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The power of positivity? The influence of positive psychological capital language on crowdfunding performance

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ABSTRACT

We extend the entrepreneurship literature to include positive psychological capital — an individual or organization's level of psychological resources consisting of hope, optimism, resilience, and confidence — as a salient signal in crowdfunding. We draw from the costless signaling literature to argue that positive psychological capital language usage enhances crowdfunding performance. We examine 1726 crowdfunding campaigns from Kickstarter, finding that entrepreneurs conveying positive psychological capital experience superior fundraising performance. Human capital moderates this relationship while social capital does not, suggesting that costly signals may, at times, enhance the influence of costless signals. Post hoc analyses suggest findings generalize across crowdfunding types, but not to IPOs.

1. Executive summary

The rapid rise of crowdfunding provides entrepreneurs with a new and important means of raising funds for the creation of new ventures or the development of new products. Indeed, annual investments in crowdfunded projects now exceed \$34 billion (Massolution, 2015) and are expected to soon overtake venture capital as the leading provider of startup funding (Barnett, 2015). Research examining entrepreneurial fundraising efforts, including crowdfunding, has frequently drawn from signaling theory as a means to understand investment transactions between investors and entrepreneurs (e.g., Ahlers et al., 2015; Vismara, 2016). Signaling theory contends that investors prefer to act on information that is costly because costly signals are believed to be indicative of higher firm quality, while costless signals will be ignored because they can be sent by both high- and low-quality firms (Connelly et al., 2011). This assertion appears to run counter to decades of leadership research suggesting that individuals project a number of attributes indicative of successful leaders (e.g., confidence, optimism, or resolve). These attributes, although costless from a signaling perspective, allow individuals to attract support for their cause and improve perceptions of the quality of their organization (e.g., Avey et al., 2011; Conger, 1991). Therefore, such qualities could possibly serve as influential signals in investment contexts.

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Costless signaling provides a theoretical lens that bridges the gap between signaling theory culled from the finance literature and traditional leadership perspectives. Costless signaling supports the general idea that investors would prefer costly signals, but suggests that signals bearing little cost to acquire can be influential under certain conditions. Specifically, less costly signals are influential when objective information is very scarce (e.g., Lin et al., 2013), when there is a lack of explicit behavioral norms for a given context (e.g., Danilov and Sliwka, 2016), and when an audience is unsophisticated (e.g., Loewenstein et al., 2014). These three conditions epitomize crowdfunding, suggesting that less costly signals might be particularly valuable in crowdfunding contexts.

We identify language indicative of positive psychological capital — an individual or organization's level of psychological resources consisting of hope, optimism, resilience, and confidence (Luthans et al., 2004) — as an important costless signal in crowdfunding. Signaling positive psychological capital would portray an entrepreneur that is confident, resilient, motivated, and otherwise positively oriented toward taking the needed steps to achieve their goals. Specifically, we seek to answer two research questions: 1) *To what extent, if any, do displays of positive psychological capital influence fundraising performance in crowdfunding?* 2) *Do costly signals of quality — social capital and human capital — alter the relationship between displays of positive psychological capital and crowdfunding performance?*

We investigate our research questions by examining 1726 crowdfunding campaigns from Kickstarter—one of the world's largest rewards-based crowdfunding platforms. Our results indicate that increasing the use of positive psychological capital language leads to greater crowdfunding performance. Signaling human capital strengthens this relationship, but signaling social capital does not. We also examine how our primary finding, that positive psychological capital language leads to greater crowdfunding performance, generalizes to another crowdfunding context (i.e., debt-based crowdfunding) and to a traditional investment context (i.e., IPOs). We find that that positive psychological capital language facilitates greater performance when raising funds through debt-based crowdfunding platforms, but has no influence in IPOs.

Our findings offer three contributions. First, we demonstrate that crowdfunding investors value costless signals differently than traditional investors and are comfortable using such signals to make investment decisions. Second, we add to the growing literature examining the interaction of signals by investigating how social and human capital alter the effect of displayed positive psychological capital on crowdfunding performance. While past literature has examined the interactions of costly signals (e.g., Plummer et al., 2016; Stern et al., 2014), we provide the first analysis explicitly highlighting how costless and costly signals may work together to influence entrepreneurial fundraising efforts. Third, our work adds to the literature examining how 'people-related' capital influences entrepreneurial outcomes by showing how key forms of such capital may work together to facilitate fundraising.

2. Introduction

Crowdfunding has ushered in an era of democratized fundraising for entrepreneurs and inventors alike (Mollick and Nanda, 2016; Short et al., 2017). The rapid proliferation of crowdfunding across the globe has led to a substantial increase in interest among entrepreneurship researchers in recent years (e.g., Davis et al., 2017; Mollick, 2014; Parhankangas and Renko, 2017). Work in crowdfunding has sought to determine the drivers of crowdfunding performance as well as the theoretical and practical implications of crowdfunding to entrepreneurship (McKenny et al., 2017). Research interest in this phenomenon comes at a time where the dollar amount of crowdfunding has surpassed \$34 billion in annual investments (Massolution, 2015) and is expected to soon surpass venture capital as the leading provider of startup financing (Barnett, 2015).

Signaling theory (Spence, 1973, 2002) has been a preeminent theory in explaining financial transactions in entrepreneurial fundraising (e.g., Davila et al., 2003; Kirsch et al., 2009; Ozmel et al., 2013), including crowdfunding (e.g., Ahlers et al., 2015). Signaling theory suggests that the value of a signal — activities or attributes of individuals or organizations that alter the beliefs of, or convey information to, others in a market (Spence, 1974) — is directly related to the cost to realize and send that signal (Connelly et al., 2011). Investors prefer to rely on costly signals given their ability to create a separating mechanism between higher and lower quality firms (Bergh et al., 2014). Conversely, less costly signals are of lower value because they are easier for both high- and low-quality firms to produce, and hence easier to imitate (Connelly et al., 2011). For example, a venture with prestigious 'blue-chip' executives signals higher firm quality to prospective investors given the costly, difficult-to-imitate nature of this signal (Pollock et al., 2010). In contrast, signals such as founders' statements regarding their motivation or optimism to start a new venture will be less impactful because it is not costly to make such statements and it is easier for another founder or firm to imitate.

While the importance of costly signals is well established in the fundraising process, the general predictions of signaling theory run counter to decades of leadership research indicating that projecting attributes indicative of a successful leader, such as charisma, confidence, optimism, or resolve, enables individuals to attract support to their cause (e.g., Avey et al., 2011; Conger, 1991; LePine et al., 2016). Although they do not generally use a signaling theory lens, work in leadership finds that projecting such attributes enhances perceptions of an individual's capability of achieving important goals, an individual's authenticity, and of the quality of the organization or cause in which they lead (e.g., Avey et al., 2011; Awamleh and Gardner, 1999; Jensen and Luthans, 2006). Consistent with this research, a smaller stream of work in entrepreneurship notes that investors will base investment decisions, in part, on their own subjective impressions of an entrepreneur's motivation and abilities irrespective of cost (e.g., Martens et al., 2007; Parhankangas and Ehrlich, 2014). Such work indirectly implies that costless information, such as entrepreneurial passion, positively influences investment decisions in certain settings (e.g., Li et al., 2017). Taken together, these literature streams suggest that projections of qualities indicative of successful leaders may act as signaling mechanisms that influence organizational assessments even though these signals bear little cost.

An important theoretical lens that allows us to bridge the gap between signaling and leadership perspectives is costless signaling. Costless signaling supports the central arguments of traditional signaling theory, but suggests that signals bearing little to no cost to

acquire can nonetheless be influential under certain conditions. Costless signals (also referred to as low-cost signals) are particularly influential when objective information about the firm is unavailable (e.g., Lin et al., 2013), when there are fewer explicit norms of behavior in a given context (e.g., Danilov and Sliwka, 2016), and/or when an audience lacks sophistication (e.g., Loewenstein et al., 2014). Under these conditions, costless signals manifest as instrumental information that can shape impressions and beliefs about the abilities of another party (Prendergast, 2002; Trager, 2016). Costless signals, then, might be particularly important in crowdfunding where objective information concerning a venture is exceedingly scarce, investors have less-established vetting processes compared to more traditional fundraising settings, and investors are less sophisticated.

To begin narrowing the gap between what we know and what we need to know concerning how costless signals influence crowdfunding performance, we examine how displays of positive psychological capital communicate quality in crowdfunding campaigns and impact crowdfunding performance. Specifically, we seek to answer the research question: *To what extent, if any, do displays of positive psychological capital influence fundraising performance in crowdfunding?* Positive psychological capital is defined as an individual or organization's level of psychological resources and consists of four dimensions — hope, optimism, resilience, and confidence (Avey et al., 2011; Luthans et al., 2004). Crowdfunding appeals conveying positive psychological capital would provide insight into an entrepreneur's temperament and highlight aspects of each dimension, such as an entrepreneur that is hopeful about achieving organizational goals, optimistic about the future, resilient in the face of adversity, and confident in his/her abilities. Communicating these qualities involves no explicit cost, but still conveys desirable qualities concerning entrepreneurs launching a new firm or product. Further, entrepreneurs higher in positive psychological capital are perceived as more authentic (Jensen and Luthans, 2006), which may be particularly important in crowdfunding where investors and entrepreneurs often lack established relationships.

While signaling research has largely examined important signals in isolation (Connelly et al., 2011), signals rarely occur in isolation in practice (Drover et al., 2018; Plummer et al., 2016; Stern et al., 2014). As such, understanding the importance of positive psychological capital as a costless signal also requires an understanding of its importance with respect to other signals, in particular, costly signals. Therefore, we seek to explore a second research question: *Do costly signals of quality — social capital and human capital — alter the relationship between displays of positive psychological capital and crowdfunding performance?* We focus on social and human capital because both are well-established costly signals important to entrepreneurial fundraising (e.g., Ahlers et al., 2015; Baum and Silverman, 2004). Because signaling theory contends that costly signals are considerably more important than costless signals in influencing investment decisions, it is possible that costly signals could weaken or nullify the influence of costless signals. However, both types of signals provide information in a noisy environment (i.e., where information asymmetry is high), thus it is also possible that the signals may work together to reduce information asymmetries similar to how costly signals work together to promote investment (e.g., Plummer et al., 2016). Further, because some investors believe that costless signals are less credible, the inclusion of costly signals in tandem with costless signals may provide evidence that the costless signals are indeed credible, strengthening their influence.

We probe our research questions by examining how using language indicative of positive psychological capital in 1726 crowdfunding campaigns culled from Kickstarter — one of the world's largest rewards-based crowdfunding platforms — influences crowdfunding performance. After conducting our primary analysis, we provide a post hoc analysis to examine whether the positive psychological capital-performance relationship generalizes across crowdfunding contexts (i.e., across rewards-based crowdfunding and debt-based crowdfunding contexts). Because crowdfunding platforms attract different types of projects as well as offer differing incentives to potential investors, generalizing findings from one type of crowdfunding to another cannot be taken for granted (McKenny et al., 2017). Therefore, there is a need to examine the generalizability of results found in one crowdfunding context to another. We then further extend this investigation by evaluating the role of positive psychological capital in initial public offerings (IPOs), providing a rare comparison of traditional versus emerging funding mechanisms as well as providing insight into important boundary conditions for our findings.

Our work provides important implications for several literatures. First, developing positive psychological capital as a salient costless signal in crowdfunding illuminates a potential boundary condition to our understanding of how investors value and use information. While investors operating in traditional financing contexts, such as venture capital, have placed little value on costless signals (e.g., Chen et al., 2009), the crowdfunding setting strongly resembles the conditions for which such signals should be valuable. Indeed, recent work in crowdfunding implies language-based costless signals shape performance (e.g., Allison et al., 2013; Davis et al., 2017; Parhankangas and Renko, 2017), although the literature has yet to explicitly address the role of costless signals in crowdfunding. Our study demonstrates that crowdfunding investors value costless signals differently than traditional investors and that crowdfunding are comfortable making decisions based on these signals. In doing so, we also advance attributes of successful leaders (i.e., positive psychological capital) as an overlooked type of costless signal that may influence perceptions of organizational quality. Second, scholars have called for deeper inquiry into how important organizational signals interact (e.g., Drover et al., 2018; Plummer et al., 2016; Stern et al., 2014). We answer this call by developing theory concerning the interplay between costless and costly signals and exploring how an entrepreneur's social and human capital may alter the effect of displayed positive psychological capital on crowdfunding performance. Thus, we provide a first examination of how costly signals interact with costless signals to influence entrepreneurial fundraising efforts. Third, we add to the literature examining the importance of 'people-related' capital in entrepreneurship. Studies laying the foundation for positive psychological capital include human and social capital as other critical types of capital (e.g., Luthans et al., 2004; Luthans and Youssef, 2004) and numerous studies have shown that all three forms of capital play an important role in entrepreneurship (e.g., Baron et al., 2016; Davidsson and Honig, 2003). Our work adds to the literature examining how 'people-related' capital influences entrepreneurial outcomes by showing how key forms of 'people-related' capital work together in facilitating important outcomes, such as acquiring needed resources.

3. Crowdfunding performance

Crowdfunding research to date has primarily focused on the drivers of crowdfunding performance (Short et al., 2017). On rewards-based platforms, crowdfunding performance typically refers to the amount of total funds raised or the ability of campaigns to meet their funding targets in a finite timeline (e.g., Allison et al., 2017). Investors in this context pledge a specific dollar amount toward a crowdfunding campaign in exchange for some reward in the future (e.g., merchandise, the product itself, or insight into product development). Crowdfunding campaign characteristics such as the inclusion of a video, funding goal, campaign length, and project category all influence the performance of the crowdfunding campaign (Mollick, 2014). Additional research has begun to show that firm orientations may influence crowdfunding performance. For example, sustainability orientation promotes crowdfunding performance for social ventures (Calic and Mosakowski, 2016). Work in crowdfunding has also illustrated the importance of language use in communicating important information about an entrepreneurial firm (e.g., Allison et al., 2015; Parhankangas and Renko, 2017). For example, in crowdfunded microfinance, investors respond to language highlighting the venture as an opportunity to help others (Allison et al., 2015). Finally, information providing insight into the abilities and motivation of the entrepreneur also enhances crowdfunding performance. For example, entrepreneurial passion (Li et al., 2017), social networks (e.g., Colombo et al., 2015), and human capital (e.g., Ahlers et al., 2015) may all promote crowdfunding performance.

3.1. The salience of costless signals in examining crowdfunding performance

Signaling theory argues that organizations send signals that communicate the quality of the organization to key outside stakeholders such as investors (Certo, 2003; Pollock et al., 2010). Investors then choose to invest largely based on perceived organizational quality. Traditionally, the cost to acquire and send a signal has been viewed as the key mechanism that separates high-quality signalers from low-quality signalers (Connelly et al., 2011). For example, Spence's (1973) seminal work on signaling proposed that the costs associated with acquiring an education make it a meaningful signal when determining job applicant quality. As such, the costliness of signals has served as a key component in research focusing on traditional financing transactions (e.g., Busenitz et al., 2005). Because signals bearing little to no cost should have minimal value in communicating quality information about a firm, they should have little value in helping investors in separate high quality firms from low quality firms (Bhattacharya and Krishnan, 1999; Crawford and Sobel, 1982). For instance, Chen et al. (2009) demonstrated that entrepreneur preparedness for business plan presentations, which is indicative of the time, effort, and resources invested into the company, leads to more positive evaluations from venture capitalists. However, entrepreneurial passion — affective emotional displays that signaling theory would deem costless — has no influence on venture capitalist evaluations.

Although costly signals have been the primary focus of signaling research, an emerging stream of signaling research has identified contexts in which costless signals transmit important information about a firm to investors (Danilov and Sliwka, 2016; Martí and Balboa, 2007). Costless signals are particularly useful under three conditions: when there is an absence of objective information concerning a firm (e.g., Lin et al., 2013), when there are fewer explicit norms of behavior in a given context (e.g., Danilov and Sliwka, 2016), and when an audience lacks sophistication (e.g., Loewenstein et al., 2014). In such cases, costless signals may be used to make quality judgments about a firm. Notably, work in costless signaling has identified types of language use or statements from organizational leaders as key costless signals that may be used to evaluate a firm (e.g., Guillamon-Saorin et al., 2017). It is important to note that although language-based signals may be 'costless' in that they do not incur an explicit cost to realize and send, these signals may indeed have other associated costs (Payne et al., 2013). For example, if these signals are disingenuous or misleading, a firm may incur substantial costs in terms of a damaged reputation, legal costs, or lost customers.

To date, crowdfunding research has yet to explicitly leverage costless signaling as an important theoretical lens despite the potential value this perspective holds for understanding crowdfunding performance. While more costly signals, such as the inclusion of a professionally developed video, past entrepreneurial success, previously successful crowdfunding campaigns, or product prototype (e.g., Courtney et al., 2017; Devaraj and Patel, 2016), are important to crowdfunding performance, costly signals are likely rarer than in traditional funding contexts given that ventures are in the earliest stages of formation and that crowdfunding appeals are presented online (Agrawal et al., 2014). In addition, investments are much smaller compared to more traditional fundraising contexts, and thus carry less financial risk. Further, because individuals supporting crowdfunding campaigns often have little to no investment experience, they generally do not conduct any formal vetting of the venture (Ahlers et al., 2015). In sum, crowdfunding often occurs in the absence of objective information concerning a firm, where there are fewer explicit norms of behavior (i.e., no formal vetting requirements), and investments are mostly made by unsophisticated investors. As such, crowdfunding epitomizes the conditions under which costless signals may prove influential to investors, thereby influencing crowdfunding performance. To further understand how costless signals may influence crowdfunding performance, we introduce positive psychological capital language as an important costless signal.

3.2. Positive psychological capital as a costless signal

Positive psychological capital spans numerous streams of inquiry such as organizational behavior, human resource management, and entrepreneurship (Baron et al., 2016; Luthans et al., 2007). At the individual level, positive psychological capital influences organizational commitment, coping, performance, and the likelihood of achieving important goals (Avey et al., 2011; Luthans et al., 2007). At the organizational level, positive psychological capital influences innovativeness and firm performance (McKenny et al., 2013; Memili et al., 2014). Overall, a growing body of research documents the influential role of positive psychological capital in

individual and organizational outcomes (Avey et al., 2010).

Positive psychological capital is defined as the positive psychological resource stock of an organization and is composed of four dimensions: hope, optimism, resilience, and confidence (McKenny et al., 2013). In contrast to human and social capital, which embody ‘what you know’ and ‘who you know’ respectively, positive psychological capital embodies ‘who you are’ (Hmieleski et al., 2015; Luthans et al., 2004). Hope is concerned both with the motivational energy to pursue a goal and the ability to proactively and effectively plan to meet these goals (Luthans et al., 2007), and has been linked to increases in managerial performance, an entrepreneur’s leadership capabilities, and employee achievements (e.g., Jensen and Luthans, 2006; Peterson and Luthans, 2003). Optimism refers to expectancies about future outcomes and attributions about past outcomes (Luthans et al., 2004). Individuals higher in optimism tend to expect positive things to occur in the future (Carver and Scheier, 2002). Optimism has been linked to employee performance (e.g., Luthans et al., 2007), the pursuit of entrepreneurial opportunities (e.g., Dushnitsky, 2010), and entrepreneurs’ responses to failure (e.g., Ucbasaran et al., 2010). Resilience is characterized by the ability to cope with and bounce back from adversity, uncertainty, risk, or failure (Luthans et al., 2004). High resiliency is associated with the ability to adapt well to change in turbulent environments (e.g., Newman et al., 2014), a commitment to achieving organizational goals (e.g., Youssef and Luthans, 2007), and entrepreneurs’ ability to rebound from setbacks (e.g., Hayward et al., 2010). Confidence refers to the belief in one’s ability to achieve goals and improve on current performance (Newman et al., 2014). Those high in confidence believe they can exercise control over outcomes and be successful in tackling difficult tasks (Luthans et al., 2004). Confidence has been associated with managerial, employee, and entrepreneurial performance (e.g., Hmieleski and Baron, 2008; Judge and Bono, 2001).

Signaling positive psychological capital to another party provides insight into the signaler’s mindset, communicating that one is capable, confident, resilient, motivated, and otherwise positively disposed toward taking the needed steps to achieve a stated goal. These qualities can be communicated through language use and word choice (McKenny et al., 2013). For example, expressions of optimism contain language and statements indicative of a positive expectancy regarding an idea or cause, while expressions of resilience utilize language indicative of an unwillingness to give up (McKenny et al., 2013). Using words and phrases to communicate information about one party to another is not costly per se, thus communicating positive psychological capital through language use is considered costless.

Despite its low cost, signaling positive psychological capital can have a beneficial impact when seeking others’ support. Individuals high in positive psychological capital are often viewed as capable and high performing (Avey et al., 2011). Those seen as confident and capable are able to inspire and convince others of the worthiness of a goal or cause (e.g., Luthans et al., 2007). Further, a vast body of research suggests individuals are more willing to help those who are able bodied and can help themselves (e.g., Eden and Aviram, 1993; Wasko and Faraj, 2000). Simply, people are more likely to support an individual or group who is willing to take the needed steps to meet an objective and express confidence the objective can be achieved than someone who appears to lack the necessary motivation or commitment. Thus, communicating positive psychological capital is likely to be beneficial when seeking others’ support.

Displays of positive psychological capital are distinct from other displays of positivity that may influence the ability to raise funds. In particular, entrepreneurial passion is a positive emotional display that has been shown to influence fundraising performance in angel investing and crowdfunding (e.g., Li et al., 2017; Mitteness et al., 2012). While passion and positive psychological capital overlap in that they provide an individual with goal-directed motivation (e.g., Cardon et al., 2009; Luthans et al., 2007), the constructs differ in meaningful ways in that passion is rooted in the literature on emotions while positive psychological capital reflects beliefs concerning individual or team abilities and expectations about future outcomes that promote effort and task achievement, but does not require an emotional component (Luthans et al., 2004). This notion is empirically substantiated by numerous works indicating that positive psychological capital is distinct from emotional constructs (e.g., Avey et al., 2008, 2010; Luthans et al., 2007).

3.3. Positive psychological capital and crowdfunding performance

Linguistic cues have long served as a means of sending costless signals in an effort to cultivate impressions concerning the value of a firm (e.g., Allon et al., 2011; Baginski et al., 2016). For example, a positive linguistic tone in earnings announcements is predictive of increasing security prices (Baginski et al., 2016), suggesting that the tone of earnings announcements influences how investors value the firm. CEO presentations that contain optimistic promises about the future have been shown to increase investor perceptions of the firm, even though such promises bear little cost (e.g., Whittington et al., 2016). Retail firms that provide specific, but costless, claims about the importance of monitoring customer service quality are more positively evaluated by their customers (e.g., Balvers et al., 2016). Further, in online written communication, where words can be carefully chosen and other forms of communication (e.g., interpersonal interactions, body language) are muted, readers are often left to form assessments “relying on language and content cues” (Walther, 2007, p. 2539). This phenomenon suggests costless linguistic cues may play an elevated role in online settings. Given that crowdfunding occurs through an online medium, it follows that costless linguistic cues may play an elevated role in motivating investment decisions. This idea is supported by numerous studies illustrating how use of specific types of language, which would be considered costless from a traditional signaling perspective, shape crowdfunding performance (e.g., Allison et al., 2013; Parhankangas and Renko, 2017; Pietraszkiewicz et al., 2017).

Positive psychological capital language portrays an organization that is hopeful regarding its ability to meet goals, optimistic about the future, resilient in the face of adversity, and confident in its abilities. Such qualities, while not costly to signal, are critical in launching a successful venture. Therefore, it is likely that displaying positive psychological capital influences the positive perceptions of an individual or firm (e.g., Friend et al., 2016; McKenny et al., 2013). Indeed, conceptual work has theorized that positive psychological capital may act as a positive signal, through the portrayal of confidence, optimism, and resiliency, leading to more

positive evaluations by stakeholders (Friend et al., 2016). Further, those who desire to appear competent will attempt to signal qualities such as confidence (Holoien and Fiske, 2013), while optimism is positively related to perceptions of leadership potential (Chemers et al., 2000). Entrepreneurs high in positive psychological capital are perceived to be more authentic (Jensen and Luthans, 2006), which is particularly salient in crowdfunding where investors and entrepreneurs often lack established relationships. Such arguments are generally consistent with leadership research indicating that leaders high in positive psychological capital instill greater belief in a cause among followers (e.g., Gooty et al., 2009; Norman et al., 2005). Further, a rich history across political science, economics, marketing, and sociology research provides empirical evidence that pronounced displays of confidence, optimism, and hope facilitate similar beliefs and expectations in an audience (e.g., Olson, 2006; Strang and Soule, 1998).

Taken as a whole, the ability of language-based signals to shape assessments — particularly in online settings — suggests the signaling of positive psychological capital may lead to favorable evaluations. This body of work suggests that signaling positive psychological capital may, in turn, communicate to investors that an entrepreneur is ready and able to meet the challenges before them. Therefore, investors become confident and optimistic that the entrepreneur can be successful in pursuing and achieving his or her goals. In total, positive psychological capital language is an important costless signal where firms with higher displayed positive psychological capital may be evaluated more positively compared to firms with lower displayed positive psychological capital. Accordingly, we hypothesize:

Hypothesis 1. There is a positive relationship between the use of positive psychological capital language and crowdfunding performance.

3.4. The moderating influence of social capital

Investors, at times, have difficulty making sense of firm signals in noisy environments (i.e., where information asymmetry is high) (Plummer et al., 2016). Such difficulty arises because there may be multiple interpretations of any one piece of information (Gioia and Chittipeddi, 1991). The online nature of crowdfunding, where information can be difficult to verify, combined with the inexperience of investors, makes crowdfunding a particularly noisy environment (Belleflamme et al., 2015). For instance, while expressions of positive psychological capital may signal confidence, resilience, or psychological strength to some investors, others may question if expressions of positive psychological capital are genuine and may desire more information to make an investment decision.

Firms often send signals that work together in conveying information to investors simultaneously (Pollock et al., 2010; Stern et al., 2014). In doing so, firms facilitate the interpretation of individual signals by providing additional information that can be used to evaluate a firm. In this way, the presence of one signal can influence how another is interpreted. In the entrepreneurial setting, for instance, certain signals flowing from a young venture can be magnified or strengthened in the presence of a key external signal, such as involvement in an accelerator program (Plummer et al., 2016). In a similar vein, effects stemming from organizational status and prestige signals are amplified when in congruence with one another (Stern et al., 2014). Thus, because positive psychological capital language may provide beneficial information about an entrepreneur and the underlying quality of his or her concept, its influence may change when accompanied by another potentially beneficial signal.

The entrepreneurship literature has long recognized social capital as a key signal of quality used by investors. Social capital refers to the value received from social relationships of individuals or collectives and the available goodwill created through personal ties (Gedajlovic et al., 2013; Grichnik et al., 2014). Social capital takes time, effort, and resources to cultivate. Consequently, social capital has been traditionally viewed as a costly signal (e.g., Ahlers et al., 2015; Khoury et al., 2013). Signals relating to social capital create an endorsement effect that indicates others have vouched for the entrepreneur (Honig et al., 2006). Further, because social capital increases an entrepreneur's credibility, social capital facilitates the building of rapport between investors and entrepreneurs (Florin et al., 2003).

The current signaling literature remains unclear as to how the presence of costly signals, such as social capital, alongside costless signals may influence investment decisions. Costly signals are argued to inherently create more value than costless signals (Connelly et al., 2011). As such, investors prefer to rely on costly signals. This might suggest that when costly signals become available, investors would prioritize costly signals, weakening or negating the influence of costless signals. However, an alternative view argues that in noisy environments more information is preferred to less information (e.g., Stern et al., 2014; Wang and Lim, 2008). Indeed, a key premise of signaling theory is that signals are useful because they provide information in noisy environments, where one party desires more information about another party (Connelly et al., 2011). Given the need for information, even if costly signals are preferred, it is unlikely that investors would disregard costless signals that provide further insight into an entrepreneur or venture's prospects. This should be particularly salient in contexts, such as crowdfunding, where costless signals are likely to be valued and costly signals are still rare. In addition, because costless signals are difficult to verify, the inclusion of a costly signal in tandem with a costless signal provides evidence supporting the credibility of the costless signal, allowing investors to trust that the costless signal is genuine.

In this view, a costly social capital signal should strengthen the impact of a positive psychological capital signal on crowdfunding performance. When standing alone, positive psychological capital signals reside in a noisy environment where potential investors may have trouble interpreting the genuineness of one's hope, optimism, confidence, and resilience. Therefore, while it may be perceived as a positive signal by some, others may be less inclined to accept positive psychological capital language at face value. Because social capital signals that an entrepreneur is trustworthy and credible, it suggests that expressions of positive psychological capital are genuine, and therefore are reliable. Thus, the presence of social capital signals should strengthen the influence of positive

psychological capital on crowdfunding performance. Accordingly, we hypothesize:

Hypothesis 2. Social capital moderates the relationship between positive psychological capital language and crowdfunding performance such that increases in social capital strengthen the relationship between use of positive psychological capital language and crowdfunding performance.

3.5. The moderating influence of human capital

Projections of human capital provide another well-established, costly signal important to entrepreneurial fundraising (e.g., Ahlers et al., 2015; Baum and Silverman, 2004). Human capital represents the capabilities possessed by an individual or team, such as the knowledge and skills of the individuals launching the venture (Martin et al., 2013). These skills are often obtained from costly investments such as obtaining an education, acquiring experience in an industry, or developing experience through starting or growing a new business (Martin et al., 2013). The cost of developing human capital signals suggests to investors that an entrepreneur has abilities that make him or her more capable of successfully launching and operating a new business (e.g., Bruns et al., 2008).

While positive psychological capital language provides an indication that the entrepreneur has characteristics associated with entrepreneurial success, human capital provides tangible evidence of past success. For example, entrepreneurial experience provides investors with an indication that an entrepreneur can successfully launch and grow a venture. Thus, a human capital signal provides evidence that an entrepreneur's confidence or optimism is warranted because of past successes. Specifically, signaling human capital and positive psychological capital simultaneously suggests that the entrepreneur not only has the mental hardiness to execute on a proposed venture, but has a track record of doing so. Therefore, costly human capital signals indicate to investors that the positive psychological capital displayed by the entrepreneur is a reliable signal. It follows that human capital signals should strengthen the influence of positive psychological capital. Accordingly, we hypothesize:

Hypothesis 3. Human capital moderates the relationship between positive psychological capital language and crowdfunding performance such that increases in human capital strengthen the relationship between use of positive psychological capital language and crowdfunding performance.

4. Methods

To examine the role of positive psychological capital in crowdfunding performance we collected two random samples of crowdfunding campaigns drawn from the Kickstarter crowdfunding platform. Kickstarter is a rewards-based crowdfunding platform, one of the top two crowdfunding websites by volume, and has provided over USD 2.8 billion to more than 117,888 successfully funded campaigns (Kickstarter, 2017a). We drew part of our sample from a list of 45,815 crowdfunding campaigns that were created before June 2, 2012. This sample was originally collected in 2013 and 900 campaigns were randomly selected. This sample maximizes comparability to recent examinations of crowdfunding phenomena using the same sampling time frame (e.g., Mollick, 2014). From these 900 campaigns, two suspended campaigns and three canceled campaigns were eliminated leaving a sample of 895. In addition, we collected a more recent sample from 2016. In late 2012, Kickstarter made changes to the way crowdfunding appeals must be presented on the platform (Kickstarter, 2017b). For example, projects must include descriptions of potential risks that may impede the completion of a project and restrictions on the use of simulations for hardware products were also released (Kickstarter, 2017b). Thus, these changes in how projects must be presented suggest a need for a more recent sample that reflects the current requirements for how a new venture must be pitched. From the projects created in 2016, we selected 1000 campaigns to examine bringing the total number of campaigns in our sample to 1895. Once observations with missing data were removed, we were left with 1726 campaigns to analyze, with 48% of the observations coming before June 2, 2012 and 52% of the observations coming after this date.

4.1. Dependent variables

We examine the effect of positive psychological capital on two outcomes of interest in crowdfunding research: whether the project's funding target was met and the total amount of funds raised. On Kickstarter, a funding target is set at the beginning of the campaign. If the funding target is not met over the duration of the campaign, the investors are refunded and the entrepreneur receives no funds (Kickstarter, 2017b). This ensures that meeting the funding target is a salient crowdfunding performance outcome for organizations. This also enhances comparability with other venture finance research that uses funding success as a dependent variable (e.g., Batjargal, 2007; Davis et al., 2017). If at the end of the campaign, the funds raised were greater than or equal to the funding target, a value of 1 was assigned to the *success* variable. If the funds raised were less than the funding target, a value of 0 was assigned. Past venture funding and crowdfunding research has also used continuous measures for the amount of money invested in an entrepreneurial firm as a measure of evaluating funding performance (e.g., Cholakova and Clarysse, 2015; Gompers, 1995; Li et al., 2017). In line with this research, we also operationalize crowdfunding performance as a continuous variable measuring the amount of money committed to the project by investors called *funds raised*.

4.2. Independent variables

Language associated with positive psychological capital was measured using computer-aided text analysis (e.g., McKenny et al., 2013). Computer-aided text analysis is a member of the content analysis family and measures the salience of constructs based on the frequency with which words are used in a text (McKenny et al., 2016; Short et al., 2018). For example, scholars have examined innovativeness rhetoric by identifying the frequency with which words such as ‘innovation’ and ‘creativity’ are used within organizational texts (e.g., Moss et al., 2015). Each instance of these words or other words associated with innovativeness would increment the innovativeness construct by one.

We measured positive psychological capital using the word lists developed and validated by McKenny et al. (2013). One word list was created for each of the positive psychological capital dimensions: hope, optimism, resilience, and confidence. Example words from the resilience word list include “adamant”, “dogged”, and “resolute” (McKenny et al., 2013). We examine the project descriptions for each crowdfunding campaign and use the DICTION 7.0 (Hart and Carroll, 2014) software to provide counts of each of the four dimensions. Because positive psychological capital is a superordinate higher-order construct (Luthans et al., 2007), we operationalized positive psychological capital as the sum of the results from each of the four dimensions to provide a single positive psychological capital variable for each crowdfunding text (e.g., Luthans et al., 2008; McKenny et al., 2013). For example, if a profile description used 3 instances of words from the hope dictionary, 2 from the optimism dictionary, 4 from the resilience dictionary, and 6 from the confidence dictionary, the total positive psychological capital score would be 15. Appendix A illustrates the language associated with each dictionary using crowdfunding examples.

4.3. Interaction variables

Our study examines four interaction variables: two reflecting social capital and two reflecting human capital. To operationalize social capital, we follow prior precedent in crowdfunding work and use the number of projects backed by the entrepreneur (e.g., Colombo et al., 2015). By funding the projects of others, entrepreneurs can build social capital within crowdfunding communities. In addition, the signaling literature has measured costly social capital signals by examining endorsement effects, notably, the relationships between the entrepreneur(s) and prestigious third parties, such as important partnerships, endorsements, or sponsors (e.g., Khoury et al., 2013; Ozmel et al., 2013). To code for endorsements, we searched for permutations of the words “partner”, “endorse”, and “sponsor” to identify campaigns potentially highlighting important relationships with third parties. Each campaign was then individually inspected to determine if the entrepreneurs were referring to a specific third-party relationship. For those that highlighted an important relationship we coded an *endorse* variable as ‘1’ and ‘0’ otherwise.

Entrepreneurial experience is commonly used as a costly indicator of human capital (e.g., Dimov and Shepherd, 2005). As such, an *entrepreneurial experience* variable was created using a dummy variable coded ‘1’ for lead entrepreneurs with functional experience in the same or similar context of the current venture and coded ‘0’ otherwise (Davis et al., 2017). The second human capital variable captures crowdfunding experience. Individuals that have launched past crowdfunding campaigns have incurred expenses (time, rewards costs, Kickstarter fees, etc.) making the launch of a campaign costly. Further, entrepreneurs who have launched previous campaigns have had opportunities to learn about what is needed to successfully raise funds as well as deliver on promised rewards or products (Belleflamme et al., 2013). Therefore, entrepreneurs with crowdfunding experience may be perceived as better able to deliver on campaign promises. To operationalize crowdfunding experience, we use the number of past campaigns launched by the entrepreneur represented by the *created* variable.

4.4. Controls

To account for the effects of other antecedents of crowdfunding performance, we included several control variables. Crowdfunding research has found that the categories of products or services differ in their ability to raise funds (e.g., Allison et al., 2015). To isolate these effects, we controlled for *category* using the fifteen project categories available on Kickstarter. Crowdfunding research has also found that the structure of the crowdfunding campaign selected by the entrepreneur can influence crowdfunding success (e.g., Mollick, 2014). To capture these differences, we controlled for the effect of the *funding goal* and campaign *duration*. Because crowdfunding continues to evolve over time and Kickstarter has made changes to how projects can be pitched since its inception, it is important to control for when a campaign was conducted. Our sample includes projects from five years: 2009, 2010, 2011, 2012, and 2016. Dummy variables are included for years 2010, 2011, 2012 and 2016 with 2009 being the excluded dummy variable.

We introduced a number of controls identified by past research indicative of campaign quality. Specifically, we control the inclusion of a *video* (video = 1; no video = 0), the direct effect of *entrepreneurial experience*, the direct effect of past campaigns *created* by the entrepreneur, the number of *Facebook friends*, and the *word length* of the campaign (e.g., Davis et al., 2017; Parhankangas and Renko, 2017). We included an additional human capital control, *education*, using a dummy variable coded ‘1’ for lead entrepreneurs who possessed a master's degree or above and otherwise coded ‘0’ (e.g., Davis et al., 2017). If a campaign was featured staff pick (meaning that it has been identified by the Kickstarter staff as a project they support), a *staff pick* variable was coded as ‘1’, while other campaigns were coded as ‘0’. We use the *numerical terms* CATA word list provided by the DICTION software program, as such language highlights reliance on specific, objective data rather than abstract goals. We code for an outside web presence with a *web* variable coded ‘1’ when the campaign provided a link to a formal outside website and ‘0’ otherwise. Finally, sex and ethnicity of entrepreneurs may influence funding preferences (e.g., Davis et al., 2017). Entrepreneur sex was controlled with a dummy variable

coded '1' for campaigns led by a male entrepreneur and coded '0' for ventures led by a female entrepreneur. Likewise, an *ethnicity* dummy variable was coded '1' for entrepreneurs that appear Caucasian and otherwise coded '0'.

4.5. Statistical analysis

Our *funds raised* dependent variable, positive psychological capital variable, two variables used for interactions (*created* and *backed*), and several control variables followed a right skewed, gamma distribution, which presents analytical challenges. For variables with non-zero values (e.g., funding goal) we used a natural log transformation to correct for this skewness. However, many of the skewed variables had zero values in the data preventing us from using the natural log transformation. In these cases, we use an inverse hyperbolic sine transformation: $\sinh^{-1}(y) = \log(y_i + (y_i^2 + 1)^{1/2})$ (e.g., Franke and Richey Jr, 2010; Nyberg et al., 2010). The inverse hyperbolic sine transformation has two benefits. First, it allows us to correct for right skew in the data, mitigating the influence of extreme observations (Bonaccorsi et al., 2013; Sauerwald et al., 2016). Second, the interpretation of a variable transformed using this method is identical to the natural log interpretation (Burbidge et al., 1988). Thus, this transformation allows us to interpret variables transformed using the natural log and those using the inverse hyperbolic sine transformation in the same way. Positive psychological capital, funds raised, created, Facebook friends, and backed were all transformed using the inverse hyperbolic sine transformation.

We use two different statistical procedures to test our hypotheses. Because funding success in crowdfunding is a dichotomous variable, we use logistic regression to test for the influence of positive psychological capital on crowdfunding *success*. For our other dependent variable, *funds raised*, we use generalized linear modeling (GLM). GLM is a generalization of linear regression that allows for dependent variables that have an error distribution other than a normal distribution and are estimated using maximum likelihood (McCullagh, 1984). After examining our error distributions, we found them to be approximately normal and, thus, made no changes to models to account for non-normality. Robust standard errors are used in all models.

5. Results

Before testing our hypotheses, we conducted a factor analysis to empirically assess the appropriateness of operationalizing our positive psychological capital measure as a composite of the content analytic scores for each of the four dimensions (e.g., Anglin et al., 2017). One factor was retained (eigenvalue = 3.23) that explained approximately 81% of the variance in the positive psychological capital variable and the factor loadings were as follows: hope = 0.93, optimism = 0.95, resilience = 0.95, and confidence = 0.74. We then conducted a parallel analysis, which considers normal sampling error when determining how many and which factors should be retained (Fabrigar et al., 1999; Ruscio and Roche, 2012). The adjusted eigenvalue was 3.15 with an estimated bias of 0.08. Both analyses suggest that treating positive psychological capital as a composite of hope, optimism, resilience, and confidence is appropriate.¹ The results of these analyses are provided in Appendix B along with a scree plot of the eigenvalues. Appendix B also includes a depiction of our theoretical model and variable operationalizations that we examine below.

Tables 1 and 2 provide the descriptive statistics and correlations for our sample, respectively. Table 3 presents the results for the funding *success* dependent variable. We provide both the log odds coefficients and the average marginal effects in this table. The average marginal effects (AME) —the average change in probability for a given change in x — are particularly useful for interpreting interactions in logistic regressions as interactions between log odds or odds ratios do not lend themselves to intuitive interpretations (Plummer et al., 2016). Table 4 provides the results for the *funds raised* variable.

Hypothesis 1 suggested that positive psychological capital will be positively related to funding performance in crowdfunding. The coefficient for funding success was positive and significant ($b = 0.30$, odds ratio = 1.37, $p < 0.01$; AME = 0.05, $p < 0.01$) and the coefficient for funds raised is positive and significant ($b = 0.34$, $p < 0.01$), providing support for Hypothesis 1. These results indicate that a 10% increase in the use of positive psychological capital would be associated with an approximate 3% increase in the probability of success and an approximate 3.4% increase in the amount of funds raised. If we evaluate these effects at the sample means for positive psychological capital (mean = 21.72) and our dependent variables (success = 0.44; funds raised = 8721.16), a 10% increase in positive psychological capital would be associated with a change in the success rate from 44% to 45.32% and an additional \$296.52 raised.

Hypothesis 2 suggested that an interaction between social capital and positive psychological capital will be positively with associated crowdfunding performance. The coefficient in the funding *success* models for both social capital variables were not significant (psychological capital \times backed: $b = 0.03$, odds ratio = 1.03, $p > 0.05$, AME = 0.00, $p > 0.05$; psychological capital \times endorse: $b = -0.46$, odds ratio = 0.63, $p > 0.05$, AME = -0.07 , $p > 0.05$). Likewise, the coefficient in *funds raised* models for both social capital variables were not significant (psychological capital \times backed: $b = 0.02$, $p > 0.05$; psychological capital \times endorse: $b = -0.09$, $p > 0.05$). Thus, Hypothesis 2 is not supported.

Hypothesis 3 suggested that an interaction between human capital and positive psychological capital will be positively associated with crowdfunding performance. Both interaction terms using the human capital variables for the *success* models were positive and significant (psychological capital \times created: $b = 0.39$, odds ratio = 1.47, $p < 0.01$, AME = 0.06, $p < 0.01$; psychological capital \times experience: $b = 0.28$, odds ratio = 1.32, $p < 0.05$, AME = 0.04, $p < 0.01$), supporting Hypothesis 3. Plots of these

¹ At the request of an anonymous reviewer, we conducted an analysis of each positive psychological capital dimension individually and its relationship to crowdfunding performance. We will be happy to provide the results upon request.

Table 1
Descriptive statistics.

Variable	Mean	Std. dev.	Min	Max	Variable	Freq.	% of sample
Success	0.44	0.50	0.00	1.00	2009	9	0.52
Funds raised	8721.16	65,269.84	0.00	1,924,018.00	2010	138	8.00
PsyCap	21.72	29.37	0.00	281.00	2011	380	22.02
Video	0.72	0.45	0.00	1.00	2012	276	15.99
Duration	35.75	14.95	1.00	91.96	2016	923	53.48
Funding goal	18,271.00	70,656.47	0.76	1,641,791.00	Art	124	7.18
Web	0.65	0.52	0.00	2.00	Comics	64	3.71
Numerical terms	18.89	23.73	0.00	263.00	Crafts	21	1.22
Staff pick	0.09	0.28	0.00	1.00	Dance	31	1.8
Created	1.88	5.48	1.00	111.00	Design	113	6.55
Ent. experience	0.17	0.38	0.00	1.00	Fashion	90	5.21
Ethnicity	0.81	0.39	0.00	1.00	Film and video	341	19.76
Sex	0.70	0.46	0.00	1.00	Food	91	5.27
Education	0.04	0.20	0.00	1.00	Games	132	7.65
Facebook friends	514.87	955.30	0.00	11,746.00	Journalism	17	0.98
Word length	616.70	555.73	19.00	6205.00	Music	297	17.21
Backed	5.83	20.66	0.00	538.00	Photography	43	2.49
Endorse	0.01	0.12	0.00	1.00	Publishing	170	9.85
PsyCap dimensions written texts ^a					Technology	140	8.11
Hope	8.55	11.38	0.00	107.00	Theater	52	3.01
Optimism	4.94	7.00	0.00	60.00			
Resilience	6.75	10.62	0.00	109.00			
Confidence	1.48	2.39	0.00	22.00			
Video transcriptions (N = 527)							
PsyCap	0.10	1.60	0.00	30.00			
Hope	0.03	0.53	0.00	9.00			
Optimism	0.03	0.49	0.00	10.00			
Resilience	0.03	0.55	0.00	11.00			
Confidence	0.00	0.06	0.00	1.00			

^a Approximately 93% of campaigns include at least one term related to at least one of the four dimensions of positive psychological capital, 39% incorporated at least one term related to all four dimensions, 28% used at least one term from three dimensions, and 11% utilized at least one term from two dimensions. Hope was the most prominently used dimension with at least one word in 89% of the campaigns. Confidence was the least used dimension with at least one word in 56% of the campaigns.

Table 2
Correlations.

Variables ^a	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Success																	
2 Funds raised	0.13																
3 PsyCap	0.04	0.14															
4 Video	0.15	0.06	0.21														
5 Duration	-0.10	0.00	-0.13	-0.06													
6 Funding goal	-0.14	0.04	0.13	0.03	0.02												
7 Web	0.19	0.07	0.06	0.14	-0.03	0.03											
8 Numerical terms	0.20	0.08	0.38	0.21	0.02	0.02	0.15										
9 Staff pick	0.30	0.21	0.19	0.16	0.00	0.00	0.13	0.18									
10 Created	0.08	0.00	0.01	0.03	-0.09	-0.02	0.07	0.06	0.01								
11 Ent. experience	0.12	0.06	-0.04	-0.04	0.06	-0.01	0.14	0.08	0.08	0.20							
12 Ethnicity	0.11	0.03	0.04	0.02	-0.03	-0.02	0.03	0.08	0.04	0.04	0.02						
13 Sex	-0.04	0.05	0.09	0.08	0.00	0.06	0.01	0.07	0.00	0.04	0.04	0.03					
14 Education	0.01	-0.01	0.04	0.00	-0.02	0.02	0.05	0.01	0.00	-0.02	0.01	0.01	-0.06				
15 Facebook friends	0.10	-0.03	-0.02	0.00	-0.04	-0.03	0.06	-0.01	0.00	0.00	0.10	-0.05	-0.01	0.02			
16 Word length	0.12	0.14	0.81	0.20	-0.06	0.10	0.16	0.51	0.23	0.02	0.07	0.07	0.06	0.04	-0.04		
17 Backed	0.16	0.04	0.09	0.05	-0.04	-0.01	0.10	0.12	0.14	0.09	0.11	0.05	0.07	0.01	0.06	0.16	
18 Endorse	0.03	0.04	0.16	0.04	-0.01	0.03	0.04	0.12	0.09	0.01	0.00	-0.01	0.00	-0.03	0.01	0.17	0.01

N = 1726.

^a All correlations with an absolute value greater than (0.05) are significant at $p < 0.05$ and an absolute value greater than (0.07) at $p < 0.01$.

interactions are provided in Figs. 1a and 2a below. The marginal effect at the mean of positive psychological capital for an entrepreneur who has created two past campaigns (i.e., the approximate mean of previous campaigns) is 0.45. Because the positive psychological capital and created variables had previously been transformed, logged values are used to compute the effect at the

Table 3
Positive psychological capital and funding success.

Variables ^a	Controls		Main effects		Social capital moderators				Human capital moderators			
	1	AME	2	AME	3	AME	4	AME	5	AME	6	AME
Video	0.78** (0.14)	0.13** (0.02)	0.74** (0.15)	0.12** (0.02)	0.64** (0.15)	0.09** (0.02)	0.74** (0.15)	0.12** (0.02)	0.73** (0.14)	0.12** (0.02)	0.73** (0.14)	0.12** (0.02)
Duration	-0.35* (0.16)	-0.06* (0.02)	-0.35* (0.16)	-0.06* (0.02)	-0.40* (0.16)	-0.06* (0.02)	-0.35* (0.16)	-0.06* (0.02)	-0.35* (0.16)	-0.06** (0.02)	-0.34* (0.16)	-0.05* (0.03)
Funding goal	-0.64** (0.05)	-0.10** (0.01)	-0.66** (0.05)	-0.11** (0.01)	-0.66** (0.05)	-0.10** (0.01)	-0.66** (0.05)	-0.11** (0.01)	-0.66** (0.05)	-0.10** (0.01)	-0.66** (0.05)	-0.10** (0.01)
Website	0.74** (0.12)	0.12** (0.02)	0.75** (0.12)	0.12** (0.02)	0.61** (0.13)	0.09** (0.02)	0.75** (0.12)	0.12** (0.02)	0.73** (0.12)	0.12** (0.02)	0.75** (0.12)	0.12** (0.02)
Numerical terms	0.01** (0.00)	0.00** (0.00)	0.01** (0.00)	0.00** (0.00)	0.01* (0.00)	0.00** (0.01)	0.01** (0.00)	0.00** (0.00)	0.01** (0.00)	0.00** (0.00)	0.01** (0.00)	0.00** (0.00)
Staff pick	3.50** (0.37)	0.56** (0.05)	3.50** (0.37)	0.56** (0.05)	3.34** (0.39)	0.49** (0.05)	3.51** (0.37)	0.56** (0.05)	3.55** (0.37)	0.56** (0.05)	3.50** (0.37)	0.56** (0.05)
Created	0.21 (0.14)	0.03 (0.02)	0.20 (0.15)	0.03 (0.02)	-0.23 (0.16)	-0.03 (0.02)	0.20 (0.15)	0.03 (0.02)	-0.86** (0.30)	-0.14** (0.05)	0.28 (0.15)	0.04 (0.02)
Ent. experience	0.17 (0.19)	0.03 (0.03)	0.18 (0.19)	0.03 (0.03)	0.29 (0.21)	0.04 (0.03)	0.19 (0.19)	0.03 (0.03)	0.48 _s (0.21)	0.08 _s (0.03)	-0.50 (0.37)	-0.08 (0.06)
Ethnicity	0.45** (0.17)	0.07** (0.03)	0.47** (0.17)	0.08** (0.03)	0.37* (0.17)	0.05 _s (0.02)	0.48** (0.17)	0.08** (0.03)	0.49** (0.17)	0.08** (0.03)	0.48** (0.17)	0.08** (0.02)
Sex	-0.36** (0.14)	-0.06** (0.02)	-0.34* (0.14)	-0.05* (0.02)	-0.30* (0.14)	-0.04* (0.02)	-0.34* (0.14)	-0.05* (0.02)	-0.36* (0.14)	-0.06** (0.02)	-0.34* (0.14)	-0.05* (0.02)
Education	0.28 (0.32)	0.05 (0.05)	0.25 (0.32)	0.04 (0.05)	0.12 (0.36)	0.02 (0.05)	0.26 (0.33)	0.04 (0.05)	0.26 (0.33)	0.04 (0.05)	0.27 (0.32)	0.04 (0.02)
Facebook friends	0.05** (0.02)	0.01** (0.00)	0.05** (0.02)	0.01** (0.00)	0.02 (0.02)	0.00 (0.00)	0.05** (0.02)	0.01** (0.00)	0.05** (0.02)	0.01** (0.00)	0.05** (0.02)	0.01** (0.00)
Word length	0.00** (0.00)	0.00** (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Categories ^b												
Years ^c												
Constant	2.60** (0.87)		2.45** (0.86)		2.07* (0.98)		2.49** (0.86)		2.94** (0.93)		2.53** (0.86)	
PsyCap			0.30** (0.10)	0.05** (0.02)	0.18 (0.11)	0.03 (0.02)	0.30** (0.11)	0.05** (0.02)	0.19 (0.11)	0.03 (0.02)	0.24* (0.11)	0.04* (0.02)
Backed					0.59** (0.15)	0.09** (0.02)						
PsyCap × backed					0.03 (0.05)	0.00 (0.01)						
Endorse							2.40 (1.88)	0.38 (0.30)				
PsyCap × endorse							-0.46 (0.48)	-0.07 (0.08)				
PsyCap × created									0.39** (0.10)	0.06** (0.02)		
PsyCap × experience											0.28* (0.13)	0.04* (0.02)
Pseudo R ²	0.291		0.295		0.345		0.296		0.30		0.30	
Log likelihood	-839.01		-834.77		-774.98		-833.37		-827.92		-832.40	
N	1726		1726		1726		1726		1726		1726	

* $p < 0.05$.

** $p < 0.01$.

^a Standard errors reported in parenthesis.

^b 15 Categories, 14 controls, not reported.

^c 5 Years, 4 controls, not reported.

mean of positive psychological capital and two past campaigns. These results suggest that a 10% increase in the use of positive psychological capital language for an entrepreneur who has launched two previous campaigns is associated with an additional 4.5 percentage points, which is a success rate of approximately 48.5%. The marginal effect at the mean of positive psychological capital for an entrepreneur with experience (entrepreneurial experience = 1) is 0.54. Therefore, using the positive psychological capital mean as a starting point, a 10% increase in the use of positive psychological capital language for someone with entrepreneurial experience is associated with an additional 5.4 percentage points, which is a success rate of approximately 49.4%. Both interaction terms for the *funds raised* models were positive and significant (psychological capital × created: $b = 0.23$, $p < 0.01$; psychological capital × entrepreneurial experience: $b = 0.41$, $p < 0.01$), supporting Hypothesis 3. Plots of these interactions are provided in Figs. 1b and 2b below. In practical terms, a 10% increase positive psychological capital language when paired with the launch of two previous campaigns is associated with an extra 6.29% in the amount of funds raised, which equates to \$548.56 using the mean of

Table 4
Positive psychological capital and funds raised.

Variables ^a	Controls	Main effects	Social capital moderation models		Human capital moderation models	
	7	8	9	10	11	12
Video	1.29** (0.15)	1.23** (0.15)	1.11** (0.14)	1.23** (0.15)	1.23** (0.15)	1.21** (0.15)
Duration	-0.02 (0.15)	-0.02 (0.15)	-0.03 (0.15)	-0.02 (0.15)	-0.02 (0.15)	-0.01 (0.15)
Funding goal	0.03 (0.05)	0.02 (0.05)	0.07 (0.05)	0.02 (0.05)	0.02 (0.05)	0.02 (0.05)
Website	1.06** (0.12)	1.06** (0.12)	0.87** (0.12)	1.05** (0.12)	1.05** (0.12)	1.05** (0.12)
Numerical terms	0.01* (0.00)	0.01** (0.00)	0.01* (0.00)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)
Staff pick	2.23** (0.15)	2.22** (0.15)	1.81** (0.16)	2.21** (0.15)	2.21** (0.15)	2.18** (0.15)
Created	0.03 (0.14)	0.02 (0.14)	-0.35** (0.13)	0.01 (0.14)	-0.62* (0.30)	0.12 (0.14)
Ent. experience	-0.10 (0.19)	-0.10 (0.19)	-0.04 (0.18)	-0.09 (0.19)	0.09 (0.20)	-1.14** (0.36)
Ethnicity	0.87** (0.17)	0.88** (0.17)	0.78** (0.16)	0.88** (0.17)	0.89** (0.17)	0.88** (0.17)
Sex	-0.51** (0.13)	-0.48** (0.13)	-0.44** (0.12)	-0.48** (0.13)	-0.49** (0.13)	-0.48** (0.13)
Education	0.20 (0.28)	0.17 (0.28)	0.07 (0.27)	0.18 (0.28)	0.18 (0.28)	0.21 (0.28)
Facebook friends	0.08** (0.02)	0.08** (0.02)	0.04* (0.02)	0.08** (0.02)	0.08** (0.02)	0.08** (0.02)
Word length	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)	0.00** (0.00)
Categories ^b						
Years ^c						
Constant	3.01** (1.02)	2.81** (1.05)	1.93 (1.08)	2.84** (1.05)	3.00** (1.02)	2.95** (1.06)
PsyCap		0.34** (0.10)	0.24* (0.11)	0.34** (0.10)	0.29** (0.10)	0.26* (0.10)
Backed			0.59** (0.11)			
PsyCap × backed			0.02 (0.04)			
Endorse				0.98 (2.04)		
PsyCap × endorse				-0.09 (0.47)		
PsyCap × created					0.23** (0.09)	
PsyCap × ent. experience						0.41** (0.12)
Deviance	10,364.74	10,293.68	9542.32	10,284.44	10,254.93	10,225.78
Log likelihood	-3996.10	-3990.17	-3924.76	-3989.39	-3986.91	-3984.46
N	1726	1726	1726	1726	1726	1726

* $p < 0.05$.

** $p < 0.01$.

^a Standard errors reported in parenthesis.

^b 15 Categories, 14 controls, not reported.

^c 5 Years, 4 controls, not reported.

funds raised as a reference point. Likewise, entrepreneurial experience was associated with an additional 4.1% in the amount of funds raised for a 10% increase in positive psychological capital language — an additional \$357.57 when using the mean of *funds raised* as a reference point.²

6. Generalizability of findings

Given the heterogeneity among crowdfunding types, we sought to test the generalizability of our finding that positive psychological

² Our results are robust to project size, the choice of controls, and modeling choices. These robustness tests are available from the authors upon request.

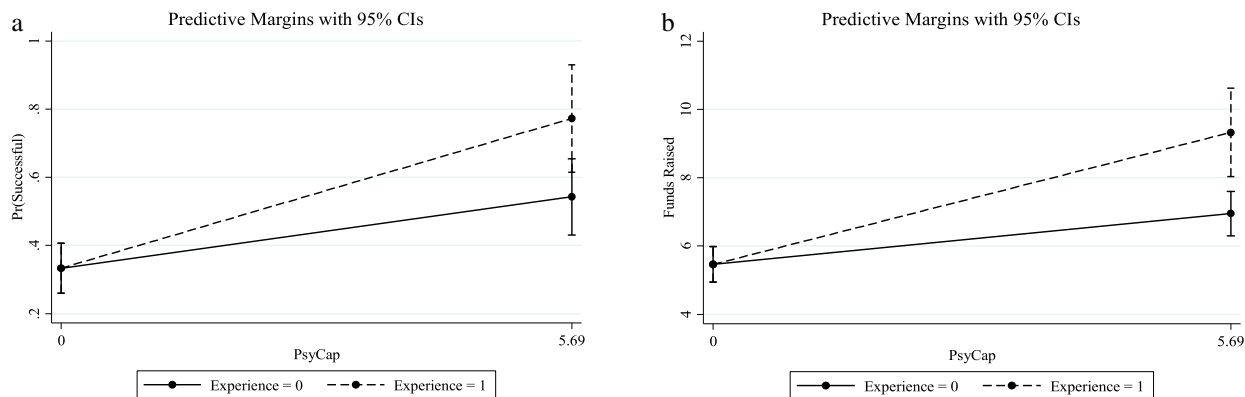


Fig. 1. a and b. Interactions between entrepreneurial experience and positive psychological capital.

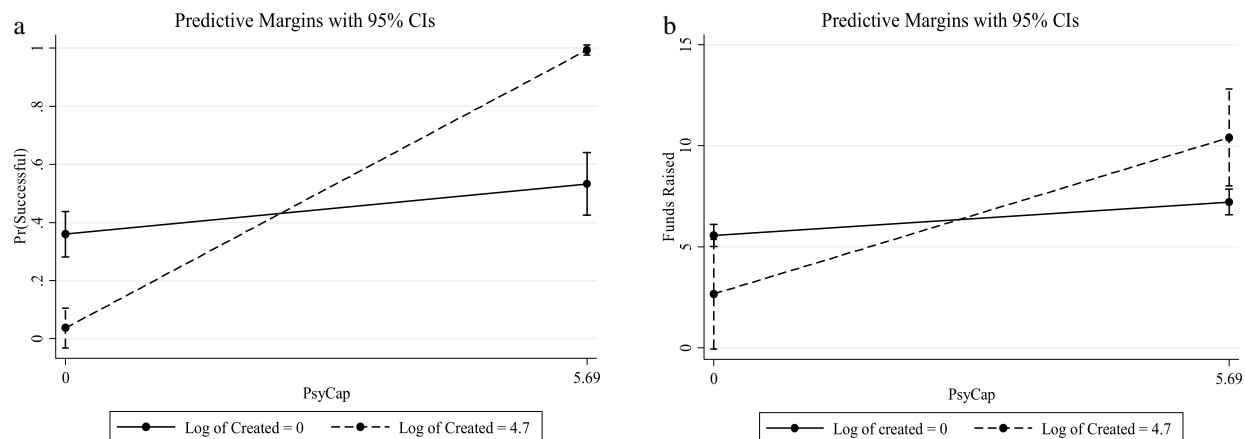


Fig. 2. a and b. Interactions between created and positive psychological capital.

capital language is a salient predictor of crowdfunding performance. We constructed random sample of 1726 crowdfunding campaigns drawn from the Kiva website. Kiva is the world's first and one of the largest debt-based crowdfunding websites, having facilitated over USD 1.07 billion in loans to over 2.6 million entrepreneurs (Kiva, 2017). Kiva's business model focuses on assisting economically disadvantaged entrepreneurs from around the world. In this model, socially minded individuals agree to fund a portion of a microloan given to an entrepreneur (Allison et al., 2013). No interest is received for making this loan, but there is an expectation of being repaid the principal. Kiva profiles do not include videos, but include a written appeal and picture of the entrepreneur.

To examine crowdfunding performance on the Kiva platform, we examined three dependent variables. We examine funding success and funds raised for comparability with our Kickstarter results. In addition, several studies examining the Kiva platform evaluate the rate at which a crowdfunding a campaign achieves its goals (e.g., Allison et al., 2015; Anglin et al., 2014). For comparability with these studies, we assess funding speed, measured by the number days it takes the meet the funding goal (e.g., Allison et al., 2013). We introduce several context-specific controls. We included a control for campaigns that indicated involvement with group lending. Group lending occurs when a borrower is placed within a lending group where all members of group are all responsible for the repayment of all loans taken by other members of that group (Braun and Woller, 2004). This method has been shown to increase repayment rates and is seen as a signal of higher quality in microfinance (Armendáriz de Aghion and Morduch, 2000). We also included country controls for Kiva campaigns (e.g. Allison et al., 2013). Kiva borrowers are dispersed throughout the world and prior research has suggested that geographic location may drive funding outcomes (Allison et al., 2015). We inserted 42 dummy variables to control for the 43 countries in our sample. In the Kiva campaigns, the duration is fixed to thirty days. In addition, no entrepreneurs utilized existing websites, linked to Facebook, past campaigns created are not reported, no entrepreneurs had Master's degrees, and entrepreneurial experience was not discussed. Thus, these controls were not included. The lack of this information is likely reflective of the fact that individuals seeking microloans are often impoverished, therefore opportunities for education, website creation, and other signals of quality are quite rare.

In estimating the logistic models for the success variable, we encountered separation issues with some of the country dummy variables. Separation occurs in logistic regression when an independent or control variable perfectly predicts the dependent variable (Menard, 1995). Failure to correct for separation issues may lead to biased parameter estimates and model misspecification (Hosmer Jr et al., 2013). To fit these models and in order to ensure conservative parameter estimates while minimizing bias, we use Firth's

method of penalized maximum likelihood estimation for the logistic models (Firth, 1993).

Appendix C presents the results for this analysis. The positive psychological capital variable was a significant predictor of performance when examining *funds raised* ($b = 0.02$; $p < 0.05$) and when examining *funding speed* ($b = -0.08$; $p < 0.01$). Note that a negative coefficient for funding speed indicates that funding took fewer days, therefore is indicative of a positive effect. The coefficient for *funding success* ($b = -0.07$; $p > 0.05$), was not significant. In all, we find evidence to support our primary argument that positive psychological capital should be a salient predictor of funding performance for two of the three performance variables.

6.1. Generalizability to traditional entrepreneurial fundraising sources: initial public offerings

Our theory suggests that costless signals may be valuable sources of information to crowdfunding investors because there are few objective costly signals available and investors are not as sophisticated as in traditional investment settings. However, in situations where more objective information is available and investors are more sophisticated, we expect that costless signals should be less salient. For instance, Chen et al. (2009) demonstrated that entrepreneur preparedness for business plan presentations, which would be considered costly under the general tenets of signaling theory, leads to more positive evaluations from venture capitalists, while entrepreneurial passion, which would be considered costless, has no influence on venture capitalist evaluations. We sought to examine this boundary condition by testing our hypothesis in a non-crowdfunding fundraising sample where objective information is more readily available and investors are sophisticated. We selected a second post hoc sample of companies that underwent an initial public offering (IPO) in the years 2011, 2012, or 2013 to conduct this test. Just as key investment considerations in crowdfunding are conveyed by a crowdfunding campaign text, in IPOs key investment considerations are also communicated via a key fundraising text: the IPO prospectus (Arthurs et al., 2008). Studying the drivers of IPO performance has been a central focus in both strategic management and entrepreneurship research (e.g., Kroll et al., 2007). Thus, by including IPOs in our analysis we provide a reference point to the existing literature on funding performance in which to compare the crowdfunding results. We initially identified 560 US IPOs that occurred during this time period that had a published prospectus. Using EdgarPro, Yahoo Finance, and Compustat data, we compiled complete data on 432 of these IPOs for our analysis.

We examine the effect of positive psychological capital on a primary outcome of interest in the IPO context, IPO underpricing (e.g., Daily et al., 2003; Pollock and Rindova, 2003). IPO underpricing captures the difference between the offer price received by firm owners compared to the closing price on the first day of trading and is a commonly used measure when investigating short-term IPO performance (Certo et al., 2009). IPO underpricing is measured as $(\text{Stock Price} - \text{Offer Price}) / \text{Offer Price} \times 100$ on the first day a stock traded on a national exchange. We also introduced several context-specific controls associated IPO performance: We controlled for organizational size operationalized by company revenues and by the number of firm employees (e.g., Sanders and Boivie, 2004). Given that economic conditions in a given year influence the valuation of IPOs in that year, we included dummy variables for the years 2012 and 2013 to control for the three IPO years in our sample (e.g., Payne et al., 2013). The market exchange platform (e.g., NYSE) has been identified as a factor in IPO success (e.g., Moore et al., 2012). Accordingly, we introduce dummy variables for each of the four market exchanges facilitating the IPO. Finally, we controlled for industry effects using the first two digits of an organization's SIC code by inserting 45 dummy controls for the 46 industries in our study.

Appendix C provides the results for our IPO sample. When examining underpricing, a negative coefficient suggests a positive relationship with fundraising performance because it reduces IPO underpricing (Payne et al., 2013). The coefficient for positive psychological capital in the model was negative, but not significant ($b = -0.05$; $p > 0.05$) suggesting that positive psychological capital language may not play a role in funding performance in the IPO context.

6.2. Positive psychological capital language in video transcriptions

Many campaigns include videos of the founders showcasing the product or service to generate interest in the campaign (Mollick, 2014). Because a video provides an additional opportunity to signal positive psychological capital to potential investors, in this post hoc we test whether the positive psychological capital language use in videos also leads to crowdfunding performance. 562 campaigns were professionally transcribed to produce an exact transcript of the video. After accounting for missing data in our controls, we conducted our analysis on 527 campaigns using the same models as in our primary analysis. Surprisingly, positive psychological capital in the video transcriptions has no influence on either performance variable (success: $b = -0.03$, $p > 0.05$; funds raised: $b = -0.35$, $p > 0.05$).

6.3. The influence of positive psychological capital over time³

Our sample examines crowdfunding campaigns that were launched across several years. Given that crowdfunding is a continually evolving phenomenon, it is probable the influence of positive psychological capital has continued to evolve over time. To test this notion, we take two steps. First, we separate the 2009–2012 and the 2016 samples and estimate the impact of positive psychological capital on each sample. We found no significant relationships in the earlier sample (success: $b = 0.15$, $p > 0.05$; funds raised: $b = 0.10$, $p > 0.05$), but did find significant relationships in the 2016 sample (success: $b = 0.48$, $p < 0.01$; funds raised: $b = 0.67$, $p < 0.01$). The effect sizes for positive psychological capital in the 2016 sample are also substantially larger than the estimated effects sizes using the entire sample. These results might indicate that our results are driven entirely by the 2016 sample.

³ We would like to thank an anonymous reviewer for suggesting that we explore how time impacts the influence of positive psychological capital.

Alternatively, the results might indicate that positive psychological capital is gaining in importance over time.

To further investigate how the importance of positive psychological capital may have changed over time, we interact the positive psychological capital variable with the year dummies and estimated the models using the combined sample. A table of the interaction terms is provided in [Appendix D](#). For the success dependent variable, we find a significant positive direct effect that is weakened in early years and disappears in later years. For the funds raised models, we find a non-significant main effect but positive and significant interactions that increase in size for the three latter years in our sample. The joint effects in both models are the same however: positive psychological capital increases in importance over time. Thus, the results of this analysis provide evidence that the importance of displaying positive psychological capital has increased as crowdfunding has continued to evolve.

7. Discussion

Our study demonstrates that language indicative of positive psychological capital is an important costless signal tied to fundraising outcomes for entrepreneurs raising funds through crowdfunding. We add to the signaling literature by providing evidence that positive psychological capital may be an important costless signal, particularly in non-traditional fundraising contexts like crowdfunding where information is scarce, there is no formal vetting process, and investors are often less sophisticated. Indeed, past work in crowdfunding has implied the importance of costless signals in crowdfunding ([Davis et al., 2017](#); [Li et al., 2017](#)). However, the literature has yet to leverage a costless signaling lens to expand our knowledge of such signals. By adopting a costless signaling lens, a key implication of our work is that an understanding of the drivers of crowdfunding performance requires a deeper understanding of costless signals and how they lead to performance.

Our work contributes to the emerging work in strategic management and entrepreneurship examining the interaction of signals (e.g., [Plummer et al., 2016](#); [Stern et al., 2014](#)). Signaling research has mostly examined signals in isolation ([Connelly et al., 2011](#); [Drover et al., 2018](#)). However, in practice, signals rarely occur in isolation and signals are often accompanied by other signals that may alter the influence of each ([Stern et al., 2014](#)). As such, exploring the interaction of signals allows for a more accurate depiction of how signals relate to organizational outcomes in naturally occurring settings. Our study provides evidence that costly human capital signals strengthen the positive effect of costless positive psychological capital signals, indicating that signals representative of capabilities (e.g., entrepreneurial experience) and signals representative of motivation and psychological strength work together in facilitating crowdfunding performance. Thus, an entrepreneur likely to successfully raise funds in crowdfunding is one that can simultaneously demonstrate both evidence of past success and a positive, motivated mindset.

While the interactions between human capital and positive psychological capital language significantly impacted crowdfunding performance, social capital did not alter this relationship. One explanation for this unexpected outcome concerns the differences in information provided by human capital versus social capital signals. Human capital signals provide insight into entrepreneurs' individual capabilities ([Marvel et al., 2016](#)) and positive psychological capital signals provide insight into psychological strengths. Individual capabilities and psychological qualities are often closely related (e.g., [Dimov, 2010](#)), thus combining these signals provides a more complete picture of the individual entrepreneurs (e.g., one that is skillful, resilient, and motivated). In contrast, social capital signals capture 'outside' information about an entrepreneur provided by others ([Khoury et al., 2013](#)). Although these signals provide endorsement or social proof effects, they do not necessarily provide additional information concerning entrepreneurs' individual characteristics (i.e., capabilities or mindsets). Instead, they tell investors how others might view the entrepreneur. Thus, while important in evaluating the overall potential of an entrepreneur, it is probable that these signals are considered separately from signals pertaining to individual qualities. Theoretically, this suggests that for costly signals to enhance the influence of costless signals, the costly signals must add more than just additional information, they must add information that is complementary to the costless signal, allowing for the construction of a more complete picture of valued signaler qualities. In our case, the inclusion of human capital signals allows for a more complete picture of the entrepreneur's individual qualities. Together, this begins to trace out a more nuanced relationship of how multiple signals interact.

Our post hoc analyses provide insight into important boundary conditions of our study. We find evidence that our key finding – that positive psychological capital leads to better fundraising performance – generalizes from our Kickstarter data to other types of crowdfunding. However, it does not generalize to more traditional means of fundraising such as IPOs. While exploratory, the results of the post hoc analyses are also consistent with the notion that costless signals are more salient in contexts where there is less objective information (e.g., [Lin et al., 2013](#)). The findings also add to the small but growing literature suggesting that indications of personal characteristics are particularly important in contexts where investors lack sophisticated risk assessment routines and investment preferences are largely taste-based (e.g., rewards-based crowdfunding, peer-to-peer lending, microfinance; [Ciuchta et al., 2016](#); [Davis et al., 2017](#)).

We were surprised by the absence of a relationship between positive psychological capital in the video transcriptions and crowdfunding performance. Though this was a post hoc test, it appears to clash with the premise that videos are a key part of crowdfunding campaigns (e.g., [Mollick, 2014](#)). However, recent crowdfunding research that draws from the Elaboration Likelihood Model (ELM) suggests that potential crowdfunding backers may go through a two-step process when evaluating a crowdfunding campaign ([Allison et al., 2017](#)). This work indicates that investors may initially be in a 'low elaboration' (i.e., low attention) state wherein they are primarily responsive to surface-level cues, such as exciting graphics or an enthusiastic presentation ([Allison et al., 2017](#)). Because videos appear at the top of most crowdfunding pages, this is the state most backers are likely to be in when viewing the included video. If the video grabs their attention, they may then switch to a 'high elaboration' (i.e., high attention) state, where they more thoroughly evaluate other materials in the crowdfunding campaign, such as the narrative. It is possible that because the video serves as a sorting function that other costless signals, such as emotional displays (e.g., [Li et al., 2017](#)), may be more salient in garnering initial investor attention. Moreover, because videos also contain non-verbal cues that are easily observed by viewers but are

not present in the written narratives, costless signals embedded in written language are more salient once backers begin to evaluate the narratives. However, we still know little about how signals embedded in videos relate to signals embedded in texts, which provides opportunities for future research. For example, future research could juxtapose insights from signaling theory and the ELM to tease out which costless signals are most salient in grabbing an investor's initial attention and which signals play a stronger role in the narratives once the campaign has captured the attention of investors. Such research could also explore the interactions between signals in videos and signals in narratives to better understand how these signals may act as complements or substitutes for one another. In a broader vein, future research should carefully examine the impact of visual aesthetics inherent to videos or other graphic content that might otherwise impact crowdfunding performance.

Finally, our post hoc analyses indicate that the influence of positive psychological capital language on crowdfunding performance has increased over time. We believe this result is explained by the increasing demand for crowdfunding (e.g., Assadi, 2015; Massoulon, 2015). As demand for crowdfunding increases, entrepreneurs face greater pressure to distinguish themselves from one another and show that they are worthy of investor funds. Because displaying positive psychological capital provides a means for entrepreneurs to demonstrate their worth, it follows that such displays would become more important as pressures to display one's worth increases. More broadly, these results also suggest that the influence of signals in crowdfunding is not constant over time. However, to date, little work has investigated the evolution of crowdfunding signals. Thus, we encourage future researchers to adopt a temporal perspective to examining signals in crowdfunding to provide insight into how the influence of signals change as crowdfunding becomes more mature.

7.1. Limitations and future research

The contributions of our research should be understood in light of the study's limitations. One of the challenges in crowdfunding research is the lack of data on the individual investors in the campaigns (McKenny et al., 2017). As a result, while our results indicate that crowdfunding campaigns with language indicative of positive psychological capital tend to outperform those without, we cannot directly measure the impact of this language on the decision making of individual investors using field data. However, this limitation presents an opportunity for future research to build on our findings by using experimental designs where investor preferences can directly be accounted for and measured (e.g., Davis et al., 2017; Drover et al., 2017b). Such work would allow researchers to more intricately tease out the decision processes used by investors. For example, researchers could ask potential investors to weight the signals used in making their decisions to determine the relative importance of signals such as human, social, and positive psychological capital.

Our work provides evidence that costless signals enable crowdfunding performance. However, it remains unclear whether these costless signals are truly indicative of the underlying quality of the firm. Given the prevalence of costless signals in crowdfunding, if costless signals are not indicative of firm quality but can be used to drive investment then crowdfunding platforms could become mechanisms where financial resources flow to low-quality firms. This would lead to a waste of resources and undercut the value of crowdfunding in providing financial capital to promising new ventures. Accordingly, it is critical that future research examine relationships between firm quality and costless signals. For example, research examining how crowdfunding campaigns deliver on the promises made during campaigns remains rare (e.g., Mollick, 2014). Future research could examine the presence of positive psychological capital or entrepreneurial passion in campaigns and examine the extent to which these campaigns deliver on campaign promises. Further, future research could examine if costless signals predict other indicators of quality, such as future growth of the firm or subsequent capital raises from professional investors.

In addition, while we address how human and social capital interact with positive psychological capital, we do not investigate how these forms of capital were acquired. For example, social capital may enable the development of human capital (e.g., Coleman, 1988) and positive psychological capital can be developed through experience (Newman et al., 2014). Accordingly, more work remains in investigating the relationships among the different forms of people-related capital in crowdfunding. For example, future work could examine how the completion of previous crowdfunding campaigns leads to changes in the use of positive psychological capital language in future crowdfunding campaigns.

Recent work examining the drivers of crowdfunding performance has found that positive emotional displays, notably entrepreneurial passion, may lead to greater crowdfunding performance (e.g., Davis et al., 2017; Li et al., 2017). While positive psychological capital is distinct from emotional constructs like passion (e.g., Avey et al., 2008, 2010; Luthans et al., 2007), thematically, passion and positive psychological capital overlap in that they both provide an individual with increased motivation (e.g., Cardon et al., 2009; Luthans et al., 2007). Work in organizational behavior suggests that positive psychological capital and emotions often work together to facilitate desirable outcomes, such as goal achievement and job performance (Norman et al., 2005). Future research might build from this work to examine how displays of passion and displays of positive psychological capital collectively influence crowdfunding performance. For instance, passion is often displayed by outwardly visible manifestations of emotion, such as an energetic tone of voice or expressive body language (Li et al., 2017). A future study might examine the interaction between an energetic tone of voice and positive psychological capital language and the resulting influence on crowdfunding performance. Further, because those high in positive psychological capital often experience more positive emotions, future research might examine if an entrepreneur's positive psychological capital is predictive of the level of passion shown in a crowdfunding campaign.⁴

Entrepreneurs often use various mediums to convey their message on crowdfunding platforms, including videos, pictures, and textual narratives (Drover et al., 2017a). Given that prior research has shown that the mere presence of a video has the potential to

⁴ We thank an anonymous reviewer for directing us to this important area of inquiry.

influence funding outcomes (Josefy et al., 2017; Mollick, 2014), future research should consider how these mediums can be used independently to signal quality to potential backers. Indeed, prior work has shown that subtle changes in visual content can alter the effectiveness of the message and the behaviors of resource providers (e.g., Chan and Park, 2015; Pollack et al., 2012). Future crowdfunding studies that leverage prior work on the content analysis of multimedia, including audio tones, photos, and video content could further extend our work on linguistic content by considering the relative effect of signals embedded within videos and images (e.g., Pope and Sydnor, 2011). Further, entrepreneur updates and backer comments represent a dialogue between the entrepreneur and the crowd that may provide researchers with further insight into how the dynamics between the entrepreneur and the crowd shape crowdfunding decisions. Future work might examine how the linguistic content of updates and comments as well as entrepreneur responsiveness to backer comments relates to crowdfunding performance.

Our study indicates that certain costly signals and costless signals (i.e., human capital and positive psychological capital, respectively) work together to facilitate crowdfunding performance. However, it currently remains unclear whether this finding would hold across other venture financing mediums. The value of individual signals is often contextual (Connelly et al., 2011; Plummer et al., 2016), suggesting that the joint impact of signals is also likely contextual. Further, costless signals may play a less salient role in fundraising situations where there is more risk involved, investors are sophisticated, and more formal means of vetting exist (e.g., venture capital, IPO). It is possible that in contexts where costless signals are less relevant, investors may continue to ignore low cost signals even if they are accompanied by costly signals. Therefore, future research should continue to investigate how costly and costless signals may influence each other in various contexts. For example, future research could examine how the presence of social and human capital alter the influence of displaying of positive psychological capital in equity crowdfunding, pitches to angel investors, or pitches to venture capitalists.

8. Conclusion

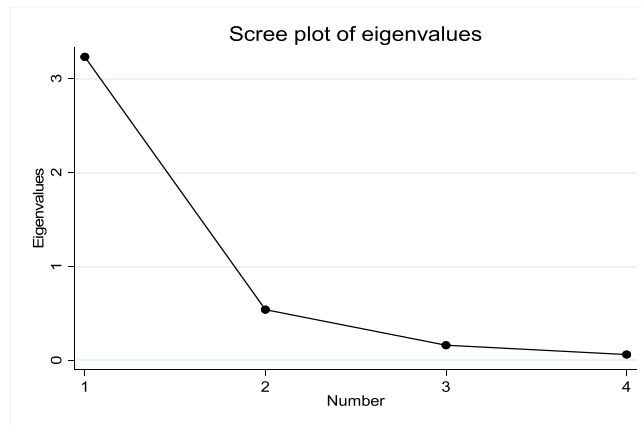
Our study is the first to investigate positive psychological capital language as an important costless signal and explore its role in the entrepreneurial fundraising process. For scholars, our study advances understanding of the determinants of successful crowdfunding campaigns — introducing costless signaling as an important theoretical lens for understanding crowdfunding performance. Our study also underscores the importance of considering the interactions of multiple signals, versus studying one signal in isolation. For entrepreneurs, our research suggests that entrepreneurs would benefit from proactively signaling positive psychological capital when raising funds through crowdfunding. We hope that these findings and their associated implications lead to further academic inquiry regarding the role of positive organizational phenomena in entrepreneurship.

Appendix A. Language indicative of positive psychological capital in crowdfunding texts

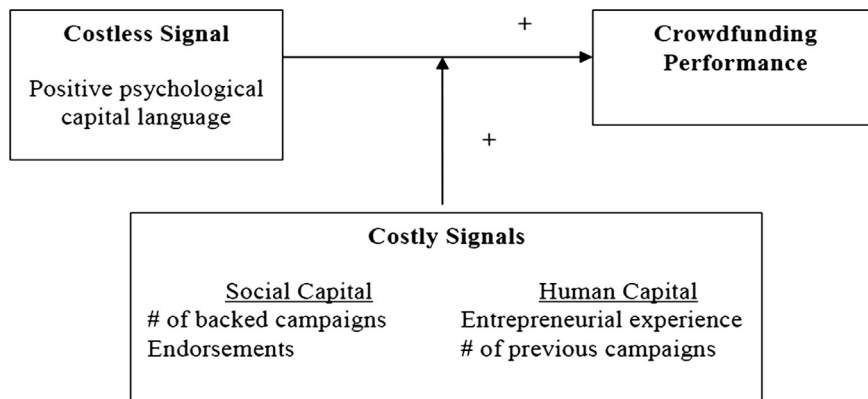
Dimension	Representative crowdfunding text excerpts
Hope	“I have what I believe is a very funny book.” “We hope these offerings create pause in your life and rouse you from your waking-slumber.”
Optimism	“Egypt presents many opportunities that make it an ideal project for Dom.” “That is what I aspire to do with ‘The MO Factor’.”
Resilience	“...we want nothing less than to build the next enduring , iconic, American denim company and capture it all on film.” “We were determined to build a studio that took that mantra seriously.” “We’ve always been steadfast in remaining independent and much of what we do at Village Underground is on a not-for-profit basis”
Confidence	“We have brilliant, experienced actors and a very capable crew.” “We are so confident in our jeans that we also have a one-year guarantee against defects (beyond normal wear and tear). If we can't fix it, we will replace it. So pledge with confidence! ”

Appendix B. Factor and parallel analysis for positive psychological capital variable

Factor	Eigenvalue	Proportion	Component	Loading
1	3.23	0.81	Hope	0.93
2	0.54	0.14	Optimism	0.95
3	0.16	0.04	Resilience	0.95
4	0.06	0.02	Confidence	0.74
Parallel analysis				
Adjusted eigenvalue		3.15		
Estimated bias		0.08		



B.1. Theoretical model



Appendix C. Descriptive statistics and results for Kiva and IPO samples

C.1. Descriptive statistics and correlations for Kiva sample

Variables ^a	Mean	S.D.	Min	Max	1	2	3	4	5	6	7	8	9
1 Successful	0.99	0.07	0.00	1.00									
2 Funds raised	813.11	805.72	0.00	9100.00	0.08								
3 Funding speed	5.18	8.01	0.00	53.14	0.05	0.18							
4 Group	0.12	0.32	0.00	1.00	0.03	0.40	-0.04						
5 Loan amount	816.58	803.88	50.00	9100.00	0.02	1.00	0.18	0.40					
6 Sex (1 = female)	0.27	0.44	0.00	1.00	0.01	-0.04	-0.32	0.12	-0.04				
7 Payments	14.61	11.19	1.00	78.00	0.03	-0.09	0.04	-0.12	-0.09	0.11			
8 Numerical	18.97	11.47	0.00	71.43	0.12	-0.07	-0.05	0.00	-0.08	-0.00	0.27		
9 Word length	140.78	83.12	2.00	1473.00	0.12	0.15	-0.02	0.27	0.14	0.06	-0.06	-0.10	
10 Psychological capital	1.12	1.37	0.00	9.00	0.06	-0.03	-0.07	0.06	-0.04	0.03	0.07	0.00	0.31

N = 1726.

^a All correlations with an absolute value > 0.05 are significant at p < 0.05, those with an absolute value > 0.07 are significant at p < 0.01.

C.2. *Kiva results*

Variable ^{a,b,c}	Successful (Controls)	Successful	Funds raised (Controls)	Funds raised	Funding speed (Controls)	Funding speed
Group	−1.61 (1.14)	−1.55 (1.42)	−0.01 (0.01)	−0.01 (0.01)	−0.12 (0.08)	−0.12 (0.08)
Loan amount	0.51 (0.87)	0.50 (0.87)	0.97** (0.01)	0.98** (0.01)	0.58** (0.03)	0.58** (0.03)
Sex	−0.22 (0.91)	−0.21 (0.91)	−0.03 (0.03)	−0.03 (0.03)	0.69** (0.05)	0.69** (0.05)
Payments	−0.11 (0.80)	−0.09 (0.82)	−0.01 (0.01)	−0.01 (0.01)	0.09** (0.03)	0.09** (0.03)
Numerical	−0.01 (0.04)	−0.01 (0.04)	0.01** (0.00)	0.01** (0.00)	0.00 (0.00)	−0.00 (0.00)
Word length	2.22** (0.59)	2.19** (0.63)	0.01** (0.00)	0.00** (0.00)	0.07* (0.03)	0.10** (0.03)
Constant	8.90 (6.81)	−8.81 (6.85)	−2.19 (1.89)	−2.19 (1.89)	−3.92 (0.30)	−3.97 (0.30)
Psychological capital		−0.07 (0.92)		0.02* (0.01)		−0.08**
Penalized log likelihood/log likelihood	−51.31	−51.30	−1126.64	−1126.00	−2245.74	−2242.97
Sample	1726	1726	1726	1726	1726	1726

* $p < 0.05$.** $p < 0.01$.^a Standard errors reported in parenthesis.^b 42 Country controls included that are not reported.^c 16 categories not reported.C.3. *Descriptive statistics and correlations for IPO sample*

Variables	Mean	S.D.	1	2	3	4	5
1 Underpricing	8.71	178.05					
2 Psychological capital	1402.49	501.66	−0.01				
3 Revenues ^a	622.00	2260.00	−0.01	0.26**			
4 Employees	3678.23	15,935.45	−0.01	0.10*	0.62**		
5 Numerical	61.23	40.78	0.02	−0.01	0.11*	0.14**	
6 Word length	119,650.40	43,722.08	0.01	0.87**	0.21**	0.11*	−0.08

^a Reported in millions, USD.* $p < 0.05$.** $p < 0.01$.C.4. *Psychological capital and funding performance in IPOs*

Variables ^{a,b}	Controls only**	IPO underpricing
Employee count	0.01 (0.05)	0.03 (0.04)
Revenues	0.08* (0.04)	0.08* (0.04)
Numerical language	−0.01 (0.04)	−0.01 (0.04)
Word Length	−0.03 (0.05)	0.01 (0.12)

Year 2012	– 0.10 (0.17)	– 0.10 (0.16)
Year 2013	– 0.03 (0.17)	– 0.02 (0.15)
NYSE	– 0.17 (0.15)	– 0.17 (0.15)
OTCBB	0.23 (0.33)	0.23 (0.33)
AMEX	– 0.48* (0.21)	– 0.49* (0.22)
Constant	0.15 (0.18)	0.18 (0.23)
Two digit SIC code ^c		
Psychological capital		– 0.05 (0.10)
Log likelihood	– 585.29	– 585.20
N	432	432

* $p < 0.05$.

** $p < 0.01$.

^a Standard errors reported in parenthesis.

^b NASDAQ is the excluded market.

^c 45 Industry controls included that are not reported.

Appendix D. Exploring positive psychological capital over time interactions

	Success	Funds raised
PsyCap	1.20** (0.16)	– 0.74 (0.43)
PsyCap and year interactions		
2010	– 1.14* (0.46)	0.82 (0.49)
2011	– 1.03* (0.42)	0.88* (0.44)
2012	– 0.72 (0.43)	1.21** (0.46)
2016	– 0.75 (0.42)	1.35** (0.45)

* $p < 0.05$.

** $p < 0.01$.

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