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# The Differential Effects of Virtual Reality (VR) on the Novice and Experienced VR Users<sup>☆</sup>

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## Abstract

Although research on Virtual Reality (VR) has uncovered numerous technical advantages of VR over traditional media, little is known about how individual VR users with varying prior experience respond to VR differently. This paper examines the effect of users' prior VR experience on their subsequent real-life behavior in the domain of charitable consumption. Specifically, we find that compared to experienced VR users, novice VR users are more likely to support a charitable cause in real life (e.g., ocean conservation) after experiencing this cause in VR. The increased support among novice VR users occurs because they perceive the use of VR to be more novel. We find a boundary of this effect such that when VR is used to promote a noncharitable cause, novice VR users no longer increase their real-life support after VR. This research offers new possibilities for future studies on the use of VR in societal marketing.

**Keywords:** Virtual Reality (VR), Consumer technology, Novelty, Charitable consumption

## 1. Introduction

The task of securing committed and invested donors for charity organizations has become increasingly difficult. As COVID-19 posed financial challenges to many consumers, nonprofit and charity organizations from all over the globe saw a decline in charitable donations in recent years (CAF 2021). In the United States, people only support 4.5 charities on average even though there are 1.5 million registered nonprofits (Qgiv 2020). In South Korea, close to 60% of people reported that they are hesitant to make donations due to low trust in charity organizations (Kim 2019). In response, charity organizations are turning to VR and investing in this technology to distinguish themselves from other organizations that are also trying to win donors' hearts.

Many are producing their own VR content (e.g., United Nations VR) or collaborating with VR production companies, hoping that their efforts will be reciprocated with prospective donors' engagement and participation in their charitable cause. For example, International Rescue Committee (IRC) partnered with a VR production company YouVisit to create

their own VR film "Four Walls" that depicts the harsh realities of Syrian refugees in Lebanon. The viewers get to step into the tented settlements where the refugee families live and go to school with the refugee children. IRC also set up a VR booth at their fundraiser event so that the attendees can get a more direct and vivid understanding of the refugee crisis (Sydell 2017). Despite the growing use of VR, there is scant research on the effects of VR on consumers' subsequent behaviors in physical reality (cf. Wedel, Bigné, and Zhang 2020; Jun 2021). This paper aims to fill this gap by focusing on charitable consumption, and examining how consumers' prior VR experience affects the way they perceive their VR experience and their subsequent real-life behavior.

One possible reason that a nonprofit organization expects VR to increase donor engagement is that its use of VR can lead people to see the organization as different from others. Given that a key benefit of using VR in societal marketing (El-Ansary 1974) is its newness and a firm's "act of choosing" VR as a communication tool "is a statement in and of itself" (Stambol 2018), the firm would expect the consumers to appreciate how novel it is that the firm is using

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VR technology. This perception of novelty can then contribute to consumers' decision to support the firm through their real-life actions. To examine the effect of perceived novelty on the VR users' subsequent real-life behavior, we test if the novice VR users (i.e., people who use VR for the first time) perceive it to be more (vs. less) novel for the same organization to use VR in its charitable campaign than consumers who have prior experience with VR. The novice VR users would then respond more positively after VR, by increasing their likelihood to act on this charitable cause in real life. To test the boundary of this effect, we present the same VR content that is either framed as a charitable VR or entertainment VR and examine whether novice VR users (vs. experienced VR users) respond more positively and donate more after VR. The novice VR users' differential response to charitable VR and entertainment VR suggests that their real-life support is expected only when a firm uses this novel technology to promote a cause that is (vs. is not) related to their charitable behavior.

## 2. Theoretical background

### 2.1. Virtual Reality (VR) in societal marketing

Defining VR as "a real or simulated environment in which a perceiver experiences telepresence," Steuer (1992) highlighted the experience of individual users that makes VR technology unique. Consumers use head-mounted displays (HMD), or VR headsets, to immerse into an interactive VR environment. A VR HMD replaces users' perceptual (e.g., visual, auditory cues) inputs from the physical world with those from a virtual world, entirely displacing users from their real-life presence. VR is unlike other types of media such as television in that, instead of passively receiving information, users get to experience the environment as both the creator and receiver of information. As a result, VR allows people to experience a world beyond their reality, inducing the sensation of "being there" (Lombard and Ditton 1997; Ahn, Bailenson, and Park 2014).

One prominent use case of VR is the VR-based societal marketing by nonprofit organizations and charities. Donors expect charities to communicate close-to-reality messages that accurately represent their social causes (Bendapudi, Singh, and Bendapudi 1996; Lee 2017). However powerful they may be, the conventional ways of persuasion such as the use of images or videos can no longer motivate potential donors to take actions. Charity organizations that rely only on these traditional media cannot differentiate themselves from others.

Previous research on the use of VR for societal marketing has shown that VR is effective at promoting charitable behavior. Many researchers have demonstrated the benefit of using VR compared to traditional 2D media, such as images or videos (Gillath et al. 2008; Rosenberg, Baughman, and Bailenson 2013). Kandaurova and Lee (2019) showed that participants who watched the same video about the importance of clean water through a VR headset (vs. laptop screen) donated more money and time to support this social cause. Similarly, Kristofferson, Daniels, and Morales (2022) showed that participants who viewed a video on endangered species in VR (vs. on a television screen) donated more money for an organization that supports this cause. Even though prior research has demonstrated that VR is different from traditional 2D media, what remains unclear is whether the *same* VR experience may be perceived differently and result in different real-life support behavior as a function of individual VR users' prior experience.

### 2.2. Prior experience with Virtual Reality and perceived novelty

In this paper, we investigate how the perceived novelty of VR affects VR users' subsequent behavior in real life by comparing novice VR users (i.e., first-time VR users) and experienced VR users. We posit that novice VR users perceive it to be more novel that an organization is using VR to promote its charitable cause. This perceived novelty should encourage them to respond more positively by supporting the cause in real life.

Existing research suggests that compared to more experienced VR users, novice VR users should perceive VR to be more novel because they are unfamiliar with this medium, its use cases, and the nature of the VR experience in general (Sagnier, Loup-Escande, and Valléry 2019). Research on media novelty has revealed that as people continue to use a certain media channel, their familiarity and perception of novelty decrease (Kent and Allen 1994). Although no research has directly tested the effect of prior VR experience on perceived novelty of VR, prior work on a related technology, Augmented Reality (AR) has found that users with greater AR experience perceive AR to be less novel (Yim, Chu, and Sauer 2017). Importantly, the negative effect of previous media experience on novelty was only observed for AR but not for a web platform, because there was a floor effect in generating the perception of novelty for such an established media channel. VR is not yet as widely used as traditional marketing channels such as websites or TV. Therefore, we anticipate a similar impact of prior experience such that the novice VR users will perceive

VR to be highly novel, compared to experienced VR users.

Further, we expect that the high perceived novelty among novice VR users should lead them to respond more positively to charitable VR by supporting the cause in real life. Prior research on advertising media suggests that when firms use a new, unfamiliar media technology, consumers' perception of its newness drives their positive reaction (Lang 2000). Theories of habituation (Tellis 1997) also suggest that a new stimulus is more impactful when it is novel, and the impact wears out as users become more experienced with it. The effect of a new media technology like VR is, thus, expected to dwindle as a result of increased consumer experience with it. The novelty of VR and the impact of the VR experience on subsequent real-life behavior are expected to be lower among experienced VR users.

Furthermore, prior literature on consumer reciprocity (Morales 2005) suggests that consumers reciprocate with firms' positive behavior with their own behavior, such as increasing willingness to pay and overall evaluation. Consumers recognize and appreciate when a firm uses a new technological innovation (Rogers 1976; John, Weiss, and Dutta 1999). Therefore, people's perception that a charitable organization is using a novel and unique technology in their charitable efforts could elicit consumers to respond positively in return, by supporting this cause in real life. Kristofferson, Daniels, and Morales (2022) speculated that the novelty of VR could contribute to VR's effect on people's charitable actions, but this idea was not tested. Here, we directly test the role of novelty by keeping constant the VR experience (i.e., everyone watched the same VR content using the same VR HMD) and testing the effect of prior VR experience on perceived novelty and the subsequent real-life charitable behavior.

We propose that novice (vs. experienced) VR users are more likely to respond positively to a VR content with a charitable appeal by increasing their real-life support afterwards. The studies in this paper provide direct evidence for the advantage of using VR on novice VR users to promote the firm's charitable cause. We hypothesize as follows:

**H1.** *Compared to experienced VR users, novice VR users who undergo a VR experience about a charitable cause increase their subsequent support for this cause in real life.*

Further, we hypothesize that the benefit of charitable VR among novice users occurs because these consumers perceive the organization's use of VR to be more novel (see Fig. 1). More formally,

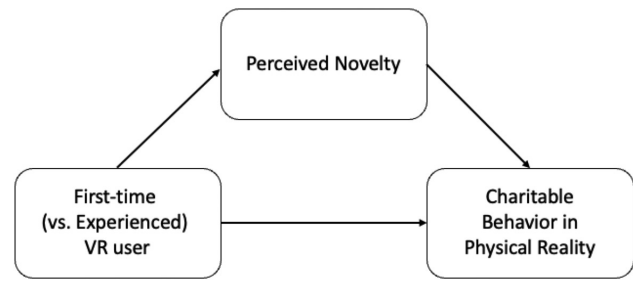


Fig. 1. Conceptual model. The effect of prior VR experience on charitable behavior is mediated by the perceived novelty of VR usage.

**H2.** *Novice (vs. experienced) VR users increase their support for a cause in real life because they perceive the use of VR to be more novel.*

### 2.3. Importance of a clear charitable appeal in VR

We also predict that not every VR should encourage a positive response from novice VR users because they must clearly understand how this novel technology is used. For novice VR users, it is essential to clarify that the VR content is designed to encourage charitable behavior. This clarification is necessary to help novice users understand the link between their VR experience and their subsequent behavior. Without this link, these users may not realize how to use VR to guide their behavior in real life. Prior research suggests that the novice VR users need more direct guidance than experienced users on how and why VR is used because it is difficult for them to simply “get into” VR and engage with it otherwise (Lombard and Ditton 1997). Without a clear guidance on how the VR experience relates to their subsequent real-life behavior, novice VR users are unable to make out the purpose of VR for themselves, such as deciding whether the VR task is to be used for a hedonic purpose of having an interesting experience or for a pragmatic purpose of learning something from VR (Sagnier, Loup-Escande, and Valléry 2019). For example, upon finishing an assembly task in a VR aircraft-manufacturing workshop, VR users with no prior VR experience found it more challenging to see the pragmatic appeal of the virtual task (i.e., how one can use VR as a tool to assist real-life activities). This suggests that firms need to clarify the appeal of their VR experience to novice VR users because without a clear guideline, these consumers are less likely to associate their VR experience with subsequent behaviors in real life.

In societal marketing, a charity organizations' use of VR is intended to communicate a social or environmental cause more effectively. The appeal of the VR content, therefore, is charitable and the users are

Table 1. Overview of results.

		Novice VR users	Experienced VR users
Study 1	Willingness to pay for ocean conservation activity	100.49	90.01
	Perceived novelty of VR	3.87	3.37
Study 2	Donation amount to marine life initiative after charitable VR	21.28	15.93
	Donation amount to marine life initiative after entertaining VR	16.85	18.13

Note: The table reports summary of results of all studies in this paper.

expected to respond to this charitable appeal. When the charitable appeal in VR is direct, we anticipate an increase in charitable behavior among the novice VR users. However, when the charitable appeal is indirect and unclear because the VR is used for a cause that is unrelated to consumers' charitable behavior (e.g., for entertainment), the positive effect of VR among novice VR users would disappear.

We predict that the entertainment (vs. charitable) appeal of the VR experience should mitigate the novice VR users' increased donation in real life. The novice VR users should respond positively by supporting the charitable cause in real life when the same VR experience is framed as a campaign for charity, but not when it is framed as an entertainment experience. Formally,

**H3.** *Novice (vs. experienced) VR users' increased support behavior occurs when a firm's use of VR is associated to a charitable appeal, but not when the use of VR is associated to an unrelated appeal.*

### 3. Research methodology

#### 3.1. Overview of studies

All participants in our studies watched a VR video using a VR head-mounted display (HMD). In the video, the viewer engages in various sea exploration activities to investigate the undersea flora and fauna as well as some watersports experiences. We used this VR video because the experiences in VR had both charitable appeal (i.e., preserving ocean life) and entertainment appeal (i.e., enjoying watersports). Therefore, the VR content could be credibly framed as either one of these two appeals. In study 1, the participants are told that this VR content is produced for an organization's charitable "Save the Sea" campaign. In study 2, participants are either told that this VR content is created for a charitable "Save the Sea" campaign, or entertaining "Enjoy the Sea" campaign. Using the VR HMD, the participants could get a 360-degree view of the scenes simply by turning their heads, and they could walk through their physical environment in order to navigate in VR. Given that not every participant was familiar with this

technology, an experimenter gave verbal instructions on how to use the VR HMD and assisted all participants throughout the study. After the VR experience, the participants completed a follow-up survey. At the end of the survey, the participants reported their prior experience with VR by indicating whether this was their first time using a VR device or they had prior experience with VR before. We compare the willingness to support a charitable cause in real life between first-time VR users (i.e., novice VR users) and VR users with some prior experience (i.e., experienced VR users). See Table 1 for an overview of our results. Across our studies, we rule out several alternative explanations for our finding, including the differences in quality perception and enjoyment of the VR content, and nausea.

#### 3.2. Study 1

The goals of study 1 are twofold: First, it aims to test whether the novice VR users (vs. experienced VR users) are more likely to take charitable actions in real life after a VR experience about a charitable cause—ocean preservation. Second, study 1 tests the underlying mechanism by which VR induces greater charitable behavior from novice VR users. We predict that compared to experienced VR users, novice VR users are more likely to appreciate how novel and unusual it is for the organization to use VR in their charitable campaign, and this perceived novelty of VR increases their real-life support for this cause. All participants used the VR HMD to experience the same VR video that was purportedly created as part of an organization's "Save the Sea" campaign. Afterwards, we asked the participants to report their willingness to pay for a real-life ocean conservation activity.

##### 3.2.1. Method

To examine the effect of prior VR experience, participants who either had or did not have prior VR experience before the experiment participated in the study. In exchange for a small reward, one hundred thirty undergraduates ( $M_{age} = 22.0$ , 59.2% female) from a large North American university completed the study and were assigned to one of two conditions (VR experience: novice VR users vs. experienced VR



users) based on their self-report. All participants were recruited for a “VR video campaign” study where they would be watching a VR video using a VR device. Upon entering the behavioral lab, the participants were informed that the study involves watching a campaign VR video using a VR headset and an online survey. First, the participants were told that they would watch a VR environmental campaign video that was produced by an organization as part of the “Save the Sea” campaign. To increase the participant’s focus on the charitable appeal of the video, we further instructed them to think and write about why the organization made the VR video. Then, the participants used the VR HMD to experience the content for approximately 4 minutes. The participants were encouraged to look in every direction by turning their heads and walk around their physical environment for full immersion in VR.

After the VR experience, participants were instructed to complete a follow-up survey on a computer. The participants reported how much they liked and enjoyed the VR experience on a 7-point Likert scale (1 = *Not at all*; 7 = *Very much*). We averaged the two items ( $\alpha = .928$ ) and used the resulting measure as a measure of VR enjoyment. Using the same scale, the participants also reported how well-made they thought the video was. Then, they reported how novel and unusual (i.e., unlike other campaigns they know) they thought it was to use VR technology for this environmental campaign. The two items ( $\alpha = .842$ ) were averaged to form a measure of our mediator, perceived novelty, in our analyses.

Next, the participants were asked to evaluate a 2-hour ocean conservation activity. They were told that this activity involves a marine life investigation and consumers would get to interact with underwater fauna and flora, so they could learn the beauty of the ocean and why we need to preserve it. We also told the participants that no prior knowledge is necessary, and the activity is for beginner to intermediate-level swimmers, to control for participants’ knowledge about ocean conservation and swimming skill. The participants reported their willingness to pay (WTP) for this activity package on a slider that ranged from \$0 to \$150. Participant’s WTP was used as our focal measure of interest.

Lastly, we measured our independent variable by asking participants whether or not they have used VR equipment before, in a binary choice (“*Yes, I have used it before*”; “*No, it is my first time using it*”). Participants also reported how much they experienced nausea during the VR video and basic demographic information, such as gender and age. Our focal measure of interest was the average WTP for the real-life ocean conservation activity between novice VR users

(who had no prior VR experience before the study) and experienced VR users.

### 3.2.2. Results

Of all our participants, 71 participants (55.6% of participants) were novice VR users, and 59 participants (45.4%) were experienced VR users. There was no difference in age ( $M_{first-time} = 22.30$  vs.  $M_{experienced} = 21.64$ ,  $t(128) = .75$ , *NS*) or gender distribution ( $t(128) = -1.74$ , *NS*) between the two groups.

Consistent with our prediction, the novice VR users were willing to pay more for the ocean conservation activity compared to experienced VR users ( $M_{first-time} = 100.49$  vs.  $M_{experienced} = 90.01$ ,  $t(128) = 2.09$ ,  $p < .05$ ). Moreover, they thought it was more novel to use VR for the environmental campaign ( $M_{first-time} = 3.87$  vs.  $M_{experienced} = 3.37$ ,  $t(128) = 2.32$ ,  $p < .05$ ). We then examined the mediating effect of perceived novelty of VR usage for a charitable cause. A bootstrap analysis using 5,000 resamples with replacements (Hayes and Scharkow 2013, Model 4) indicated that perceived novelty of VR significantly mediated the relationship between novice VR use and greater WTP for a real-life ocean activity supporting the charitable cause ( $b = 1.58$ ,  $SE = .89$ , 95% CI: [.18, 2.67]).

There was no difference between novice VR users and experienced VR users in their enjoyment of the VR experience ( $M_{first-time} = 4.51$  vs.  $M_{experienced} = 4.36$ ,  $t(128) = .39$ , *NS*), or their evaluation of VR video quality ( $M_{first-time} = 5.77$  vs.  $M_{experienced} = 5.69$ ,  $t(128) = .47$ , *NS*). Therefore, we rule out the possibilities that novice VR users increase their WTP for the charitable activity in real life because they enjoyed the VR content more, or they thought the VR content was higher in quality. All of our participants reported low nausea ( $M = 2.02$  out of 7). There was no difference between novice VR users and experienced VR users in their nausea level ( $M_{first-time} = 1.82$  vs.  $M_{experienced} = 2.22$ ,  $t(128) = -1.36$ , *NS*).

### 3.2.3. Discussion

Study 1 showed that the novice VR users (vs. experienced VR users) perceive the use of VR in an organization’s charitable campaign (i.e., ocean preservation) to be more novel and different from other campaigns, and as a result, they increase their willingness to pay for an activity in support of that cause. The results from study 1 suggest that the novice VR users are more likely to infer from VR that an organization is trying something novel to promote the charitable cause. This inference about the firm’s novel attempt, in turn, increases novice VR users’ support. This suggests that the positive effect of charitable VR

on inducing consumers' real-life charitable behavior is driven by the perceived novelty of VR.

Still, it remains unclear whether any VR experience will encourage novice VR users' actions in real life, or there has to be a clear association between the use of VR and its charitable appeal. Is the novelty of VR technology enough, or should this novel technology be used for the "right" purpose for the novice users to increase their real-life interest? If the observed effect occurs because the novice VR users are excited about any VR simply because it is new to them, then any VR video about the sea—even VR with an entertainment appeal—should suffice to make them engage in a real-life sea activity. That is, those who did a VR sea activity for the first time should always have a higher willingness to donate for ocean preservation than experienced VR users, regardless of whether this VR had a charitable appeal to encourage ocean preservation or not. However, if the novice VR users are willing to take subsequent actions because they appreciate a firm's VR usage for a specific charitable cause, then the benefit of VR among the novice VR users should only occur when the purpose of VR is clearly associated (vs. not associated) with a charitable appeal. When the VR video is unrelated to a charitable appeal, then the novice VR users would not increase their donation in real life.

### 3.3. Study 2

Study 2 tests the boundary condition of the observed effect by examining a case where novice VR users try a VR that does not have a charitable appeal. We tested our prediction by providing participants with the same ocean VR experience from study 1 while instructing them that either this VR was created for a charitable purpose or for entertainment purpose by a firm. In order to inspire these consumers to take real-life actions supporting a charitable cause, they should be able to associate their novel VR experience with a charitable appeal, and not with other appeals. This suggests that the novice VR users are not just excited to do any VR and want to follow up with similar real-life experiences; rather, they are attuned to why this novel technology is being used, and this association between VR and its charitable appeal leads them to reciprocate with a greater corresponding action in real life. When there is no clear association between a firm's use of VR and its charitable appeal, the novice VR users would not increase their real-life support after VR.

#### 3.3.1. Method

Three hundred nine undergraduates ( $M_{age} = 23.1$ , 59.0% female) from a large North American univer-

sity completed the study and were assigned to one of four experimental conditions in a 2 (novice VR users vs. experienced VR users)  $\times$  2 (charitable purpose vs. entertainment purpose) between-subjects design. First, participants were randomly assigned to either the charitable appeal condition or entertainment appeal condition. We manipulated the reason for a firm's use of VR by telling the participants that the firm created this VR content either to promote ocean conservation and develop initiatives to preserve biodiversity (charitable appeal condition), or, to increase awareness of outdoor activities and to develop initiatives to bring more consumers into watersports such as surfing (entertainment appeal condition). To increase the participants' focus on the appeal, we further instructed the participants to think and write about why they think the VR content was produced. In both conditions, participants watched the same VR video for approximately 4 minutes. Keeping constant the actual VR content across conditions, we manipulated whether or not the firm's use of VR was connected to a charitable cause or not.

In a follow-up survey, participants were told that the firm that created the VR content recently started a new marine life conservation initiative and were asked to write how much they would be willing to donate to support this cause. The participants reported their donation amount on a slider that ranged from \$0 to \$100. This was used as our focal measure of interest. We predicted that the novice VR users would donate more to the firm's conservation initiative only if they can attribute the firm's use of VR for a charitable, but not for entertainment, appeal.

Lastly, the participants reported their prior VR experience as in study 1. Participants also reported how much they experienced nausea during the VR video and basic demographic information, such as gender and age. The participants also reported their enjoyment of the VR experience, and how well-made they thought the video was on 7-point Likert scales (1 = *Not at all*; 7 = *Very much*) as in study 1.

#### 3.3.2. Results

Of all our participants, 174 participants (49.5% of participants) were novice VR users and 185 participants (51.5%) were experienced VR users. There was no difference in age ( $M_{first-time} = 23.19$  vs.  $M_{experienced} = 22.91$ ,  $t(307) = .47$ , *NS*) or gender distribution ( $t(307) = -.89$ , *NS*) between the two groups.

Consistent with our prediction, we found a significant interaction between the charitable appeal of VR and the participants' prior VR experience ( $F(1,305) = 3.69$ ,  $p = .055$ , see Fig. 2). There was no significant main effect of appeal ( $F(1,305) = .419$ , *NS*) or prior VR experience ( $F(1,305) = 1.39$ , *NS*). Specifically, when

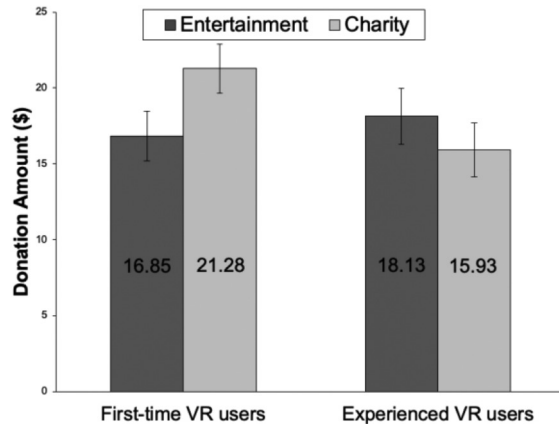


Fig. 2. Study 2 results: Effect of prior VR experience and charitable appeal of VR on donation amount.

the firm used VR technology to promote ocean conservation, novice VR users were willing to donate more to support this firm's charitable initiative compared to experienced VR users ( $M_{first-time} = 21.28$  vs.  $M_{experienced} = 15.93$ ,  $F(1,305) = 4.93$ ,  $p < .05$ ). However, when the firm used VR technology for a reason that is unrelated to ocean conservation, i.e., to convince more people to try watersports, the increase in donation amount among novice VR users disappeared ( $M_{first-time} = 16.85$  vs.  $M_{experienced} = 18.13$ ,  $F(1,305) = .27$ , *NS*). This suggests a boundary condition such that the sheer novelty of trying VR for the first time does not always make novice VR users to support the firm afterwards. These consumers support a firm's action after VR, only when they can (vs. cannot) see how they are supposed to use VR in relation to their subsequent behavior in real life.

There was no difference between novice VR users and experienced VR users in their enjoyment of the VR experience ( $M_{first-time} = 4.66$  vs.  $M_{experienced} = 4.67$ ,  $t(307) = -.09$ , *NS*), or their evaluation of VR video quality ( $M_{first-time} = 5.58$  vs.  $M_{experienced} = 5.72$ ,  $t(307) = -.96$ , *NS*). All of our participants reported low nausea ( $M = 1.83$  out of 7). There was no difference between novice VR users and experienced VR users in their nausea level ( $M_{first-time} = 1.87$  vs.  $M_{experienced} = 1.80$ ,  $t(307) = .41$ , *NS*). There was no interaction between prior VR experience and appeal of VR on any of the above variables (interaction  $ps > .534$ ).

### 3.3.3. Discussion

Study 2 showed a boundary condition of our effect. The results show that novice VR users respond positively to a firm's novel use of VR with their own charitable behavior only when the VR technology is clearly used for a charitable reason, but not for an unrelated entertainment reason. If they cannot see the use of VR as part of a firm's charitable appeal

to save the ocean, then the novice VR users would not reciprocate with real-life support for this cause. This suggests that the novice VR users are not simply excited about trying VR for the first time; rather, they are particularly attuned to whether VR is being used for the right purpose. This is in line with the conceptualization that the novice VR users are more susceptible to the guidelines of VR (e.g., clear purpose for VR) when using this media for the first time.

## 4. General discussion

VR is a valuable tool for charity organizations to motivate potential donors to take actions. We find that compared to experienced VR users, novice users who try VR for the first time are more likely to support a charitable cause in real life after going through a charitable experience in VR. This effect occurs because the novice VR users think it is more novel that an organization is using VR for its campaign. However, these consumers do not respond positively to any VR. When they realize that the organization's use of VR is unrelated to a charitable cause (i.e., for entertainment purpose), novice VR users do not increase charitable behavior in real life.

### 4.1. Managerial contribution

From the nonprofits' side, it takes a lot of resources to produce and implement VR in their campaigns. Using VR technology often requires organizations to hire a professional design and production team with expertise in VR development. Shooting a VR film can cost as much as \$10,000 per minute (Giardina 2016). Additionally, organizations need to acquire high-quality VR headsets and software to deploy this technology and showcase their VR experiences. Thus, it is managerially important to examine whether a firm's use of VR does, in fact, set them apart from others who are also trying to win prospective donors' hearts. Our work suggests that part of the charitable VR's advantage in raising people's engagement is the perceived novelty. Novice VR users acknowledge that the use of VR is novel and different from other organizations' campaigns, and they respond positively by increasing their real-life support.

Given that consumers appreciate a firm's novel use of VR, our findings also contribute to firm's choice of communication channels. Prior work suggests that the medium *is* the message in some cases (Worchel, Andreoli, and Eason 1978) because the medium alters how a message is processed by the recipient. Newspaper (written medium), for example, facilitates message elaboration and recall, whereas television increases the impact of visual communicator cues



(DeFleur et al. 1992). More recently, researchers found that the same message delivered via a candidate's Twitter page (vs. newspaper interview) heightened the sense of direct conversation with the candidate and induced more favorable impressions (Lee and Shin 2014). However, our work focuses on the novelty of a firm's media choice (to use VR in their campaign) rather than how the firm's message gets processed differently depending on the media. Our work suggests that the same VR charitable campaign is more effective among novice (vs. experienced) VR users, and this competitive advantage of using VR as a communication channel manifests in consumers' support behavior in real life. This is in line with the marketers' intuition that the "act of choosing" VR can be "a statement in and of itself" (Stambol 2018).

Our results also have managerial implications on brands' advertising tactics. Even though we manipulated VR's appeal by directly instructing the participants that the VR is either a charitable or entertainment content, firms often employ different communication tactics to make their advertising appeal more, or less, direct (Homer 2008). For example, hard-sell advertising tactics are more straightforward and direct in their delivery of information than soft-sell tactics. Okazaki, Mueller, and Taylor (2010) defined hard-sell tactics as the use of direct appeals (such as specifying the brand name or explicit mention of factual information). On the other hand, soft-sell tactics use indirect appeals (such as using an abstract or emotional story), and are thus harder to understand than hard-sell tactics. For novice VR users who may struggle to navigate through their first VR experience, marketers may utilize hard-sell tactic that is direct and information-oriented. In contrast, experienced VR users may respond better to a soft-sell tactic that employs more indirect or subtle advertising cues in VR.

#### 4.2. Theoretical contribution

This paper contributes to the growing consumer research on VR (Kristofferson, Daniels, and Morales 2022; Jun 2021). Our results suggest that from the consumers' side, a firm's innovative effort to promoting its cause does not go unnoticed. When consumers perceive that a firm is going the extra mile in their marketing activities (Morales 2005), they reward this behavior with their own response. Given that consumers value when a firm uses a new technological innovation (Rogers 1976; John, Weiss, and Dutta 1999), we test if consumers reciprocate to the firm's novel use of VR. Kristofferson, Daniels, and Morales (2022) speculated that the novelty of VR could contribute to VR's effect on charitable actions but ruled

out this explanation because in their research, they compared VR to non-VR 360-degree video, which were perceived to be equally novel compared to traditional 2D video. It remained unclear whether novelty is contributing to VR's role in increasing donation. Here, we directly test the role of novelty by keeping constant the VR content, and testing that the novice (vs. experienced) VR users think the use of charitable VR is more novel and the perceived novelty increases their subsequent charitable behavior. This suggests that the positive effect of VR on inducing consumers' charitable behavior is driven, at least in part, by the perceived novelty of VR.

We note that in study 2, the experienced VR users did not change their donation amount, regardless of whether the VR had a charitable or entertainment appeal. One potential reason that the experienced VR users were less influenced by our manipulation is that they do not necessarily discern the purpose of VR. For example, someone who has ample prior experiences with a smartphone is likely to use the smartphone for many different purposes at once, whether to send an email, call friends, or use as GPS. There is less distinction as to what the smartphone's specific purpose is. On the other hand, someone who has little to no prior experience with a smartphone is likely to focus on one or two specific uses of a smartphone, such as to make a phone call, and then adhere to that specific use only. In study 2, our manipulation varied the purported purpose of VR, while keeping the actual experience constant across conditions. Novice VR users, thus, may be more likely to adhere to the specific purpose of VR due to our manipulation. It is possible that they strongly associated VR with the charitable appeal in mind, and this association increased their willingness to participate in charitable behaviors. On the other hand, experienced VR users who already have some understanding of the varied purposes of VR could be less likely to focus on one particular purpose of VR due to our manipulation. Understanding how people come to understand and incorporate multiple uses of VR is an interesting avenue of future research.

This paper contributes to VR research by exploring the role of consumers' prior VR experience. VR is "an experience, rather than a machine" (Steuer 1992) because what makes VR unique compared to other communication media is that the users get to participate in, and determine their own experience in the VR environment. However, most existing research on VR has focused on the technical features of VR such as the graphic quality (Zeltzer 1992) or camera techniques that allow realistic movements in VR (Lombard 1995). Here, we focus on the users and study how individual users' prior experience affects their VR experience. Although previous research has examined the impact

of prior VR experience on telepresence (Freeman et al. 1999), no work has tested how prior VR experience affects the perceived novelty of VR. Understanding VR users is critical because the same VR content may generate different outcomes from different users. Our paper contributes to this understudied area of research by investigating the role of people's prior VR experience on perceived novelty and the subsequent real-life behavior.

#### 4.3. Limitations and future research

In this paper, we presented the participants with a positive VR experience, i.e., the flora and fauna of the ocean, to make them realize why we need to conserve biodiversity. Future research can study the effects of different VR content. For example, firms may highlight the negative consequences (e.g., damages of ocean acidification), rather than the positive consequences of our environmental efforts. Many existing VR experiences allow the user to take the perspective of another person, such as living as a refugee or as a homeless person in VR. Other charitable VR content involve social interactions with other people to highlight helping behavior. We expect that in cases where the VR experience is more socially engaging, such as helping or talking to others in VR, there may be other potential mechanisms at play among novice users besides perceived novelty, such as stronger emotions or empathy (Waterworth et al. 2003). Future research can explore how novice VR users respond differently to different types of charitable VR content.

Even though our results demonstrate a mediating role of novice VR users' perceived novelty on their subsequent charitable behavior, we suspect that the novelty effect of VR can be multifaceted. Consistent with the habituation theory (Tellis 1997), VR may be more impactful among novice users because the effects of virtual stimuli have not yet depleted among these consumers. Also, because not many firms are using VR in their marketing efforts yet, consumers may be more likely to reward the firms' novel use of VR because they think this decision is bold and risky. The effect of novelty on positive consumer response could also arise from heightened attention, as people tend to be more involved when they are processing new stimuli (Lang 2000). People tend to experience higher arousal when they encounter unfamiliar sensory stimulus (Easterbrook 1959). Because our participants evaluated the novelty of VR in terms how unusual it is, the novice VR users could have experienced higher level of arousal from engaging with a stimulus that they were not expecting. Future research could pinpoint the mechanism by which the

perceived novelty induces similar real-life behavior after a VR experience.

Lastly, given that the novelty effect has been shown to disappear at some point (Yim, Chu, and Sauer 2017), future research could study the longevity of our observed effect among novice VR users by testing how the same VR user comes to develop knowledge and expertise with VR, and how that impacts their evaluation of VR. We expect that the perceived novelty of charitable VR and its impact in generating corresponding real-life consumption will change over time. It is possible that as people become more experienced with VR, they may be less impacted by their prior VR experience, or they may even learn to use VR as a substitute to actual behavior (Jun 2021) and reduce their desire to engage in charitable behavior in real life after VR.

This paper examines the effect of VR in societal marketing. The implications of VR, however, go far beyond societal marketing. With a wide distribution of mobile HMDs (e.g., NYTimes' distribution of 1.3 million Google Cardboard to its subscribers), people's smartphone could turn into a VR module, so users can enter into a VR environment anytime, anywhere. We hope that the findings from our research on consumers' perception of novelty and prior VR experience can advance our knowledge of this exciting technology.

#### Conflict of interest

There is no conflict of interest.

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