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Assessing the interplay between crowdfunding and sustainability in social media

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ABSTRACT

This paper aims to assess the degree to which sustainability-oriented dimensions are integrated within the public discourse on crowdfunding in social media. Utilizing Social Media Analytics (SMA), we track discussions on crowdfunding in user-generated content published in social media. Based on an empirical material of 141,754 user-generated content, we identify 308 entries (0.21 percent) explicitly or implicitly relating to sustainability and 80 percent of these 308 entries came from professional actors. In this material, 37 sustainability-oriented campaigns are identified and 26 of them (70 percent) received one entry. Taken together, this paper adds to previous literature by assessing and describing the seemingly minor role played by social media with regards to the interplay between crowdfunding and sustainability.

1. Introduction

Crowdfunding has over recent years become an alternative way of funding new ideas or projects. It is often viewed as an early stage financing for entrepreneurial ventures in terms of attracting donations through collaborative contributions from the crowd (Mollick, 2014; Thorpe, 2014), where funding has been emphasized as a fundamental challenge for the implementation of ideas (Belleflamme et al., 2014) and the development of sustainable ventures (Ortas et al., 2013).

While previous contributions to the field of crowdfunding have been made (Moritz and Block, 2016; Short et al., 2017; Vismara, 2017), little work has been done concerning the potential interplay between crowdfunding and sustainability in settings of public discourse. Specifically, no study as of now has systematically analyzed data from social media concerning the interplay between sustainability and crowdfunding. Such empirical data would arguably be of importance to the field, bearing in mind that social media has been suggested to play a key role in crowdfunding campaigns (Palmer and Verhoeven, 2016) and that crowdfunding may facilitate sustainability-oriented ventures (Calic and Mosakowski, 2016).

This paper aims to assess to what extent and in what ways sustainability-oriented dimensions are integrated within public discourse on crowdfunding in social media. *We set out to answer the following research question: how is sustainability integrated within the public discourse on crowdfunding in social media?* We do so by utilizing a novel

methodological approach called Social Media Analytics (SMA) which allows us to track all public discussions concerning crowdfunding in the social media landscape. Based on an empirical material of 141,754 user-generated content and two rounds of data collection, we assess the role played by social media with regards to the interplay between crowdfunding and sustainability and offer a systematic assessment of key characteristics of the interplay at hand.

The remainder of this paper is structured as follows. First, a review of ways in which sustainability-oriented crowdfunding initiatives by social and sustainable entrepreneurs within the field of entrepreneurship and sustainability, is provided. We then continue by reviewing the literature related to crowdfunding and social media, specifically highlighting the potential implications of social media for sustainability-oriented crowdfunding initiatives framed in our synthesis and research problem. Next, procedures associated to the methodology of SMA applied in this study are reported. Following our analysis and results, a discussion is provided along with theoretical and practical implications of the study, limitations as well as directions for future research before we conclude.

2. Elements of the topic

2.1. Social and sustainable entrepreneurship

There have been several studies that outline the distinct

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characteristics of social entrepreneurs for social entrepreneurship and sustainable entrepreneurship. Bornstein (2004), for example, highlighted that social entrepreneurs are characterized by a number of shared traits in terms of being creative individuals who question the status quo, identify novel ways in which to exploit opportunities and are persistent in their ambition to improve the world. Although the need of human and financial resources is comparable to commercial entrepreneurs, social entrepreneurs' needs are different due to the difficulties they face in resource mobilization as they often rely on volunteers for their key functions. The projects or tasks undertaken by social entrepreneurs are also distinct from commercial entrepreneurs, primarily due to the ambiguity and complexity in measuring the return on investment from their entrepreneurial projects. Finally, contrary to commercial entrepreneurs, the target market for social entrepreneurs may not necessarily be a large market (Austin et al., 2006). Other differences between commercial and social entrepreneurs concern autonomy, competitive aggressiveness and risk-taking dimensions (Lumpkin et al., 2013). In essence, social entrepreneurs consider making a social impact rather than only maximizing shareholder returns (Austin et al., 2006).

A number of research studies have focused on social entrepreneurship that addresses environmental and/or sustainability issues (Choi and Majumdar, 2014; Hockerts and Wüstenhagen, 2010; McMullen and Warnick, 2016), a topic that is sometimes referred to as 'sustainable entrepreneurship' (Hall et al., 2010; Schaltegger and Wagner, 2011). Sustainable entrepreneurship can be defined as "the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society" (Shepherd and Patzelt, 2011: 142). Some have argued that sustainable entrepreneurs are involved in a balancing act with regards to economic health, social equity and environmental resilience throughout their entrepreneurial endeavors (Kuckertz and Wagner, 2010). Therefore, sustainable entrepreneurs essentially focus their business on solving societal and environmental problems while attaining economic viability; in other words, they are focused on the triple bottom line of social, environmental and economic objectives (Lozano, 2008).

While there are similarities between the broader context of social entrepreneurship and sustainable entrepreneurship, Belz and Binder (2017) noted the differences between the two in terms of the multiplicity of goals and the notion of equity. Sustainable entrepreneurship is much more focused on triple bottom line goals and is also more concerned with the benefits of both future and present generations. Social entrepreneurship, on the other hand, is a hybrid and may only consider economic and social issues (McMullen and Warnick, 2016) while being primarily focused on the present generations (Belz and Binder, 2017). However, social entrepreneurs are also realizing sustainable development agenda (Rahdari et al., 2016) and indeed, there is an increasing number of academic contributions that have highlighted the issue of sustainability in entrepreneurship projects. As such, in this study we consider both social entrepreneurship and sustainable entrepreneurship as being similar in that they have both embedded sustainability-orientation in their mission and objectives.

Having illustrated the character of the two main categories of entrepreneurs that are most likely to engage in sustainability-oriented initiatives with regard to crowdfunding, we will in the next section elaborate further on the context of such initiatives, namely crowdfunding platforms and social media.

2.2. Crowdfunding and social media

In the contemporary digital media landscape, there are several crowdfunding platforms with different funding models. Some platforms offer returns based on equity, others are rewards-based or donation-based, while there are some others that enable debt/loans that can be

repaid over a period of time (Larralde and Schwiendbacher, 2012). Crowdfunding provides businesses with an alternative approach for financial support and a way to gain feedback or validation for the products and services they provide (Belleflamme et al., 2013; Mollick, 2014). Crowdfunding also increases visibility and product consumption (Burtch et al., 2013). Indeed, the initiation, development and finalization of crowdfunding campaigns are now possible to be observed throughout their lifespan.

Within the management and marketing disciplines, there is a small yet growing number of scholarly research that is focused on crowdfunding. For example, Herzenstein et al. (2011) illustrated the role of narratives and the importance of a good story in accomplishing crowdfunding success. Ordanini et al. (2011) highlighted the behavior of the investor, i.e., the crowd, in crowdfunding models, and the role of the crowdfunding service providers. Agrawal et al. (2013) explored the role of transaction costs, reputation and market design in explaining the rise of crowdfunding. Frydrych et al. (2014) examined organizational legitimacy in reward-based crowdfunding, while Mollick (2014) looked at the success factors in crowdfunding. In further determining the success rates of crowdfunding campaigns, Chan and Parhankangas (2017) found that those campaigns that are related to incremental innovations tend to generate better success in financial outcomes than those that are characterized by radical innovation.

Another angle of arguments in extant studies of crowdfunding is related to examining social networks or social capital with crowdfunding projects. For example, Lehner (2014) highlighted the role of social capital in crowdfunded social ventures where ideas are constantly exchanged between the entrepreneurs and the crowd. Lin et al. (2013) further described that the relational aspects of networks are significant in the outcomes of peer-to-peer lending. In a study of crowdfunding connecting artist-entrepreneurs and investors, Agrawal et al. (2011) found that distance actually does not become a significant factor in obtaining funding, although local investors, mainly those connected to the entrepreneurs, i.e., family and friends, tend to invest relatively early in such campaigns. Social networks between entrepreneurs and their family and friends have also been analyzed in order to predict crowdfunding success (Agrawal et al., 2015).

Crowdfunding and social media are highly interrelated because social media facilitates the creation and maintenance of social networks (Borst et al., 2017; Lu et al., 2014; Palmer and Verhoeven, 2016). Examining crowdfunding and social media, Mollick (2014) assessed the role of online social networks, i.e., whether the number of friends on Facebook influenced the success of crowdfunding efforts, and found those with 1000 friends would have a 40% probability of success in their crowdfunding campaigns. Lu et al. (2014) also noted that the actual use of social media can contribute to the success of a crowdfunding campaign. Similarly, Beier and Wagner (2015) highlighted that engaging in social media provides high media richness and high frequency which consequently leads to crowdfunding success. Borst et al. (2017), focusing on the entrepreneurs or the project creators, found that 'lagged tweets' have a significant and positive relationship with the performance of the project, although 'lagged Facebook messages' do not indicate a significant relationship with project performance. Despite the stream of literature reviewed above, scholarly literature is not yet extensive in terms of examining the interplay between crowdfunding initiatives and social media. Much remains to be understood in terms of whether the same effects also apply to sustainability-related crowdfunding initiatives carried out by social and sustainability entrepreneurs. Having reviewed bodies of literature on social and sustainability entrepreneurship as well as the context of these initiatives, i.e. crowdfunding platforms and social media, the next section provides a synthesis and an outline of the research problem for the present study.

2.3. Synthesis and research problem

Although research on crowdfunding and sustainable start-ups has

expanded in recent years, the specific domains of crowdfunding in sustainability start-up projects needs to be further investigated (Lehner, 2013; Manning and Bejarano, 2017; Mollick, 2014), particularly in terms of examining such interplay in the social media landscape. Recent studies on crowdfunding confirm that research concerning the interplay between crowdfunding and sustainability in social media is presently lacking (Moritz and Block, 2016; Short et al., 2017). Additionally, the research forefront has not yet reached a consensus with regard to whether sustainability-oriented actors are more successful in their crowdfunding initiatives vis-à-vis non-sustainable initiatives.

On the one hand, numerous scholars have highlighted the potential of crowdfunding, suggesting that it may enable economic growth that encompasses both social and environmental needs (Bartenberger and Leitner, 2013). Crowdfunding can potentially generate direct consequences for sustainability due to innovative application of social networking (Goodman and Polycarpou, 2013). Furthermore, crowdfunding is particularly interesting for green initiatives as it offers possibilities to combine the pursuit of profit with the ability to take environmental awareness into account (Bonzanini et al., 2015; Lam and Law, 2016). Small and young firms have been found to be much better at incorporating sustainability as part of their business model (Schaltegger and Wagner, 2011), and entrepreneurs with a sustainability orientation have also been shown to be more likely to experience greater levels of success in obtaining financial resources through crowdfunding (Calic and Mosakowski, 2016). One reason for the potentially higher success rates for sustainability-oriented initiatives was unraveled by Allison et al. (2015) who indicated that the crowd tends to respond more favorably if the campaigns are designed to help others or if these projects have social impact, rather than if they are solely portrayed as commercial business opportunities.

On the other hand, there are studies that find little evidence of any positive impact for sustainability-oriented crowdfunding initiatives. Notably, Hörisch (2015) did not find that the sustainability aspects of a business have any effect on its crowdfunding success. These findings may echo some of the conclusions from the crowdfunding literature, suggesting that differences between crowdfunding and conventional finance are potentially exaggerated (Moss et al., 2015).

Summing up, while the crowdfunding model is increasingly viewed as a way to engage both sides of the venture – the entrepreneurs as well as the crowd, to be more involved in idea implementation and the success of the business, the interplay between sustainability and crowdfunding merits further empirical investigation, especially as research to date is inconclusive and rests largely on correlational studies (Nielsen and Reisch, 2016). Moreover, little is known about the current discourse in social media concerning crowdfunding and sustainability. With crowdfunding becoming increasingly popular as a novel funding source, this study therefore sets out to assess the degree to which sustainability-oriented dimensions are integrated within the public discourse on crowdfunding in social media.

3. Method

To explore how sustainability-oriented dimensions are integrated within the public discourse on crowdfunding in social media, Social Media Analytics (SMA) was employed. SMA is an interdisciplinary approach that seeks to combine, extend, and adapt methods for the analysis of social media data (Stieglitz et al., 2014). Social media data contains rich expressions of how users perceive different phenomena. Combined with the unobtrusive character of SMA, this type of data is therefore highly suitable for analyzing how a specific phenomenon is framed.

3.1. Data collection

The lack of standardized ways of gaining access to social media data from major social media platforms is one of the main challenges

associated with applying SMA.

We used a service called Notified to collect data as this service offers structured access to user-generated content across social media platforms in terms of Twitter, Instagram, Facebook, blogs, forums and YouTube. The service is used by first entering one or several keyword and thereafter selecting which language or languages that data collection should be limited to. The design of the language limitation is important to consider as a particular keyword can have either a narrow or broad set of connotations both within a specific language as well as across different languages. Even though a broad set of languages potentially generate richer data sets, a more narrow language limitation allows for a more focused approach. After keywords and language limitations have been designed and entered in the service, publicly posted user-generated content published throughout the social media landscape is collected in a database in real-time.

The keyword “crowdfunding” was used to collect data throughout two time periods. The first period, between May 6 and May 12, 2017, generated a data set of 74,678 social media posts from Twitter, Instagram, Facebook, blogs, forums, and YouTube which included the keyword. The second period, between October 12 and October 18, 2017, generated a data set of 67,076 social media posts drawn from the same social media platforms. The data sets only comprised user-generated content written in English as the English term enables an international approach to the ways in which value and meaning are attributed to the phenomenon and because the English term have relatively few associated or alternative connotations.

3.2. Data analysis

After data collection had been completed, the data sets were analyzed by applying content analysis (Silverman, 2006) in three subsequent phases by using the collected user-generated content as the object of analysis. More specifically, structured (i.e., account details) and unstructured (i.e., textual content) data associated with the collected user-generated content were analyzed.

3.2.1. First phase – analyzing the distribution of captured user-generated content

In the first phase, the data sets were reviewed by analyzing the distribution of captured data per social media platform. Table 1 presents the distribution of the 141,754 captured posts across social media platforms and illustrates that a considerable share of the material was generated from Twitter over the studied periods. In alignment with the underlying principle of SMA, to study natural occurrences in real-world environments (Stieglitz et al., 2014), no action was taken concerning the distribution of data across social media platforms or reposts (such as retweets on Twitter or “regrams” on Instagram) as both the distribution and reposts contribute to the public discourse of the phenomenon at hand.

Table 1
Collected and publicly posted user-generated posts per social media platform.

Social media	Period 1		Period 2	
	Frequency	Share	Frequency	Share
Blogs	1942	2.6%	2261	3.4%
Facebook	1873	2.5%	750	1.1%
Forum	227	0.3%	175	0.3%
Instagram	462	0.6%	406	0.6%
Twitter	69,901	93.6%	63,276	94.3%
YouTube	273	0.4%	208	0.3%
Total	74,678	100%	67,076	100%

3.2.2. Second phase – identifying user-generated content explicitly or implicitly referring to sustainability

In the second phase, instances where the 141,754 collected user-generated content referred explicitly or implicitly to sustainability were identified and analyzed in further detail in four steps. In the first step, this was carried out by reviewing each of the user-generated content to determine whether or not these explicitly referred to the keywords “sustainability” or “sustainable”. This review identified a total of 261 user-generated content containing the keywords “sustainability” and/or “sustainable”, out of which 166 user-generated content were identified in the first period and 95 user-generated content were identified in the second period.

In the second step, ways in which the explicit keywords of “sustainability” and “sustainable” became related to other implicit sustainability-related keywords within the 261 identified user-generated content was reviewed. This review was carried out by reviewing all hashtags in the 261 identified user-generated content which resulted in a total of 204 identified unique hashtags, out of which 123 unique hashtags were present in the first period and 81 unique hashtags were present in the second period. These 204 identified hashtags were subsequently assessed vis-à-vis the triple bottom line of sustainability, i.e. sustainability oriented towards economic objectives, environmental objectives, social objectives, or the full integration of the triple bottom line in terms of general objectives associated with sustainability (Lozano, 2008). With the help of these four distinct forms of sustainability, 33 hashtags were identified to implicitly be related to sustainability out of which 14 were present in the first period and 19 were present in the second period. Table 2 presents the identified hashtags along with their related sustainability dimension vis-à-vis the four distinct forms of sustainability (Lozano, 2008).

In the third step, following the identification of these sustainability-related hashtags, the total material of 141,754 collected user-generated content was revisited to also identify user-generated content that implicitly referred to sustainability through the usage of the identified hashtags presented in Table 2. By doing so, an additional material of 47 user-generated content was identified to implicitly be referring to sustainability without explicitly referring to the terms “sustainability” or “sustainable”. Out of the 47 identified user-generated content, 36 user-generated content were found in the first period and 11 user-generated content were found in the second period.

In the fourth step, the identified user-generated content that implicitly referred to sustainability (47 user-generated content in total) were subsequently added to the material which previously had been identified to contain explicit references to sustainability (261 user-generated content). In total, the identified implicit and explicit material when combined therefore amounted to 308 user-generated content in total, i.e. 202 user-generated content in the first period and 106 user-generated content in the second period.

3.2.3. Third phase – in-depth analysis of user-generated content explicitly and/or implicitly referring to sustainability

In the third and final phase, data analysis continued by first comparing occurrences of user-generated content that explicitly and/or implicitly referred to sustainability over the two periods. This was carried out by analyzing the frequency of sustainability-oriented occurrences per hour throughout the two periods as well as the relative share of sustainability-oriented occurrences vis-à-vis the total material of 141,754 user-generated content including the keyword “crowdfunding”. By doing so, this analysis enabled the assessment of whether or not considerable variances were present throughout, or between, the two respective periods.

Following this analysis, the next step consisted of reviewing the unstructured part, i.e. the textual content, of the empirical material containing implicit and explicit references to sustainability. This was carried out by applying qualitative content analysis (Silverman, 2006) with the aim of identifying ways in which the 308 identified sustainability-oriented user-generated content either revolved around specific sustainability-oriented campaigns or more generally discussed the interplay between crowdfunding and sustainability. Following this analysis through which a relatively wide spectra of 37 sustainability-oriented campaigns and 12 thematic discussions were identified, these campaigns and themes were thereafter assessed to determine which sustainability dimensions these primarily referred to (Lozano, 2008). After this review had been carried out, the frequency and share of sustainability dimensions within the campaign-specific material and the general material was mapped.

In the final step, structured data in terms of the account details of actors who related crowdfunding to sustainability were studied in detail in order to assess their professional or non-professional orientation. After the total material of 159 unique social media users in the first

Table 2
Identified hashtags and associated frequency per sustainability dimension.

Sustainability dimension	Period 1		Period 2	
	Hashtag	Frequency	Hashtag	Frequency
Economic	#circularbiz	6	#buylessbuybetter	1
	#circulareconomy	5	#socialinnovation	3
	#sustainablefinance	5		
Environmental	#ActOnClimate	2	#eco	3
	#ecodesign	4	#Eco4Clim17	2
	#gogreenorgohome	1	#ecofriendly	4
	#green	32	#ecogift	1
	#greenbuilding	1	#growyourown	2
	#greenissues	2	#growyourownfood	1
			#organic	4
Social			#organiccotton	1
	#socialcare	1	#organicfood	2
	#socialwork	8	#organicgarden	
			#urbanorganicgardener	1
General			#citizenship	1
	#sustainablecities	6	#ethical	6
	#sustainablefashion	1	#ethicalfashion	5
Total	#sustainableliving	2	#sustainabledevelopment	1
			#sustainablefashion	2
			#sustainableliving	1
	76		41	

period and 84 unique social media users in the second period had been categorized into a professional or non-professional category, ways in which these actors related to the different sustainability-oriented dimensions (Lozano, 2008), and the associated frequency and share of them doing so, were calculated.

4. Results

Our results are presented in five steps. First, an overview of the occurrence of user-generated content that implicitly and explicitly refer to sustainability over the two respective periods, is presented. Second, results on how user-generated content refers to specific campaigns and also the sustainability-oriented dimensions of these campaigns, are provided. Third, general user-generated content in terms of crowdfunding and sustainability are presented. Fourth, the total distribution of campaign-specific and non-campaign-specific user-generated content in the three sustainability dimensions are illustrated. Fifth, the ways in which professionals and non-professional actors relate to crowdfunding and sustainability are then shown.

4.1. Occurrence of sustainability-related user-generated content

Fig. 1 presents the frequency of sustainability-related user-generated content per period. In terms of frequency, the first period exhibits an average of 442.5 user-generated content on crowdfunding published per hour, out of which an average of 1.20 user-generated content was identified as explicitly or implicitly sustainability-related. The second period shows an average of 399.2 user-generated content published on crowdfunding per hour, out of which an average of 0.63 user-generated content was identified as being explicitly or implicitly sustainability-related. Fig. 2 presents the share of sustainability-related user-generated content in comparison to the total material per period. In terms of the share, the first period exhibits an average share of 0.23% sustainability-related user-generated content per hour while the second period exhibits an average of 0.15% sustainability-related user-generated content per hour. Taken together, the total share of sustainability-related user-generated content compared with the total material when aggregating both periods amounts to 0.21%.

4.2. Campaign-specific user-generated content

Table 3 presents the 37 campaigns identified in the analyzed material out of which 25 campaigns were identified in the first period and 12 campaigns were identified in the second period. As the table illustrates, a total of 12 campaigns have a general sustainability orientation, 9 campaigns are oriented towards the environmental dimension, 4 campaigns are oriented towards the social dimension, and no campaign was identified as being related to the economic dimension during the first period. During the second period, a majority of 7 campaigns have a general sustainability orientation, 3 campaigns are oriented towards the environmental dimension, 2 campaigns are oriented towards the social dimension and no campaign was identified as being related to the economic dimension. Furthermore, the distribution of the frequency in which individual campaigns are discussed exhibits a long tail during both periods, as 6 out of the 25 identified campaigns in the first period generated more than the mean of three (3.18) user-generated content while two out of 12 campaigns during the second period generated above the mean of one and a half (1.66) user-generated content.

4.3. General sustainability-oriented user-generated content

In parallel to the amount of 79 user-generated content in the first period and 20 user-generated content in the second period that were devoted to discussing specific campaigns (see previous Table 3), a total of 123 user-generated content in the first period and 86 user-generated content in the second period that discussed more general aspects related to crowdfunding and sustainability, were identified. As illustrated in Table 4, a total of 12 themes emerge from the non-campaign specific material which illustrates the different ways in which public discourse on crowdfunding and sustainability take place. More specifically, discussions concerning specific platforms were the most dominant theme in the first period, followed by discussions about specific actors ranging from sustainability-oriented NGOs, foundations and other non-commercial entities. In addition to these themes, discussions which concern specific sectors of the economy vis-à-vis sustainability as well as specific magazines devoted to sustainability-oriented issues were also frequently occurring themes. With regards to the second period, sector

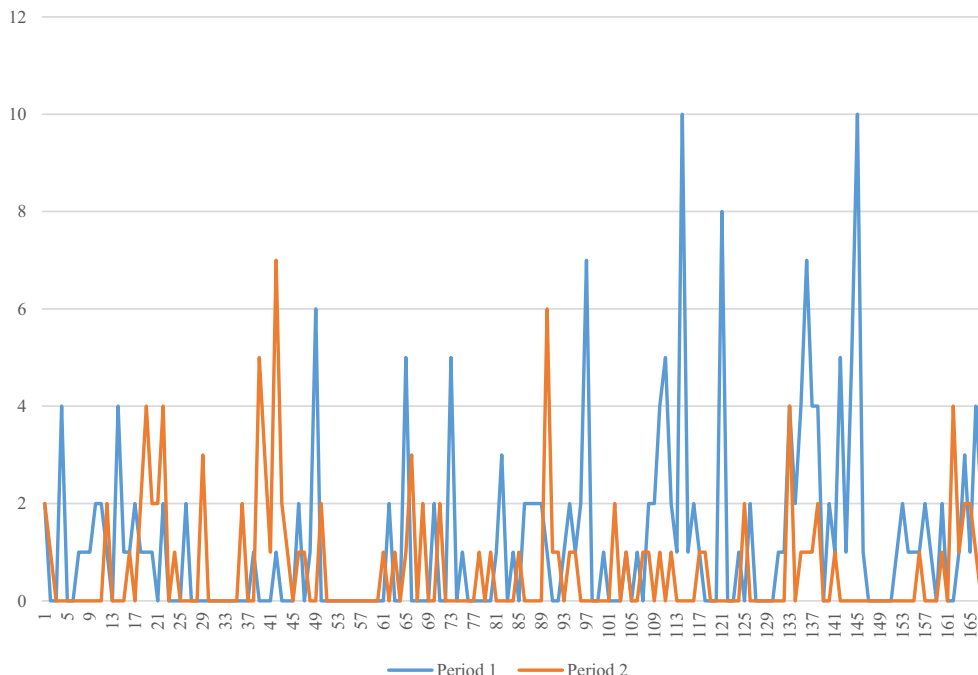


Fig. 1. Frequency of sustainability-related user-generated content per period.

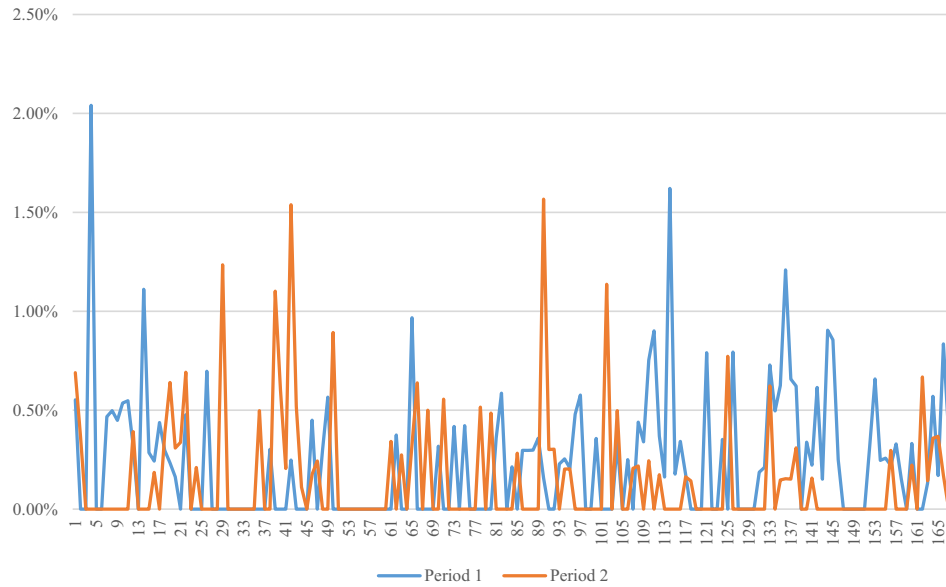


Fig. 2. Share of sustainability-related user-generated content per period.

Table 3 Identified sustainability-oriented crowdfunding campaigns.

Period	Campaign	Sustainability orientation	Frequency
Period 1	Sustainable accelerator	General	21
	Ethical hedonist magazine	General	10
	Pisces	Environmental	10
	Get the Green Party on Dudley ballot papers!	General	7
	Cambridge sustainable food hub	Social	5
	Rotherhithe garden build & summer school	Social	4
	Gerrad street	General	2
	Hemp cigarettes - organic & nicotine-free	General	2
	The sustainable studio	Social	2
	AquaGenie	Environmental	1
	Cornell natural dye garden	Environmental	1
	Crinkling news	General	1
	Documentary	General	1
	et's Build a Sustainable a Business in Rwanda	General	1
	HubidiCom	Environmental	1
	IDDS Sisaket	General	1
	Lets Make June The End Of May!	General	1
	LightSpeed	Environmental	1
	Luseed community	Environmental	1
	milo + nicki	Environmental	1
	MYRKA STUDIOS	Environmental	1
	Powur	Environmental	1
	Smallchange.com	General	1
	Sustainable sanitary solution	Social	1
	Getting my life back now	General	1
Subtotal (25 campaigns)		79	
Period 2	Bike friday	General	8
	Speciality coffee shop	Environmental	2
	Böhten5 eyewear	General	1
	Ethical art fashion	General	1
	Ethical food & fashion guide	General	1
	GlobalGiving	Social	1
	Green unit	General	1
	Green weaved	General	1
	Kranôg - off-grid living	Environmental	1
	Lasso	General	1
	Organic air purifier	Environmental	1
	SustainableActionNepal	Social	1
	Subtotal (12 campaigns)		20
Total		99	

specific discussions dominated and this was followed by discussions on the general phenomena as well as magazines which devoted attention to sustainability-oriented issues. When taken together, the two analyzed periods exhibit considerable differences with regards to the ways in which sustainability-related aspects of crowdfunding are discussed even though sector specific discussions are reoccurring. Three illustrative examples of how sector specific discussions manifested in the empirical material across the two respective time periods were published on Twitter:

- “How #crowdfunding is helping solar scale in #Africa #sustainablefinance” (6 May, 2017)
- “Crowdfunding for sustainable housing. Younger generation needs advice on this subject!” (12 May, 2017)
- “Taking on the #efficiency challenge eluding the #construction industry #sustainability #crowdfunding” (13 October, 2017)

4.4. Distribution of sustainability dimensions

Table 5 presents the distribution of campaign-specific and non-campaign-specific user-generated content for each sustainability dimension. As illustrated, the highest concentration during the first period is found in the general sustainability dimension, for both the campaign-specific and the non-campaign-specific materials. In contrast to the campaign-specific material where no user-generated content was identified in the economic dimension, the non-campaign-specific material exhibits a share of 10.4% in this dimension. In terms of the environmental and social dimensions, a higher share can be found among user-generated content within the campaign-specific material in contrast to the non-campaign-specific material. With regards to the second period, the general sustainability dimension is dominating within the campaign-specific material while the social dimension followed by the general dimension is most pronounced during the second period in the non-campaign-specific material. When taken together, the two respective periods therefore exhibit relatively considerable variations with regards to the attention that is devoted to campaign-specific vis-à-vis non-campaign-specific material and also in terms of the associated sustainability dimensions.

Table 4

Identified sustainability-oriented themes in the non-campaign specific material (Eco = economic, Env = environmental, Soc = social, Gen = general).

Theme/sustainability orientation	Period 1						Period 2						Total	
	Eco	Env	Soc	Gen	Frequency	Share	Eco	Env	Soc	Gen	Frequency	Share	Frequency	Share
Awards		2			2	1.6%					0	0.0%	2	0.5%
Campaign promotional services				7	7	5.7%				4	4	4.7%	11	5.3%
Events					0	0.0%				4	4	4.7%	4	1.9%
Magazines	12			4	16	13.0%	6		4		10	11.6%	26	12.5%
Miscellaneous			1	4	5	4.1%	1	2	11		14	16.3%	19	9.1%
Phenomenon				7	7	5.7%			6		6	7.0%	13	6.3%
Platform	2		1	36	39	31.7%					0	0.0%	39	18.8%
Political initiatives	2			2	2	1.6%					0	0.0%	2	1.0%
Radio channels				2	2	1.6%					0	0.0%	2	1.0%
Research				3	3	2.4%					0	0.0%	3	1.4%
Sector specific discussions		9	1	7	17	13.8%		2	5	41	48	55.8%	65	31.3%
Specific actors	5	1	1	16	23	18.7%					0	0.0%	23	11.1%
Total	21	12	4	86	123	100.0%	7	4	26	49	86	100.0%	209	100.0%

4.5. Professional and non-professional actors' contribution to the public discourse

Table 6 presents the distribution of professional and non-professional actors contributing to the public discourse on crowdfunding and sustainability during the analyzed time periods. Out of the total amount of 159 unique social media users in the first period, a total of 42 professional actor groups and 4 non-professional actor groups were identified. Among the professional actors, consultants, start-ups, news actors and self-employed actors were the most common categories followed by a long tail of less dominant actor groups. Non-professionals are fragmented as indicated by the fact that 21 out of 43 contents cannot be categorized and are therefore put in a group referred to as *Others*. Out of the total amount of 84 unique social media users in the second period, a total of 32 professional actor groups and 3 non-professional actor groups were identified. Among the professional actors, start-ups, entrepreneurs, city development organizations and consultants were the most common categories followed by a long tail of less dominant actor groups. This is a pattern that is similar to the first period. With regards to the non-professionals, the second period is also characterized as fragmented as indicated by the fact that 8 out of 14 content cannot be categorized and are therefore put in a group referred to as *Others*.

Table 7 presents the distribution of professional and non-professional actor groups in the three sustainability dimensions per period. As illustrated, both professional and non-professional actors tend to relate more to the general dimension of sustainability in the first period. In terms of the economic dimension of sustainability, the non-professional actors devote considerable attention to this dimension as compared to the professional actors. Furthermore, professional actors devote more attention to the environmental dimension in comparison to the non-

professional actors, while the share of the social sustainability dimension is relatively similar. With regards to the second period, both the general as well as the social dimension of sustainability is more pronounced among both professionals and non-professionals. In contrast to the professionals, however, the non-professionals during the second period devote relatively little attention to the economic and environmental dimensions of sustainability. As is the case with regards to campaign-specific and non-campaign-specific materials for the professionals and non-professionals in the two periods, there is relatively considerable variations with regards to the sustainability dimensions which they devote attention to.

5. Analysis and discussion

Funding is regarded as a critical obstacle for the development of sustainable businesses (Ortas et al., 2013), especially as sustainable ventures on average are less successful financially (Linder, 2013). Given that crowdfunding offers the potential to reach large audiences (Verhoeven and Palmer, 2015; Young, 2013) and contributes to closing this funding gap, empirical insights into understanding the extent to which sustainability dimensions are integrated in public discourse on crowdfunding is needed (Lu et al., 2014; Manning and Bejarano, 2017).

Based on 141,754 user-generated content concerning crowdfunding which have been collected throughout two different periods, we observe that sustainability-oriented campaigns and general discussions concerning sustainability currently receive limited attention in the specific context of social media. In total, 0.21% of all content reviewed about crowdfunding in social media concern aspects of sustainability, either explicitly or implicitly. In light of that the first period exhibits an average share of 0.23% sustainability-related user-generated content per hour while the second period exhibits an average of 0.15%

Table 5

Distribution of campaign-specific and non-campaign-specific user-generated content per sustainability dimensions.

Period	Sustainability dimension	Campaign-specific material		Non-campaign-specific material		Total material	
		Frequency	Share	Frequency	Share	Frequency	Share
Period 1	General	49	24.3%	86	42.6%	135	66.8%
	Economic	0	0.0%	21	10.4%	21	10.4%
	Environmental	18	8.9%	12	5.9%	30	14.9%
	Social	12	5.9%	4	2.0%	16	7.9%
	Subtotal	79	39.1%	123	60.9%	202	100.0%
Period 2	General	14	13.2%	34	32.1%	48	45.3%
	Economic	0	0.0%	7	6.6%	7	6.6%
	Environmental	4	3.8%	4	3.8%	8	7.5%
	Social	2	1.9%	41	38.7%	43	40.6%
	Subtotal	20	18.9%	86	81.1%	106	100.0%
Total		99	32.1%	209	67.9%	308	

Table 6
Identified professional and non-professional actors contributing to the public discourse on crowdfunding and sustainability.

Category	Period 1		Period 2	
	Sub-category	Frequency	Sub-category	Frequency
Professional	Consultants	18	Start-ups	13
	Start-ups	17	Entrepreneurs	10
	News actors	16	City development organizations	10
	Self-employed	11	Consultants	8
	Educational programs	8	Sustainability experts	6
	Entrepreneurs	7	Magazines	5
	Platforms	7	Municipal organizations	4
	Foundations	6	Charities	3
	Professional associations	6	Professional associations	3
	Car-clubs	4	Manufacturers	3
	Innovation hubs	4	Self-employed	2
	Magazines	4	Researchers	2
	Networks	4	Media aggregators	2
	Communities	3	Consultancies	2
	Event organizers	3	Event organizers	2
	Filmmakers	3	Entrepreneur hubs	1
	Politicians	3	Accelerators	1
	Research organizations	3	Programmers	1
	Accelerators	2	Innovation hubs	1
	Chefs	2	Crowdfunding specialists	1
	City branding organizations	2	Environmental organizations	1
	Investment firms	2	Interest groups	1
	Journalists	2	Changemakers community	1
	Political parties	2	Digital agencies	1
	Production companies	2	Actors	1
	Researchers	2	Business law firms	1
	Award organizations	1	Platforms	1
	Charities	1	Librarians	1
	Designers	1	Journalists	1
	Digital marketing projects	1	Urban planners	1
	Insurance companies	1	Filmmakers	1
	Interest groups	1	Political professional	1
	Municipal organizations	1	Subtotal	92
	PR firms	1		
	Radio stations	1		
	Refurbishment companies	1		
	Restaurants	1		
	Sustainability forums	1		
	Teachers	1		
	Video services	1		
	Waste and recycling services	1		
	Writers	1		
	Subtotal	159		
Non-professional	Others	21	Others	8
	Activists	15	Activists	4
	Students	5	Bloggers	2
	Bloggers	2	Subtotal	14
Subtotal	43			
Total		202		106

Table 7
Distribution of campaign-specific and non-campaign-specific user-generated content in the three sustainability dimensions per period.

Period	Sustainability dimension	Professionals		Non-professionals	
		Frequency	Share	Frequency	Share
Period 1	General	111	55.0%	24	11.9%
	Economic	7	3.5%	14	6.9%
	Environmental	28	13.9%	2	1.0%
	Social	13	6.4%	3	1.5%
	Subtotal	159	78.7%	43	21.3%
Period 2	General	40	37.7%	8	7.5%
	Economic	7	6.6%	0	0.0%
	Environmental	7	6.6%	1	0.9%
	Social	38	35.8%	5	4.7%
	Subtotal	92	86.8%	14	13.2%
Total		251	81.5%	57	18.5%

sustainability-related user-generated content per hour, no considerable difference such as dramatic increases between the two measured periods can be found. In light of these results, several interpretations can be made.

First, the emergence of public discourses within the specific setting of social media has in previous literature been illustrated to differ considerably to for example traditional media. More specifically, traditional media has been shown to be more nuanced and elaborative in terms of highlighting the societal consequences of novel phenomena and innovations, while social media tend to focus more on the specific values and attributes of a novel phenomenon or a specific innovation but being more simplistic in character (Laurell and Sandström, 2018). In light of these differences with regards to how public discourse has been illustrated to emerge in different media categories, crowdfunding in general may therefore be regarded as being relatively well aligned with social media outlets due to the considerable amount of user-generated content dealing with crowdfunding as identified in the present study (141,754 user-generated content). Due to that only 0.21% of all

content reviewed about crowdfunding in social media concern aspects of sustainability, however, this result indicates that social and sustainability entrepreneurs (Bornstein, 2004; Hall et al., 2010; Schaltegger and Wagner, 2011; Shepherd and Patzelt, 2011) that take their point of departure in the triple bottom line of sustainability encompassing economic, environmental and social objectives (Lozano, 2008), seemingly struggle to gain a foothold in the public discourse on crowdfunding in social media.

The difficulties to gain a foothold can potentially be related to two reasons. First, social and sustainability entrepreneurs have in existing literature been shown to be associated with ambiguity and complexity in for example measuring the return from their entrepreneurial projects (Bornstein, 2004). In a scenario where social media users are presented with competing offers from commercial entrepreneurs, that more clearly articulate the expected return of their projects, social media users might as a consequence regard these offers to be more precise with regards to the specific values and attributes that these projects seek to provide (cf. Laurell and Sandström, 2018). Second, the target market for social and sustainability entrepreneurs may not necessarily be a large market contrary to commercial entrepreneurs (Austin et al., 2006). Therefore, initiatives by social and sustainability entrepreneurs may not seek to create substantial engagement among large groups of social media users across platforms but rather be focused on reaching specific user segments that focus on compassion for others and societal consequences of specific initiatives (Estrin et al., 2013; Miller et al., 2012). As a consequence, the actions of social and sustainability entrepreneurs in social media may as a consequence of the simplistic character of social media, be better aligned with traditional media outlets which devote more attention to elaborating on societal consequences. If this is indeed the case, the observed discourse on crowdfunding in social media which is oriented towards both campaign-specific and non-campaign-specific aspects of sustainability (see Table 5), may indicate that the general character of social media favors sustainability-oriented initiatives that clearly communicate specific values and attributes offered by crowdfunding campaigns (see Table 3). As usage of crowdfunding to fund sustainable ventures is arguably still in its infancy, the use of social media to accomplish such objectives is also observed to be presently situated in an emerging phase.

Second, previous literature on social media has illustrated that heterogeneous, in contrast to homogeneous, user groups tend to be able to generate higher levels of engagement for specific issues and phenomena in social media (Kozinets, 2010). In light of the presented results, a plethora of professional and non-professional actors (159 in Period 1, and 84 in Period 2) contributed to the public discourse on crowdfunding and sustainability in social media (see Table 6). The heterogeneity of these user groups thereby provide an additional indication that the interplay between crowdfunding and sustainability is in an emerging phase in the particular setting of social media, with a strong potential to rapidly evolve in the coming years.

More specifically, the vast majority (81.5%) of contents that explicitly or implicitly refer to sustainability come from professional actors, while content from non-professionals amount to 18.5% of all contents. The category of professional actors is heterogeneous with 42 professional actor groups being identified in the first period and 32 professional actor groups being identified in the second period. Start-ups and entrepreneurs in both periods provide substantial contributions to the public discourse on crowdfunding and sustainability in relative terms as these two actor groups make up 15% of the contents published during the first period and 25% in the second period (see Table 6). These specific actors, by utilizing social media, provide positive signals for the crowd to get them involved (Estrin et al., 2013) by focusing considerable attention to general sustainability (see Table 7) as part of their ambition of making a social impact (Austin et al., 2006). Arguably, the substantial contributions to public discourse on crowdfunding and sustainability by start-ups and entrepreneurs in social media is related to the fact that these actors seek to achieve crowdfunding

success (Lu et al., 2014) and that these actor groups utilize the high media richness and high frequency of interactions with others that social media offers to achieve this objective (cf. Beier and Wagner, 2015; Borst et al., 2017). Due to this incentive, these actor groups along with other interrelated professional actors are therefore fundamental in shaping the future discourse by promoting crowdfunding and sustainability in social media. In doing so, such action not only facilitates the potential success of their own respective crowdfunding initiatives but also aid future crowdfunding initiatives by their successors which seeks to balance economic health, social equity and environmental resilience throughout their entrepreneurial endeavors (Kuckertz and Wagner, 2010).

It is nevertheless not obvious how to explain the low participation of non-professionals in the public discourse on crowdfunding and sustainability. Previous research on social media has shown that social media outlets have become a space where consumers, amateurs, professional and non-professional users develop new practices (Pihl, 2013). Generally, social media is regarded as a sphere where a mix of consumers and professionals meet but where consumers tend to dominate (Al-Saggaf and Simmons, 2015). However, with a significant majority of content in the analyzed material coming from professionals instead of consumers, our results indicate that the interest in sustainability within the context of crowdfunding is consequently rather low among consumers in general at this point in time. More specifically, 26 out of the 37 campaigns during our studied time period generated one entry in social media and 6 of the campaigns generated more than the average of three content during the first period. In addition, 2 of the campaigns generated more than the average of one and a half content during the second period. As previous research has shown, social networks and online relational aspects play important roles in successful crowdfunding (Mollick, 2014; Lin et al., 2013). The current levels of engagement among non-professionals therefore indicate that the initiation of momentum by professional actors with regards to sustainability-oriented crowdfunding campaigns is crucial in order to leverage the potential effects of social media (Bartenberger and Leitner, 2013; Bonzanini et al., 2015; Goodman and Polycarpou, 2013; Lam and Law, 2016). Therefore, it is important for professional actors to create engagement among non-professional actors as such action can further strengthen the interplay between crowdfunding and sustainability in social media, and thereby providing momentum for a potential diffusion of sustainability-oriented initiatives not only from the perspective of professional actors but in more general terms. Taken together, our empirical data drawn from social media indicates that we at this point in time should remain cautious regarding our expectations of sustainability-oriented crowdfunding initiatives and their contribution to a more sustainable society, as the empirical results illustrate that the public discourse found in social media with regards to the interplay between crowdfunding and sustainability is currently in an emerging phase.

The study offers several theoretical and practical contributions in terms of its originality and utility (Corley and Gioia, 2011). First, by using the novel methodological approach of SMA, we contribute to previous literature on crowdfunding (Moritz and Block, 2016; Short et al., 2017; Vismara, 2017) by providing empirical evidence regarding the ways in which the public discourse on crowdfunding in social media manifests. Second, by examining the degree to which sustainability-oriented dimensions are integrated within the public discourse on crowdfunding in social media, our study is revelatory with regards to the present state of the interplay between crowdfunding and sustainability. More specifically, we add to social and sustainability entrepreneurship literature (Austin et al., 2006; Bornstein, 2004; Hall et al., 2010; Schaltegger and Wagner, 2011) by providing a systematic assessment of key characteristics of the interplay at hand as well as the broader entrepreneurship literature in which the emerging theme of crowdfunding has not been extensively examined (Mollick, 2014; Ordanini et al., 2011).

The study further offers utility (Corley and Gioia, 2011) in terms of its practical implications by highlighting the role of social media in crowdfunding campaigns. Messages communicated through social media are spread and re-transmitted faster than offline communication (Phelps et al., 2004). Consequently, social media offers the potential of electronic Word of Mouth (eWOM) to diffuse new practices quickly (Pihl, 2013). We found that while sustainability-oriented campaigns are still emerging in the public discourse on crowdfunding on social media, social media simultaneously provide outlets based on which to create momentum for a potential diffusion of sustainability-oriented initiatives in general. Therefore, our findings indicate that the support from key professional actors, most notably start-ups and entrepreneurs, are important in pushing forward new sustainability-oriented initiative which has the potential of engaging non-professional actors in the public discourse on crowdfunding and sustainability in social media.

5.1. Limitations and future research

We acknowledge three main limitations of our study. First, the collected data sets solely contain user-generated content published in English. This means that the study is limited to the interplay between crowdfunding and sustainability among English speaking users of social media. As such, discourses in other languages and in specific national settings might very well differ substantially from the English discourse. For example, countries investing heavily in sustainable development may potentially exhibit a stronger interplay between crowdfunding and sustainability in social media. Second, the limited timespan of the conducted data collection imposes some constraints upon generalizations from this data. As pointed out in the discussion, the use of crowdfunding to drive sustainable ventures is arguably still in its infancy, and our assessments need to be understood with this in mind. Our data should thus be interpreted as a study of how crowdfunding and sustainability are interrelated in social media in two different occasions where much still remains in assessing the evolution of the phenomenon in the coming years. Third, data analysis in this study focuses attention on systematically assessing the interplay at hand by quantifying key aspects in terms of the frequency and the share of: sustainability-related user-generated content; sustainability-oriented crowdfunding campaigns; sustainability-oriented themes in the non-campaign specific; distribution of sustainability dimensions, and distribution of professional and non-professional actors. Therefore, this means that the study is solely limited to these aspects and does not analyze specific ways in which actors explicitly and implicitly relate, discuss and debate sustainability-oriented dimensions within the public discourse on crowdfunding in social media.

Several avenues for further research can be identified. First, it would be interesting to explore variations between countries. Previous research has suggested that crowdfunding has a large potential in transitioning societies towards sustainability. Examining specific country contexts could potentially reveal any significant similarities or differences between them.

Second, in relation to previous literature that has pointed out a positive relationship between sustainability and successful crowdfunding (Calic and Mosakowski, 2016), our data indicates that more research is needed in this area. While our data does not provide evidence concerning whether firms are successful at crowdfunding when focusing on sustainability or not, the results indicate that this relationship needs to be investigated in further detail with a particular focus on the degree to which sustainability-oriented campaigns create engagement in social media over time.

Third, as the specific setting of social media has been illustrated to be simplistic in character (Laurell and Sandström, 2018), an exploration of ways in which sustainability-oriented dimensions are integrated within other specific settings of the public discourse would be beneficial. For example, the more nuanced setting of traditional media which tends to elaborate on the societal consequences represents one

relevant setting that can add to the general understanding of the interplay at hand. In addition, exploring other specific settings can also shed light on the degree to which different categories of media contribute to the interplay between crowdfunding and sustainability. Given that there are differences between media types, such differences can potentially have implications for the ways in which sustainability-oriented campaigns are targeted in specific media outlets.

Finally, systematic approaches to assess the potential interplay between critical phenomena in relation to sustainable development can be studied beyond the phenomenon of crowdfunding as analyzed in this study. By doing so, rather than studying sustainability in a broader sense, it is possible to measure the extent to which a novel phenomenon such as crowdfunding contributes to sustainable development. Research into sustainability can hopefully benefit from exploring this approach and SMA in more detail.

6. Concluding remark

This paper has assessed the degree to which sustainability-oriented dimensions are integrated within the public discourse on crowdfunding in social media. Drawing upon the novel methodological approach of SMA and an empirical material of 141,754 user-generated content, our findings point towards the fact that the interplay between crowdfunding and sustainability is currently limited (0.21 percent) and that primarily professional actors address crowdfunding and sustainability. We identified 37 sustainability-oriented campaigns and 70 percent of these received one entry in social media. When taken together, this paper therefore adds to previous literature on crowdfunding, social and sustainability entrepreneurship as well as entrepreneurship in general by illustrating the role played by social media with regards to the interplay between crowdfunding and sustainability and by providing a systematic assessment of key characteristics of the interplay at hand.

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