VISUAL REVIEW | 2022 | ISSN 2695-9631
International Visual Culture Review / Revista Internacional de Cultura Visual
https://doi.org/10.37467/revvisual.v9.3534

ENGAGING THE PUBLIC IN SCIENCE CROWDFUNDING

Scientists calling to action through visual and verbal strategies

ANA CRISTINA VIVAS-PERAZA
Universidad de Zaragoza, Spain

KEYWORDS

Science crowdfunding
Digital communication
Engagement
Persuasion
Rhetoric
Multimodality

ABSTRACT

Crowdfunding is a collaborative funding strategy increasingly used by scientists to finance their research projects. It involves raising small donations from the online public, which challenges scientists to create engaging crowdfunding proposals in digital platforms. These proposals become more persuasive with a short video promoting the project and arguing why it deserves funding. By adopting a multimodal approach, this paper explores the visual and verbal engagement strategies used in those videos, to observe how scientists exploit different semiotic resources to reach out to the public and call them to action.

PALABRAS CLAVE

Micromecenazgo científico
Comunicación digital
Captación
Persuasión
Retórica
Multimodality

RESUMEN

El micromecenazgo es una estrategia de financiación colectiva cada vez más utilizada por la comunidad científica para financiar proyectos de investigación. Consiste en recaudar pequeñas donaciones del público en línea, lo que desafía a científicos y científicas a crear propuestas de micromecenazgo atractivas en plataformas digitales. Estas propuestas son más persuasivas con un breve vídeo que promueva el proyecto y argumente por qué merece financiación. Adoptando un enfoque multimodal, este artículo explora estrategias visuales y verbales de captación utilizadas en esos vídeos, para observar cómo las personas científicas explotan diferentes recursos semióticos para llegar al público y pedirle que participe.

Recibido: 26/ 04 / 2022
Aceptado: 31/ 05 / 2022

1. Introduction

The advent of digital technologies and the Web 2.0 have facilitated science popularisation and citizen participation in scientific research, in line with the Open Science movement (Luzón & Pérez-Llantada, 2019). Open Science not only makes scientific knowledge accessible to all publics, but also promotes society's involvement in scientific issues by collecting and interpreting data (Citizen Science) or by helping to fund research through online collaborative platforms like crowdfunding (Franzoni & Sauermann, 2014). Crowdfunding is the practice of raising money for a project by reaching out the public and asking them for donations. It has proven useful for start-ups, product launches, and other business ventures; and as such, scientists are increasingly considering it to fund their research projects (Wheat et al., 2013). Science crowdfunding offers scientists a time-saving alternative to the lengthy and competitive process of applying for traditional research grants; with the difference that, in crowdfunding, the ones to be persuaded to invest money are not official granting institutions, but a broad audience who may not necessarily be familiarised with the scientific cause in question and who do not get any reward other than the pleasant feeling of contributing to the advancement of science (Mehlenbacher, 2017, 2019). Crowdfunding thus challenges scientists to call these diversified audiences to action, and the Internet offers a range of semiotic resources to achieve that goal.

Online crowdfunding proposals consist of a narrative and a short video. Videos are arguably the most persuasive element of a crowdfunding proposal since they enhance communication through the use of images (Vachelard et al., 2016), and increase the chances of obtaining funding (Wheat et al., 2013). In the science crowdfunding platform Experiment.com, it is stated that videos can increase the chances of funding by 60%. Besides, it is recommended that videos are 2-3 minutes long, and include a summary of the project and a clear argument on why the project should be funded (Experiment, 2022). In terms of design, edition is allowed and no template needs to be followed, so that videos present a great deal of variation regarding audiovisual material, ranging from a sequential display of images along with superimposed text, to those in which scientists themselves appear on screen to convince the audience about the project's worth. This latter type resonates with the elevator pitch (Daly & Davy, 2016; Díez-Prados, 2019), or the product pitch (Ruiz-Madrid & Valerias-Jurado, 2020; Valeiras-Jurado, 2021), in which entrepreneurs also have a very short time to persuade the audience to fund their product or business idea. Similar to those entrepreneurs, scientists promoting their crowdfunding campaigns through videos aim to raise funds for their research projects (Mehlenbacher, 2019), so it is expected that they will use a range of engagement strategies to get their audience involved.

The expression of engagement has to do with to the ways in which the author of a work acknowledges the presence of the intended audience, by "pulling them along with their argument, focusing their attention, (...) and guiding them to interpretations" (Hyland, 2005, p. 178). In this sense, engagement goes in hand with persuasion. By means of engagement, an author can connect with the set of values and ideologies shared by the audience (p. 175), and thus, laying the groundwork to make them create new beliefs or modify the existing ones, which is the very objective of persuasion (Pullman, 2013). In his engagement model for academic writing, Hyland (2005) mentions five linguistic devices that writers use to express engagement and persuade the audience: reader pronouns, personal asides, appeals to shared knowledge, directives, and questions (p. 182). By using the second-person pronoun you, and the inclusive form of the first-person pronoun, the writer gets the reader involved in the argument, thus creating a space for intimacy, dialogue, and participation. Personal asides are brief comments that writers make about what they are saying, expecting the agreement of readers and fostering dialogic involvement with them. Appeals to shared knowledge push readers to accept an argument as truthful, by evoking familiar situations with which readers can feel identified. Directives instruct readers to engage in an activity or to accept the writer's arguments in a straightforwardly manner. As for the use of questions, these are used to attract the readers' attention and invite dialogic involvement too (pp. 182- 186).

In brief, Hyland's engagement devices fulfil a twofold function: to get readers involved in an argument, and to convince them about the veracity of such argument. To illustrate these devices a bit further, Table 1 summarises them and provides some examples of possible materialisations into lexico-grammatical resources.

Table 1. Hyland's (2005) taxonomy of engagement devices

Engagement devices	Examples of linguistic realisations
Reader pronouns	you inclusive we
Personal asides	By the way, this is… … (and I believe this is often the case) …
Appeals to shared knowledge	We all know that… Of course, this is not new…

Directives	Imperatives (imagine that…/ see the table below/) Modals (one should remember that…)
Questions	Is this necessary?... What can we do to prevent this?

Source: own elaboration based on Hyland, 2005.

For a long time, the notion of engagement has been the object of research in the study of academic and professional writing (Hyland, 2001, 2002, 2004, 2005; Hardwood, 2005; Lafuente- Millán, 2014; Jing & Ma, 2018; McLaren-Hanken, 2019), and more recently, it has been adopted for the study of persuasion in digital audiovisual genres, such as elevator pitches (Díez-Prados, 2019), science online videos (Luzón, 2019), and TED Talk videos (Xia & Hafner, 2021). Díez- Prados (2019) examined the verbal and non-verbal engagement strategies of 4 business entrepreneurial pitches and found that non-verbal strategies were more abundant and persuasive than verbal ones. Luzón (2019) studied the multimodal strategies used in 14 science online videos to recontextualise scientific knowledge for a broad internet audience, and she noticed a variety of semiotic resources apart from language (e.g., static and moving images), through which scientists engage the audience. Similarly, Xia & Hafner (2021) observed the expression of engagement in a small-scale corpus of 28 TED Talks videos and showed how the creators of those videos exploit the semiotic affordances of digital technologies to get the viewers involved. These are just some examples of recent studies that extend the linguistic perspective of engagement to other modes of communication, such as image and non-verbal sound, and thus incorporate multimodality concepts to the analysis.

Jewitt, Bezemer & O'Halloran (2016) define multimodality as the set of semiotic modes that people use to communicate (p. 158) and claim that all communication is multimodal, being language just one amongst a wide range of visual and auditory modes for making meaning (p. 169). By mode, they refer to an "organised set of semiotic resources" that "are recognised within a community as realising meaning" (p. 157) (e.g., images, writing, speech, gestures). For instance, wearing black clothing during a funeral shows respect for the deceased in some cultures, whereas in others the appropriate colour to wear is white or red. Colour here then becomes a semiotic resource that conveys a meaning that is recognised by the members of a particular community. For a few decades already, studies on multimodality have offered an extension to the traditional linguistic analytical approaches that considered that language was the most important mode of communication. Kress & van Leeuwen (2006) were one of the first who extended this tradition to the study of visual communication, by developing a comprehensive and systematic visual "grammar" to examine the ways in which images are designed to communicate, just as the grammar of language helps understand how words are assembled to convey meaning. Crowdfunding videos are clear multimodal texts drawing on a variety of visual and verbal modes of communication that are socially recognised as meaning making, including images, speech, writing, film editing effects, and so on. Scientists can exploit these semiotic affordances at will to present their projects and convince the audience to donate for them. Hence, the analysis of engagement in these videos should be approached from a multimodal perspective.

2. Objectives

In this paper, I continue expanding the study of engagement in multimodal texts for academic and professional communication, with a focus on science crowdfunding. The aim is to display the array of visual and verbal engagement strategies that scientists use to make the call to action in their promotional crowdfunding videos. In order to do so, I focus on the analysis of the final section of the videos, where that call to action is made. Communication in this section is expected to be particularly persuasive, since it is where the researcher attracts the audience's attention to ask for support.

The research questions guiding the analysis are the following:

- RQ1:What verbal and visual engagement strategies are used by scientists when calling the audience to action?
- RQ2:Which of these strategies are more frequent?

The study results show the variety of strategies that are used in science crowdfunding videos to engage a broad Internet audience and get donations for a scientific project. Such results intend to inform scientists interested in crowdfunding on how to make the best use of the semiotic resources that the video offers to persuade the public and thus meet their funding goal.

3. Methodology

3.1. Data collection

To answer the research questions, a set of videos associated with science crowdfunding campaigns between 2017 and 2021 were collected for analysis. The crowdfunding platform from which those videos were collected

is Experiment.com. This platform hosts scientific projects related to the following hard-science and soft-science disciplines: Biology, Ecology, Education, Psychology, Mathematics, Chemistry, Physics, Palaeontology, Anthropology, Social Science, Materials Science, Medicine, Art and Design, Data Science, Economics, Earth Science, Neuroscience, and Computer Science. For this study, I selected videos related to crowdfunding campaigns on the hard-science disciplines of Biology, Ecology, and Medicine.

As for the platform Experiment, it was chosen as a source of data collection for two main reasons. First, it is the only crowdfunding platform specialised in scientific projects (Mehlenbacher, 2019), and these are displayed according to disciplines, which facilitates the collection of videos focusing on the three disciplinary fields mentioned before. Second, it was assumed that videos on this platform would show a large amount of engagement devices, since Experiment follows an "all-or-nothing" model (Gerber & Hui, 2016). This model implies that scientists can only obtain the donations if they have reached the final funding goal at the end of the campaign (which can last up to 45 days) (Experiment, 2022), and to achieve that, they need to engage as many people as possible, since the more backers, the more donations, and therefore, the more chances to reach the goal and get the money to cover the expenses of their scientific experiments.

Experiment does not establish any guidelines for design, so that videos can be edited, and as stated earlier, present a great deal of variation as far as audiovisual content is concerned. After looking at all the videos related to all the Biology, Ecology and Medicine campaigns that took place from 2017 to 2021 on Experiment (a total of 99 videos), I was able to distinguish the following types of videos according to the combinations of modal resources used in them:

- Type 1: Slideshow with voice-over.
- Type 2: Video shoots with voiceover.
- Type 3: Researcher on screen during the whole video (also selfie video).
- Type 4: On-screen researcher during the opening and closing sections of the video, embedding other visual elements in the middle sections.

With regards to content requirements, Experiment establishes that videos should at least include the following sections: a description of the research goals, a statement about the challenges that the project presents, and a pitch on why people should donate money for it (Experiment, 2022). The pitch constitutes the last fragment of the video, where scientists make their call to action (i.e., ask the audience to support the research project and donate money for it). Nevertheless, after a secondary visualisation of the 99 videos, I realised that this call-to-action section is not always included.

As the analysis focuses on the call-to-action section, I only selected the videos that included this section. At the same time, I selected only those videos in which researchers appear on screen to address the audience during this section (types 3 and 4). This resulted in 44 videos for analysis that were ordered chronologically (oldest first) and named V1, V2, V3..., V44 respectively (See Appendix for more details). The selection was based on the assumptions that (i) the last section is the most persuasive one, since it is when scientists call the audience to action, and (ii) if researchers appear on screen to make this call, the communicative event becomes more engaging, since they personally need to connect with the audience to create an intimate and collaborative setting where these will be more likely to be convinced about the significance of the research, and thus, be motivated to donate money. In addition, only videos related to successful campaigns were selected. This was an easy and convenient choice since the Experiment platform only displays running-on campaigns and past succesful campaigns, and the videos selected were associated to past campaigns from 2017 to 2021.

3.2. Analytical methods

After downloading the videos, I transcribed their spoken narrations in order to identify the last section. To do that, I used the online automatic transcriptor transcribe by Wreally, which converts any type of audio and video file into text, and generated one transcription text for each video (a total of 44 transcriptions). It was observed that videos typically open with an introduction of the scientist and the research project in question (opening stage), follow with a more detailed description about the project (i.e. context, aims, methodology)(middle stages), and finish with the call to action (closing stage). Once the closing stage for each video was recognised through their corresponding transcriptions, the organisational structure was observed in this section, to see the communicative stages that fulfill its overall communicative function. Then, the verbal and visual engagement strategies used by scientists were identified. In order to find possible patterns and facilitate the discussion, the results were quantified.

The identification of engagement strategies and the interpretation of results was based on Hyland's (2005) model of engagement for the verbal strategies, and Kress & van Leeuwen's (2006) visual grammar for the visual strategies. Constrictions of space do not allow for an analysis of all semiotic modes contributing to engage the audience, so I decided to focus on the following: speech, gaze, facial expression, background, and camera shot. This decision was motivated after noticing these were the modes contributing to engage the viewers. Other modes such as the use of hand gestures or paralinguistic features of speech were left out of the analysis, as I realised that

the majority of scientists do not show their hands and seem to be reading the content of their narrations, which could lead to misleading intepretations of rhythm stress and intonation of speech. Similarly, the use of music was not analysed as it is too complex to be addressed in this study and requires other theoretical frameworks.

To facilitate the analysis, as well as the collection of quantitative data, I used Atlas.ti 8, a research tool that allows a large number of texts of any type (audio, video, and text files) to be coded for subsequent data search and visualisation. The procedure involves creating a project with a collection of documents, selecting segments of interest in those documents (what the software refers to as quotations), coding those segments with codes that are created by the user, and exploring co-occurrences between codes (Friese, 2017). By adopting this procedure, I followed the steps summarised below (see Figure 1 for the visualisation of the software):

I started a project called "Engagement in science crowdfunding".

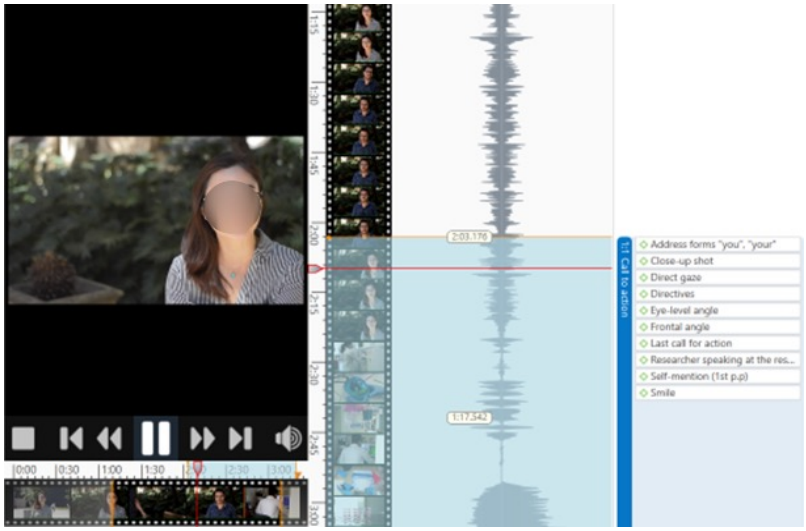
I added the 44 video documents to the project.

For each video, I created a segment (quotation) corresponding to the last section of the video, where the call to action is made (In Figure 1, this is the vertical segment in blue at the end of the video).

For each segment (i.e., each final section or call to action) I assigned codes, one for each visual or verbal strategy identified (In Figure 1, these are the labels attached to the right of the blue segment)

Once all the final sections of the videos were selected and coded with engagement strategies, the software allowed looking at the number of times the codes were used (i.e., the number of times each engagement strategy was used in the final section).

Figure 1. Example of a video coded with Atlas.ti 8



Source: Shu & Das, 2017.

4. Results

The closing section can vary in terms of duration, as in the videos analysed it ranges from 1:67 to 0:06 minutes (0:32 on average). Its main communicative function is to call the audience to action, that is, to persuade them to contribute to the campaign. To achieve that function, scientists organise the content of the section by including at least one of the communicative stages mentioned in Table 2. The table shows the communicative stages on the left column in order of appearance along the section, and the number of videos in which those stages were observed in the right column.

Table 2. Communicative stages of the Call-to-action section

Stages in the closing section	No. of videos (Out of 44)
Justification of expenses	27
Potential value of donations	27
Appeal for support	28
Expression of gratitude	32

Source: own elaboration.

Table 3 lists the engagement strategies found in the call-to-action section of the science crowdfunding videos analysed, as well as their semiotic realisations in verbal and visual modes. The left column shows the 3 groups into which the strategies were classified. The groups are associated with the communicative function that the strategies fulfil. The possible semiotic realisations of those strategies are displayed in the middle column, and examples of these realisations are provided in the Discussion part of this paper (see 5. Discussion). As for the right column, it shows the number of videos in which these strategies were found. As can be seen, the semiotic realisations are sorted in descending order of frequency to show the most frequent first.

Table 3. Visual and verbal engagement strategies found in the call-to-action section

Engagement strategies	Semiotic realisations	No. of videos (Out of 44)
Promoting intimacy, dialogic involvement, and group membership	2nd person mentions	44
	Eye contact	44
	Smile	39
	Research context in the background	35
	Medium-close shot	22
	Close-up shot	17
	Inclusive we	4
Instructing the audience to perform an action	Directives	38
Guiding the audience to interpretations	Positive evaluative language	16

Source: own elaboration based on results.

5. Discussion

5.1. Characteristics of call-to-action section

The closing section of science crowdfunding videos is typically devoted to call the audience to action. It is a section where scientists need to bring to the table what they want from the audience, and it seems right to do so at the end of the video once the necessary details about their credentials and the goals of their research projects have been made clear. Scientists build their researcher persona and address the relevance of their projects throughout the previous sections, so it could be argued that they only ask for support once they have established a basis of trust with the audience. Only then does it make sense to proceed to solicit altruistic donations for a project.

The range of length variation of this section indicates that scientists can extend it as much as they please. However, the average duration (0:32) shows that it covers just a small part of the whole video, which needs to be between 2 and 3 minutes long. A likely reason for this is that this section is directive and much less informative than the previous sections, which should cover more information about the scientists and their projects and thus be more extensive. It is then suggested that this final section should be brief, but very engaging, since it constitutes the take-home message that will give scientists the final chance to persuade the audience.

The quantitative data shows that the communicative stages observed are not compulsory; however, each of them was observed in more than half of the videos, showing their relevance in fulfilling the overall communicative function (i.e., persuading the audience to support the campaign). What each stage communicates is explained below with the help of some examples.

- Appeal for support

ex. 1: “Every bit counts, and no donation is too small. If you don’t have the funds to help donate now, then you can help by sharing our campaign within your network.” (V8)

ex. 2: “Please donate to help us reach our target five thousand US Dollars and kickstart this exciting exploratory mission for manta rays.” (V42)

When scientists make a direct appeal for support, they may not only ask for donations, as in V42, but for follow-ups and media diffusion. The example from V8 shows that contributing to the project does not only involve donating money, but also following the updates and sharing the campaign through social media. Asking strangers to donate money for a project may be too much to ask, so scientists offer them alternative ways to get involved,

because the more people the campaign reaches, the more visibility it will gain, and the more chances it will have to get funded.

The crowdfunding practice is based on collecting as many donations as possible from a big "crowd", and this is also reflected in statements like "Every bit counts, and no donation is too small" (V8). This emphasis on the worth of every single donation regardless of their quantity was found in other 8 videos, suggesting that this is an argument used for some scientists to convince the public to donate. At the same time, it aims to remind them that participation is affordable for all budgets.

- Justification of expenses

  ex.3: "The travel cameras and scuba will cost around $4,500" (V3).
  ex.4: "In order for this research to be accomplished, necessary laboratory supplies such as microcentrifuge tubes, Multiplex PCR kits, and fluorescently labelled primers must be purchased." (V9).

To justify how the funds raised in the campaign will be expended, some scientists take advantage of this closing section as well. As can be seen in the examples from videos V3 and V9, they do so by listing the costs that need to be covered to complete the research project. This way, the audience is informed about where their money will go if they decide to contribute, which helps reinforce trust between the scientist and the audience. In her examination of the narratives of science crowdfunding proposals, Mehlenbacher (2019) acknowledges that transparency in budgets is crucial to persuade potential donors, since it allows these to decide if the funds will be used in a responsible manner (p. 73). In the same way, this analysis shows that this information is often provided in the videos.

- Potential value of donations

  ex.5: "With more support our research could save and improve many lives." (V5).
  ex.6: "On behalf of the birds at your feeder, the birds you see out on your hikes, and all of the birds that help keep this planet as beautifully biodiverse as it is, help us answer this question." (V39).

Scientists also attempt to convince their audience to participate by announcing the positive outcomes that could be generated if the project were successfully funded. The examples in V5 and V39 show that scientists here try to find a common ground to appeal to the emotions of the public and then make them accept the arguments that support the potential value that the project (and then, the donations) may have. The example taken from V5 is associated to a medicine crowdfunding campaign related to cancer, so the utterance "our research could improve and save many lives" easily connects with the audience's common ground, for it is referring to human lives. But even if it is not human lives, but animal lives that are at stake, as in V39, scientists also find ways to recall familiar places with which the audience can feel identified. The scientist in V39 is carrying out an ecology project to prevent songbird populations from declining, and to highlight the relevance of this matter, she wants the public to create an affective bond with these endangered birds. Her strategy is recalling pleasant situations where the audience may be delighted with the presence of birds.

- Expression of gratitude

  ex.7: "So thank you in advance to any donors and any backers, (…) and please stay tuned as I will be updating this page weekly if not daily. So, thank you again!" (V33).
  ex.8: "Thank you so much for watching my video and I hope that you learn something about the Palo Santo tree." (V34).

The last content that can appear in the oral narratives in this section is an expression of gratitude towards the audience, which generates a warm feeling of affection and solidarity between scientists and potential donors. The example from V33 shows that this content can also be used as a persuasive strategy, since by thanking in advance for the donations, the scientist is taking these donations for granted, pushing the audience to also accept them as granted and, subliminally, making them responsible for making this assumption (i.e., making these donations) a reality. On the other hand, the scientist in V34 reveals that science crowdfunding videos can also have a pedagogical function.

5.2. Engaging by promoting intimacy, dialogic involvement, and group membership

The first group of engagement strategies listed in Table 3 can be realised semiotically through speech, gaze, facial expression, background, and camera shots.

- Speech: 2nd person mentions and inclusive we

As far as speech is concerned, the use of 2nd person pronouns you and the possessive adjective your to address the audience is present in this section in all the videos, whereas inclusive we was only found in 4 videos. The examples below serve to illustrate how these are typically used in context:

> ex.9: "To make this project a reality, I need your help. The cost of supplies for analyzing samples and conducting susceptibility trials and can add up quickly. So any donations that you can make are greatly appreciated and I will be happy to answer any questions that you have for me, please feel free to contact me, and I will be posting regular updates to my projects experiment profile. So, to wrap things up, I just want to say thank you so much for listening and thank you so much in advance for your donations to help amphibian conservation." (V21)
>
> ex.10: "By addressing the high cost of producing artificial blood, we can begin to break down barriers that prevent lower income populations from receiving better medical care and pre-emptively address the future blood crisis." (V30)

V21 exemplifies the dialogic tone that this part of the video presents. The scientist makes as many self-mentions (pronouns I and me) as viewer mentions (pronouns you and your), to achieve this intimate relationship between expert and audience, and get the audience involved in what he is saying and asking. As Hyland (2005) points out, reader mentions are the most explicit way in which an author can acknowledge the presence of their audience and bring them to discourse (p. 183). In this part of the video, it is not surprising that 2nd person mentions are frequent, since it is the moment when the audience are asked to do something (supporting the campaign).

An aspect worth discussing about the possessive adjective your is the nouns that are collocated after this adjective. By using possessive adjectives, scientists are taking for granted that the audience possess the material or immaterial entities that the nouns collocated after those adjectives designate. In other words, if the entities help, support, donations, contribution, money, etc. are preceded by your, it is assumed that the viewer possesses those entities, and thus can make use of them. Table 4 provides a list with the noun collocates found for each possessive adjective used in along the speech. Collocations are ordered by frequency of use.

Table 4. Collocates for possessive adjective your

Collocation	No. of tokens
Your help	18
Your support	11
Your donations	2
Your contribution	2
Your attention	2
Your money	1
Your partnership	1
Your time	1

Source: own elaboration based on results.

As can be observed, the most recurrent collocates for your were help and support, which shows again that, as discussed earlier, scientists are not only asking for money (even if the ultimate goal is to get funded), but also for other expressions of support (sharing, commenting, following up) from which scientists can also get their campaigns spread on the media. At the same time, these nouns act as mitigators for material entities such as donations and money. This shows that scientists try not to be too straightforward when asking for money, as a way of politeness and solidarity towards the audience.

Although inclusive we is the most frequent engagement device in academic writing to claim group membership (Hyland, 2005, p. 183), the results of my analysis shows that is not the case for this section of the science crowdfunding video. V30 is one of the few videos using inclusive we while doing the call-to-action. This video promotes a campaign that intends to cover the world's high demand of red blood for transfusions by producing artificial blood. The positive impact that this campaign could have for the whole society is reflected in the use of inclusive we, used here to make the audience feel as part of this project and highlight that the entire community will benefit from it (Hardwood, 2005, p. 353). Further research would be necessary to observe if this device is frequently used in other sections of the video.

- Gaze and facial expression: eye contact and smile

By keeping eye contact and smiling, scientists also acknowledge the presence of the audience. Both expressions accompany the speech and help construct a positive, dialogic, collaborative, and intimate environment to get the message across. In all the videos analysed, scientists maintain constant eye contact with the camera along the call-to-action section, which simulates eye contact with the viewers. These results are not surprising, given the conversational tone that scientists want to convey. As for the smiles, these evoke positive emotions with the aim of triggering such emotions in the viewers. Scientists typically smile when they finish speaking, and the very few cases where no smile was found (only 4) was in videos where the end is not explicitly stated by the scientists (e.g., they do not end by saying goodbye or thanking the audience) or the video is clearly cut off before doing so.

In their study of images, Kress and van Leeuwen (2006) also argue that direct gazes are used as a way of demanding something from the audience, which is often to enter into an imaginary relationship with the person in the image (p. 89). In the case of science crowdfunding videos, the combination between direct gaze and smile determine that the type of relationship demanded between scientists and the audience is one of social affinity (p. 118). At the same time, supporting the campaign is clearly another demand made by scientists, and this is also realised by maintaining eye contact along this final section.

- Background

Another remarkable engaging visual strategy found was the choice of background against which scientists are filmed. In most videos (35), scientists appear in the facilities of their institutions, or in the research context itself. This choice is not casual, and it fulfils a persuasive communicative function, because it intends to attract the audience's attention to raise their interest and thus engage them. Figure 2 illustrates three examples obtained from V6, V14, and V28 respectively.

Figure 2. Scientists engaging the audience with research background in V6, V14, and V28

Source: Duscher & Vroom, 2018; McInnes, 2018; & Boesen, 2019.

For their biology project, scientists in V6 study the genetics of a kind of squid and its beneficial bacteria, and as can be seen, they are being filmed from what looks like the research laboratory where they are carrying out their work. V14 revolves around the improvement of the life of the Scandinavian brown bear, and the scientist speaks from a forest, suggesting that this is the forest where the bears live, and thus, her workspace. Similarly, the scientist in V28 studies the population of dolphins in California and he seems to be addressing the audience from a beach whose sea is probably the one in which those dolphins are found. Whether indoors or outdoors, scientists calling to action from their workplaces transmit credibility and a feeling of readiness, which in turn reinforces the public's trust and encourages personal involvement in the project.

- Camera shots: close-up shot and medium-close shot

Closeness and intimacy with the public are also conveyed through personal space, and in film, this is realised through the distance chosen between the individual being filmed and the camera lens. Most scientists in these videos (39 in total) opt for a close-up camera shot (showing head and shoulders of the subject) or a medium-close camera shot (cutting the subject off at about the waist). Figure 2 above illustrates an example of a close-up shot (V14), and two of medium-close shots (V6 and V28). These types of shots constitute ways of achieving a personal distance that is convenient to build an intimate relationship between the scientist and the public (Kress & van Leeuwen, 2006), and as such, are considered important visual engagement strategies.

5.3. Engaging by instructing the audience to perform an action

Given the communicative purpose of the call-to-action section, it is not surprising to find that in most videos (38), scientists make use of directives to engage the audience. As in academic writing, one of the most common ways to signal directives in science crowdfunding videos is by means of imperatives (Hyland, 2005, p. 185). Interestingly,

another way is using transitive sentences expressing the scientist's necessity for support. Table 5 displays the number of imperatives and transitive sentences found, as well as the acts that they aim to engage the audience in.

Table 5. Directives to engage the audience

	Imperatives	Transitive sentences
Asking for money	10	0
Asking for follow-ups	7	0
Asking for help/ support	3	17
Asking for diffusion	2	0
	22	17

Source: own elaboration based on results.

Scientists use directives to engage the audience in the actions that help them accomplish their research goals; that is, donating money, following the campaign's updates, or facilitate visibility by sharing online. They do so through imperatives and transitive sentences. Imperatives are slightly more frequent and mostly refer to actions that have to do with donating money (see examples 11 and 12 below), although they can also refer to follow-ups (ex. 13), help in general (ex. 14), and media diffusion (ex. 15).

ex. 11: "Please donate to help us carry out this investigation." (V2).

ex. 12: "And if you find that my project is interesting and useful then fund me." (V23).

ex. 13: "Please stay tuned as I will be updating this page weekly if not daily." (V33).

ex. 14: "Help us restore sight. Be a part of the story" (V1).

As for transitive sentences, they are a less invasive way of asking the audience to do something, as the word order focuses on the needs of the scientist rather than on the actions to be taken by the audience. For instance, the request "help me" is reformulated into sentences like "I need your help" (ex. 15), "I hope that you will help me" (V16), or "I'd like to ask you to help me" (ex. 17). Contrary to the imperatives, transitive sentences do not refer to money, but to the mitigating entities help or support. Once again, it is observed that scientists often downgrade or mitigate their directives by choosing subtle ways to elicit a response from the audience.

ex. 15: "But to make this project a reality, I need your help." (V21).

ex. 16: "I hope that you will help me fund this project and thank you very much for your attention and your support.

ex. 17: "I'd like to ask you to help me figure out what's in bat poop that could help us conserve two endangered bats." (V32).

5.4. Engaging by guiding the audience to interpretations

Scientists need to get the audience's participation in the campaign, and to do so, they need to convince them about the project's worth. One way in which they do that is by using positive evaluative language to refer to their work, so that the audience is guided to accept those evaluations as truthful too. In the call-to-action section, this positive language can make reference to the project itself (ex. 18), or to the research object in question (ex. 19).

ex. 18: "We invite you to help make this exciting and important research possible." (V12).

ex. 19: "The Apple Sphinx are gorgeous animals. Understanding how to visually separate them, is just the first step before we can get useful data." (V43).

When positive evaluations are made about the project, these refer to its relevance and uniqueness. On the other hand, when made about the research object, evaluations deal with the aesthetic aspects of that object, which in the case of ecology projects, it is some animal species (V43). With these personal judgements, scientists intend to connect with a value system of what is assumed to be positive by the audience (Hyland, 2005, p. 175); in the case of the examples aforementioned, to connect to what makes the research project "exciting" and "important", and the research object "gorgeous". To observe the verbal and visual arguments that support these evaluations, the earlier sections of these videos should receive further critical attention in future research.

6. Conclusions

The Open Science movement, together with the development of digital technologies, has brought about alternative research funding practices such as crowdfunding. Science crowdfunding encourages the participation of society in scientific research, not only by donating money, but by getting involved in a personal relationship with the scientist and helping the campaign get visibility over the network. To get that participation, crowdfunding proposals need to be engaging and scientists can count on a variety of digital and multimodal affordances to achieve that goal.

The present study has explored the expression of engagement in the closing section of science crowdfunding videos, to observe the most salient visual and verbal devices that scientists use when calling the audience to action. For that purpose, a multimodal approach has been followed, as it accounts for all semiotic modes that can convey meaning in a particular situation, in this case, communication through an online video. The call-to-action section generally lasts a few seconds and can be segregated into four communicative stages. The first consists in an explicit appeal for support. The second intends to justify how the funds will be invested in the project, to gain the public's trust on the project. The third builds on pathos by appealing to the potential benefits that can result from the project, with special emphasis on how the audience will take advantage of those benefits. As for the fourth, it is an expression of thanks to the audience which may also take donations and support for granted as an ultimate persuasive strategy.

With regards to engagement strategies, the results show that most of them aim to promote an intimate, dialogic, and collaborative environment to gain the trust of the public and convince them to donate money for the scientific cause. For that purpose, scientists resort to verbal and visual communication. The use of second person mentions is always present in their discourse, which contributes to the construction of a personal dialogue between expert and non-expert. By maintaining eye contact with the audience and smiling, scientists also contribute to this dialogue, and demand the audience to enter in a positive relationship with them, with the aim of making them feel part of their projects. Proximity is also conveyed by choosing a close shot for their recordings. In addition, the choice of background allows the public to enter in the scientists' research spaces, as well as to arouse their interest and cultivate their trust. In a symbolic fashion, these efforts to open up a personal space between the scientists and the public represent the whole paradigm of Open Science, which aims to bring society closer to scientific knowledge.

The other two group of strategies involve getting the audience to perform an action and develop a positive attitude towards the research project and object of study. These are only realised through speech and consist in the use of directives and positive evaluative language. Directives can be signalled through imperatives or through transitive sentences. The latter offer an alternative formula to the straightforward demands conveyed by imperatives, this way showing an empathetic attitude towards the audience and acknowledging the fact that asking for money can be a sensitive topic. As for the use of evaluative language, this intends to assign positive attributes to the project in order for the audience to also accept those attributes, and thus, get interested and involved.

These results provide an insight on the semiotic resources that can be exploited to engage a broad Internet audience through an online video and reinforce the idea that all communication is multimodal. More importantly, they can be useful for scientists and entrepreneurs of any kind interested in financing their projects through crowdfunding campaigns.

Acknowledgements

This study is a contribution to the project Digital Genres and Open Science: An Analysis of Hybridisation, Innovation, and Interdiscursivity Processes and Generic Interdiscursivity, funded by the Spanish Ministry of Science and Innovation (PID2019-105655RB-I00) and to the research group Comunicación Internacional y Retos Sociales (International Communication and Social Challenges) funded by the regional Government of Aragón (H16_20R).

References

Boesen, A. (2019). Effects of lead exposure in Scandinavian brown bears. Norway: Experiment.com. Retrieved from https://experiment.com/projects/effects-of-lead-exposure-in-scandinavian-brown-bears

Daly, P., & Davy, D. (2016). Structural, Linguistic and Rhetorical Features of the Entrepreneurial Pitch: Lessons from the Dragon's Den. The Journal of Management Development, 35(1), 120-132. https://doi.org/10.1108/JMD-05-2014-0049

Díez-Prados, M. (2019). Verbal and nonverbal engagement devices in business persuasive discourse. The elevator pitch. In C. Sancho- Guinda (Ed.). Engagement in professional genres (pp. 217-242). John Benjamins.

Duscher, A., & Vroom, M. (2018). Squid in Space: Symbiosis and Innate Immunity. Florida: Experiment.com. Retrieved from https://experiment.com/projects/squid-in-space-symbiosis-and-innate-immunity

Experiment (2022). Researcher Guide. Design an Experiment. Retrieved June 2022 from https://experiment.com/guide

Franzoni, C., & Sauermann, H. (2014). Crowd science: The organization of scientific research in open collaborative projects. Research policy, 43(1), 1-20. https://www.sciencedirect.com/science/article/pii/S0048733313001212

Friese, S. (2017). ATLAS. ti 8 Windows Quick Tour. Berlin: Atlas. ti scientific software development. http://downloads.atlasti.com/docs/quicktour/QuickTour_a8_win_es.pdf

Gerber, L., & Hui, J. (2016). Crowdfunding: how and why people participate. In International perspectives on crowdfunding. Emerald Group Publishing Limited.

Harwood, N. (2005). We do not seem to have a theory. The theory I present here attempts to fill this gap: Inclusive and exclusive pronouns in academic writing. Applied Linguistics, 26(4), 343-373. https://academic.oup.com/applij/article/26/3/343/181373?login=true

Hyland, K. (2001). Bringing in the reader: Addressee features in academic articles. Written Communication, 18(4), 549-574. https://journals.sagepub.com/doi/10.1177/0741088301018004005

Hyland, K. (2002). Directives: Argument and engagement in academic writing. Applied Linguistics, 23(2), 215-239. https://academic.oup.com/applij/article/23/2/215/153874

Hyland, K. (2004). Engagement and disciplinarity: The other side of evaluation. In G. Del Lungo- Camiciotti, and E. Tognini- Bonelli (Eds.). Academic discourse: New insights into evaluation (pp. 13-30). Bern: Peter Lang.

Hyland, K. (2005). Stance and engagement: a model of interaction in academic discourse. Discourse Studies, 7(2), 173-192. https://doi.org/10.1177/1461445605050365

Jewitt, C., Bezemer, J., & O'Halloran, K. (2016). Introducing multimodality. Routledge.

Jiang, F., & Ma, X. (2018). 'As we can see': Reader engagement in PhD candidature confirmation reports. Journal of English for Academic Purposes, 35, 1-15. https://www.sciencedirect.com/science/article/pii/S1475158518301954

Kress, G., & van Leeuwen, T. (2006). Reading images. The grammar of visual design. (2nd ed.). London: Routledge.

Lafuente-Millán, E. (2014). Reader engagement across cultures, languages and contexts of publication in business research articles. International Journal of Applied Linguistics, 24(2), 201-223. https://onlinelibrary.wiley.com/doi/10.1111/ijal.12019

Luzón, M. J. & Pérez-Llantada, C. (2019). (Eds.). Science Communication on the Internet. Old genres meet new genres. Amsterdam: John Benjamins.

Luzón, M. J. (2019). Bridging the gap between experts and publics: The role of multimodality in disseminating research in online videos. Ibérica, 37, 167-192. https://zaguan.unizar.es/record/86410/files/texto_completo.pdf

McInnes, J. (2018). Population Ecology of Risso's Dolphins in Monterey Bay, California. California: Experiment.com. Retrieved from https://experiment.com/projects/population-ecology-of-risso-s-dolphins-in-monterey-bay-california

McLaren-Hankin, Y. (2019). Rebuilding trust in the banking sector: Engaging with readers in corporate press releases. In C. Sancho- Guinda (Ed.). Engagement in professional genres (pp. 87-100). John Benjamins.

Mehlenbacher, A. R. (2017). Crowdfunding Science: Exigencies and Strategies in an Emerging Genre of Science Communication. Technical Communication Quarterly, 26(2), 1-18. https://www.tandfonline.com/doi/pdf/10.1080/10572252.2017.1287361

Mehlenbacher, A. R. (2019). Science Communication Online: Engaging Experts and Publics on the Internet. Columbus: The Ohio State University Press.

Pullman, G. (2013). Persuasion. History, Theory, Practice. Indianapolis: Hackett Publishing Co.

Shu, D. & Das, S. (2017). How do cataracts form and how can they be prevented? Sidney: Experiment.com. Retrieved from https://experiment.com/projects/how-do-cataracts-form

Ruiz-Madrid, N., & Valeiras-Jurado, J. (2020). Developing multimodal communicative competence in emerging academic and professional genres. International Journal of English Studies, 20(1), 27-50. https://

revistas.um.es/ijes/article/download/401481/285021
Vachelard J., Gambarra-Soares, T., Augustini, G., Riul, P., & Maracaja-Coutinho, V. (2016). A Guide to Scientific Crowdfunding. PLoS Biol 14(2), e1002373. https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1002373
Valeiras-Jurado, J. (2021). Multimodal persuasive strategies in product pitches. Text & Talk, 41(4), 561-584. https://www.degruyter.com/document/doi/10.1515/text-2019-0254/html
Wheat, R. E., Wang, Y., Byrnes, J. E., & Ranganathan, J. (2013). Raising money for scientific research through crowdfunding. Trends in ecology & evolution, 28(2), 71-72. https://www.sciencedirect.com/science/article/pii/S0169534712002984
Xia, S. A., & Hafner, C. A. (2021). Engaging the online audience in the digital era: A multimodal analysis of engagement strategies in TED talk videos. Ibérica, 42, 33-58. http://revistaiberica.org/index.php/iberica/article/download/598/188

Appendix: Videos selected for analysis

Vx	Date	Title and link of the project	Category
v1	12/11/17	How do cataracts form and how can they be prevented? https://experiment.com/projects/how-do-cataracts-form	B+ MED
V2	14/12/17	Maceration of Skull Tissue by Mealworms https://experiment.com/projects/maceration-of-skull-tissue-by-mealworms	B+ EC
V3	31/01/18	How have warming waters influenced reef species around Poor Knights Islands, New Zealand? https://experiment.com/projects/how-have-warming-waters-influenced-coral-species-around-poor-knights-islands-new-zealand	B+ EC
V4	15/01/18	Why do wolverines need snow? https://experiment.com/projects/why-do-wolverines-need-snow/discussion	B+ EC
V5	17/03/18	How do chemical exposures trigger autoimmune diseases? https://experiment.com/projects/how-do-chemical-exposures-trigger-autoimmune-diseases	B+ MED
V6	04/03/18	Squid in Space: Symbiosis and Innate Immunity https://experiment.com/projects/squid-in-space-symbiosis-and-innate-immunity	B+ EC
V7	03/03/18	How do Hovering Hummingbirds Survive Hot Days? https://experiment.com/projects/how-do-hovering-hummingbirds-survive-hot-days/methods	B+ EC
V8	17/04/18	How Will Global Climate Change Impact Tropical Communities? https://experiment.com/projects/how-will-global-climate-change-impact-tropical-communities/labnotes	B+ EC
V9	22/03/18	Genetic diversity across the Atlantic in a red seaweed https://experiment.com/projects/genetic-diversity-across-the-atlantic-in-a-red-seaweed	B+ EC
V10	19/05/18	What genes make domestic dogs friendlier than wolves? https://experiment.com/projects/what-genes-make-domestic-dogs-friendlier-than-wolves	B
V11	16/04/18	MeadoWatch: When do Mt. Rainier Wildflowers Bloom? https://experiment.com/projects/timing-is-everything-when-do-mt-rainier-wildflowers-flower	EC+ ED
V12	12/07/18	How do wildfires reshape plant-pollinator networks in oak woodlands? https://experiment.com/projects/how-do-wildfires-reshape-plant-pollinator-networks-in-oak-woodlands/methods	B+ EC
V13	04/05/18	Bio-Fluorescence on Coral Reefs as a Measure of Reef Health https://experiment.com/projects/bio-fluorescence-on-coral-reefs-as-a-measure-of-reef-health	B+ EC

V14	16/06/18	Population Ecology of Risso's Dolphins in Monterey Bay, California https://experiment.com/projects/population-ecology-of-risso-s-dolphins-in-monterey-bay-california	B+ EC
V15	21/07/18	How does sleep deprivation impact problematic eating? https://experiment.com/projects/how-does-sleep-deprivation-impact-problematic-eating/methods	MED
V16	04/08/18	The Potential of Compost and Compost Tea on Athletic Turfgrass https://experiment.com/projects/the-potential-of-compost-and-compost-tea-on-athletic-turfgrass/methods	EC
V17	15/08/18	An expedition in search of one of Australia's most mysterious marsupials https://experiment.com/projects/an-expedition-in-search-of-one-of-australia-s-most-mysterious-marsupials	B+ EC
V18	01/11/18	CRISPR Cas9 testing model https://experiment.com/projects/crispr-cas9-testing-model	B
V19	20/10/18	Ticks and tick-borne pathogens of the Mojave Desert Tortoise https://experiment.com/projects/ticks-and-tick-borne-pathogens-of-the-mojave-desert-tortoise	B + EC
V20	20/09/18	Do Pacific Northwest marine mammals carry antibiotic-resistant bacteria from land animals? https://experiment.com/projects/do-urban-marine-mammals-of-the-pacific-northwest-carry-antibiotic-resistant-bacteria-from-humans-or-terrestrial-animals	B+ MED
V21	20/09/18	Are Costa Rican salamanders susceptible to Batrachochytrium salamandrivorans? https://experiment.com/projects/are-costa-rican-salamanders-susceptible-to-batrachochytrium-salamandrivorans	B+ EC
V22	25/10/18	How do amphibious fishes find their way around on land? https://experiment.com/projects/how-do-amphibious-fishes-find-their-way-around-on-land	B + EC
V23	10/01/19	Creating a neural network that classifies Dinoflagellate species https://experiment.com/projects/creating-a-neural-network-that-classifies-dinoflagellate-species	B
V24	22/12/18	Refining and improving techniques to increase survival of macaw chicks using foster macaw parents in the wild https://experiment.com/projects/refining-and-improving-techniques-to-increase-survival-of-macaw-chicks-using-foster-macaw-parents-in-the-wild	B + EC
V25	15/02/19	How do lichens withstand dessication? https://experiment.com/projects/how-do-lichens-withstand-desiccation	B
V26	5/04/19	Can intensive forestry benefit the threatened Rusty Blackbird? https://experiment.com/projects/can-intensive-forestry-benefit-the-threatened-rusty-blackbird	B + EC
V27	21/06/19	Do hummingbirds use cool perches so they can fly in the heat? https://experiment.com/projects/do-hummingbirds-use-cool-perches-so-they-can-fly-in-the-heat	B + EC
V28	03/07/19	Effects of lead exposure in Scandinavian brown bears https://experiment.com/projects/effects-of-lead-exposure-in-scandinavian-brown-bears	B + EC
V29	03/07/19	Can we utilize natural bat colony behavior as a vaccination strategy? https://experiment.com/projects/can-we-utilize-natural-bat-colony-behavior-as-a-vaccination-strategy	B + MED

V30	26/07/19	Can we grow a supply of red blood cells by differentiating stem cells to replace donor blood? https://experiment.com/projects/can-we-grow-a-supply-of-red-blood-cells-by-differentiating-stem-cells-to-replace-donor-blood	B + MED
V31	28/07/19	Uncovering the cryptic ecological diversity of Caribbean sponges https://experiment.com/projects/uncovering-the-cryptic-ecological-diversity-of-caribbean-sponges	B + EC
V32	07/11/19	What is in endangered bat poop ? https://experiment.com/projects/what-s-in-endangered-bat-poop	B + EC
V33	24/11/19	How does ocean acidification affect carbon dioxide sequestration in coccolithophores? https://experiment.com/projects/how-does-ocean-acidification-affect-carbon-dioxide-sequestration-in-coccolithophores	B + EC
V34	04/12/19	Does the palo santo tree consist of multiple distinct species? https://experiment.com/projects/does-the-palo-santo-tree-consist-of-multiple-distinct-species	B + EC
V35	18/12/19	Could teeth and scale chemistry reveal threatened Amazonian mega-fish movements? https://experiment.com/projects/could-teeth-and-scale-chemistry-reveal-threatened-amazonian-mega-fish-movements	B + EC
V36	22/03/20	Mercury is in our fog, so what about our food? https://experiment.com/projects/mercury-is-in-our-fog-so-what-about-our-food	EC
V37	30/08/20	Growing edible algae on the Moon https://experiment.com/projects/growing-edible-algae-on-the-moon	B
V38	30/09/20	Can blood lactate levels help guide treatment for birds suffering from monofilament line entanglement injuries? https://experiment.com/projects/can-blood-lactate-levels-help-guide-treatment-for-seabirds-suffering-from-monofilament-line-entanglement-injuries	EC + MED
V39	30/09/20	Is lead toxicity a contributing factor to large scale songbird population decline? https://experiment.com/projects/is-lead-toxicity-a-contributing-factor-to-large-scale-songbird-population-decline	B + EC
V40	29/11/20	Modeling Zika virus transmission from mother to child using uterine mini-organs https://experiment.com/projects/modeling-zika-virus-transmission-from-mother-to-child-using-uterine-mini-organs	MED
V41	01/07/21	Restoring native oysters to Biscayne Bay, as a tool to mitigate algal blooms https://experiment.com/projects/can-native-oyster-be-restored-at-select-sites-which-have-new-freshwater-flow	B + EC
V42	04/02/21	Discovering and monitoring manta rays in the remote Conflict Islands https://experiment.com/projects/discovering-and-monitoring-manta-rays-in-the-remote-conflict-islands	B + EC
V43	22/02/21	Are cryptic characteristics preventing the protection of two similar Sphingidae moths? https://experiment.com/projects/are-cryptic-characteristics-preventing-the-protection-of-two-similar-sphingidae-moths/labnotes	B + EC
V44	09/03/21	Community-based Leishmaniasis research in Sri Lanka https://experiment.com/projects/community-based-leishmaniasis-research-in-sri-lanka	B + MED