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Analysis

Voluntary Contributions to Hiking Trail Maintenance: Evidence From a Field Experiment in a National Park, Japan

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ABSTRACT

Donation is one of the most important solutions to inadequate funding for protected area management; however, there has been little agreement on the measures to be used to encourage visitors to donate. We conducted a field experiment in Daisetsuzan National Park, Japan, to examine the effect on donation behavior of providing information about two types of initial contributions. The first type of contribution is toward the fundraising campaign for trail maintenance and the initial amount of government funding (i.e., seed money) and information is provided about the target amount. The second type is for trail maintenance and information is provided on the value of one day's contribution by other participants. We found that announcing the seed money amount and the target significantly increased the probability of a positive contribution and raised the average contribution, compared with the control treatment of no additional announcements. When the participants knew others' contribution beforehand, the likelihood of a positive contribution increased; however, the average contribution tended to decrease. In conclusion, announcing the seed money and the fundraising target is superior to the other measures studied in this paper to raise funds in this specific context of protected area management.

1. Introduction

1.1. Study Background

With increased demand for biodiversity conservation and maintenance of ecosystem services, the coverage of protected areas expanded rapidly. By 2030, protected areas are likely to reach 15–29% of the surface area of the earth (Chape et al., 2005; Li et al., 2013; McDonald and Boucher, 2011). However, most protected areas do not receive sufficient funding for their management, even though their value has been realized (Emerton et al., 2006). Although these insufficient situations are mostly reported in developing countries (Emerton et al., 2006), other countries also face the challenges of sustainable park management because of poor funding. For example, Olympic National Park in the U.S. needed $13.3 million to operate the park; however, only $7.8 million was available (NPCA, 2015). The Japanese national parks face the same problems, and the government declared a law in 2015 that allows local communities to collect an entrance fee to resolve these problems (Ministry of the Environmental, Japan, 2015). Especially, insufficient funding has significant impacts on the maintenance of trails, visitor centers, and other facilities, and leads to a lack of development of new protected areas even if the costs are relatively small. Although donation or voluntary contribution is one of the most important options to aid in sustainable management of protected areas (Emerton et al., 2006; Thur, 2010), there is still much room to improve fund raising measures in most countries.

This paper analyzes the nature of measures that encourage people to donate for park management using a field experiment. That is, we investigate the effects of announcing previous contributions by park visitors at a national park, Japan, using a field experiment. In particular, we evaluate the effect of providing information about the target for the fundraising campaign for trail maintenance and the initial amount of government funding (hereafter *SEED*), as well as information about the amount contributed in one day by other participants to trail maintenance (hereafter *PREV*). As described further below, some field experimental studies have been carried out on the effect of information provision on the decision-making of park visitors about their contributions. However, no studies have investigated the effect of information about seed money and the amount of previous contributions, rather than that of a typical contribution.

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1.2. Literature Review

In response to the lack of adequate financial resources of protected areas, a growing body of literature addresses finance mechanisms (e.g., entrance fee; voluntary contributions) using environmental valuation methods. Baral et al. (2008), for example, conducted a contingent valuation (CV) survey to estimate visitors' willingness to pay (WTP) a candidate entry fee at Annapurna Conservation Area, Nepal. They found that most visitors were willing to pay a higher than the current entry fee, and that their WTP were associated with their family size, their satisfaction, use of a guide, and group size. Similarly, Baral and Dhungana (2014) used a CV method and found that over 60% of visitors were willing to pay higher than the current entry fees in the same area. In Ecuador's Galapagos National Park, Viteri Mejía and Brandt (2015) used a choice experimental survey and found that tourists were willing to pay 2.5 times more for a tour with a high level of protection against invasive species than for a current tour. Their findings suggest that charging new access fees adjusts the number of tourists and reduces the risk of invasive species without revenue loss. As described above, the findings from many stated preference studies suggest that the implementation of new finance mechanisms could improve the financial conditions of protected areas.

However, stated preference studies have been the subject of criticism due to potential biases. One of the significant biases is *hypothetical bias*: the willingness to pay stated by respondents on a survey differs from their actual payment (see Foster and Burrows, 2017; Murphy et al., 2005). Thus, some policy makers are reluctant to implement a policy based on findings from stated preference studies. To address the bias and introduce an evidence-based policy, field experiments have received much attention recently; this is due to their substantial advantages in increasing external validity along with examining real world contexts (Harrison and List, 2004; List and Metcalfe, 2014; List and Price, 2016). That is, field experiments can empirically evaluate the influence of some policy interventions in a real world context and advert to the causal relationship between implemented policies and outcomes. The findings from field experiments are forthright and provide comprehensible information to policy makers.

Despite the substantial advantages of field experiments, surprisingly few applications have been conducted in the context of park and protected area management. Thus, there is still much room for improvement in understanding the contribution behavior of visitors in parks and protected areas. To our knowledge, only Alpizar and his colleagues have analyzed park visitors' donation behavior at a national park (Alpízar et al., 2008a, b; Alpízar and Martinsson, 2012, 2013). In terms of announcing contributions, Alpízar et al. (2008a) have shown that announcing the low typical contribution of others (i.e., $2) increased the probability of a contribution and decreased the conditional–given a positive–contribution, compared with no announcement; conversely, announcing a high typical contribution (i.e., $10) increased the conditional contributions. They have also found that participants' contributions increased when obtained in front of a solicitor instead of in private; further, giving a gift to participants increased the probability of a contribution and decreased the conditional contribution. Alpízar et al. (2008b) conducted a field experiment and a CV survey to evaluate the effects of information provision about a typical previous contribution by other visitors, and investigated the difference in actual and hypothetical contributions. Although they found a hypothetical bias concerning the amount of contributions, they found that information provision increased the share of positive contribution and decreased the conditional and sample average contribution in both approaches. Further, they investigated the effect of anonymity of donations using both approaches and did not find clear differences between anonymous and non-anonymous contributions.

There has been an increasing amount of experimental studies focused on behavior related to contributions (e.g., donations) in other areas. Especially, many recent studies have investigated the nature and manner of information provision that encourage donors to contribute more. Seed money, for example, is one of the best-known approaches (Gneezy et al., 2014). Researchers show that publicly announced seed money increases the number of contributors and the amount of contributions (List and David, 2002; Rondeau and List, 2008), which is consistent with theoretical predictions (Andreoni, 1998). Another popular approach is providing information about the contributions of other contributors. For example, Shang and Croson (2006) announced typical contributions to a radio station and used a field experiment to show that their highest reference amount resulted in a higher contribution. Further, Martin and Randal (2008) revealed the amount of contributions to visitors at an art gallery, and found that the average donation increases when a larger contribution amount is displayed. However, to the best of our knowledge, no previous studies have attempted to compare the influences of information about the initial amount of government funding with information about the amount contributed in one day by other participants, as is done in this present study.

2. Design

2.1. Research Site

The surveys were conducted at the Numameguri Hiking Trail (NHT) in the Daisetsuzan National Park, Japan, in mid-September 2015. This is the largest Japanese terrestrial park, receiving approximately 5 million visitors per year (Ministry of the Environmental, Japan, 2016). Visitors are not charged any entrance fee. The NHT is one of the most popular hiking trails in the park because of the beautiful color of leaves in fall. However, visitors face a high risk of bear attacks; thus, they are requested to attend a lecture at an information center at the trailhead before hiking (for detail, see Kubo and Shoji, 2014). In addition, they need to be registered before hiking and are required to report their safety after hiking using a logbook. The NHT faced the risk of an insufficient management budget, especially due to reduced government funding over the last few years. A donation box at the information center was provided to cover the budget shortfall; however, it accumulated only a few thousand JPY[1] per year until 2015 (personal communications with park staffs in July 2015). Thus, it was necessary for park authorities to find new measures to encourage park visitors to donate to the park management.

2.2. Experimental Design

When all participants (park visitors) reported their safety using the logbook at the trailhead, park staff informed them about the trail maintenance and potential voluntary fees at the park. All participants in the field experiment were requested to answer the questionnaires, which comprised questions concerning individuals' characteristics and their contributions to trail maintenance. In the experiment, participants were randomly allocated to three groups: the control, *SEED*, and *PREV*. To control observable and unobservable differences across days, two treatments were implemented in a day (see Appendix 1 for detail). First, participants in the control treatment received information about the current situation and maintenance of the trail. The necessity of fund raising to maintain the trails of the park was also described. Participants were asked to write their contributions on the questionnaire and put the same amount of money into the brown envelope with their questionnaires; then, they were asked to put their envelope into a white (non-transparent) box. Even if participants were not willing to donate, they answered the questionnaires, put them into the envelope, and placed the envelope into the box. The condition was not perfectly anonymous (even though brown envelopes were used so as not to see

[1] JPY: Japanese Yen; 100 JPY = 0.83 USD in September 2014.