



On relationship types, their strength, and reward crowdfunding backer behavior

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ABSTRACT

This study examines the association among relationship types, their strength, and contribution behavior in reward crowdfunding. We analyzed data on 568 relational dyads between fundraisers and backers from successful campaigns on KarolinaFund. We collected data from fundraisers and classified the relations they had with backers before the campaign, and their strength. Our findings show that pre-existing relations contribute to a greater extent than previously unknown backers. Among backers with whom relations exist prior to the campaigns, those that have stronger relations with the fundraiser make higher contributions. Strength of relations negatively moderates the association between purely private relations and contribution extent, and positively moderates the association between professional relations and contribution extent. When comparing sub-samples of early and late contributors, we find that private relations contribute to a significantly greater extent at earlier stages, and professional relations contribute to a significant lesser extent in later stages.

1. Introduction

The rapid emergence of crowdfunding as an alternative fundraising channel (Ziegler et al., 2020) has attracted growing interest in the determinants of successful crowdfunding practice and the mechanisms unlocking financial contribution behavior among prospective funders (Butticè & Ughetto, 2021; Shneur & Vik, 2020; Short et al., 2017). Digital crowdfunding represents a family of fundraising models that builds on the principle of collecting relatively small sums from many people, often with little or no involvement from traditional financial intermediaries (Mollick, 2014; Short et al., 2017). These models include those known as ‘investment models’ (offering financial returns), including fully or partially crowd-financed lending and equity investments, as well as those known as ‘non-investment models’ (offering non-financial benefits), such as reward-based crowdfunding and donations (Belleflamme & Lambert, 2016).

A recent literature review on crowdfunding success studies (Shneur & Vik, 2020) suggested that some of the leading theories used to explain successful performance of crowdfunding practice include social capital (Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998) and social network

theory (Carpenter et al., 2012; Granovetter, 1985). Furthermore, a survey of entrepreneurship scholars has also identified these theories as the most promising for guiding future research on crowdfunding (McKenny et al., 2017). Most recently, a comprehensive literature review of research on social capital in the context of crowdfunding identified 108 papers published in the past decade while showing a constant increase in interest (Cai et al., 2021).

The preference for such theoretical anchoring is based on the fundamental argument that relationships help to unlock access to resources by reducing some of the uncertainties associated with entrepreneurial ventures (Davidsson & Honig, 2003; Kwon & Arenius, 2010; Shane & Cable, 2002). Accordingly, when viewing crowdfunding as a form of relationship-based financial intermediation, knowledge and trust embedded in social relations provide quality signals that help alleviate information asymmetries (with respect to the projects and the fundraisers behind them), and facilitate funding decisions (Polzin et al., 2018). Some studies have even found that social capital signals are more important than human and intellectual capital signals when using crowdfunding for fundraising (Liu et al., 2021).

Some of the key findings that emerged from earlier studies showed

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that the buildup of internal social capital (such as within the crowdfunding community) contributes to the acceleration of contributions throughout the campaign period (Colombo et al., 2015), and that such benefits may be carried over to future campaigns (Skirnevskiy et al., 2017). However, this effect gradually erodes when running multiple consecutive campaigns (Butticè et al., 2017). Other studies that explored external social capital (for example, outside the crowdfunding platform and its community of users) mostly used the number of contacts that fundraisers have on various social media applications (Facebook, LinkedIn, etc.) as a proxy for social capital. Such research shows a positive association between network size and campaign success in both investment (Troise & Tani, 2020; Vismara, 2016) and non-investment crowdfunding models (Kunz et al., 2017; Zheng et al., 2014).

Nevertheless, this treatment of relationships may be criticized as requiring greater nuance, as not all relations are identical, and since different relations may have different characteristics and meanings for the individuals concerned. Emerging from this critique, a few studies have started addressing the potential role of variance in the strength of relations rather than their existence. In this context, a study examining Dutch backers of crowdfunding campaigns (in both investment and non-investment models) showed that the strength of the relation that backers have with a campaign creator influences the type of campaign information they consider most critical in their funding decision-making (Polzin et al., 2018). An additional study in a Dutch reward crowdfunding platform showed negative associations between social media campaign communications and contributions from latent and weak ties, arguing for a bystander effect, in which wide-reaching communications lead individuals to trust that someone else would contribute (Borst et al., 2017). A different experimental study, involving an independent (non-platform-based) donation crowdfunding campaign, showed that backers' perceived social closeness and frequency of contact with the campaign creator were both positively associated with contribution behavior (Simon et al., 2019).

The current study aims to further untangle the possible influence that relational characteristics may have on contribution behavior by distinguishing between different relational types and strength levels. Accordingly, we examine associations between private and professional relations, their relative strength, and the extent of contributions made by such contacts in reward crowdfunding campaigns more generally, and at different campaign stages more specifically. We do so by analyzing a unique dataset of 568 relational dyads between fundraisers and backers, representing specific individuals that made financial contributions to campaigns on an Icelandic reward crowdfunding platform called KarolinaFund. Combining platform and interview data, we analyzed the association between relational types, the strength of these relations, and the contributions made by each backer. For this purpose, campaign creators (hereafter referred to as 'fundraisers') were interviewed to provide information about each of the individuals who made financial contributions to their campaign, while indicating the types and characteristics of relations they have had with each at the time of the campaign's launch.

The study's findings present several interesting insights. First, we show that individuals with whom a fundraiser had relations before the campaign contribute to a greater extent than those with whom the fundraisers had no such prior relations. Second, among those with whom fundraisers had relations prior to the campaign, higher contributions were associated with stronger relations and lower contributions were associated with weaker relations. Third, we find that relationship strength negatively moderates the contribution extent of private relations, implying that such contributions represent symbolic support for the campaigner rather than interest in the concept being funded. However, the same interaction positively moderates the contribution extent of professional relations, implying that relationship quality amplifies professional interest in the concept being funded or interest in symbolically supporting such relations. Fourth, when controlling for the interactions between relation types and their strength, we find that private

relations contribute to a significantly greater extent, while professional relations do not contribute to either a greater or lesser extent. Finally, when comparing these associations at early and late stages of the campaign, and while controlling for moderating effects of relationship strength, we find that private relations contribute to a greater extent at early stages, but do not contribute to a greater or lesser extent at later stages. This implies private relations make symbolic contributions at earlier stages, while shifting towards instrumental ones at later stages for ensuring campaign successful completion, based on actual funding gaps between goal sum and the sum of funds raised. However, professional relations do not contribute to greater or lesser extent at earlier stages but do contribute to a significantly lesser extent at later stages. This implies that the funding power of professional interest is mostly exhausted earlier at the campaign when both interest-based and symbolic contributions are made. However, at later stages professional relations only make modest symbolic contributions by those feeling compelled to signal their support to a valued professional contact.

These findings represent several contributions. First, from a theoretical perspective, we provide evidence for the importance of conceptually distinguishing between relational types, their strength, and the interactions between them, each making a unique contribution to the extent of backer contributions. Second, we clearly distinguish among private, professional, and other relations and show empirically that while the strength of private relations negatively moderates their effect on contribution extent, the strength of professional relations positively moderates the same effects. Third, we also show how these effects differ between early and late contributors. Specifically, stronger private relations are small and symbolic at early stages but differ in size according to needs at later stages. At the same time, professional contributions are enhanced with relational strength regardless of stage. Fourth, from a methodological perspective, our evidence is provided based on direct rather than proxy measures of social capital (which were used in earlier studies), as collected directly from fundraisers about their actual relations with each backer, further enhancing the reliability of our findings. Fifth, when considering contextual relevance, we provide evidence from campaigns on a national platform, which, despite representing most platforms globally, have been relatively underrepresented in research in comparison to some global outlier platforms. As such, we answer earlier calls to provide more detailed conceptualizations of social capital in crowdfunding behavior and gain a better understanding of relational dyads as a unit of analysis in crowdfunding in the context of national rather than international platforms (Cai et al., 2021; McKenny et al., 2017; Shneor & Vik, 2020).

The remainder of this paper is structured as follows. We first present a literature review that theoretically anchors the study in social capital and network theory, then establish conceptual linkages to crowdfunding realities and suggest a series of hypotheses for testing. Next, the methodology is outlined, and the findings are presented. A discussion of the findings follows, and the paper concludes by highlighting the study's contributions, limitations, and implications for both research and practice.

2. Social capital theory

Social capital originates in sociological research, which identified it as a distinct form of capital that uniquely captures the aggregation of actual and potential resources accessible thanks to an individual's membership in a social group (Bourdieu, 1986). Shortly after its introduction, the concept was adopted in a wide range of disciplines, leading to varying definitions and inconsistent operationalizations (Payne et al., 2010). However, Nahapiet and Ghoshal's (1998) approach to social capital has emerged as one of the more widely accepted conceptualization in business and management research (Lee, 2009). Its allure is tightly linked to both its conceptual breadth, as well as its de-facto popular use (Cai et al., 2021).

Nahapiet and Ghoshal (1998) defined social capital as "the sum of

actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet & Ghoshal, 1998, p. 243). This suggests that social capital includes resources that are both embedded in the social relations of a focal actor, often referred to as 'internal social capital', as well as in the linkages among individuals in a collective, often referred to as 'external social capital' (Adler & Kwon, 2002). Fundamental to their approach is the view of social capital as having three dimensions – structural, relational, and cognitive (Nahapiet & Ghoshal, 1998). The structural dimension relates to patterns of connections between individuals embedded in social networks. The relational dimension captures the interpersonal relations developed through interpersonal interactions and translates them into relational capital in the forms of trust, sense of obligation, norms, and identity. The cognitive dimension relates to resources providing shared interpretations, representations and meaning in a group. While these dimensions illuminate different facets of social capital, the boundaries between them are often ambiguous because they are inherently interrelated (Cai et al., 2021).

Social capital is generated through its embeddedness in social networks (Carpenter et al., 2012). It captures the contextual influences of social ties on participants' actions (Granovetter, 1985), which manifest in relational and structural forms (Moran, 2005). Relational embeddedness suggests that strong ties and a cohesive network facilitate norms of trust and reciprocity, which then translate into cooperation and mutual support between members. Structural embeddedness suggests that structural features of networks have both benefit and cost implications to members.

Unsurprisingly, social capital theory has been applied in a wide range of studies linking entrepreneurial resource acquisition to network relations (M.-H. Chen et al., 2015; Davidsson & Honig, 2003; Kwon & Arenius, 2010; Shane & Cable, 2002). In the same spirit, since crowdfunding is essentially concerned with fundraising from members of social collectives, it fits well with the logics of social capital, where resources are accessed and mobilized thanks to and through networks of interpersonal relationships. In this case, crowdfunding is viewed as a form of relationship-based financial intermediation in which the knowledge and trust embedded in social relations serve as quality signals, alleviating information asymmetries that prospective backers may be concerned with and facilitating their funding decisions (Polzin et al., 2018).

2.1. Social capital theory in crowdfunding

Recent literature reviews have found consensus around the importance of social capital in predicting crowdfunding success (Butticè & Ughetto, 2021; Shneor & Vik, 2020). Furthermore, a specific review of literature on social capital research in the context of crowdfunding (Cai et al., 2021) highlighted several findings that are integrated into an overarching dynamic model. First, research shows that fundraisers' social capital originates from both social networks within the crowdfunding platform, referred to as 'internal social capital', and from social networks outside the crowdfunding platform, referred to as 'external social capital'. Second, both types of social capital are characterized by structural, relational, and cognitive dimensions. Third, both internal and external social capital are positively associated with crowdfunding dynamics and results. Fourth, the impact of internal and external social capital changes over time, where external social capital is essential early in the process and internal social capital becomes more influential in later stages of the campaign.

Research has shown a positive association between different aspects of social capital and campaign success in both investment (Kang et al., 2016; Troise & Tani, 2020; Vismara, 2016) and non-investment models (Kunz et al., 2017; Zhao & Vinig, 2019; Zheng et al., 2014). It has also shown that these positive associations are evident with respect to internal social capital (Bi et al., 2017; Butticè et al., 2017; Colombo et al., 2015), external social capital (Lin et al., 2012; Vismara, 2016), as well as

both types of social capital (Davies & Giovannetti, 2018; Kromidha & Robson, 2016).

In the absence of direct prior social ties, people may be tempted to engage in zero-sum business transactions while being primarily motivated by self-interest, but when they do exist people shift from the pursuit of self-interest to the pursuit of mutual gain (Uzzi, 1996). Here, again, since knowledge and trust embedded in social relations provide quality signals that help alleviate information asymmetries surrounding the project and the fundraiser, existing relations can facilitate funding decisions in crowdfunding (Polzin et al., 2018). Hence, based on both the core assumptions of social capital theory and the consistent evidence of positive associations between social capital and funding outcomes as identified in earlier research, we suggest that having social capital embedded in existing relations prior to the campaign results in greater backer contributions.

While such an assumption may seem intuitive, it does merit re-testing thanks to the unique potentialities underlying crowdfunding practice. Specifically, since crowdfunding allows for wider reach, it may allow previously unfamiliar people that may have special interest in a project or have vested interest in its success to contribute to a greater extent than familiar people who have no special interest in the project itself, beyond supporting someone they know. In such cases, it is at least potentially possible that people with greater interest may contribute more than people that are familiar but less interested. Hence, we suggest re-examining established assumptions in studies of crowdfunding. Accordingly, we hypothesize:

H1. Individuals who have relations with the fundraiser prior to the campaign are likely to contribute more to the campaign than those who have no such relations with the fundraiser.

The hypothesis above, and all those that follow, seek to explain how relationships and their strength influence contribution extent of backers. Contribution extent is hereby defined as the absolute monetary value contributed to the campaign by the individual backer. Here, the intention is to capture whether one backer contributes more or less than others, rather than whether they contribute a larger or smaller share of their overall income, expense budget, or donation budget.

2.2. Private and professional relations

Research shows that most early contributors to crowdfunding campaigns originate from social networks external to the platform (Agrawal et al., 2015; Ordanini et al., 2011; Skirnevskiy et al., 2017), and has argued for their criticality in creating positive momentum leading to a campaign's eventual success (Lehner, 2014; Vismara, 2018). By signaling the trustworthiness of the fundraiser to third parties and by creating an initial critical mass of interest that spreads campaign information wider, members of external social networks encourage the increasing interest and involvement of members of internal social networks in the campaign. Such growing interest from members of internal networks eventually triggers a herding effect in later campaign stages (Bretschneider & Leimeister, 2017; Y. Chen et al., 2020).

Most researchers in this field have associated external social capital with friends and family mirroring practice in entrepreneurship in general, where initial funding originates from close social circles (Bellavitis et al., 2017). This has led some to label the first stage of crowdfunding campaigns as the 'friend-funding' phase (Ordanini et al., 2011). While some have equated this with private contacts such as friends and family (Agrawal et al., 2015), others have provided evidence that such contacts are part of both private and professional networks (Skirnevskiy et al., 2017). Some have also used geographical proximity as a proxy indicator for local social capital versus more distant connections without distinguishing between private and professional relations (Giudici et al., 2018; Mendes-Da-Silva et al., 2015).

In any case, crowdfunding is characterized by relatively high degrees of information asymmetry between backers and fundraisers (Belleflamme et al., 2014; Courtney et al., 2017). One way to limit potential

negative outcomes under such conditions is in risking less resources by offering more modest contributions. Here, it is assumed that thanks to experience enshrined in relations existing prior to the campaign, those who choose to support the fundraiser are likely to be those who trust them to deliver on their promises, hence contributing as much as they can with less consideration of limiting risk through smaller contributions. However, supporters who are unfamiliar with the fundraiser may use more modest contributions to limit the negative potential outcomes that may emerge from supporting a fundraiser under conditions of high information asymmetries and trust barriers.

Based on the above, we hypothesize the following while distinguishing between private and professional contacts, and timing of their contributions:

H2(a). Individuals with whom the fundraiser has had (i) private or (ii) professional relations prior to the campaign will make greater contributions to the campaign than others.

H2(b). Individuals with whom the fundraiser has had a private relation prior to the campaign will make greater contributions at earlier stages of the campaign.

H2(c). Individuals with whom the fundraiser has had a professional relation prior to the campaign will make greater contributions at later stages of the campaign.

2.3. Strength of social relations

While a large body of research supports the general argument of a positive effect of social capital on campaign outcomes, studies vary significantly in the way they have captured it, whether they refer to internal, external, or both types of social capital, as well as in their operationalization of related measures (Cai et al., 2021). However, since not all relations are the same and may not carry equal levels of trust and obligations between individuals, we suggest that contribution behavior may vary based on the strength of such relations. The strength of ties was found to positively impact resource acquisition in general entrepreneurship research (Newbert et al., 2013; Shane & Cable, 2002). This is explained by dynamics in which, as relationships become deeper through long-term repeated interactions, a sense of trust evolves between the parties (Granovetter, 1992), which then serves to mitigate some of the uncertainties inherent to risky investments in entrepreneurial venturing (Glücksman, 2020; Hain et al., 2016).

In the context of crowdfunding, several studies have shown a positive association between trust and crowdfunding contribution behavior (Kang et al., 2016; Liang et al., 2019; Zheng et al., 2016), as well as between individuals who have a close social circle supportive of crowdfunding (subjective norms) and their contribution intentions (Baber, 2020; Shneor, Haque Munim, et al., 2021; Shneor & Munim, 2019). However, very few studies have specifically examined whether the strength of relations has an impact on campaign outcomes. Here, while not examining campaign outcomes per se, a study of Dutch crowdfunding backers showed that the strength of the relation backers have with a fundraiser influences the type of information they consider most critical in their funding decision making (Polzin et al., 2018). A different study, involving an experiment in donation crowdfunding, has shown that backers' perceived social closeness and frequency of contact with the fundraiser were both positively associated with contribution behavior (Simon et al., 2019). In accordance with these insights and in line with earlier research linking strength of relations and fundraising outcomes outside the crowdfunding context, we hypothesize the following:

H3. The stronger the relation between the fundraiser and the backer prior to the crowdfunding campaign, the higher the contribution that will be made by the backer.

2.4. Moderating effect of social relationship strength

Private relations, such as friends and family, tend to contribute to a

fundraiser's campaign based on personal loyalties and commitments (Davidson & Poor, 2015) rather than strategic business considerations. Furthermore, since family relations and friendships are unlikely to be defined or substantially influenced by a contribution to a crowdfunding campaign, support in such a context may be more symbolical than utilitarian. Hence, private ties can be satisfied with a contribution's symbolic effect in publicly signaling an endorsement through their campaign contributions (Zaggl & Block, 2019). Such a symbolic effect may be achieved within a narrow range of contribution amounts, while satisfying the sense of relational obligation to support the fundraiser (Simon et al., 2019; Zaggl & Block, 2019). Accordingly, in such cases, relational strength may negatively moderate the effect of private relations on amounts contributed overall. This suggests that closer private relations may lead to smaller contributions that are symbolic signals of endorsement rather than large economic commitment to the venture's success.

However, when considering the contributions' timing, private relations may serve different functions at early and late campaign stages. Here, private relations may make symbolic small-sum contributions signaling endorsement and encouragement of others to contribute. However, at later stages, as the campaign proceeds towards its deadline, the urgency of support becomes more prevalent shifting their involvement towards instrumental contributions. This implies that contributions from private relations will aim to ensure successful completion of the campaign, regardless of the actual remaining funding gaps. Accordingly, such relations will contribute more if the gap is large or contribute less if the gap is small. Hence, there will be no clear a priori direction of contribution, which depends on the remaining funding gaps. Under such conditions, stronger relations will be associated with making necessary contributions (large or small), leaving the interaction effect to be non-significant overall across campaigns, as they will experience different levels of funding gaps at late campaign stages. Accordingly, we hypothesize the following:

H4a. The strength of the relations will negatively moderate the effect of private relations on the contribution extent of early backers.

H4b. The strength of the relations will not moderate the effect of private relations on contribution extent in later campaign stages.

When considering professional acquaintances, one may argue that they have stronger uncertainty reduction effects than private relationships. In professional relations, information asymmetry is reduced, thanks both to the ability to better evaluate the quality of the project proposed and due to relational familiarity with the fundraiser. Evidence for this can be found in the different type of information that such contacts require when considering backing relevant campaigns (Polzin et al., 2018), as well as in the trust created through long-term interpersonal interactions that supersede the specific crowdfunding campaign (Kang et al., 2016). One could also argue that professional contacts may have greater vested interests in their peers' success, as part of a larger agenda of promoting certain sectors, innovations, or artistic styles. In such environments, deal flows depend on a tight-knit network of professionals with common agendas, where one's success is interdependent with a peer's success, as is often evident in industrial networks' dynamics and benefits (Gadde et al., 2003). Moreover, when considering contribution timing, one can expect that professional relations' contributions will be more stable throughout the campaign period. Here, since their vested interests in developing the professional relations, as well as in enhancing sectoral agendas remain unchanged throughout the period, stronger professional relations are likely to contribute to a greater extent, regardless of campaign stages. Accordingly, we hypothesize the following:

H4c. The strength of the relations will positively moderate the effect of professional relations on contribution extent, regardless of campaign stage.

3. Methods

Our unit of analysis is the relational dyad between a fundraiser and their campaign's backer. Specifically, we collected our data about relational dyads from several successful campaigns that were run on KarolinaFund, Iceland's only crowdfunding platform. KarolinaFund is a reward-crowdfunding platform that has operated since 2012, and while it accommodates projects from all sectors, it has been particularly successful in attracting projects from the creative and cultural sectors. Since its establishment, it has overseen more than 600 projects, successfully raising a total of close to EUR 3.8 million from more than 130,000 backers (KarolinaFund, 2021). In this respect, we respond to earlier calls to study crowdfunding in the context of national platforms representing the majority of crowdfunding platforms globally (Ziegler et al., 2020), rather than the global outlier platforms that have dominated earlier research (Shneor & Vik, 2020).

Iceland itself is an interesting setting, being a small-developed economy that has been hit particularly hard by the 2008 Global Financial Crisis, following which it has seen a dramatic tightening of financial regulation and growing public disillusion with the traditional credit industry (Bergmann, 2014). While this combination of conditions has hampered the development of an investment crowdfunding sector in the country, it did facilitate a healthy development of the local non-investment crowdfunding model. Due to the relatively small size of the home market, and the extensive network of its team of funders, no local challenger has emerged for KarolinaFund since its establishment.

3.1. Data collection

Data about relational dyads were collected from two complementary primary sources: the platform's database and interviews with several fundraisers. First, the platform contacted fundraisers that it deemed representative while inviting them to participate in our research and requesting permission to share relevant information about their campaigns. Seven agreed to participate and interviews were scheduled. During the interview, each fundraiser was presented with the list of people that contributed to their campaign (as provided by the platform) and asked to characterize their relations with each backer at the time of their campaign's launch. These characterizations of relations were based on a list of prespecified indicators (see measures below). Once this information was recorded, the platform provided information about the sums contributed by each backer and the list of contributors was anonymized.

Table 1 provides background details about the seven campaigns for which information on relational dyads was collected. This information is provided as the contextual boundary of the relational dyads' data used in our analyses. Here, the campaigns serve as context of study, while the relational dyads serve as the prime unit of analysis.

Some corrections to the data were applied prior to the analysis. First, in cases of multiple contributions made by the same contributor to the

same campaign, we used the total amount contributed by the same person as a single observation in our dataset. Second, observations of self-pledging were removed from the dataset to exclude the fundraiser's relational dyad with him or herself. In some cases, self-funding events were explained by the fundraisers as their own reporting of contributions received from other people outside the platform in either cash or direct transfers. However, since the fundraisers were often unable to trace the exact identities and amounts of such contributors, all records of self-funding were removed from the dataset. After these corrections, our dataset included a total of 568 observations of unique relational dyads.

3.2. Measurements

To capture contribution extent as our dependent variable, we used two separate measures. *Amount* is the absolute ln value of the sum contributed by each backer to a specific campaign in euros. *Contribution-goal ratio* is the relative share of a sum contributed by a certain individual to a certain campaign out of the total sum set as the campaign's fundraising goal. To avoid very small values, we duplicated the contribution-goal ratio by 100.

Our independent variables included a series of indicators characterizing the specific relations between each contributor and the fundraiser. First, we used *existence of relations* as a dichotomous indicator of whether a fundraiser had any form of relation with a certain backer prior to the launch of their campaign (value '1'), or not (value '0').

Second, we used two dichotomous variables to distinguish between private and professional relations. Pure *private relation* indicates whether a contributor is either a friend or family member (value 1), or not (value 0), and is not classified as a professional relation as well. A professional relation indicates whether a contributor is either a work colleague or business partner (value 1), or not (value 0), regardless of whether the same person is also classified as a friend or family member or not. Overall, our data included 102 relations classified as purely private relations, 67 classified as professional relations, and 180 as other types of relations (neighbors, people familiar to fundraiser from same school, church, political party, parent of the fundraiser's child's friend, etc.).

Third, to capture relational strength we used three indicators: familiarity level, length of relation, and communication frequency. Each of these required scoring on a five-point Likert scale. Each variable's scale values are presented in Table 2. Since these indicators were highly intercorrelated, we created a composite score for *relational strength* that included all three. Hence, we first ensured that our data lends itself to factor analysis. A KMO value of 0.695, and Bartlett's test p-value of 0.00 confirmed that is the case. We proceeded with a factor analysis resulting in a single factor with a Cronbach's alpha of 0.813. We used this composite score for relational strength in our analysis.

Furthermore, for testing moderation effects, we created two interaction terms, including: *Private tie * Relational strength* and *Professional tie * Relational strength*.

To compare early and late contributions, we divided the duration

Table 1
Campaigns included in dataset.

	Campaign 1	Campaign 2	Campaign 3	Campaign 4	Campaign 5	Campaign 6	Campaign 7
Project theme	Book production	Book production	Documentary film	Book production	Performing Arts	Music Concert	Performing Arts
Goal sum	EUR 2,600	EUR 3,000	EUR 5,500	EUR 4,000	EUR 6,000	EUR 1,000	EUR 13,000
Sum raised	EUR 2,616	EUR 3,010	EUR 6,500	EUR 4,510	EUR 6,290	EUR 1,232	EUR 16,159
Number of unique backers	53	55	165	87	73	23	112
Lead fundraiser location*	Rural	Rural	Urban	Urban	Urban	Rural	Urban
Duration	35 days Sept–Oct 2014	55 days July–Aug 2017	36 days June–July 2014	31 days Aug–Sept 2017	51 days Aug–Sept 2017	43 days Nov 2016–Jan 2017	29 days March–April 2015
Fundraiser team members	3	3	4	2	4	1	2

Note: 'Urban' implies location in either Reykjavik or Akureyri greater areas. 'Rural' is any other location in Iceland.

Table 2
Relational strength measurements.

Variable	Scale
Familiarity	1. Not at all 2. A little familiar 3. Somewhat familiar 4. Familiar 5. Highly familiar
Relationship length	1. <1 year 2. 1–3 years 3. 3–5 years 4. 5–10 years 5. More than 10 years
Frequency of communication	1. Once a year or less 2. Few times a year 3. Monthly 4. Weekly 5. Daily

length of each campaign into three periods. Backers that contributed during the first third of the campaign’s duration were labelled as ‘early backers’, while those that contributed during the last third of the campaign’s duration were labelled as ‘late backers’.

In addition to the above, we also included several control variables. Since earlier studies have shown the importance of internal social capital in campaign outcomes (Colombo et al., 2015; Wang et al., 2018; Zhao & Vinig, 2019), we controlled for internal social capital effects by using the ln value of two variables: *Followers*, which captured the number of platform users following the fundraiser’s activities, and *Following*, which captured the number of platform users followed by the fundraiser. In similar spirit, we also included two controls that captured the backers’ previous crowdfunding experience on the platform. *Creator* is a dichotomous variable that indicates whether a backer has previously used crowdfunding to fund its own project(s) on the platform (value ‘1’) or not (value ‘0’). *Backed* is the ln value of the total number of campaigns backed by the same backer at the time of data collection.

Finally, we included two demographic controls related to gender and geography. Since gender effects were identified to have a consistent association between female backers and reward crowdfunding campaign success in earlier research (Shneor & Vik, 2020), we included the dichotomous control *Female* indicating whether the backer was a woman (value 1) or a man (value 0). Furthermore, because earlier research presents inconsistent evidence with respect to the association between geographical distance and reward crowdfunding campaign outcomes (Shneor & Vik, 2020), we included a *Distance* variable measuring the ln value of the physical distance between a fundraiser’s and backer’s locations in miles.

Table 3
Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Ln_amount	568	3.198	1.027	2	6.745
Contribution-goal ratio	568	1.133	1.562	0.145	20
Relational strength	568	0.461	0.514	0	1.811
Existence of relations	568	0.614	0.487	0	1
Pure private relations	568	0.180	0.384	0	1
Professional relations	568	0.118	0.322	0	1
Creator	568	0.072	0.259	0	1
Ln_distance	568	0.582	0.845	0	2.373
Ln_backed	568	0.82	0.943	0	4.875
Ln_following	568	0.086	0.468	0	4.787
Ln_followers	568	0.16	0.513	0	4.29
Female	568	0.639	0.481	0	1

4. Analysis and findings

Tables 3 and 4 report the descriptive statistics and correlation matrix of the variables included in our analysis. As expected, the independent variables correlate with the dependent variable. We checked for multicollinearity by examining the variance inflation factors (VIFs). As presented in Table 4, all values are well below the strictest requirement of 4 (Hair et al., 2010), with the maximum VIF value being 2.81. Therefore, we conclude that our data does not suffer from problems of multicollinearity.

The hypotheses were tested using multiple regression analyses reported in Tables 5–8. Table 5 and 7 use amounts, while Tables 6 and 8 use contribution-goal ratio as the dependent variable. Tables 5 and 6 present findings with respect to full sample, while Tables 7 and 8 represent findings with respect to early and late backers. H1 predicted that the existence of social relations between fundraisers and backers is positively associated with the extent of contribution. We used the full sample of 568 relational dyads to test this hypothesis. The results support H1 with respect to both amounts contributed ($t = 5.17, p < 0.01$) and contribution-goal ratio ($t = 3.87, p < 0.01$).

The remaining hypotheses are tested with the sub-sample of 349 dyads where a relationship existed prior to the campaign, as the analysis of relational characteristics requires the existence of a relation. H2a suggested that private and professional relations, respectively, will be positively associated with the extent of contribution. This is supported with respect to professional relations in terms of both amounts contributed ($t = 4.79, p < 0.01$) and contribution-goal ratio ($t = 3.32, p < 0.01$). However, it is not supported with respect to private relations in terms of both amounts contributed ($t = -0.15, n.s.$) and contribution-goal ratio ($t = -1.80, p < 0.1$). Interestingly, when introducing moderation effects of relational strength, positive associations between pure private relations and contribution extent become significant with respect to contributed amount ($t = 3.53, p < 0.01$), but association with contribution-goal ratio remain non-significant. On the other hand, associations with professional relations become non-significant with respect to contribution amount ($t = 1.36, n.s.$) and negative with respect to contribution-goal ratio ($t = -2.55, p < 0.05$).

H2b suggested that private relations will make greater contributions at earlier campaign stages. This was not supported with respect to both amounts contributed ($t = 0.10, n.s.$) and contribution-goal ratio ($t = -0.60, n.s.$). However, these associations became positively significant when moderating effects are introduced into the model, both with respect to contribution amount ($t = 3.53, p < 0.01$), and contribution-goal ratio ($t = 3.40, p < 0.01$).

H2c suggested that professional relations will make greater contributions at later campaign stages. This is supported with respect to amounts contributed ($t = 1.69, p < 0.05$), but not with respect to contributions-goal ratio ($t = 1.65, n.s.$). However, when introducing moderation effects of relational strength, the association with amount ($t = -2.55, p < 0.05$) become significantly negative at late campaign stages, while association with contribution-goal ratio remains non-significant.

H3 suggested that relational strength is positively related to extent of contribution. This hypothesis is confirmed with respect to both amounts contributed ($t = 8.47, p < 0.01$) and contribution-goal ratio ($t = 6.22, p < 0.01$). Furthermore, these associations are evident with respect to both early and late contributors, as well as when introducing additional independent and moderating variables into the respective models.

To test moderation effects, we added the two interaction terms. This improved the share of variance explained as captured by an increase in R² values from 45 percent to 50 percent in the regression using amounts contributed as the dependent variable, and from 28 percent to 31 percent in the regression using the contribution-goal ratio as the dependent variable. Improvements in explanatory power were also recorded in the separate analyses of early and later backers.

H4a suggested that relational strength will negatively moderate the

Table 4
Correlation matrix.

	Ln_amount	Relational strength	Relational existence	Pure private relations	Professional relations	Creator	Ln_distance	Ln_backed number	Ln_following	Ln_followers	Female	VIF
Ln_amount	1											
Relational strength	0.522***	1										2.6
Existence of relations	0.265***	0.711***	1									2.3
Pure private relations	0.061	0.284***	0.371***	1								1.34
Professional relations	0.421***	0.470***	0.290***	-0.171***	1							1.50
Creator	-0.081*	0.056	0.011	-0.024	0.249***	1						1.65
Ln_distance	0.235***	0.344***	0.423***	0.249***	0.029	0.003	1					1.3
Ln_backed	-0.117***	-0.014	0.041	-0.022	-0.021	0.208***	-0.123***	1				1.35
Ln_following	-0.077*	-0.092**	0.113***	-0.073*	-0.051	0.203***	-0.093**	0.264***	1			1.98
Ln_followers	-0.098**	-0.016	0.078*	-0.049	-0.011	0.485***	-0.081*	0.278***	0.684***	1		2.81
Female	0.038	0.116***	0.098**	-0.011	0.093**	0.017	-0.003	-0.019	-0.096**	-0.134***	1	1.05

Note: Robust t-statistics in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 5
Regression results full sample (dependent variable: amount).

	Model 1	Model 2	Model 3	Model 4	Model 5
Creator	-0.51*** (-3.71)	-0.63*** (-3.27)	-0.65*** (-3.56)	-0.74*** (-4.05)	-0.69*** (-3.86)
Ln_distance	0.15*** (2.6)	0.22*** (3.2)	0.16*** (3)	0.22*** (4.09)	0.24*** (4.84)
Ln_backed	-0.16*** (3.00)	-0.27*** (-3.62)	-0.23*** (-4.00)	-0.22*** (-4.14)	-0.18*** (-3.48)
Ln_following	0.01 (0.14)	0.06 (0.58)	0.21 (1.59)	0.22* (1.88)	0.19 (1.59)
Ln_followers	0.07 (0.76)	0.15 (1.52)	-0.05 (-0.38)	-0.00 (-0.01)	0.01 (0.05)
Female	0.04 (0.51)	0.20* (1.69)	0.07 (0.71)	0.05 (0.52)	0.04 (0.48)
Relational strength			1.32*** (12.47)	1.06*** (8.47)	1.13*** (6.30)
Pure private relations				-0.01 (-0.15)	0.62*** (4.35)
Professional relations				0.79*** (4.79)	-0.23 (-0.77)
Relational strength *					-0.84*** (-3.45)
Private relations					
Relational strength *					0.88*** (3.01)
Professional relations					
Existence of relations	0.46*** (5.17)				
Constant	2.95*** (34.05)	3.34*** (23.33)	2.47*** (20.46)	2.49*** (20.99)	2.38*** (18.60)
Observations	568	349	349	349	349
R-squared	0.113	0.096	0.388	0.453	0.497

Note: Robust t-statistics in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 6
Regression results full sample (dependent variable: contribution-goal ratio).

	Model 1	Model 2	Model 3	Model 4	Model 5
Creator	-0.75*** (-3.71)	-1.03*** (-3.19)	-1.05*** (-3.14)	-1.21*** (-3.28)	-1.15*** (-3.13)
Ln_distance	0.19* (1.8)	0.23* (1.71)	0.17 (1.32)	0.26** (2.37)	0.30*** (2.80)
Ln_backed	-0.25*** (-2.82)	-0.40*** (-2.75)	-0.35*** (-2.71)	-0.34*** (-2.82)	-0.29** (-2.40)
Ln_following	0.02 (0.27)	0.08 (0.92)	0.26* (1.69)	0.26* (1.80)	0.22 (1.44)
Ln_followers	0.15 (1.64)	0.21* (1.85)	-0.03 (-0.18)	0.05 (0.30)	0.06 (0.34)
Female	0.26** (2.58)	0.48*** (3.07)	0.33** (2.47)	0.28** (2.30)	0.27** (2.31)
Relational strength			1.59*** (7.07)	1.16*** (6.22)	1.28*** (5.47)
Pure private relations				-0.21* (-1.80)	0.65*** (3.98)
Professional relations				1.30*** (3.32)	0.02 (0.03)
Relational strength *					-1.14*** (-4.03)
Private relations					
Relational strength *					1.10* (1.68)
Professional relations					
Existence of relations	0.58*** (3.87)				
Constant	0.73*** (9.08)	1.27*** (4.87)	0.21 (1.05)	0.30 (0.281)	0.15 (0.66)
Observations	568	349	349	349	349
R-squared	0.089	0.068	0.211	0.281	0.307

Note: Robust t-statistics in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 7
Regression results early and late contributors (dependent variable: amount).

	Early Contributors				Late Contributors			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Creator	-0.79*** (-2.81)	-0.86*** (-2.88)	-0.88*** (-3.25)	-0.80*** (-2.76)	-0.65** (2.06)	-0.42 (-1.31)	-0.51 (-1.46)	-0.53 (-1.57)
Ln_distance	0.23** (2.35)	0.12 (2.40)	0.16** (2.11)	0.19*** (2.61)	0.14 (1.05)	0.23** (2.22)	0.32*** (3.01)	0.36*** (3.57)
Ln_backed	-0.24** (-2.29)	-0.21** (-2.46)	-0.20*** (-2.65)	-0.12 (-1.57)	-0.37*** (-2.90)	-0.34*** (-3.57)	-0.35*** (-3.79)	-0.31*** (-3.46)
Ln_following	-0.19 (-0.98)	-0.07 (-0.28)	0.11 (0.44)	0.10 (0.37)	-0.35** (-2.11)	-0.33 (-1.49)	-0.28 (-1.41)	-0.20 (-1.21)
Ln_followers	0.33 (1.61)	0.27 (1.18)	0.12 (0.54)	0.06 (0.26)	0.03 (0.18)	-0.35* (-1.73)	-0.19 (-0.85)	-0.14 (-0.59)
Female	-0.05 (-0.30)	-0.15 (-0.97)	-0.11 (-0.76)	-0.11 (-0.75)	0.19 (0.81)	0.14 (0.74)	0.11 (0.60)	0.12 (0.069)
Relational strength		1.24*** (6.80)	0.99*** (5.28)	1.22*** (4.10)		1.45*** (8.45)	1.25*** (5.39)	1.14*** (3.62)
Pure private relations			0.10 (0.067)	0.78*** (3.53)			-0.29 (-1.48)	0.38 (1.22)
Professional relations			1.10*** (4.46)	0.39 (1.36)			0.47* (1.69)	-1.02** (-2.55)
Relational strength * Private relations				-1.00** (-2.39)				-0.72* (-1.90)
Relational strength * Professional relations				0.69* (1.75)				1.29*** (3.06)
Constant	3.40*** (18.38)	2.70*** (15.73)	2.62*** (14.70)	2.37*** (11.84)	3.75*** (11.46)	2.42*** (9.01)	2.45*** (9.21)	2.43*** (8.73)
Observations	147	147	147	147	131	131	131	131
R-squared	0.103	0.354	0.470	0.522	0.122	0.420	0.465	0.517

Note: Robust t-statistics in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 8
Regression results early and late contributors (dependent variable: contribution-goal ratio).

	Early Contributors				Late Contributors			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Creator	-0.78** (-2.35)	-0.86** (-2.27)	-0.98*** (-2.88)	-0.87** (-2.52)	-1.32** (-2.23)	-1.03* (-1.75)	-1.25* (-1.73)	-1.26* (1.77)
Ln_distance	0.29** (2.10)	0.15 (1.32)	0.20** (1.98)	0.25 (2.73)	0.04 (0.10)	0.14 (0.43)	0.33 (1.15)	0.36 (1.24)
Ln_backed	-0.28* (-1.85)	-0.23* (-1.89)	-0.24** (-2.32)	-0.12 (-1.39)	-0.58* (-1.80)	-0.54* (-1.81)	-0.54* (-1.85)	-0.51* (-1.71)
Ln_following	-0.18 (-0.90)	-0.05 (-0.16)	0.18 (0.62)	0.18 (0.57)	-0.11 (-0.56)	-0.09 (-0.23)	0.03 (0.07)	0.09 (0.27)
Ln_followers	0.36 (1.53)	0.27 (1.04)	0.09 (0.34)	-0.01 (-0.03)	0.01 (0.06)	-0.47 (-1.59)	-0.14 (-0.38)	-0.08 (-0.21)
Female	0.20 (1.00)	0.08 (0.47)	0.15 (0.95)	0.15 (0.98)	0.55* (2.51)	0.49* (1.87)	0.46* (1.68)	0.47* (1.74)
Relational strength		1.48*** (5.74)	1.16*** (4.81)	1.33*** (3.09)		1.83*** (4.56)	1.36*** (3.66)	1.44*** (3.71)
Pure private relations			-0.11 (-0.60)	0.80*** (3.40)			-0.40* (-1.74)	0.62 (1.60)
Professional relations			1.47*** (3.82)	-0.17 (-0.48)			1.08 (1.65)	-0.06 (-0.04)
Relational strength * Private relations				-1.29** (-2.55)				-1.17** (-2.43)
Relational strength * Professional relations				1.70*** (2.82)				0.92 (0.73)
Constant	1.15*** (5.53)	0.31 (1.41)	0.30 (1.54)	0.05 (0.18)	1.92** (2.51)	0.23 (0.36)	0.24 (0.42)	0.11 (0.19)
Observations	147	147	147	147	131	131	131	131
R-squared	0.090	0.318	0.469	0.563	0.064	0.169	0.208	0.220

Note: Robust t-statistics in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1.

effect of private relations on the extent of contribution at early campaign stages. This was supported with respect to both contribution amounts of private relations (t = -2.39, p < 0.05) and with respect to contribution-goal ratio (t = -2.55, p < 0.05). H4b suggested that relational strength will have no moderating effects on private relations' extent of contribution at later stages of the campaign. This is rejected, indicating a negative moderation effect with respect to amounts contributed (t = -0.73, p < 0.1) and contribution-goal ratio (t = -2.43, p < 0.05).

Finally, H4c suggested that relational strength will positively moderate the effect of professional relations on the extent of contribution. This was supported with significant associations between the interaction term and both contribution amount (t = 3.01, p < 0.01) and contribution-goal ratio (t = 1.68, p < 0.1) when examining the full sample of backers. This association was also evident in the subsamples of early and late backers. Specifically, it was evident in the case of amounts contributed in early (t = 1.75, p < 0.1) and late stages (t = 3.06, p <

0.01). however, when considering contribution-goal ratio, it was evident at early ($t = 2.82, p < 0.01$), but not late stages ($t = 0.73, n.s.$).

5. Discussion

The current study examined associations between relational types, their strength, and the extent of contribution in reward crowdfunding campaigns. As such, it further supports a growing body of literature documenting the importance of social capital in crowdfunding backers' contribution behavior (Cai et al., 2021). Specifically, the study highlights the distinct effects that private and professional relations of fundraisers with backers, their strength, and some of their interactions have on the extent of contributions made.

First, we show that having relations with a prospective backer prior to the campaign increases the extent of contributions made by such a person. This finding generally supports earlier findings of positive association between average contribution amounts and various measures of both internal (Zheng et al., 2016; Zheng et al., 2014) and external social capital (Aprilia & Wibowo, 2017), as well as between total amount raised and both internal (Calic & Mosakowski, 2016; Zhao & Vinig, 2019) and external social capital (Kromidha & Robson, 2016; Vismara, 2016). Nevertheless, it is important to note that these studies have used proxy measures of relations and did not link actual evaluations of specific relations and the specific amounts contributed by each backer, as was done in the current study.

Second, our findings highlight the importance of relational strength in defining the extent of contributions made by various social contacts. Such findings support earlier research in the wider entrepreneurship literature showing that strength of relations was positively associated with successful resource acquisition (Newbert et al., 2013; Shane & Cable, 2002). They also further contribute to the limited evidence in the crowdfunding literature showing a positive association between backers' perceived social closeness and frequency of contact with the fundraiser and the same backers' contribution behavior (Simon et al., 2019).

Third, we highlight that the type of a relation alone is insufficient for explaining the role of social capital in crowdfunding behavior, as both private and professional ties may vary in terms of their strength. Our findings show that the nature of the relations' strength significantly alters the way each relational type makes their contribution. It is only when the moderation effect of relations strength is introduced that we find that private relations contribute to a significantly greater degree than others, and that this contribution is negatively moderated by relational strength. On the other hand, we also show that while professional relations do not contribute to a greater or lesser extent than others, their contributions are enhanced when the relationship with the relevant fundraisers is stronger.

In this respect, we present opposing moderation effects depending on the nature of the relationship concerned. Stronger private relations may be more immune to actual contribution levels, where symbolic contributions are all that is necessary to signal support. However, in the case of professional relations, contributions are made more based on professional interest than on personal loyalties, but when those exist, they significantly enhance such contributions.

Here, earlier research has mostly highlighted the importance of an early 'friend-funding' stage in creating positive momentum for fundraising throughout the campaign period (Agrawal et al., 2015; Ordanini et al., 2011). However, these were only related to relations characterized as family and friends. Our study contributes by distinguishing between private and professional relations and their contribution patterns, as well as by showing that it is not only the existence of relation that matters, but also its strength in defining the contribution behavior.

In the case of private relations such as family members and friends, a deep professional understanding of the concept being promoted is often absent, and contributions are driven by interpersonal loyalties and obligations without necessarily understanding or caring about the

commercial or professional value of the concepts that are being promoted (Davidson & Poor, 2015; Zaggi & Block, 2019). Here, earlier research shows that backers distinguish between their engagement with campaigns and their engagement with the fundraisers behind the campaigns. The latter is triggered by personal relations and communication, but the same does not apply to the campaign itself (Efrat et al., 2020) and may require additional motivations such as professional interests or benefits. Hence, we suggest that stronger private relations' smaller contributions at early campaign stages are more symbolic in signaling support and loyalty to the fundraiser, while their contributions in later stages are more instrumental. By instrumental, we mean that contributions are made in order to ensure campaign success based on remaining funding needs. Accordingly, private relations make greater contributions when there is a large gap between the amount that was raised and the goal sum. Similarly, they make smaller contributions when the same gap is relatively small. This also leads to the non-significant association between private relations and extent of contribution at late campaign stages as, at that stage, it is less about the absolute amount contributed and more about the remaining amount needed to complete the campaign successfully.

This differs in the case of professional relations. Such contacts are concerned with maintaining good relations with peers in business networks, as a basis for future professional opportunities for exchanges, regardless of the actual interest in the product or service being promoted. Some of them may also be concerned with the potential added value of the same product or service to the further development of their own professional work. Accordingly, those contacts who are only interested in network relationship maintenance may opt for modest contributions as network membership fees. However, those interested in the product or service being developed or their impact within the sector may be willing to contribute more resources to see them fully developed. Accordingly, we see that contributors motivated by both incentives contribute both large and small sums at early stages, which results in a non-significant association with extent of contribution. In later stages, however, professional relations actually interested in the concept's value creation potential have been exhausted, and what remains are professional contacts that may contribute modest sums for maintaining professional network relations. Hence, we see that lesser contributions are associated with professional relations at later campaign stages.

Finally, in addition to findings relating to our hypotheses, some of the findings related to our control variables are also worth mentioning. First, contrary to expectations, we find that backer's gender is not associated with contribution extent with respect to amount, but not with respect to contribution-goal ratio, which partially contradicts some earlier findings (Groza et al., 2020). This can be explained by the gender-equalitarian characteristic of Nordic societies (McDaniel, 2008). Second, we find a positive association between physical distance and contribution amount. This can be explained by the geography of Iceland as a sparsely populated large island with human settlements distant from each other, as well as by the fact that Iceland has a relatively large diaspora of Icelanders living abroad (Birka & Kļaviņš, 2020) with acquaintances in Iceland they may still wish to support. Third, and most interesting, we found a negative association between the internal social capital indicators and the extent of backer contribution. This may suggest that while internal social capital is indeed a good predictor of contribution behavior (Bi et al., 2017; Colombo et al., 2015; Wang et al., 2018), it also predicts more modest contributions. Here, when examining the amounts and extent of such contributions, they may seem closer to symbolic community membership fees than strategic investments, and the more one engages in backing campaigns, the fewer disposable resources he or she has to contribute to each additional campaign.

5.1. Acknowledging limitations

First and foremost, the generalizability of our findings may be

limited to the context in which data was collected. Indeed, earlier research has shown that national culture does affect patterns of crowdfunding practice, as well as contribution intention and behaviors along the individualism-collectivism cultural dimension (Cho & Kim, 2017; Schwartz, 1994; Shneor, Munim, et al., 2021). Iceland scores high on individualism, so some relational effects that were found may better reflect similar societies (such as Anglo-Saxon and Nordic societies) than social pressures and expectations that dictate exchanges in collectivistic societies (for example, Asian and African societies). Additionally, while certain findings that may be related to the geographic nature and population spread of Iceland are relevant for some small island nation economies and countries with significant diasporas, they may not generalize to other types of geographical and population patterns. Here, fundraisers in populous nations may experience greater competition with other fundraisers and may have stronger incentives to tap into the power of relational types and strength. Similarly, differences between industries have also been observed (Wu et al., 2015). Accordingly, while our findings may capture relational dynamics in fundraising within the creative and cultural sector, fundraising in other industries may exhibit other dynamics. Here, products for which prospective backers may experience greater or more urgent needs may be more willing to contribute to related campaigns regardless of prior relations or their strength. To properly assess this, future studies may consider cross-country and cross-sectoral replication of our study.

Second, our study only examined the associations between relationship types and strength with financial contribution measures. However, crowdfunding involves other ways in which contacts may contribute to a campaign beyond finance, such as in increasing public awareness through the sharing of information about the campaign (Shneor & Munim, 2019) and the provision of inputs and feedback on concepts being developed (Nucciarelli et al., 2017; Quero et al., 2017). These types of contributions are not captured in the current study, and it may be relevant for future studies to explore how relationship types and strength affect these.

Third, our study considers contribution extent in absolute monetary values, rather than in relative terms. As such, it does not capture contribution vis-à-vis an individual's ability to contribute. While such data was not available to us, studies that will capture relevant data may further enhance our understanding of the impact of relational types and their strength on contribution patterns. Here, it remains to be seen whether greater financial burdens are incurred by different types of relations, or those characterized by different levels of relational strength.

6. Conclusion

A growing body of literature has documented the importance of social capital in the successful outcomes of crowdfunding campaigning efforts (Cai et al., 2021). However, most earlier research has relied on a wide variety of proxy measures of social capital harvested from secondary sources, often without distinguishing between differing relational types, levels of relational strength, or accounting for their interactions. In the current study, we addressed this gap by collecting such nuanced data from primary sources about unique relational dyads between fundraisers and backers from successfully completed campaigns on the Icelandic reward crowdfunding platform KarolinaFund.

Our findings support the claims that backers who have previous relations with the fundraiser contribute more than those without such relations and that stronger relations lead to greater contributions regardless of the timing of such contributions. Furthermore, we show that relational types are insufficient for predicting contribution extent, and the relational strength must be accounted for in order to properly capture them. Specifically, we find that private relations contribute to greater extent, but that such contributions are negatively moderated by relational strength. On the other hand, relational strength positively moderates contributions from professional relations. Finally, when

comparing early and late backers, and while controlling for the moderating effect of relational strength, we show that private relations contribute more at earlier stages, and then contribute based on need at later stages regardless of amount. We also show that professional relations' contributions include both greater and lesser contributions at earlier stage, but are mostly more modest at later stages.

6.1. Implications of research

Despite presenting interesting findings, our study has certain limitations that may serve as a springboard for future research developments. Here, researchers are encouraged to test the boundaries of the generalizability of our findings in different contexts of study. Such efforts may be aimed at comparisons across different national settings representing more and less developed economies, small and large home markets, as well as different national cultural settings, all of which have been shown to impact other facets of crowdfunding behavior (Shneor, Haque Munim, et al., 2021; Zheng et al., 2014). Other efforts may also explore these dynamics in different crowdfunding model settings, especially in investment models, where motivations for contribution may differ and financial implications of contributions are more pronounced (Cholakova & Clarysse, 2015).

Researchers are also encouraged to explore how relationship types and their strength affect other forms of contributions to crowdfunding campaigns which are not financial. These may include information-sharing efforts (Shneor & Munim, 2019), as well as the provision of inputs into product and service development efforts (Nucciarelli et al., 2017; Quero et al., 2017).

A different opportunity for research development can be found in theoretical integration efforts, where social capital can be complemented by additional theoretical concepts providing a more holistic understanding of crowdfunding contribution behavior. Some of the theories that have already been proven to hold substantial merit in explaining crowdfunding behavior include the theory of planned behavior (Ajzen, 1991) and self-determination theory (Deci & Ryan, 1985). Concerning the former, earlier insights on the role of attitudes, perceived behavior control, and subjective norms in crowdfunding behavior (Baber, 2020; Shneor, Haque Munim, et al., 2021; Shneor & Munim, 2019) can be expanded to examine how these relate and associate with relational capital and its strength. Similarly, concerning the latter theory, earlier insights into the role of extrinsic and intrinsic motivations in crowdfunding behavior (Bürger & Kleinert, 2020; Wald et al., 2019) can also be expanded to examine how they relate to relational capital and its strength.

6.2. Implications for practice

Our findings highlight the importance of strategically attracting and engaging individuals with whom fundraisers have strong relations. To better tap into the contribution potential of such individuals, platform managers may consider investing in developing dedicated community features that enable richer private and public communication between and across fundraisers and backers. Furthermore, to specifically leverage the potential of strong professional relations, platforms may develop professionally themed discussion forums within their community for users or enter strategic alliances with relevant professional media outlets and forums. In such forums, fundraisers may receive professional inputs for the projects promoted on the platform while indirectly creating, developing, and enhancing professional relations between users.

From a fundraiser's perspective, our findings encourage engagement with both private and professional contacts more readily around crowdfunding campaigns, as well as factoring in such contributions when engaging in campaign plans and goal settings. Moreover, to leverage the potential of professional contacts' contributions, fundraisers may invest in developing dedicated promotional

communications with this segment in addition to generic social media messaging about their campaign. This may include more detailed narratives about the professional value and quality of the products and services offered, as well as invitations to influence and shape their development through professional inputs. Furthermore, some have argued for the opportunity to re-configure value chains where open innovation can be facilitated through interactions between developers and users and backers as part of the crowdfunding campaign (Nucciarelli et al., 2017). Such information can be exchanged via dedicated mailing lists, or in closed online professional forums created for this purpose and further solidified relations between different stakeholders along the value chain. Finally, fundraisers can strategically leverage the instrumental value of strong private relations, with dedicated calls for support at late campaign stages for ensuring successful campaign completion.

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CRedit authorship contribution statement

Rotem Shneor: Writing – review & editing, Writing – original draft, Visualization, Validation, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Liang Zhao:** Writing – original draft, Visualization, Methodology, Formal analysis. **Jann Fabian Michael Goedecke:** Writing – review & editing, Methodology, Investigation, Data curation.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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