"YOUR ACTION IS NEEDED": THE EFFECT OF WEBSITE-INITIATED PARTICIPATION ON USER CONTRIBUTIONS TO CONTENT WEBSITES

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"Your Action is Needed": The Effect of Website-Initiated Participation on User Contributions to Content Websites

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Abstract

The success of contemporary content websites relies on users' active participation and contribution in the form of both social participation and payments. Recent research on website strategy and sustainability has found a link between users' social participation and users' willingness to pay for content-related services. However, website owners still find it challenging to elicit participation and payment behavior.

While previous research focused only on implicit encouragement to participate, we present website-initiated participation: the use of "Calls to Action" by the website that requires the user to perform participatory actions in order to consume content. We study the relation between website-initiated participation and users' willingness to contribute both effort and monetary funds. We present a series of web experiments in a website called VideoBook that provides high-quality video content.

Our first study shows that users who are given Calls to Action donate more money to the website compared with users who are not exposed to such prompts. We also show that even one prompt is enough to increase users' likelihood of voluntarily engaging with the website and to increase the number of contributions. The prompts do not affect users' enjoyment or willingness to continue using the website. Our second study, motivated by research on incremental engagement, shows that the sequence of participatory activities is also crucial; when the tasks that users are prompted to engage are presented in increasing order of effort level, users tend to donate and participate more than when tasks are not ordered. We extend our results by presenting a heterogeneity analysis that shows connection between the number of videos watched by the user and its susceptibility to website-initiated participation.

Keywords: Content Websites, Online Communities, Freemium, Donation, Prompts, Business Models.

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1. Introduction

Whether they offer news, music or videos, content websites have come to rely on users' contributions for their sustainability. Using dedicated technology provided by these websites (referred to as *social computing* platforms), users help the sites to prosper by organizing and commenting on existing content, supplying new content and jumpstarting conversations that can attract newcomers, increase user retention and spread word-of-mouth marketing of sites services (Bapna and Umyarov 2014). Therefore, it comes as no surprise that content websites are looking for new ways to increase their users' social participation.

However, social participation is not the only kind of contribution that content websites wish to elicit from their users. Alongside encouraging social engagement, many websites are making requests for monetary contributions in order to sustain their businesses. Some websites request donations; others implement paywalls or freemium business models, in which some of the content is free, while other content or services are available only to users who purchase a premium account.

Recently, Oestreicher-Singer and Zalmanson (2013) established a link between social and monetary contributions, showing that users who have socially participated in a website's community are more likely to convert to a premium account compared with users who are passive content consumers. Similarly, Wikipedia's active editors have been shown to contribute much more than the average reader in terms of monetary donations to the site (Wikimedia Blog 2012). A study by Bapna and Umyarov (2014) indicates that the relationship between social and monetary contribution is a virtuous cycle; specifically, the authors show that users who pay for a premium account will subsequently exhibit more social participation. Given these findings, websites that face the challenge of converting their users into paying subscribers may wish to socially engage them, in the hopes of receiving both kinds of contributions. However, the degree to which a website can actively influence user contributions remains an open question. Past research has focused solely on cases in which users voluntarily engaged in acts of participation and contribution (*user-initiated participation*), and the website only implicitly encouraged user contributions through social mechanisms, i.e., by making the user aware of the contribution behavior of his or her fellow users (Chen et al. 2010, Ren et al. 2012).

The objective of our research is to study an alternative approach by which websites might encourage users to contribute: *website-initiated participation*, in which the website requires the user to engage with its social features in order to consume content. A basic means by which content websites might actively initiate participation is presenting users with "calls to action", defined as graphic or textual prompts that require users' immediate attention and response. In recent years, these sorts of prompts have become more prevalent on different websites. For instance, in many websites, users run into prompts that

ask them to open an account, write a review or recommend the website to friends before being allowed to continue their free usage of the website.

The use of such prompts raises interesting empirical questions. On the one hand, they immediately grab the user's attention and lead to an immediate participatory action that might strengthen the user's subsequent contributions. Indeed, studies outside the context of online communities suggest that individuals attribute greater value to experiences or services in which they have been required (through short-term, exogenously initiated action) to invest some effort, as compared with experiences in which they have not invested such effort (Aronson and Mills 1959, Norton et al. 2009, Hsee et al. 2009). On the other hand, online engagement research has identified four dimensions of user behavior that may hint at a less positive relationship between exposure to calls to action and users' subsequent contribution behavior. These dimensions are as follows:

First, most people visit content websites solely because they seek to consume content. Industry reports suggest that very few consumers actually become active members who contribute to discussions (statistics show numbers that are anywhere between 1% and 30%). In reality, most users remain quiet observers or "lurkers", thus creating "participation inequality" (Wu 2010).

Second, social participation is considered a voluntary act initiated by the user. Presenting users with prompts that require their active response may result in a negative reaction, hurt users' satisfaction and overall enjoyment of the website experience (Edwards et al. 2002) and may actually diminish their willingness to contribute content or funds to the website.

Third, a user's social participation in a website has been shown to be dependent on the reactions he or she receives from fellow users (Burke et al. 2007). In fact, most experiments that attempted to increase users' contributions did so by increasing peer influence and exposing the focal user to more active and engaged peers (Ludford 2004, Bapna and Umyarov 2014) or by providing social proof—i.e., social cues regarding the 'correct' way to behave—by highlighting how low the user's contribution is relative to the contributions of other users (Chen et al. 2010, Ren et al. 2012). It is not clear that a website can influence user social dynamics without using any social influence or social proof mechanism.

Last, the process by which a user's participation in a communal setting intensifies is typically long and incremental, i.e., users gradually take on tasks involving increasing effort (Lave and Wenger 1991, Li and Bernoff 2008; more recent updates in their Forrester websites), and it can take months of active participation in order to convert users to fee-paying (Oestreicher-Singer and Zalmanson 2013). This might undermine the effectiveness of initiating short-term actions such as prompts.

To summarize, when user engagement is entirely voluntary, few users will actually participate, and this participation depends on community dynamics and is both incremental and slow.

In this paper, we run controlled experiments and empirically study website-initiated participation, i.e., calls to action to which the user's response is neither voluntary nor dependent on communal dynamics. For this study, we designed a specialized website called *VideoBook* that provides us with the benefits of an environment that is both controlled and realistic. VideoBook displays high-quality video content and allows us to issue different calls to action at different points in time, as well as record users' behavior on the website both before and after their exposure. The calls to action are essentially requests for the user to engage in various participatory actions that are available on the website, including the following: rating the video he or she is viewing, liking or disliking the video, commenting on the video and tagging the video using a user-chosen keyword. In our experiments, users browse VideoBook for an allotted period of time. During the first half of this time period, they are exposed to various combinations of calls to action. We then measure users' behavior on the website for the remainder of the time period, during which they are not exposed to calls to action.

Our study addresses three research questions. The first research question studies the direct effect of website-initiated participation on *users' subsequent behavior and contributions*. We evaluate users' behavior and contributions on the basis of four different dimensions (outcome variables): (i) the volume of users' voluntary engagement behavior; this is measured as the number of participatory acts that the user subsequently initiates on the site; (ii) the percentage of all users who choose to voluntarily engage at least once (referred to as participation rate); (iii) the level of users' willingness to make a monetary contribution to the website via donation; and (iv) the level of overall user satisfaction and intentions to continue using the website.

RQ1: What are the effects of exposure to calls to action on users' subsequent behavior and contributions?

Our second research question seeks to determine whether the order in which calls to action are issued (i.e., the order of the activities that users are required to engage in) affects users' subsequent behavior and contributions. This research question is motivated by prior research that provides evidence that users in online communities follow a ladder-type lifecycle. In particular, these studies suggest that voluntary acts of participation follow a natural order, such that user engagement tends to be an incremental process wherein users gradually participate in more effortful activities, and thereby increase their levels of engagement (Li and Bernoff 2008, Preece and Schneiderman 2009, Oestreicher-Singer and Zalmanson 2013). These observations were based on communal settings in which engagement was entirely voluntary, whereas we aim to study participation in a non-voluntary and non-communal setting.

As in our first research question, the effects will be measured across the above mentioned four dimensions: volume of participation, participation percentage, enjoyment and donation.

RQ2: How does the order in which different calls to action are issued affect users' subsequent behavior and contributions?

Our third question seeks to identify individual differences across users, focusing on users' consumption style. For instance, it is reasonable to assume that, in a video website such as VideoBook, given a time frame, some users will spend the allotted time viewing just a few videos from beginning to end, whereas others will "zap" through many videos. To the best of our knowledge, no prior research has linked content consumption, and specifically the number of videos watched in a timeframe, to social and monetary contributions to video websites. Interestingly, either type of consumption style might have positive implications for the user's subsequent contributions: on one hand, the tendency to focus on a small number of videos, given limited time, may suggest that a user is highly dedicated to and interested in the videos watched; this interest might later translate into positive contributions to the website. On the other hand, users who zap through many videos may remain alert throughout the viewing experience, continuously evaluating the content they are consuming; this behavior might contribute to an engaging experience and lead to positive contributions.

RQ3: Do the effects of website-initiated participation on users' subsequent behavior and contributions differ between users who watch a high number of videos in a given period of time as compared with users who consume a lower quantity of videos in that time?

The results of our first study show that exposure to one prompt to rate a video significantly increases users' likelihood of subsequently rating videos voluntarily. In addition, donations following exposure to four prompts were almost two times higher than the donations obtained when no prompts where presented. Overall satisfaction was not shown to be affected, suggesting there is no clear negative effect to the prompts used.

Our second study shows that users who were exposed to prompts that were presented in a so-called "incremental order" (specifically, prompts that were *ordered* according to the users' likelihood of engaging voluntarily in the actions encouraged by the prompts) produced higher values for each of the four outcome variables (voluntary engagement, participation percentage, overall website evaluation, and willingness to donate), compared with users who were exposed to prompts in a non-incremental order.

In a subsequent heterogeneity analysis, we observe a positive relationship between the number of videos the user has watched within the allotted 20-minute timeframe on VideoBook and the susceptibility of his or her behavior and contributions to the effects of website-initiated participation. Finally, among users exposed to prompts that are issued in increasing order of effort, we find a positive correlation between users' voluntary engagement behavior and the amounts that they donate.

Put together, these results suggest that website-initiated participation could prove valuable for websites that are facing the challenge of user conversion. We show that consistent and gradual calls to action, initiated by the website itself within a short timeframe, can encourage users to contribute both content and monetary funds. Moreover, the research shows that website users can be prompted to climb the ladder of participation (i.e., to increase their levels of engagement with a website) even in the absence community response or encouragement. Our work hints at the larger role that website managers can play in affecting user contributions and designing better and more sustainable business models in community-oriented websites.

2. Literature Survey

2.1 Encouragement to Contribute in Online Environments

Motivation to contribute, especially to contribute shared and public goods, has received substantial attention in many streams of research in the social sciences. Economists, psychologists and political scientists have observed that across a wide range of scenarios and contexts, people in a social group contribute less than the quantity of public goods that would optimally benefit the group as a whole. This phenomenon is known as a public goods dilemma (Andreoni 1988, Lenyard 1997), free riding (Groves and Ledyard 1977) or social loafing (Karau and Williams 1993, for review). In the online context, the same notion has become known as participation inequality (Wu 2010) or as a problem of under-contribution (Ling et al. 2005), which may result in websites' inability to sustain themselves.

Researchers in the disciplines of information systems (IS) and computer science have studied the ways in which changes in the design of an online environment can encourage individuals to increase contributions of either a social or monetary nature. Many of the methods studied have been influenced by insights from social psychology of groups, namely, the existence of peer influence: the phenomenon in which the individual conforms to the behavior of his or her social surroundings. In these studies, peer influence is typically achieved through mechanisms of either contagion or social proof. For example, Ludford et al. (2004) positively influenced users' rates of participation in an online discussion forum by showing those users the similarity or uniqueness of their contributions in relation to those of their peers.

Cheng and Vassileva (2006) introduced a points-based mechanism by which community members could reward other community members for specific types of activities; the number of points that a user accrued provided her with an indication of her status relative to other website users and positively influenced user behavior. Chen et al. (2010) examined a mechanism that informed users whether their contributions were above or below the median level. In their study, users who were informed that their contributions were below the median increased their contributions by 530%, whereas users who were told that their contributions were above the median lowered their contributions by 62%. Bapna and Umyarov (2014) showed that providing free subscriptions to a group of users in the music website last.fm had a positive effect on the likelihood that those users' friends would subscribe as well.

Other researchers have looked at how a user's participation in an online community is influenced by the extent to which other users enhance his or her awareness of certain website features, through invitations and notifications (Girgensohn and Lee 2002, Harper et al. 2007). These researchers observe that the invitations and features most likely to encourage participation are those that give out "community" signals, which then enforce social norms. In a similar vein, Aral and Walker (2012) found that it is possible to increase individuals' likelihood of signing up for a service merely by notifying them of their peers' signing-up activity, through a Facebook-based application. Ren et al. (2012) showed that by implementing community features that strengthen users' group identity or interpersonal bonds (for instance, by providing information on group or individual activities), a website can increase users' self-reported attachment to the community as well as the frequency at which they visit the website.

Nevertheless, it's worth pointing out that all the findings mentioned above were obtained in settings that served primarily as active online communities. In websites in which content consumption is the primary focus, and in which a strong majority of website users are non-participants, presenting users with a comparison of their participation levels to the average or even median participation level can be futile. Furthermore, many users of such sites may not even have listed friends on the website by whom they might be influenced.

Also related to our context is a stream of research that explores whether user commitment to a website can be enhanced through delegation of tasks to users and the formation of goals. Ling et al. (2005) adapted goal-setting theories and successfully improved user participation in a movie recommendation community by supplying users with clearly-set goals. Both Cosley et al. (2007) and Farzan et al. (2009) showed that the act of delegation of tasks in Wikipedia is enough to raise users' contributions in terms of article edits. While this stream of research examines user participation in the absence of an active social community, it is not necessarily applicable to the context of music, news and video websites. Wikipedia's user tasks are central to its core essence and deal with the collaborative creation of content items while in news, music and video websites, the main content in each page is

uploaded by the website or a specific user and the other users tasks are only to tag, rate or comment on it. Closer to our research is Drenner et al. (2008) which altered the entry process to a film community, adding a requirement for some users to tag photos before continuing to the main community page. They showed that, compared with users who were not required to tag photos, users who were subjected to the requirement subsequently tagged more photos voluntarily and participated in more activities on the website. However, all of the previous studies do not study monetary contributions to websites and as a consequence do not address the relations between social participation and monetary contribution. Finally, the research in this stream focuses on relatively simple tasks, whereas our focus is on multiple tasks of increasing effort.

2.2 The Effect of Labor on Appraisal of and Willingness to Pay for Products and Experiences

Psychologists and economists have shown that an individual who invests labor in a given product or experience is likely to evaluate that product or experience more favorably compared with someone who has not invested such labor. This phenomenon has been attributed to a series of mechanisms. First, researchers in social psychology have discussed people's need for *effort justification*, showing that even a short period of effort increases one's appreciation for the pursuit in which the effort was invested (Festinger 1957, Aronson and Mills, 1959). Second, the work of Hsee et. al (2009) discusses a phenomenon referred to as *idleness aversion* in which people are simply happier exerting effort than remaining idle. Notably, the researchers find that this is the case even when the exertion of effort is made mandatory. More recently, behavioral economists Norton, Mochon and Ariely (2009) have focused on effort that leads to successful completion of an activity. They show that people tend to assign higher monetary valuations to products that they have helped to assemble successfully than to products in which they have invested no effect; the researchers refer to this phenomenon as the *IKEA effect*. IS and marketing researchers have built on these theoretical foundations to investigate observed overvaluation in cases in which consumers participate in an item's production, a process that is frequently achieved using online tools (Franke and Piller 2004, Schreier 2006, Franke et al. 2010). All of the works mentioned above involve physical products (even if the co-production was conducted in a virtual environment) or, in the case of effort justification or idleness aversion, physical experiences. The case of engagement with a website is different and requires further inquiry, as it is a virtual product, without any physical or tangible essence. Moreover, the internet is characterized by lower search costs and the availability of many alternatives, including pirated content, which lowers valuation and willingness to pay for virtual products and experiences (Bhattacharjee et al. 2003). These unique characteristics call into question the applicability of past conclusions to the online environment and encourages further inquiry.

2.3 Ladder of Participation and User Lifecycle

Many researchers have attempted to characterize the user lifecycle on social websites and have identified similar patterns. Both Li and Bernoff (2008) and Preece and Schneiderman (2009) have observed a ladder-type lifecycle for users in online social environments. Specifically, they suggest that most users of a website can be organized into a well-defined hierarchy according to the extent to which they use the website's social features and are active in the website's community. Some users move gradually up to higher levels, while others stay in place. These findings regarding online communities echo the seminal work of Lave and Wenger (1991) on learning processes in communities of practice. More recently, Oestreicher-Singer and Zalmanson (2013) have offered a framework of a *ladder of participation*, an ordered list of user activities in content websites, suited to content websites that incorporate social features as part of their offerings. Drawing from organizational commitment theory, Oestreicher-Singer and Zalmanson (2013) suggest that a user's climb up the ladder of participation reflects a progression towards stronger and more fundamental types of commitment toward the website. Their research found that users on the last.fm music website who were highly engaged in the website's community, i.e., were at top rungs of the ladder, were more likely to purchase a premium subscription compared with people who exclusively listened to music, even if they were avid consumers. Bapna et al. (2014) utilized the ladder of participation by presenting the phenomenon of a *virtuous cycle* in social websites, showing that users continue to climb after purchasing premium subscriptions.

The discussion of the theory of the ladder of participation thus far has been limited to voluntary actions taken by the user. It is therefore unclear what will happen if participatory acts are initiated by the website. Moreover, the process of the climb is rather long, which suggests that, left to their own devices, only very few users will end up reaching the higher rungs of the ladder. As noted above, studies on effort justification and idleness aversion have shown by the design of randomized experiments that participatory actions can indeed be exogenously initiated, and that their effects on willingness to pay can be immediate (Norton et al. 2009). However, as discussed, studies in this vein have tested the mere effect of an action or experimented with volume of such actions, but do not emphasize more complex arrangements of user participation. The unique characteristics of online environments as well as the increasingly social nature of content websites call for a more nuanced definition of user participation and an exploration of its outcomes. This work aims to close the gaps in current knowledge regarding the connection between users' participation and their subsequent online behavior and willingness to pay in the form of donation.

3. Methodology and Results

In order to test the connection between a solitary user's engagement with a website's social features and his or her subsequent behavior on the site, it is insufficient to gather data from active real-world websites. These websites are characterized by established community dynamics that influence users' behavior on a continuous basis, making it nearly impossible to isolate users' reactions to the introduction of specific website features.

Thus, for the purpose of this work, we designed a controlled experimental setting: a YouTube-like video site named VideoBook. The website provides video clips that the user can view using a built-in video player. In designing the site, we emphasized creating an appearance and feel that would be similar to what one would experience browsing a well-known video content website such as YouTube.com or Vimeo.com, but not identical to either one of them. For that reason, rich graphic design was used to create a symbol icon and buttons that are similar in functionality to those available on established sites yet distinctive in appearance (see Figure 1). On each page, a user can navigate by clicking on a "pick random video" button or by clicking on one of four suggested video links that appear to the right of the current video.

For this experiment, videos were taken from the Vimeo.com website. Vimeo.com is one of the largest video content websites in the world and specializes in artistic, high-quality videos. By using Vimeo.com as a source (as opposed to YouTube.com, for example), we avoided creating an unplanned and uncontrollable distraction or interruption in the form of an online ad by a third-party website. In order to make sure that the quality of a user's experience would not be influenced by the specific videos he or she chose to watch, the videos to which users were expose were limited only to highly rated high-resolution nature videos. Specifically, we used the 40 highest-rated videos in the category of "nature" on Vimeo with durations of 120-150 seconds, promising a generally high level of content quality. Compared with music videos or narrative-led video clips, the nature genre, which is characterized by unique and striking aesthetics of landscapes and animals, is not as strongly associated with cultural differences and diverse personal tastes. Thus, our selection of videos enabled us to avoid bias resulting from users' personal video preferences. Along with the videos, selected tags and comments from the original video pages on Vimeo.com were randomly chosen and added into VideoBook alongside each video.

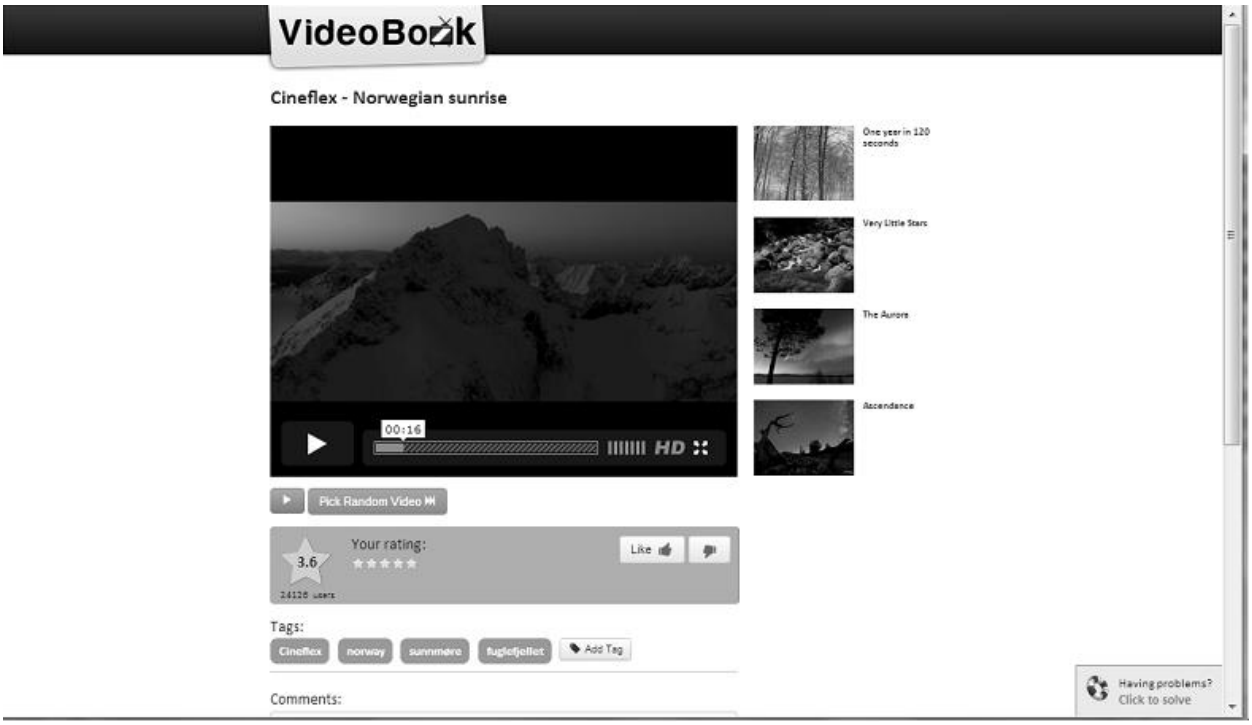

Figure 1. The VideoBook screen

As is the case on most content websites, while watching the video, each user was presented with information about the video such as the name of the video, the current rating of the video (randomly assigned between three and five), previous tags, and comments (randomly chosen from the original video). Tags and comments were limited to four at most (when there were more than four associated with the original video) in order to avoid overcrowding the layout of VideoBook and influencing the user's experience. Further, the user was offered the option to engage in one or more of the following activities: marking the video as liked or disliked by clicking on a *Like*/*Dislike* button; rating the video on a scale of 1 to 5 stars; tagging the video, that is, offering key words that best describe the video; adding a new comment in a free-text box.

A pre-test was conducted in order to test which of these actions are more likely to be performed voluntarily by users, thus implying better familiarity and ease-of-use. The pre-test included 113 users who were recruited using Amazon Mechanical Turk. Each user browsed VideoBook for 20 minutes. The results show that the rate action was performed by 65% of the users, while the like/dislike action was performed by only 53% of the users. The comment action was performed by 23% of the users. Last, the tag action was performed by 11.5% of the users. In what follows, we refer to the observed order of actions—rate, like/dislike, comment and tag—as an incremental order, assuming that actions that users are more likely to perform voluntarily are those that require them to invest less effort.

In the following experiments, users were introduced to the website as a new website that they were being asked to test for 20 minutes. Users were promised $2 USD for the task ($1 for basic participation and an additional $1 as a bonus for concluding the task and responding to a user survey). Manipulations entailed dividing the testing time in half and presenting prompts in VideoBook during the first ten minutes of usage: Calls to action that appeared on the upper right corner of the screen and were accompanied by an arrow sign, directing the user to the appropriate button for performing the prompted action (see Figure 2). Users were required to perform the actions before continuing on to browse additional videos. In the last ten minutes, users in all scenarios received no prompts and could voluntarily engage with the website. In the end, users were presented with a user survey on their website experience.

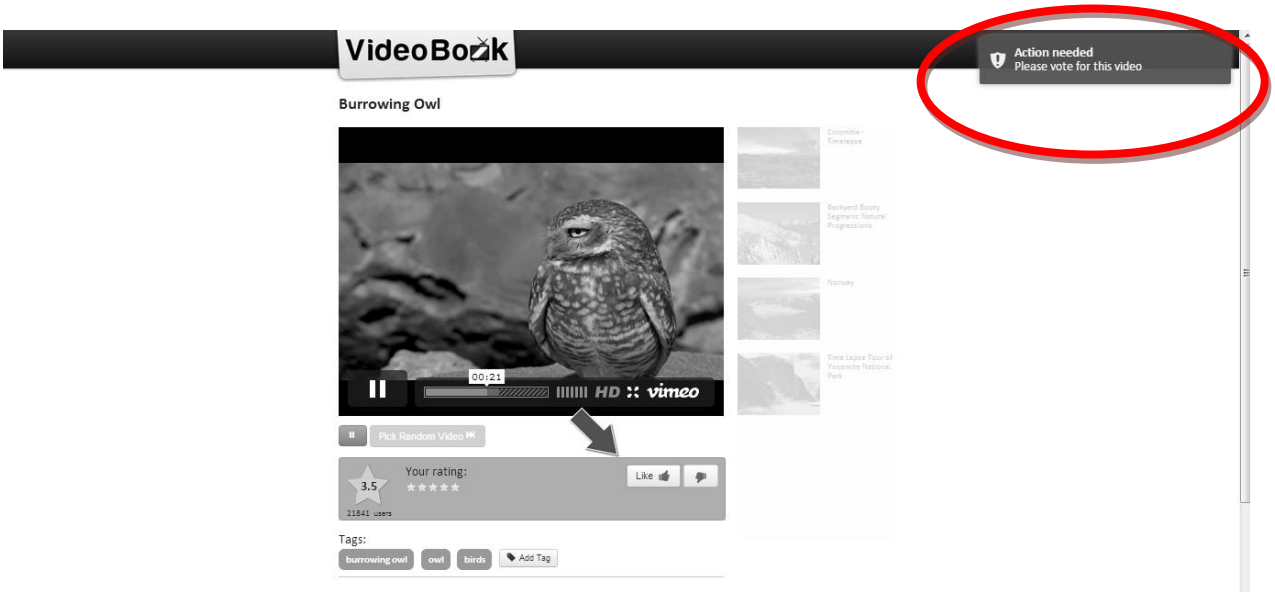

Figure 2. Call to action in VideoBook

We tested four outcome variables (see summary in Table 1). The first, **voluntary engagement behavior following initial exposure to prompts**, was tested by counting the number of *rate*, *like/dislike*, *comment* or *tag* actions that each user performed in the last ten minutes of the experiment during which he has not received any calls to action. Taking the aggregate number of participative actions follows an approach common in social media studies (Oestreicher-Singer and Zalmanson 2013, Bapna and Umyarov 2014). **Participation percentage** was calculated as the percentage of users who chose to voluntarily engage with the website (i.e., who performed *rate*, *like/dislike*, *comment* or *tag* actions) during the last ten minutes of the experiment. This variable is based on similar studies' calculations of users' overall participation rates (Nielsen 2006, Wu 2010). We tested **users' willingness to pay via website donation**

by asking users to give back part of the $1 bonus they had just received; we informed them that the purpose of this donation was for "improving website services". The amount that a user committed to paying was then deducted from his or her compensation for participation, conveying a real willingness to donate. Asking users to give back a portion of the funds they have received enables us to measure real monetary donations and is a common mechanism for accessing actual contribution (Carlsson and Martinsson 1999). Finally, **overall website evaluation** was tested by a survey that evaluated users' satisfaction with their experience of the site in addition to their expressed willingness to continue use and spread the word (Table 1). Users responded to each survey item by rating a Likert scale.

Outcome Variable	**Description**	**Measure**
Voluntary Engagement Behavior	The sum of the number of relevant voluntary participatory actions (*rate*, *like/dislike*, *comment*, *tag*, or a selection thereof) that a user engaged in during the second part of the experiment.	Aggregate number
Participation Rate	The percentage of participants who engaged voluntarily with at least one feature during the second part of the experiment.	Percentage (0-100%)
Donation	Monetary contribution to the websites that the user is willing to make from his expected compensation for participating in the experiment.	Real money donation. Range between 0-100 US cents.
Website Evaluation	Key metrics of user's website evaluation and attitudes toward the website in a series of survey items (see Table 2).	Likert scale for each survey item.

Table 1. Outcome variables

Question Topic	Survey Question
Likeability	*How did you like VideoBook website?*
Enjoyment	*How enjoyable do you find the video content consumption experience?*
Interest	*To what degree did you find VideoBook's videos interesting?*
Quality	*How would you rate the quality of the videos you watched on VideoBook?*
Recommendation to friends	*If it was a real site, how likely are you to recommend it to your friends?*
Likelihood of continuing use	*How likely would you be to use VideoBook again as a regular user?*
Commitment – Sign up for newsletter	*How likely are you to sign up for VideoBook monthly newsletter that contains recommendations of recently uploaded videos?*
Wish to continue immediately	*How willing are you to continue viewing contents through this site for $1.00 extra?*

Table 2. Survey questions

3.1 Study 1 - The Effects of Website-Initiated Participation

3.1.1. Participants and Procedure

For this study, we evaluated users' likelihood of voluntarily using the *rate* feature (which the pre-test showed to be the most common action among users who voluntarily engaged with the VideoBook platform) following exposure to different numbers of calls to action requiring them to use this feature. Participants (n = 187, 50.5% female; average age = 35.5) were divided into three groups. The first group browsed the website freely with no interruption (hereafter referred to as the ***no prompts*** condition). The second group received a single prompt (a prompt to rate the video) after one minute of usage. They could continue watching the video but could not proceed to watch additional videos prior to completion of the task (***one prompt*** condition). The third group received four prompts (each was a prompt to rate the current video) during the first ten minutes of usage (***four prompts*** condition). As videos were between 120 and 150 seconds long, we chose to display the prompts at minutes 1, 4, 6 and 9 so they would be displayed in different videos and at different times during each video. See Figure 3 for an illustration of the different groups' timelines.

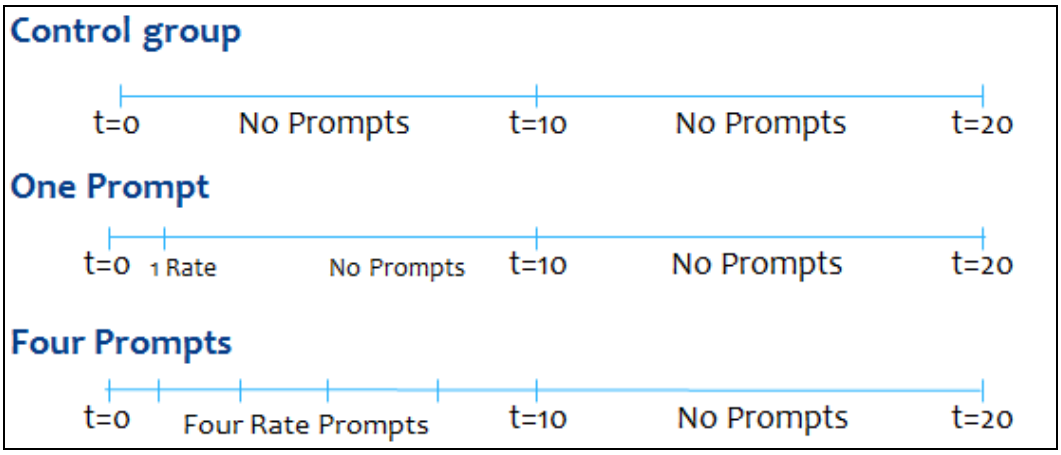

Figure 3. Study 1 scenarios

It is important to stress that, regardless of exposure to prompts, users in every condition were able to engage with all features on the website as they normally would on other video content websites. That is, they could voluntarily tag videos, write comments and use any other feature on each video. We excluded from our analysis participants who watched fewer than 6 videos and those who watched more than 30 videos, assuming that neither group engaged in a typical manner with the website (the former group spent at least half the time not watching videos, whereas the latter spent very little time on each video). Out of 187 participants, we removed 25 participants based on these criteria (13.3%).

3.1.2. Results

Voluntary engagement behavior. The number of voluntary actions are presented in the top row of Figure 4A. Given that the distributions were non-normal (as expected), we also calculated the non-parametric Mann Whitney U-test for every two scenarios in order study the differences in distributions.

Users in the one-prompt condition carried out 57% more voluntary *rate* actions (in the last ten minutes of usage) than did users in the no-prompts condition. Users in the no-prompts condition rated 2.3 videos, on average, whereas users in the one-prompt condition rated 3.62 videos on average ($p < .05$, distribution in Figure 4). Thus, exposure to one prompt significantly changed voluntary behavior compared to exposure to no prompts. Users in the four-prompts condition performed only a slightly greater number of *rate* actions compared with users in the *one-prompt* condition, rating 3.86 videos on average; the difference between the one-prompt and four-prompts conditions was not significant.

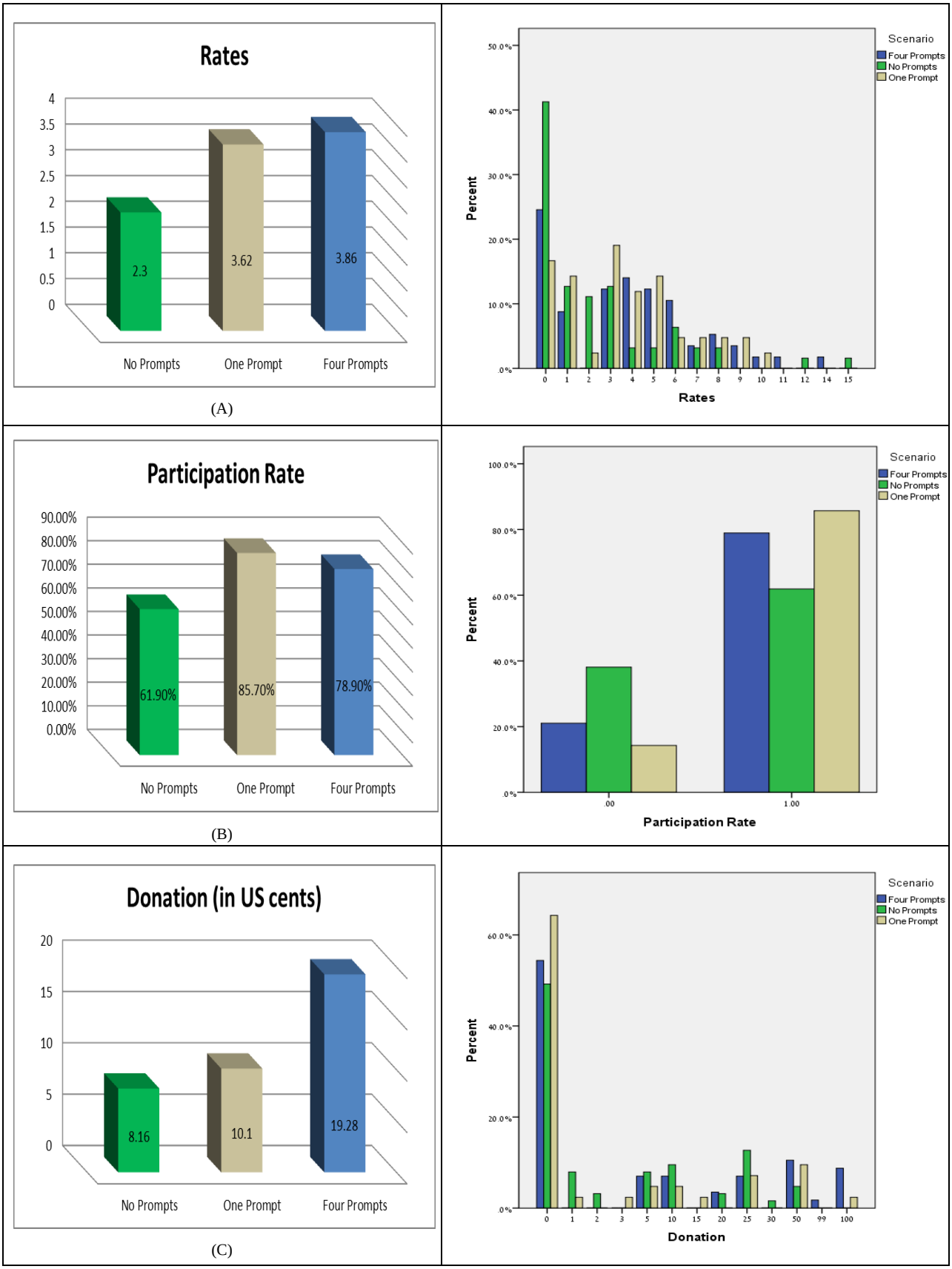

Figure 4. Effects of exposure to prompts on (A) voluntary engagement behavior, (B) participation rate and (C) donations

Participation rate. Exposure to at least one prompt also had a positive effect on participation rate (Figure 4B). In the no-prompts condition, 61.9% of users voluntarily engaged with the website during the last ten minutes, whereas in the one-prompt condition 85.7% of users did so ($p = 0.055$). Users in the four-prompts condition participated slightly less compared with users in the one-prompt condition, with a participation percentage of 78.9%. However the difference between the four prompts condition and one prompt or no-prompts was not found to be significant.

Donation. Users' willingness to donate to the website increased with the number of prompts to which they were exposed (Figure 4C). However, only the no-prompts and the four-prompts conditions were significantly different from each other. Users in the no-prompts condition agreed to donate 8.16 cents on average (of a possible 100), while users in the one-prompt condition donated 10.10 cents, and users in the four-prompts condition donated 19.28 cents, a 136% difference compared with the no-prompts condition ($p < .05$).

Website evaluation. Overall website evaluation (i.e., responses to each of the survey questions presented in Table 2) did not differ significantly across the conditions (Table 3).

Question Topic	**No Prompts**	**One Prompt**	**Four Prompts**
Likeability	5.57	5.79	5.58
Enjoyment	5.76	5.9	5.67
Interest	5.51	5.74	5.49
Quality	6.3	6.21	6.23
Recommendation to friends	5.21	5.6	5.18
Likelihood of continuing use	4.95	5.07	5.05
Commitment – Sign up for newsletter	3.52	3.98	3.68
Wish to continue immediately	5.22	5.52	5.88

Table 3. Average website evaluation scores (Likert scale)

Taken together, these results indicate that exposure to even one prompt positively influences users' likelihood of participating voluntarily, and exposure to four prompts positively influences the monetary amount that users are willing to donate. Just as important for managers, exposure to either one or four prompts did not significantly influence users' evaluations of the site or their reported attitudes toward the website.

3.2 Study 2 - The Effects of the Order of Actions

3.2.1. Participants and Procedure

Our second study focuses on the effects of an incremental (as opposed to non-incremental) process of participation on the above outcome variables. The users in this study (n = 124, 49.1% female; average age = 34.7) were divided into two groups. Each group was exposed to four different prompts during the first ten minutes of usage. In the first group (the ***ordered*** condition), the prompts were presented according to the order of users' likelihood to engage voluntarily in the various actions (as identified in the pre-test): *rate*, *like/dislike*, *comment*, *tag*. This condition is motivated by the ladder of participation theory, according to which the order of actions has a role in inducing consumers' willingness to pay. The second group was exposed to the same prompts, but in a non-ordered sequence (the ***non-ordered*** condition). In determining the latter sequence of prompts, we looked for a sequence that would be entirely different from the order identified in the pre-test, such that users would be unlikely to sense a pattern or an inherent order to the tasks. In order to achieve this we looked for a sequence such that no prompt would be in the same position as in the ordered condition (i.e., *rate* could not be placed first, *like/dislike* could not be placed second and so on), and such that "low effort" prompts (*rate* and *like/dislike*) would not appear consecutively, and "high effort" prompts (*comment* and *tag*) would also not appear consecutively. Given these constraints, we selected the following sequence: *comment*, *rate*, *tag*, *like/dislike*. Figure 5 provides an illustration of the timelines of the different conditions.

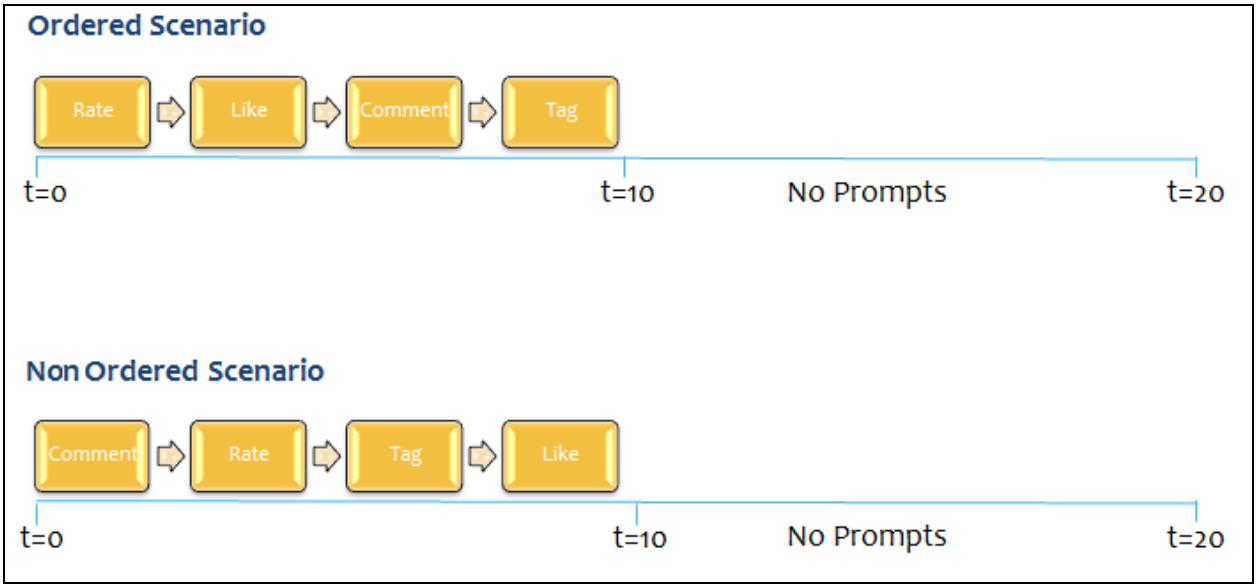

Figure 5. Study 2 Scenarios

As in study 1, users were asked to browse VideoBook for a total of 20 minutes. When exposed to prompts, they were required to perform the requested actions in order to continue browsing, but otherwise were able to engage with all features on the website as they normally would on other video content websites. We excluded 8 users who watched either fewer than 6 or more than 30 videos.

3.2.2. Results

Our results are presented in Figure 6. The values of all outcome variables (voluntary engagement behavior, participation percentage, willingness to donate, and overall website evaluation) were higher in the ordered condition than in the non-ordered condition. Similar to study 1, we used the Mann Whitney U-test to study the difference in distributions.

Voluntary engagement behavior. Users in the ordered condition performed 5.91 voluntary actions on average (counting all types of voluntary actions together), whereas users in the non-ordered condition performed 3.64 actions on average (p <.05, distribution in Figure 6A). Moreover, Figure 6A shows that the distribution of the voluntary actions in the ordered condition includes a longer tail compared with that of the non-ordered condition: all users who performed more than 20 voluntary actions belonged to the ordered condition.

Participation rate. The ordered condition was associated with a higher participation percentage compared with the non-ordered condition yet the difference is not significant (73.6% and 61.02% of users, respectively, engaged in voluntary actions during the last ten minutes; Figure 6B).

Donation. Donations to the website were almost two times higher among participants in the ordered condition than among participants in the non-ordered condition (Figure 6C), with average donations of 10.28 cents (out of a possible 100) and 5.25 cents (p < .05), respectively.

Website evaluation. Participants' ratings of most survey items in the website evaluation did not statistically differ between the two conditions (Table 4). Users' responses to three items did differ between the two conditions: Users in the ordered condition were more likely than users in the non-ordered condition to indicate a desire to return to the website (average ratings: 5.21 and 4.66, respectively; p < .07). They were also more likely to indicate willingness to sign up for the website's newsletter (average ratings: 4.32 for the ordered condition and 3.17 for the non-ordered condition, p < .05). Finally, users in the ordered condition reported that they found the videos more interesting (average ratings: 5.87 in the ordered condition and 5.41 in the non-ordered condition, p < .1).

Taken together, these results suggest that issuing calls to action according to a specific order—an order corresponding to the levels of users' likelihood of engaging in the actions voluntarily—increases participation behavior and willingness to donate, and does not negatively affect website evaluations—and

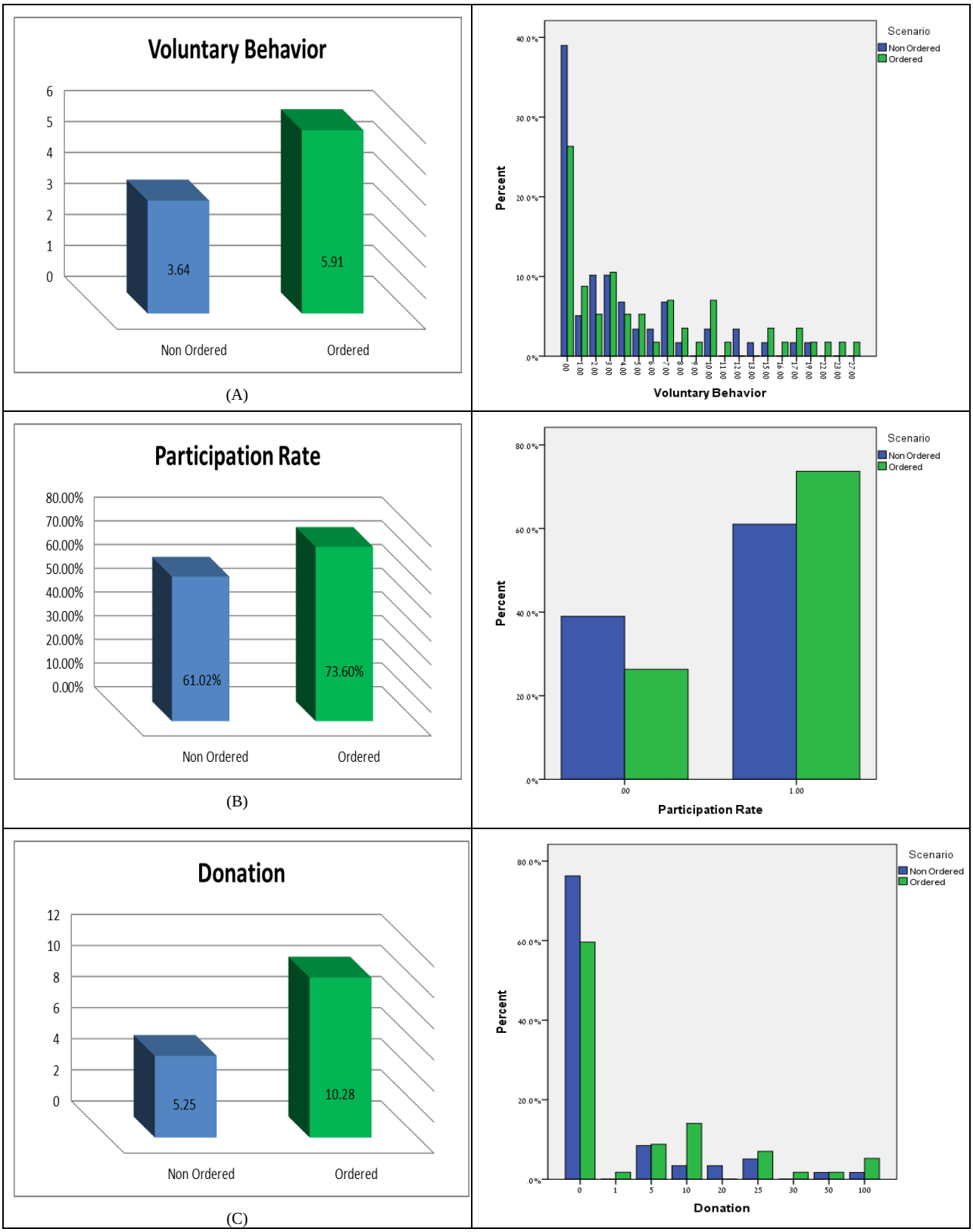

Figure 6. Effect of order of prompts on (A) voluntary engagement behavior, (B) participation rate, and (C) willingness to donate.

Question Topic	Ordered	Non-Ordered
Likeability	5.45	5.39
Enjoyment	5.84	5.68
Interest	5.81	5.47*
Quality	6.05	6.37
Recommendation to friends	5.33	5.05
Likelihood of continuing use	5.21	4.66*
Commitment – Sign up for newsletter	4.32	3.17**
Wish to continue immediately	5.51	5.24

Table 4. Average website evaluation scores (Likert scale) (*$p < .1$, **$p < .05$)

even enhances them along certain dimensions, including willingness to return to the website. These results are particularly notable given that the actions that users were required to engage in were identical between the conditions; only the order was different.

See Table 5 for a summary of the results of studies 1 and 2.

	Study 1: Number of Prompts	Study 2 – Order of Prompts
Voluntary Engagement Behavior	Exposure to even one prompt to rate a video significantly raises the number of subsequent voluntary *rate* actions, as compared with no exposure to prompts.	Exposure to a sequence of prompts ordered according to users' likelihood of voluntarily engaging in the corresponding actions significantly increases subsequent voluntary engagement (as compared with exposure to a 'non-ordered' sequence of prompts).
Participation Rate	Exposure to one prompt induces a slight increase in participation rate over no prompts (participation after exposure to four prompts is not significantly different from no prompts or one prompt).	Exposure to an ordered sequence of prompts as described above does not significantly increase participation rate (as compared with exposure to a non-ordered sequence).
Donation	Exposure to four prompts to rate the current video significantly increases the donation amount, as compared with no exposure to prompts. Exposure to just one prompt does not result in a significant change.	Exposure to an ordered sequence of prompts as described above increases the donation amount (as compared with exposure to a non-ordered sequence).
Website Evaluation	No significant differences across scenarios.	Significant differences regarding interest level as well as likelihood to continue use and to sign up for a newsletter.

Table 5. Summary of results for study 1 and study 2

3.3. Heterogeneity Analysis

We conducted heterogeneity analysis to address our third research question, i.e., to examine whether a user's susceptibility to the effects of exposure to calls to action is influenced by the number of videos that he or she views in the allotted timeframe. In all scenarios tested, the users controlled the number of videos they watched in the 20-minute timeframe. As in real life, users chose for how long they would continue to watch each clip: They could choose to watch a given clip in full and end up watching fewer videos in the time given, or watch it only in part and manage to see more videos overall. Since the videos were non-narrative (nature videos), it is no surprise that many users did not watched the clips they chose from beginning to end. As can be seen in Figure 7, within the 20-minute timeframe, the average user watched 13.3 videos in study 1 (SD = 4.78) and 13.89 videos on average in study 2 (SD = 4.51).

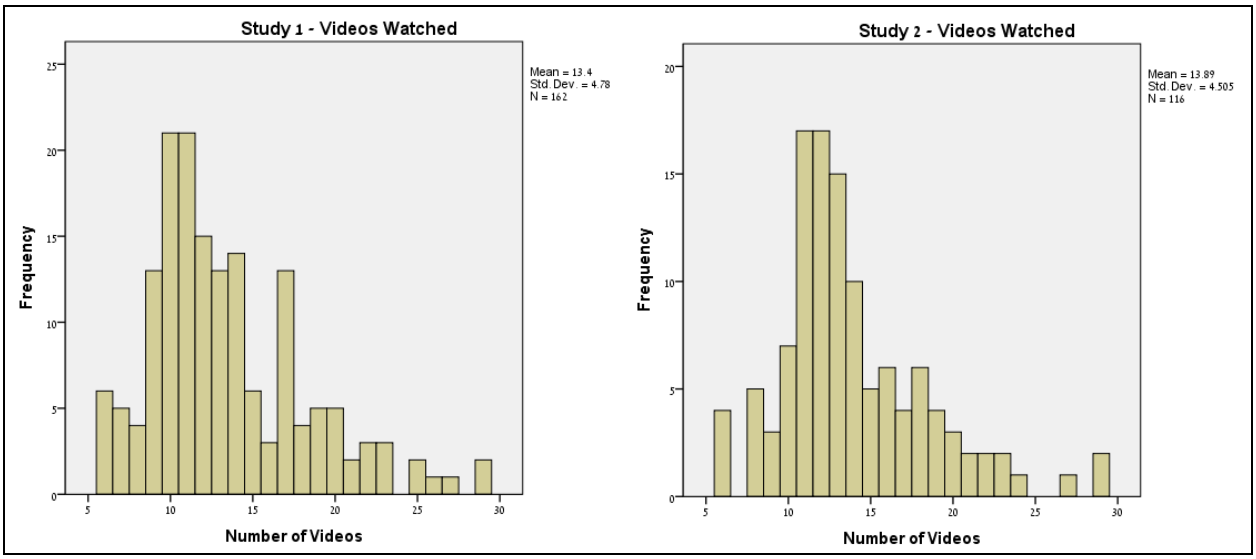

Figure 7. Distributions of the number of videos users watched in study 1 and study 2

Understanding the connection between users' consumption behavior and their responses to website-initiated prompts can help websites to improve their performance by configuring prompts to fit certain content consumption behavior. We present a nonparametric test (similar to the method described by Bapna and Umyarov 2014) that showcases cohort differences in effect. In order to identify heterogeneity in the sample of a given study, we start with the study's full sample and carry out four iterations of the analyses described above. In each iteration we cut the bottom 25% in terms of users who watched the

fewest videos in each of the scenarios (computed separately), meaning we compare between the **top** 75%, 50% and 25% of users who watched the largest quantity of videos in the 20 minutes allotted to the experiment in each scenario. For example, the top 25% of the one prompt scenario are compared to the top 25% of the four prompts and the no-prompts scenario. The top 50% of the one- prompt scenario are compared to the top 50% of the four prompts and the no-prompts scenario and so on. We chose to use only these three cut points in the analysis because of the granularity of the data.

3.3.1. Heterogeneity Results for Study 1

Voluntary engagement behavior. As shown in Figure 8A, among users who were exposed to prompts, those who watched more videos were more likely than users who watched fewer videos to use the *rate* feature voluntarily following exposure ($p < .1$ for the one-prompt condition; $p < .05$ for the four-prompts condition). Note that this heterogeneity is not observed among users in the no-prompts condition, and hence is not due to the mere fact that users who watch more vides have more opportunities to rate (that is, more videos to rate).

Participation rate. As shown in Figure 8B, among users who were exposed to prompts, the participation rate was higher among users who watched more videos than among users who watched fewer videos ($p < .05$ for both the one-prompt and four-prompts conditions). As in the case of our analysis of voluntary behavior, we observe no significant heterogeneity among users who were not exposed to prompts; thus, the heterogeneity is not necessarily attributable to the fact that users who watch more videos simply have more opportunities to participate.

Donation. As shown in Figure 8C, among users exposed to a single prompt to rate a video, those who watched more videos donated greater amounts ($p < .05$). No such heterogeneity was observed among users in the no-prompts condition. Moreover, no significant heterogeneity was observed among users exposed to four prompts, due to an insignificant difference between the top 75% of users and the full sample. However, we do observe a spike (donating 36.67 cents on average) when looking only at the top 25% four-prompts group when compared to the top 50%, 75% or 100% of the same scenario.

Website evaluation. Before performing the heterogeneity analysis, we calculated Cronbach's alpha on all questions and received a result of 0.873. This enabled us to average all survey items into a single item we refer to as the "website evaluation" grade. No significant heterogeneity was observed among users in either the no-prompts condition or the one-prompt condition. However, among users in the four-prompts scenario, those who watched more videos reported lower evaluations of the website ($p <.05$).

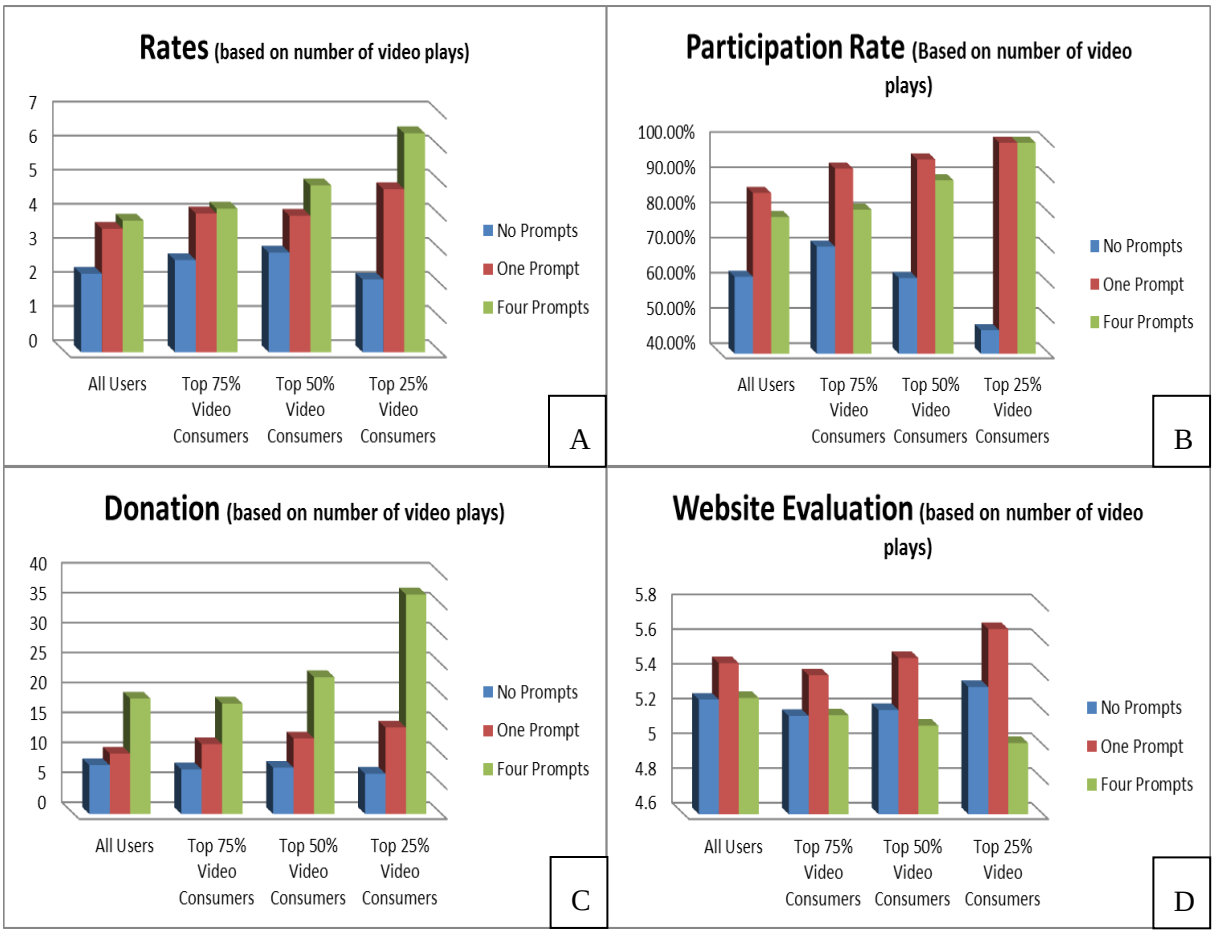

Figure 8. Values of outcome variables in study 1 when binned by video consumption

3.3.2. Heterogeneity Results for Study 2

Voluntary engagement behavior. As shown in Figure 9A, among users in the ordered condition, we observe a positive connection between the number of videos viewed and the use of social participation features (p = 0.06). No such heterogeneity is observed among users in the non-ordered condition (p = 0.89).

Participation rate, donation, and website evaluation. As shown in Figure 9B, 9C and 9D, we do not observe significant heterogeneity in either scenario for any of outcome variable aside from voluntary engagement behavior. However, the main effects are clearly demonstrated across all bins.

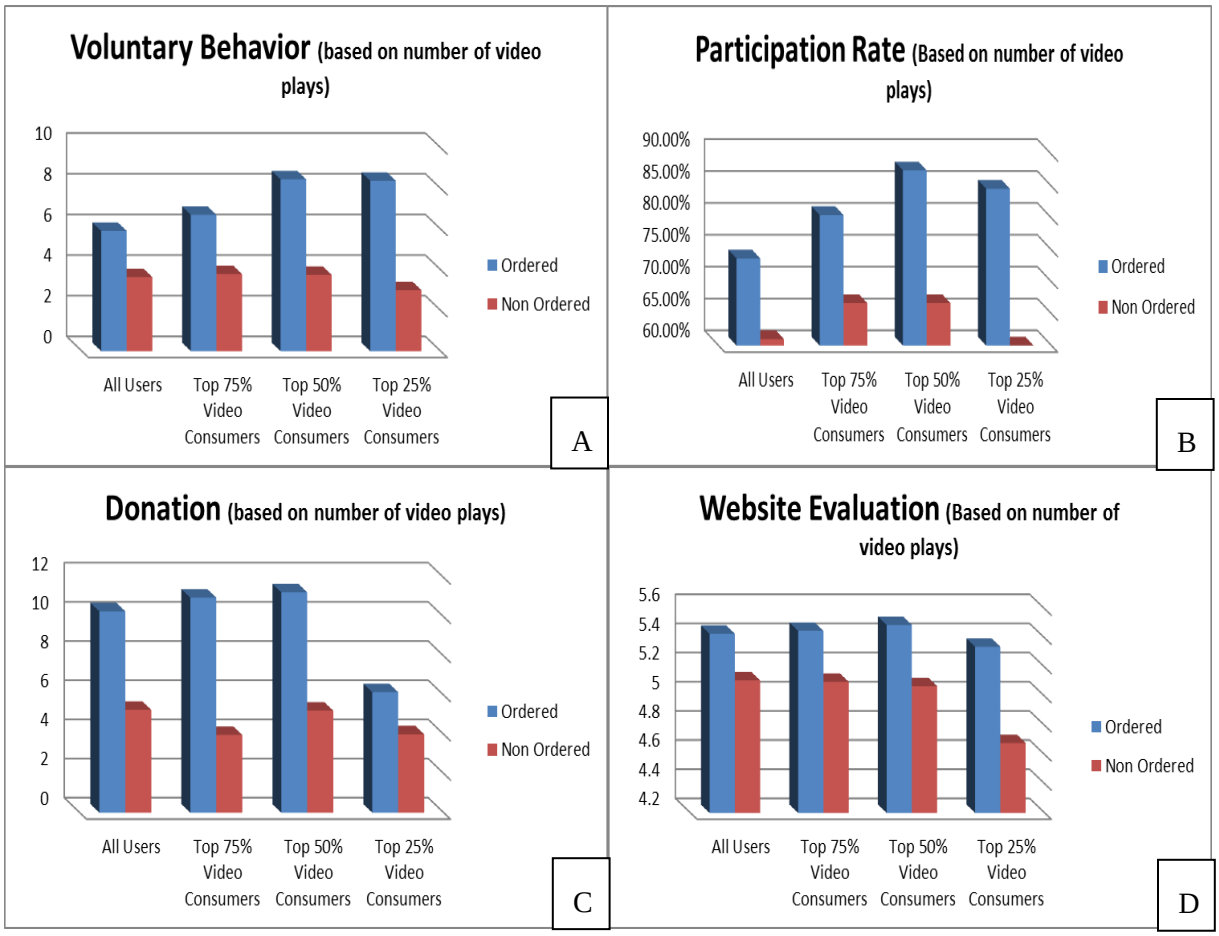

Figure 9. Values of outcome variables in study 2 when binned by video consumption

Heterogeneity analysis based on voluntary engagement behavior. In contrast to study 1, which manipulated the number of website-initiated actions that users engaged in, study 2 exposed all users to the exact same prompts in different order. As such, it allows us to bin participants according to the number of voluntary actions they carried out (in the last ten minutes of the experiment) without risking endogeneity. Thus, we investigated whether participants' donation behavior varied in accordance with their levels of voluntary engagement. We find that among users in the ordered condition, those who showed more voluntary engagement behavior also donated more to the website ($p < .05$). This heterogeneity was not observed among participants in the non-ordered condition (Figure 10A). Moreover, in both scenarios, users who participated more evaluated the website more favorably (Figure 10B).

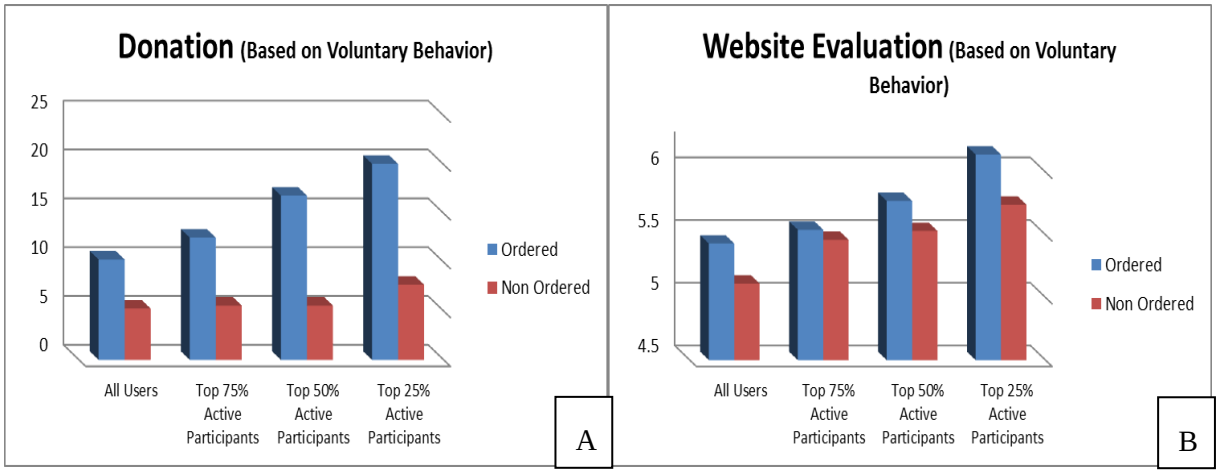

Figure 10. (A) Donation and (B) website evaluation results in study 2 when binned by voluntary engagement behavior

Discussion

This research studies the effect of website-initiated participation on users' subsequent on-site behavior, especially their voluntary engagement with social features and their monetary contributions to the website. We show that even when users engage with the social features in a website in a manner that is neither voluntary nor communal, their subsequent voluntary behavior is affected. Study 1 shows that, compared with users who are not exposed to website calls to action, users who are exposed to a single prompt to rate a video are significantly more likely to subsequently rate videos voluntarily. Exposure to three additional prompts during the course of the first ten minutes does not further increase this likelihood to a significant degree. It is possible that exposure to numerous prompts might tire the voluntary spirit; however, results show that users did not report a decrease in their enjoyment of the website experience. Exposing users to a single prompt (as opposed to none) not only increased the average number of rate actions but also increased the percentage of users who chose to participate voluntarily in general. Regarding willingness to donate, it seems that more than one prompt is needed in order to affect the donation behavior of a user: Donations following exposure to four prompts were almost two times higher than those obtained in the no-prompts and in the one-prompt conditions. This evidence supports a notion of gradual commitment similar to that described in Oestreicher-Singer and Zalmanson (2013). Specifically, commitment in the form of payment is created following multiple experiences with the website's social features.

In study 2, we show that the order of prompts matters. Compared with users in the non-ordered condition, users in the ordered condition produced higher values for each of the four outcome variables:

voluntary engagement behavior, participation rate, donation, and overall website evaluation. This result echoes the notion described in the online community lifecycle literature (Li and Bernoff 2008, Preece and Schneiderman 2009), according to which users experiment with websites in incremental order of task difficulty. Likewise, it reinforces the theory of the ladder of participation, according to which a user's incrementally-increasing engagement with a website is associated with a change in his or her willingness to contribute to the website. This research is novel in showing that a user can ascend to a higher position on the ladder—i.e., a higher level of engagement—given the encouragement of the website even in relatively short time and in the absence of feedback from a community. Instead, engagement can be elicited through a consistent and immediate call for action from the website itself. This hints at a larger role that website managers can play in affecting the user experience in a community-oriented website.

Our heterogeneity analysis raises several interesting insights. The first is that, among users exposed to website-initiated calls to action, those who watched more videos also exhibited more voluntary engagement behavior. This was not the case among users who were not exposed to such prompts, suggesting that people who watched more videos was more susceptible to the effects of prompts. The second is that, while users exposed to four prompts donated more compared with users exposed to one prompt, donation behavior was dependent on the number of videos viewed in the latter group only. Specifically, among users exposed to one prompt, those who watched more videos donated more to the website. This suggests that websites attempting to elicit participation through calls to action should not necessarily view users who zap quickly between videos as lacking interest; rather, these users are experiencing active engagement. The third insight is that among users exposed to prompts that are issued in increasing order of effort, there is a positive connection between users' voluntary engagement behavior and the amounts that they donate.

The randomized experimental setting and the unique design of the website enabled us to control for different alternative explanations. First, the randomized experiments controlled for the potential endogeneity of using observational data. That is, in our experiment, differences in user participation could be attributed to the conditions to which users had been randomly assigned, rather than to unique characteristics of the users themselves. While it is possible that study participants might have been motivated by a desire to "please" the experimenters, and therefore might have been more inclined than typical internet users to volunteer and to donate, the significant differences across randomly assigned groups are evidence of the effects of the various manipulations. Second, the various conditions included in the study design contribute to our ability to identify the drivers of the phenomena and to choose between competing theories. In study 2, for instance, users in the two conditions performed the same four tasks yet produced different outcomes. Thus, effort justification and idleness aversion cannot fully explain our results. The results of study 2 demonstrate the importance of the gradual increase in the difficulty of

the tasks, supporting the notion of a ladder of participation. From a managerial perspective, the results obtained for the one-prompt condition in study 1 are of great importance, suggesting that websites can substantially influence users by issuing a single request.

While the randomized experiment enabled us to provide new results that could not be obtained using observational data, one shortcoming of this design is with regard to the website evaluation results. Many website owners fear that an interruption in the form of a call to action might decrease user satisfaction or affect churn rate. This is not evident in the results shown here; on the contrary, the highest overall evaluation was given to a condition containing a high number of different calls to action. However, we must take into account that this is an online lab experiment and that users were paid to browse the website. They were not searching for a specific video, nor were they in any hurry. This scenario is very close to the process of exploration or ill-defined search, which characterizes a large percentage of users' online behavior on content websites (Goldenberg et al. 2012). However, our findings do not rule out the possibility that numerous users browsing through content websites might have limited time and attention spans as well as specific goals in mind. In such cases, users may react differently to these calls to action, and this remains an interesting direction for future research.

Finally, this study used an online video website. An interesting avenue for future work would be to extend our findings to willingness to pay on news or music websites. In addition, we used videos that were of high quality. Future work should study the role of quality in the observed effects.

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