FE			Sample 2019-2020		
Words	0.678** (0.334)	0.680** (0.333)	0.678** (0.332)	0.790*** (0.015)	0.792*** (0.017)	0.792*** (0.026)	0.420*** (0.086)	0.420*** (0.085)	0.420*** (0.087)
Duration	0.373 (0.971)	0.377 (0.967)	0.378 (0.981)	0.428 (0.683)	0.433 (0.671)	0.422 (0.629)	-0.306*** (0.033)	-0.307*** (0.032)	-0.307*** (0.034)
Goal	-1.526*** (0.162)	-1.532*** (0.162)	-1.525*** (0.164)	-1.641*** (0.066)	-1.642*** (0.064)	-1.647*** (0.052)	-2.157*** (0.210)	-2.157*** (0.211)	-2.157*** (0.209)
D_staff picked	2.054*** (0.148)	2.048*** (0.147)	2.056*** (0.145)	2.054*** (0.083)	2.057*** (0.085)	2.039*** (0.054)	3.902*** (0.055)	3.907*** (0.061)	3.904*** (0.047)
Visuals	1.903*** (0.226)	1.909*** (0.228)	1.902*** (0.226)	1.638*** (0.014)	1.636*** (0.016)	1.642*** (0.010)			
D_US							0.510*** (0.014)	0.510*** (0.014)	0.511*** (0.012)
D_Creator_US				0.212*** (0.031)	0.210*** (0.032)	0.212*** (0.029)			
D_Creator_UK				0.219*** (0.019)	0.220*** (0.020)	0.219*** (0.020)			
D_Minimum pledge	0.509*** (0.170)	0.517*** (0.173)	0.487** (0.233)	0.736*** (0.170)	0.734*** (0.171)	0.849*** (0.287)	0.577*** (0.016)	0.578*** (0.016)	0.576*** (0.018)
PREP	0.017 (0.105)	-0.011 (0.102)	0.018 (0.105)	0.040 (0.072)	0.050 (0.073)	0.038 (0.071)	-0.054 (0.050)	-0.054 (0.051)	-0.054 (0.049)
PASSION	0.118** (0.049)	0.095* (0.053)	0.114** (0.050)	0.056*** (0.013)	0.063*** (0.007)	0.080*** (0.020)	0.067*** (0.024)	0.066*** (0.026)	0.056*** (0.002)
PASSION x PREP		0.129 (0.083)			-0.038 (0.024)			0.018 (0.025)	
PASSION x D_Minimum pledge			0.066 (0.266)			-0.319 (0.387)			0.064 (0.144)
dummies of subcategory	yes	yes	yes	yes	yes	yes	yes	yes	yes
dummies of quarter	yes	yes	yes	yes	yes	yes	yes	yes	yes
Log-Likelihood	-590.837	-590.197	-590.824	-458.703	-458.662	-458.429	-431.539	-431.522	-431.509
Pseudo R-squared	52.242	52.294	52.243	46.370	46.375	46.402	44.832	44.834	44.836
No.	2,469	2,469	2,469	1,819	1,819	1,819	1,846	1,846	1,846

Marginal effects of PASSION at			
D_Minimum pledge=0 (<\$100)	0.009**	0.006***	0.004***
	(0.004)	(0.002)	(0.000)
D_Minimum pledge=1 (>=\$100)	0.014	-0.022	0.010
	(0.020)	(0.055)	(0.012)

Models 1-9: coefficient estimates of logistic regression for the dependent variable D_success. Models 1-3: sub-sample of projects launched in the USA. Columns 4-6: additional controls for project creators' location (i.e., dummies D_US and D_UK). Models 7-9: self-replication study on sample of Kickstarter Technology projects launched in the period 2019-2020, number of visuals not available for this period. Robust standard errors reported in parentheses. Average marginal effects of PASSION at low/high minimum pledge reported for models 3, 6, 9. Significance levels: *p<0.1, **p<0.05, *** p<0.01.