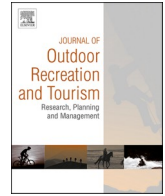


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Journal of Outdoor Recreation and Tourism

journal homepage: www.elsevier.com/locate/jort

Research Article

Financing recreational trails through donations: Testing behavioural theory in mountain biking context

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ARTICLE INFO

Keywords:

Social norms
 Conditional cooperation
 Soft policies
 Right of public access
 Public good
 Pro-social behaviour

ABSTRACT

The funding of recreational trails in publicly accessible nature areas is a prevailing challenge for the development of tourism destinations. In some cases, mandatory fees are neither ideologically nor legally supported, meaning that local stakeholders are reliant on the voluntary contributions of trail users. In light of the motivational barriers and uncertainties that hinder recreationists from donating, we tested behaviourally informed interventions to enhance cooperation in such settings. Specifically, we examined the effect of normative social cues on the share and amount of donations for mountain biking trails by conducting a field experiment in a rural destination in Sweden. Consistent with our predictions and previous studies, we found an increase in both the donation amount and share of donors after the intervention. Additionally, our research shows that the change in behaviour seems to be related to the belief about the donation behaviour of others, which can easily be targeted in policies. These findings imply that voluntary contribution schemes enhanced with normative messages can provide effective funding strategies for recreational nature-based trails. The importance of developing these strategies with regard to the local context is highlighted.

Management implications:

- Mountain bikers are, to a large extent, willing to contribute financially to the upkeep of trails through donations. Providing information about previous contributions and framing techniques to highlight this norm can further increase the share of contributions.
- Contributions of approximately SEK100–120 (€9–11) per visit seem to be the norm for mountain bikers in Rörbäcksnäs.
- Stakeholders involved in the management of recreational trails might benefit from making more effort to raise awareness about the possibilities to donate, for example through more channels and displays, and by testing different placements and designs.

1. Introduction

The scale and diversity of recreational outdoor activities has increased dramatically within recent decades, resulting in higher demand for access to natural settings all around the world (Buning & Lamont, 2020; Fredman, Romild, et al., 2012; Wilkes-Allemann et al., 2020). Not only does participation in outdoor recreation involve an accessible natural area but generally also the use of infrastructure, including trails and associated facilities. These requirements demand a certain level of finance and time to accommodate user demands, maximise visitors' contributions to the local area, and mitigate externalities

resulting from their visit. In many cases, this is largely left to local stakeholders like environmental organizations or sports associations (Buning & Lamont, 2020; Godtman Kling et al., 2017). Supporting these efforts through fiscal and regulatory policies is neither practical nor acceptable in countries where the right of public access applies (Sandell & Fredman, 2010). The maintenance and development of trail infrastructure consequently pose financial challenges to those involved (Godtman Kling et al., 2017). New strategies have been called for to realise the benefits of the increasing demand for trail-based recreation and the potential of tourism development in the Nordic countries, without compromising the freedom of residents to roam and the welfare

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<https://doi.org/10.1016/j.jort.2022.100603>

Received 10 February 2021; Received in revised form 14 December 2022; Accepted 15 December 2022

Available online 20 January 2023

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of the natural environment (Sandell & Fredman, 2010). Soft policy approaches with insights from behavioural economics may provide such alternatives if developed according to the local context (Heldt, 2005; Kubo et al., 2018).

Soft policies are based on some form of communication intended to persuade individuals and groups of people to voluntarily engage in the desired behaviour. This distinguishes them from hard policies that aim to force behavioural change via subsidies, regulations, or sanctions (Testa et al., 2018). The non-coercive approach makes soft policies such as donation schemes applicable to the funding of recreational nature areas, where voluntary individual contributions of users are required to deal with the collective challenge of managing these public resources. However, the desire of residents and visitors to retain their free right of access and hedonic experience, combined with uncertainties about local or newly introduced contribution schemes, may hinder support for these solutions (Fennell, 2006; Juvan & Dolnicar, 2014). This creates the need for methods that integrate the context-specific inter-personal as well as intra-personal factors. With the emergence of behavioural theories and concepts in policy design, soft measures informed by behavioural insights have attracted increasing attention in fields related to pro-social behaviour such as green energy (Ölander & Thøgersen, 2014), food (Testa et al., 2018), and transportation (Avineri, 2012; Dolan et al., 2012). However, this does not seem to be the case for the use and funding of nature areas.

The purpose of this paper is to test the influence that normative messages have on the donation behaviour of trail users in a natural field experiment, including a baseline, a treatment, and a survey of visitors. The context in which we explore this is Sweden, with a focus on mountain biking (MTB) trails, due to the unique public access rights in the country and the increasing popularity of this outdoor activity (Buning & Lamont, 2020; Sandell & Fredman, 2010).

The practical implications of this research concern the development of behaviourally informed policies to enhance funding for recreational nature areas without impeding the right of public access. We add to the literature by testing behavioural theory to encourage pro-social behaviour of recreationists.

2. Literature review

2.1. Mountain biking and the right of public access

Outdoor recreation in the Nordics is linked to simplicity and closeness to nature, which is expressed in the right of public access, or 'Allemansrätt' in Sweden (Sandell, 2006). This right accounts not only for much of the popularity of outdoor recreation, but also has implications on political, legal, and social-psychological levels that strongly influence the management of related activities (Fredman, Romild, et al., 2012). Although the scope of the Allemansrätt is only loosely defined in legislation, it fundamentally postulates that everyone is allowed to access the outdoors for recreation (Sandell & Fredman, 2010). This implies that landowners and businesses may not charge for entrance to natural areas. Consequently, a challenge for the management of recreational nature areas is to balance the demand for freely accessible outdoor recreation with the costs incurred on the area through these pursuits.

Management of recreational nature areas becomes particularly problematic as not only the number of recreationists increases, but also their diversity and the activities they take part in. A noticeable trend around the world is the spread of mountain bikers to trails that were predominantly used by hikers. In line with recent preferences for healthy lifestyles and environmentally friendly activities, mountain bikers are motivated by the exercise function of riding combined with its hedonic aspects like escapism, thrill, and solitude. Moreover, MTB is an easily accessible form of outdoor recreation (Skår et al., 2008). Furthermore, the sociability of the activity by way of interaction and experience sharing drives mountain bikers, who are often perceived as a community that benefits from shared trail use (Taylor, 2010).

Although locals and domestic day visitors account for the majority of MTB participation, this trend has not gone unnoticed in the tourism industry, where cycle tourism is now one of the biggest growth sectors worldwide (Zajc & Berzelak, 2016). A study involving Scandinavia, the Alp countries and North America indicates that MTB is the number-one nature-based tourism activity in terms of predicted growth in the next few years (Fredman, 2018). This highlights the potential for rural communities with suitable environmental conditions to benefit from economic diversification through tourism. While some destinations in Sweden have been keen to capitalize on the growth of MTB, biking hubs are often reactively developed through a grassroots approach. Pooled resources of residents and community organizations are used to cater for riders in line with the right of public access (Buning & Lamont, 2020; Taylor, 2010).

MTB recreationists seem to favour the locally initiated, indirect measures that are often employed instead of hard and direct regulations (IMBA, 2015; Leberman & Mason, 2000). Studies suggest that this approach has so far been largely effective since MTB requires lower investments than other activities like skiing or ice-skating, and bikers generally prefer trails with natural surfaces that convey the unique environment of the place (Yachin, 2013; Zajc & Berzelak, 2016). However, as interest in MTB continues to rise and more competing destinations emerge, visitors increasingly demand well-maintained trails along with basic facilities such as parking and bike washing (Yachin, 2013). A certain level of upkeep is also required to control negative ecological impacts like erosion and trail widening (Symmonds et al., 2000). The growing demand for diverse trails and associated services, as experienced in many Swedish destinations, calls for a coherent management approach that enables local stakeholders to maximise the benefits of and for visitors (Godtman Kling, 2019; Pröbstl-Haider et al., 2018).

As indicated in a study of European mountain bikers, around half of bikers would be willing to pay for trail development in some form (IMBA, 2015). Several international destinations provide bikers with this option through donation schemes that involve on-site payment channels, or online and mobile applications (Reed et al., 2014; Trailforks, 2020). Donations also appear as a promising funding alternative in Sweden, where command-and-control measures are neither legally nor ideologically supported. However, the willingness to donate must translate into actual behaviour by a substantial amount of people for it to generate sufficient funding. As previous research on pro-social behaviour in recreation and tourism has shown, several barriers may exist for this to happen. These and the resulting gap between attitude and behaviour have gained much attention from researchers in behavioural economics in general, and increasingly in the field of tourism (Juvan & Dolnicar, 2014; Kollmuss & Agyeman, 2002; Miller et al., 2010).

2.2. Behaviourally informed policies in recreational nature areas

Most policy tools concerned with pro-social behaviour in tourism inadequately capture the complexity of decision-making processes (Bimonte, 2008). By assuming rational choices, policymakers commonly attribute irrational choices or attitude behaviour gaps to a lack of information or personal dispositions. However, numerous studies have evidenced that increased information, or moral appeals alone, do not necessarily translate into changes in behaviour (Dolnicar et al., 2019; Miller et al., 2010; Mont et al., 2014). Various social and psychological biases and heuristics influence people's decisions. One of the most important concepts, and a central element in many behavioural interventions, is social norms, which are broadly understood as expectations or rules within a group of people that impact behaviour (Dolan et al., 2012). Research provides strong arguments that consideration of social norms can increase the effectiveness and efficiency of soft policies that target pro-social behavioural change (Avineri, 2012; Bicchieri & Xiao, 2009). Whilst the integrations of behavioural insights in policy design has increased significantly over the last decade, studies and

applications in recreation and tourism are limited, despite the distinct challenges such contexts pose (Mont et al., 2014; Thaler & Sunstein, 2008).

Past research has shown that pro-social behaviour drops substantially when people are on holiday, indicating that the behavioural gap is especially apparent in such settings (Dolnicar et al., 2019; Kollmuss & Agyeman, 2002). Educative efforts to encourage pro-social actions are not only inadequate in tourism for structural reasons but also because of the emotive factors associated with its experiential nature. These seem to stand in contrast with sacrifices made to societal welfare and appear particularly influential where the environment and associated norms are unfamiliar (Dolnicar et al., 2019). As suggested by Bimonte (2008), a lack of engagement in pro-social behaviour of tourists may be attributed to ambiguity about local needs and expectations rather than free-riding behaviour. Uncertainty or resistance may also exist among local or repeat visitors who would rationally benefit more from investments in the area if initiatives come with costs and changes in habitual behaviour. On this basis, addressing social norms related to the use of recreational goods may present a way to encourage conformity. While existing behavioural theories and models can only predict people's actions to a moderate degree, several of them can serve as a basis to develop interventions accordingly (e.g. Ajzen, 2002; Bicchieri, 2015; Schwartz, 1977).

A commonly applied model to explain the process of how norms impact pro-social behaviour is the Norm-Activation Model (NAM) (Schwartz, 1977). This model postulates that the norm-activation process is based on personal norms, which are expressed as moral obligations and mediate situational and personality influences on behaviour (Harland et al., 2007). Prior research has successfully applied the NAM to encourage pro-social or pro-environmental behaviour such as donating blood (Zuckerman & Reis, 1978), volunteering (Schwartz & Howard, 1981), or paying for the conservation of public goods (Gregory et al., 1994). Whilst these studies challenge the traditional economic assumption that individuals act exclusively in their self-interest, recent research on actual behaviour in tourism has shown that appealing to personal norms is insufficient to encourage the desired behaviours (Dolnicar et al., 2019).

Given that not everyone has the same intrinsic motivations, it may be more effective to target social norms which may, later on, translate into personal norms (Schwartz, 1977). Numerous researchers have contributed to norm literature with different interpretations of the social norm concept and how these interact with individual behaviour. Deutsch and Gerard (1955) first differentiated between informational and normative social influence in their dual process theory of social influence. Informational influence occurs when people look for cues from others in situations where they are uncertain how to behave; this is sometimes also referred to as social proof (Cialdini, 1984). Normative influence refers to the need to conform to the expectations of others, thereby reflecting people's desire for social rewards (Deutsch & Gerard, 1955). A distinction can also be made between injunctive norms, which inform us about what is typically approved or disapproved, and descriptive norms, which inform us about what is typically done (Cialdini et al., 1990). However, the distinction between the two is not universally agreed upon, as what most people do arguably inevitably directs what should be done (Burchell et al., 2013). Thus, it is often unclear in the literature whether social norms refer to actual behaviour, or people's perception of common and expected behaviour (Tankard & Paluck, 2016). To clarify, our study looks at what interventions might lead to changes in actual norms, which often first require adaptations to people's beliefs about expected behaviour. This belief is frequently termed 'subjective norm', particularly in relation to the Theory of Planned Behaviour (TPB) (Ajzen, 2002, 2012).

The TPB combines the influence that norms have on behaviour with further personal and contextual factors (Ajzen, 2012). It postulates that, building on social, informational, and personal background factors, behavioural intentions are determined by attitudes toward the

behaviour, perceived behavioural control, and subjective norms. Perceived behavioural control involves (i) controllability, meaning the extent to which the behaviour is up to the individual, and (ii) efficacy, which is the ease or difficulty of performing the behaviour. The three aspects – attitudes, perceived behavioural control and subjective norms – are related to sets of beliefs salient to the behaviour; namely, behavioural beliefs, normative beliefs and control beliefs. By integrating the NAM and TPB, Onwezen et al. (2013) showed that anticipated emotions like pride and guilt play a significant part in a person's intention to behave in line with their norms. The TPB has been proven successful in informing behaviour change interventions in various everyday life contexts (e.g. Greaves et al., 2013; Lam, 2006; Yuriev et al., 2020). However, its applicability in tourism has been questioned because of the enjoyment-focused nature, and the multiple goals and other contextual complexities that characterize tourism contexts which arguably make the TPB too general to predict behaviour (MacInnes et al., 2022).

Normative beliefs in the TPB can be broken down according to Bicchieri's (2015) concepts of normative expectations (what we believe others expect us to do) and empirical expectations (what we believe others will do). In line with the conditional cooperation hypothesis that people tend to adapt their behaviour according to the (perceived) behaviour of others, it can be theorised that individuals contribute to pro-social activities at an individual cost, if they believe that (i) others contribute and (ii) others expect everyone to contribute (Fehr & Schurtenberger, 2018). This sense of balanced payoffs is also the fundamental idea of Equity Theory (Adams, 1965). Equity Theory postulates that behaviour is motivated by fairness in the relationship between inputs, such as effort or cost and outputs. When the ratio between the two is considered fair, people are more likely to engage in the behaviour. This implies that behavioural efforts are to be compensated with rewards or that individuals are obliged to repay others for what they have received from them, which relates to the norm of reciprocity (Cialdini, 1984). Despite being based on social interaction, some scholars believe that personal norms about fairness are relatively stable, meaning that individuals who hold such norms tend to follow these unconditionally (Bicchieri & Xiao, 2009). However, whether information about the behaviour of others can influence individuals with strong personal norms of fairness remains an empirical question. So far, Equity Theory has been used to study decision-making in diverse settings, including pro-social consumption (Kapitan & Ross, 2018) and pro-environmental behaviour of tourists (Dolnicar et al., 2019). The latter study confirmed the effectiveness of equity-informed interventions in a hotel setting, where information based on the balanced cost-benefit relationship between guests and providers significantly influenced guests' engagement in the target behaviour (Dolnicar et al., 2019).

Based on the discussion above, we can predict that pro-social behaviour can be prompted if individuals are provided with a founded belief that others cooperate and that fairness between individual payoffs exists. Laboratory (Fischbacher et al., 2001) and field studies (Frey & Meier, 2004; Heldt, 2005) have confirmed these assumptions of conditional cooperation, although not everyone seems to follow them equally. The variability in conditional cooperation may, firstly, be linked to the degree of uncertainty associated with decision-making and conformity with personal norms (Frey & Meier, 2004). Further, it may be explained by the postulation that, in order for intentions to translate into behaviour, people need to accept responsibility for the impact of their actions, as suggested in the TPB and other attribution theories (Schwartz, 1977; Testa et al., 2018). Research has shown that tourists who do not participate in pro-environmental behaviour commonly attribute negative consequences that result from their visit to external factors, and thus to something out of their control (Juvan & Dolnicar, 2014; Miller et al., 2010). Mountain bikers, for instance, often underestimate their impact on natural resources as they believe that other users are causing more harm than they are (Symmonds et al., 2000).

In sum, actions that contribute to collective benefits in unfamiliar

situations tend to be taken with the expectation that others behave similarly, thereby reinforcing normative behaviour. Behavioural change interventions that seek to change social norms target people's normative beliefs by using messages that convert latent attitudes to salient ones (Testa et al., 2018). Following the above theories, it is necessary for interventions to facilitate internal attribution and perceived behavioural control and for people's attitudes to conform with the desired behaviour.

Previous studies have examined normative interventions in the form of descriptive and injunctive norm messaging, simplification and framing of information, or through indirect cues like changes to defaults. Whilst several researchers have successfully tested these with regard to pro-social behaviour (Agerström et al., 2016; Dolan & Metcalfe, 2013; Shang & Croson, 2009), behaviourally informed studies in tourism have largely focused on pro-environmental behaviour (Dolnicar et al., 2019; Goldstein et al., 2008; Nelson et al., 2019). To our knowledge, only one study has tested the influence of social norm interventions in the context of recreational trails. The experiment of Heldt (2005) found that Swedish cross-country skiers were more likely to contribute to track maintenance if many others contributed. While it was similar to the present study, Heldt's (2005) experiment did not involve framing or descriptive donation norms. Alpizar et al. (2008) tested the effect of descriptive norms in the context of donations for a national park and showed that providing a smaller or larger reference amount decreases and increases the size of the contribution, respectively. Similarly, Martin and Randal (2008) found that visitors to a museum put more money into a transparent donation box when there was money in the box than when the box was empty. While these studies have confirmed the impact of social norms in recreation and tourism, they have not used framing to link personal beliefs and attribution to the intervention messages as researchers in other contexts have (Cialdini, 1984; de Groot et al., 2013). Considering that tourism settings generally involve low social proximity to others (tourists and locals) and high uncertainty about local norms, further testing of the influence that social norms have in such settings is necessary. The present study contributes to this body of knowledge by studying the applicability of social norm interventions in a yet under-explored context of tourism, informed by a range of behavioural theories. Previous research suggests that local norms that imply proximity to the reference group are particularly influential for pro-social behaviour (Agerström et al., 2016; Goldstein et al., 2008). Therefore, the intervention in the present study is designed according to the local setting, with input from stakeholders at the destination.

3. Study area

The natural field experiment took place in Rörbäcksnäs, a small village located in Dalarna County, 35 km west of Sälen. Renowned for its unique trail qualities, Rörbäcksnäs is part of a regional collaboration of biking destinations ("Biking Dalarna"), which has facilitated the significant growth in MTB visitors over the last decade (Yachin, 2013). Bikers can choose from among nine marked trails in the destination, which start from the school located in the centre of the village (Rörbäcksnäs, 2021a, 2021b) (See Figs. 1 and 2). As a member of Biking Dalarna, Rörbäcksnäs must fulfil certain standards related to trail marking, grading and basic supporting facilities. All work is done on a voluntary basis by the non-profit sports association Rörbäcksnäs Iddrottssällskap and individual volunteers. The association collects donations via Swish (Swedish mobile payments) in a 'Karma account', which is entirely invested in the trails. However, interviews with Rörbäcksnäs MTB stakeholders have revealed that visitor numbers have grown at a rate where the funds are insufficient to cover the resources required for maintenance and to develop the destination. Currently, a signpost at the main trailhead invites visitors to contribute with basic information about the use of donations. The message also suggests a rather arbitrary chosen amount per single ride (20 SEK) and per season (100 SEK). Public funds do not appear as a sustainable alternative as they are limited in duration and amount (Yachin, 2013). While the



Fig. 1. Map of Rörbäcksnäs (mapcarta, 2021).

introduction of mandatory fees has been considered by the community members, donations remain the preferred model at this point. As indicated in interviews, the destination is not at a stage where expectations that come with mandatory charges could be catered for, and visitors as well as residents appear to value the uncommercialized approach. The key issue to creating sufficient funds seems to be that a low share of overall visitors donates, combined with high uncertainty about an appropriate donation amount.

4. Methodology

As no previous research on the behaviour of bikers in the destination had been conducted, we made use of different methods to carry out the study over a period of eight months. This included a thorough pre-study and the actual field experiment, which involved a baseline and a treatment phase. The field experiment was carried out during MTB high season, between June and August 2020.

The pre-study included interviews and cooperation with stakeholders in the local community group to define their core goals and current barriers to the development of MTB. Following this, and an extensive examination of the study location, we created surveys and decided on counting instruments for the following two field experiment phases. An electrical counter was installed by the trail entrance and tested for 27 days prior to the beginning of the high season.

4.1. Experimental design – baseline and treatment

The aim of the baseline phase was to gain insights into the current donation behaviour. We conducted a 37-day measure of mountain bikers and donations to determine a typical donation amount and share of donators with the current display; that is, without normative messages. Numbers from the electrical counter were recorded daily to

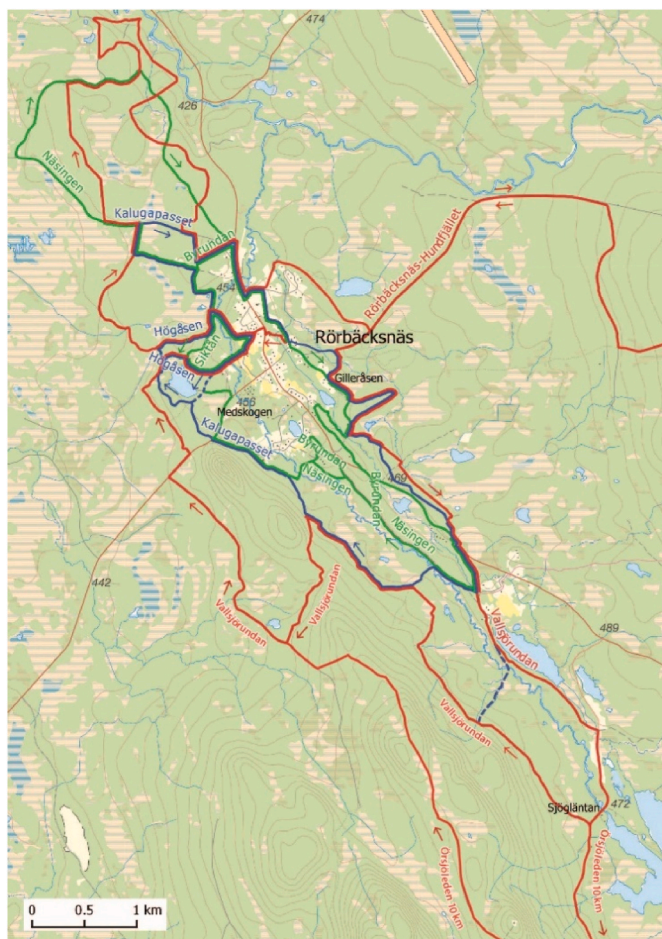


Fig. 2. Map of MTB trails in Rörbäcksnäs (Rörbäcksnäs, 2021a, 2021b).

monitor visitor flow across the conditions. The donation amounts and number of donators for the corresponding periods were retrieved from the Swish account. These were anonymous. We collected surveys for nine days during this phase, at different times between 8 a.m. and 6 p.m. The data collection was performed by one researcher. Visitors who had biked already were approached and briefly informed about the study and that answers are anonymous. Participants were handed a survey and could decide whether to fill it out on paper or online, using a QR code. We continued survey collection while participants completed the surveys to minimize social image influences. To reduce selection bias in sampling, we selected every third mountain biker when possible. If a biker did not agree to participate, we selected the next one. While trail users were aware that we were conducting research and provided with basic information about the project, they were not informed that this would involve a change in the donation message. This is typical for natural field experiments, which by definition involve a natural subject pool, a natural available choice to the subjects, a natural stake, and an absence of informed consent (Al-Ubaydli & List, 2019, p. 34).

Since the baseline and the treatment measure are not directly comparable, we included socio-demographic characteristics as control variables (age, gender, place of residence and income level). Furthermore, the field experiment took place in high season, when we expected the population to have the same characteristics throughout the study period. We also used two filtering questions to account for some existing factors and outside influences that may impact donation behaviour; namely, a question asking whether participants were aware of the possibility to donate, and open-ended reasons for not donating if applicable. While surveys were available in Swedish and English, the donation signs were only provided in Swedish. Since we found that only Swedish speakers

participated in the study, there is no reason to believe that this impacted our results.

The core measures of the survey were the subjective belief associated with the donation behaviour and behavioural outcome in the form of the decision to donate and the donation amount. We assessed the subjective norm belief in the form of empirical expectations by asking participants what percentage of other mountain bikers they believed donated. We also included two basic measures related to people's perceived behavioural control and personal norms associated with donation behaviour in this context. We adopted a measure from previous studies to assess the ascription of responsibility related to the upkeep of the trails (Blasch & Ohndorf, 2015; Bronfman et al., 2015; Liu et al., 2017).¹ Personal norms were also measured on a scale based on previous studies (Bronfman et al., 2015; Liu et al., 2017; Shin et al., 2018) but adapted to the context.²

Based on insights from the stakeholders and the first baseline surveys (N = 51 collected during the first six days of the baseline measure), we examined what normative message would be most appropriate for the treatment. The surveys showed that most mountain bikers believed that users were at least partially responsible for the upkeep of trails and that 71.4 per cent of users donated, on average 110 SEK. This indicated that people's attitudes and ascription of responsibility largely conformed with the target behaviour, and perceived behavioural control was high. The empirical belief was in turn notably lower – on average, participants believed that 43 per cent of mountain bikers donated. Hence, the use of a descriptive normative message was suitable as most participants engaged in the desired behaviour, although uncertainty about others' behaviour was high. While visitors were free to donate any amount they wanted, we decided to test the inclusion of an average donation amount of 110 SEK as a further norm. We added this firstly because the baseline condition surveys showed that visitors donated more than 20 SEK – that is, between 25 and 400 SEK – and that the most common one was 100 SEK. Proposing a higher amount thus appeared appropriate. Secondly, findings about using suggested amounts to increase donations are inconclusive in the literature. Some studies (Alpizar et al., 2008; Shang & Croson, 2009) found that a reference can significantly increase overall funding, as many experience cognitive burden and/or over-estimate the cost, resulting in the decision to not donate at all (Briers et al., 2007). Since there appeared to be high uncertainty about the normative donation behaviour, we expected that a grounded suggestion higher than the baseline condition would increase the donation amounts in line with the norm, as well as the share of donors when combined with the descriptive norm and framing. Accordingly, we hypothesized that: Activating the pro-social norm to donate in a message, using a descriptive norm, suggested amount and framing increases the share of donations and donation amount.

The baseline measure showed that 82 per cent visited Rörbäcksnäs for the first time or no more than two times per year. As we also did not encounter any treatment participants who had already visited during the baseline measure, we can assume most participants were exposed to only one study condition.³ The messages that were used are provided in Table 1 (See Appendix 1).

¹ Participants were asked which statement they agreed with most: "I believe that every visitor is partly responsible for contributing to trail upkeep", "I believe that locals or the government are responsible for trail upkeep", "I believe that visitors and locals/the government are jointly responsible for contributing to trail upkeep".

² Participants were asked to rate on a five-point Likert scale how strongly they agreed with the statement "Regardless of what other people do, because of my own values I feel that I should contribute to the upkeep of mountain biking trails." Higher scores indicated stronger expectations.

³ Ideally, an experimental design to fully test the effect of treatment would include going back to the base line; however, field conditions did not allow for this.

Table 1
Descriptive characteristics of the sample.

		Baseline (n = 120)		Treatment (n = 84)		Total (n = 204)	
Age	Average	44 years		44 years		44 years	
	Min.	21 years		22 years		21 years	
	Max.	68 years		76 years		76 years	
		Frequency	%	Frequency	%	Frequency	%
Gender	Female	46	39%	27	33%	71	36%
	Male	72	61%	55	68%	124	64%
Income	Studiemedel	5	5%	2	3%	7	4%
	under 150 000 SEK	4	4%	–	0%	4	2%
	150 000 – 259 999 SEK	4	4%	3	5%	7	4%
	260 000 – 359 999 SEK	9	9%	1	2%	10	6%
	360 000 – 459 999 SEK	25	25%	14	22%	39	24%
	460 000 SEK – 559 999 SEK	21	21%	17	26%	38	23%
	560 000 SEK – 659 999 SEK	13	13%	11	17%	24	15%
	660 000 SEK – 759 999 SEK over 760 000 SEK	9 10	9% 10%	6 11	9% 17%	15 21	9% 13%
Beliefs about others (in %)	Average (std)	40.74%	(22.852)	51.98%	(26.153)		
	Min.	5%		5%			
	Max.	95%		100%			
High expectations (dummy:0–1)	Average (std)	0.48	(0.502)	0.60	(0.494)		
Kilometres MTB (day)	Average (std)	19.82	(11.295)	21.51	(10.082)		
	Min.	3		2			
	Max.	70		51			

The baseline condition is the existing donation message with a suggested amount, and some individual-focused altruistic appeals (“help” and “ride with a good conscience”) (Fig. 4). The treatment message is informed by attribution theory, NAM and equity theory/reciprocity using awareness of consequences and attribution of responsibility (Fig. 5). The message emphasizes personal control of contributing to the trails, guiding users to accept internal attribution while underscoring that collective action is required. We aimed to raise receptivity to the social norm by using words such as “we” and “together”. Equity is indicated by highlighting the voluntary work (input by locals), which should be compensated with donations (input by other users) to create shared output. The key change in the message is the inclusion of a descriptive norm of 70 per cent, derived from the first baseline surveys. To facilitate association with a relevant reference group, we indicated spatial and temporal proximity (“visitors in recent weeks”). This provides mountain bikers with evidence that others are donating and combined with the wording of the message implies that others expect them to do so too. We anticipated that this would positively influence visitors’ subjective beliefs, encourage pro-social thinking, and increase donations. Unlike other studies that used reference groups in social interventions, we refer to donations made by a large, spatially close group rather than to a global group (Shang & Croson, 2009), only injunctive norms (de Groot et al., 2013), or local but socially closer groups (Agerström et al., 2016). Goldstein et al. (2008) applied a similar reference frame in a tourism setting. However, we also included temporal proximity, and focused on pro-social rather than

pro-environmental behaviour (See Fig. 3).

5. Findings and discussion

During the field experiment, a total of 228 bikers were asked to participate in the survey. Of these, 206 accepted to participate, which implies a response rate of above 90 per cent. After excluding two surveys filled out by respondents under 18 years, a total of 204 responses entered the analysis stage.

The distribution of survey participants was as follows: 120 (59 per cent) were in the baseline condition and 84 (41 per cent) were in the treatment condition. Regarding the profile of the mountain bikers, 36 per cent were female and 64 per cent male, with an average age of 44 years (Min = 21; Max = 76). Most participants were in the middle to upper income class. While no coherent profiling of mountain bikers in Sweden exists, these demographics are in line with mountain biker characteristics found in other studies (IMBA, 2015; Symmonds et al., 2000; Zajc & Berzelak, 2016), except that there is a slightly higher proportion of females. In terms of visitor type, 99 per cent of respondents lived in Sweden, but over half of them stated that this was the first time they visited Rörbäcksnäs. Only 15 per cent biked more than two times per year on the trails. The distribution of day visitors (48 per cent) and overnight visitors to the destination (36 per cent) was fairly even. Most day visitors came from the same municipality but none of the participants lived in Rörbäcksnäs. Only 7 per cent of all visitors stayed overnight in the village. This confirmed that visitors primarily came for

Baseline (No social information)	All work on the trails is done voluntarily. If you want to help – make a contribution. Visit once – contribute twenty. Cycle often – contribute one hundred and ride with good conscience all summer long. Everything is reinvested in the trails. Have a nice bike ride. Greetings, Rörbäcksnäs sports club.
Treatment (High social information)	All work on the trails is done voluntarily. You and everyone else who mountain bikes are important to make this possible! Thanks to your contribution, we can together enjoy MTB experiences in Rörbäcksnäs unique trail system! In recent weeks, 70 per cent of visitors contributed on average 110kr/person*. Everything is reinvested in the trails. Have a nice bike ride. Greetings, Rörbäcksnäs sports club. *Results from a study in collaboration with Dalarna University

Fig. 3. Messages accompanying the Karma account.

the MTB trails and did not use them frequently. The majority of visitors came by car and in 93 per cent of cases travelled with at least one other mountain biker in the same vehicle to Rörbäcksnäs. Table 1 provides descriptive statistics divided by baseline and treatment conditions.

5.1. Result 1: donation behaviour was affected by the normative message

Table 2 shows the share of respondents donating in the baseline and treatment conditions. The results show that 55.8 per cent of bikers gave a donation (any amount) in the baseline condition, which is a lower share than during the first week of the pre-study. However, this share increased to 72.6 per cent in the treatment condition. Comparing the behaviour in baseline and treatment using a chi-square test indicates that the difference between the share of bikers giving a donation (any amount) is significant, which demonstrates that the normative message had an effect on the donation behaviour. More so, the share of donors after the intervention was higher than the displayed norm of 70 per cent.

Table 3 shows an analysis of donation amounts during baseline and treatment. The amount increased from an average of 64.71 SEK to an average of 91.33 SEK (see Table 3).

5.2. Results 2: beliefs about others drive behaviour

Since (unlike in many other situations) individuals in this study setting cannot directly observe how others behave, we tested whether the provision of normative information would drive their behaviour accordingly. Table 4 shows the results of a logistic regression model explaining the decision to give a donation as a discrete yes/no decision. As shown in the model, the effect of the treatment is positively significant at a 10 per cent level of significance, even after controlling for other variables that might influence the behaviour.

The results show that the empirical belief seems to be a key driver for donation behaviour; that is, the higher the belief about the share of donors the higher the likelihood that one donates. The average empirical belief in the baseline condition was that 40.75 per cent of mountain bikers donated as opposed to 51.98 per cent in the treatment condition (Table 1). The most common answer changed as expected to 70 per cent, the norm displayed in the treatment message. While these results indicate that some ambiguity exists about the donation behaviour of others, the treatment had a positive effect on their empirical beliefs.

The variable capturing personal norm is significant and adds positively to the likelihood of giving a donation. With regard to the associated survey question, 68 per cent of the respondents largely or strongly agreed, and 26 per cent partially agreed with the statement that they contributed out of their own personal values, regardless of whether others donated (M = 4.1; SD = 1.0). This indicates strong personal norms in favour of donating.

Furthermore, 'kilometres biked' emerged as a highly significant variable, meaning the longer the distance participants biked, the higher the likelihood that they donated.

Looking at the other explanatory variables, the socio-demographic variables, gender and age do not contribute significantly to the likelihood of giving a donation.

Table 2 Share donating in baseline and treatment conditions.

		Baseline	Treatment	Total
Donated	<i>No count</i>	53	23	76
	<i>%</i>	44.2%	27.4%	37.3%
	<i>Yes count</i>	67	61	128
	<i>%</i>	55.8%	72.6%	62.7%
Total		120	84	204

Pearsons Chi-Square 5,956, df, significance (2-sided) = 0.015, Fisher's exact test = 0.018 (2-sided).

Table 3 Average amount donating in baseline and treatment conditions in SEK.

	Baseline	Treatment
Average amount Donated (Std)	64.71 (85.352)	91.33 (90.497)

Table 4 Model to explain donation behaviour (dummy variable 1 = Yes 0 = No, logistic regression).

Variable	Logit estimates	
	Coefficient	Std. Dev.
Age	0.013	0.017
Beliefs about others	0.042***	0.008
Gender	-0.441	0.383
High own values	0.697*	0.378
Km MTB/day	0.56***	0.021
Treatment	0.635*	0.380
Constant	-3.328***	0.993
N = 204,		
Log L. -186.277,		
Nagelkerke R ² . 0.378		

*, ** and *** indicate significance at the ten, five and one percent levels, respectively.

5.3. Discussion

Based on the finding of this research, we have reason to believe that provision of social norms related to donations for MTB trails encourages mountain bikers to donate. Considering the notably high proportion of donors after the intervention and the strong personal norms in favour of donating, it seems that the normative message appeals to conditional contributors while not deterring those that already endorsed donations. This is in line with findings on social norm intervention in other pro-social contexts (Shang & Croson, 2009; Testa et al., 2018).

The results found in this study are notably similar to those of Heldt (2005), despite the different recreational and temporal context. In both cases, being a tourist exposed to the treatment increases the probability of donating, which supports literature that argues that ambiguity about local norms rather than free-riding behaviour may commonly be the reason for a lack of engagement in pro-social behaviour of tourists (Bimonte, 2008).

While our results support the thesis that normative information increase conformity (Goldstein et al., 2008; Heldt, 2005), they also show that not all people seem to follow social norms equally (Frey & Meier, 2004). A significant share of participants with low empirical beliefs donated in the baseline and the treatment condition. Therefore, empirical beliefs about others do not appear to be an influential condition for all participants. The assumption that the level of conditional cooperation varies between people is also indicated in the results concerned with the donation amounts, which showed that the most common contribution amount was the same (100 SEK) and none of the participants contributed the displayed norm of 110SEK. While the treatment condition revealed a higher average amount than the baseline, we cannot confirm that the provision of descriptive reference amounts increase the size of the contribution accordingly, as suggested in prior research (Alpizar et al., 2008).

As also indicated in existing literature, the variability in conditional cooperation in this study may be linked to existing personal norms of participants (Frey & Meier, 2004; Schwartz, 1977). Our results show that participants held strong personal norms in favour of donating and that these formed significant drivers of donation behaviour. Personal norms are fairly stable (Schwartz, 1977) and people who hold strong personal norms are less easily swayed by social norm interventions (Bicchieri & Xiao, 2009). Accordingly, our results may suggest that the significant share of mountain bikers with strong personal norms would

donate regardless of their empirical norm belief and not reduce or increase their donations according to the descriptive donation amount. Rather than changing their donation behaviour, the donation message may have converted their latent attitudes to salient ones and acted as a reminder about their moral obligations to donate.

As postulated by Equity Theory and literature on reciprocity, people tend to feel obliged to repay others for what they have received from them, if the relationship between input and output is perceived as fair (Adams, 1965; Ariely et al., 2009). Our results show that the distance participants biked on the trails influenced their decision to donate and that participants were overall highly satisfied with the MTB trails in Rörbäcksnäs. Considering that the donation message clearly stated that all donations would be reinvested in the trails, this suggests that individuals felt a need or desire to repay the sports association for the work they do to provide and maintain the trails for them, particularly when they used them to bike a long distance. While prior research on equity-informed interventions has evidenced that offering hotel guests monetary rewards motivates them to engage in the desired behaviour (Dolnicar et al., 2019), our findings may add that tourists also feel more inclined to repay providers when they are offered with the possibility and experienced their input positively. In view of the positive treatment effect, it can be assumed that awareness of both the frequency and level of others' contribution further heightened tourists' capacity to assess the fairness in the relationship between inputs and outputs and to reduce uncertainty. In other words, bikers were assured that their donations would be effective in maintaining the trails for their own and collective benefit, thereby increasing behavioural control (Ajzen, 2012).

Lastly, existing research shows that anticipated emotions like guilt are influential in a person's intention to behave in line with their norms (Onwezen et al., 2013). Mountain bikers are often considered as a community that values the sociability of biking and shared trails use (Taylor, 2010). This suggests that they feel socially closer to fellow tourists and providers than tourists in more commercial settings like hotels may do, and have a higher level of ascription of responsibility, as also indicated in our survey results. Providing bikers with the possibility to donate and a founded belief that others in close social and spatial proximity contribute is likely to motivate them to donate in order to avoid feelings of guilt and possibly add to their biking experience (Agerström et al., 2016; Goldstein et al., 2008; Onwezen et al., 2013).

5.4. Implications and recommendations for future research

Our findings indicate that social norm interventions can be used by local stakeholders in recreational settings to effectively increase funding for recreational trails and facilities. Implementation of such interventions only requires small changes and resources. However, as our results and previous studies have shown, stakeholders need to ensure a certain understanding of current attitudes and behaviour to develop them in an effective and non-deceptive manner (Alpizar et al., 2008; Heldt, 2005). Furthermore, monitoring and necessary adjustment are required, as norms and expectations surrounding nature recreation inevitably change.

The combination of different social information and framing in the donation message appeared to be a suitable approach to increase funding in this setting. However, the intervention design limited our possibility to assess the influence of the different norms and the applicability of the different behavioural theories individually. It would be worthwhile assessing the influence of descriptive and injunctive norms, and specific theory informed framing separately. Given that the impact of suggested donation amounts is inconclusive in the present and prior research (Alpizar et al., 2008; Shang & Croson, 2009), particularly the appropriate level of suggested donations should be studied more to increase the total amount of funding.

Further investigation is also required to assess, in depth, the relationship between personal norms and empirical and normative beliefs. We found that the influence of personal norms played a more significant

role than other behavioural studies in tourism suggest (Dolnicar et al., 2017, 2019). One contextual factor that may have influenced this is that predominantly domestic visitors participated, due to international travel restrictions associated with the COVID-19 pandemic. Presuming that Swedish residents are more familiar with the principles of the *Allemansrätt*, it is likely that a more diverse composition of trail users would come with different normative expectations related to trail use and funding. Studying the personal norms on a more detailed level and comparing these among different user groups and over time could provide valuable insights to design more targeted interventions. Further consideration of practical aspects such as international payment options and the language of the messages is also required when visitor profiles are more diverse.

Close to 25 per cent of participants were unaware of the possibility to donate, and more than half of them reported that they would contribute had they been aware. Thus, additional effort should be put into improving the visibility of the donation message. This could be done by increasing the number of signs at different locations and using different channels such as social media. In relation to this, we found that a surprisingly low number of respondents in the treatment condition stated the descriptive norm we displayed. Studying not only the awareness but also the active processing of the information is another aspect that deserves more attention.

As we found that 'kilometres biked' form a significant driver in donation behaviour, it would be beneficial to investigate activity-related aspects and their influence on donation behaviour in different recreational contexts. This may enable local stakeholders to set prices or donation suggestions according to the specific activity and participation level.

Additionally, our study revealed that most mountain bikers travel in groups. Whilst the donations are not a public behaviour per se, it is likely that norms within the groups influenced the decision to donate as well as the donation amount. Moreover, trail users may have contributed for family or friends that accompanied them. Examining the social influence within groups and the differences between individual and group donations would be of interest to gain more insights into donation behaviour.

Lastly, the present study, as well as the study by Heldt (2005), measured stated donation behaviour as opposed to actual behaviour, meaning that social desirability bias may have influenced the results. Also considering that field experimental designs have limitations concerning internal validity, further field experiments should be conducted to test and verify the influence of social norms on donation behaviour in different tourism contexts.

6. Concluding remarks

In this paper, we have reported on a field experiment testing a normative message intervention. We found that the introduced social information targeting the beliefs associated with donations for MTB trails encourage higher donation rates. We also found that trail users donated more, on average, after they were provided with social information. This is consistent with our prediction and findings of previous research. While engagement in this form of pro-social behaviour seems to be conditional upon the behaviour of others to a certain extent, our research revealed that mountain bikers already held strong personal norms in favour of donations and that these form significant drivers in donation behaviour. The existing support, appropriate donation amounts and the extent to which collected funds can cover the costs incurred on the local area varies between destinations. However, taken together, our findings imply that normative messages can provide effective strategies to boost pro-social behaviour in a context where a certain level of social support towards the need to raise funding already exists. As non-costly, locally based, and freedom-preserving policies, normative interventions can easily be implemented by those involved in the management of recreational nature trails in such contexts.

To our knowledge, this is only the second study to test normative

interventions in a recreational, rather than conservation-oriented public good context, and the first to do so informed by a range of behavioural theories. We hope that further studies investigate the effects of normative information on pro-social behaviour in recreation and tourism, with insights from behavioural theories and models. Future investigations should extend the so-far-limited field studies in this body of work.

CRediT authorship statement

Tobias Heldt: Conceptualisation, Methodology, Formal Analysis, Writing – review & editing; **Marie Nowak:** Conceptualisation, Methodology, Investigation, Writing - original draft, Writing – review & editing.

Funding

Funding was provided by European Regional Development Fund, sub-project INNature, Innovative business models to fund recreational

nature-based trails using Gamification and Nudge as part of Visit Dalarna AB umbrella project: Sustainable and digital service innovation in hospitality industry in Dalarna (“Hållbar och Digital tjänsteinnovation i besöksnäringen i Dalarna”)

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The authors thank Sofia Smolle for detailed and valuable feedback that has improved the manuscript. We would also like to thank the Rörbäcksnäs community and especially Sam Risander, Coompanion Dalarna, for facilitating the field work.

Appendix 1. Donation messages accompanying the Karma account



Fig. 4. Baseline message

KarmaKontot

Allt arbete på lederna gör ideellt

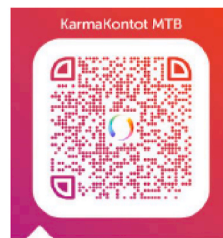
Du och alla som cyklar MTB är viktiga för att det ska vara möjligt!
Tack vare ditt bidrag kan vi tillsammans njuta av MTB upplevelser i
Rörbäcksnäs unika ledssystem!

Senaste veckorna bidrog 70% av besökarna*

Allt återinvesteras i lederna

Ha en skön cykeltur

Swish nr: 1234 170 593



Swish. Betalningslösning.

Med vänlig hälsning

Rörbäcksnäs idrottsällskap

Rörbäcksnäs MTB



*resultat från en studie i samarbete med Högskolan Dalarna

Fig. 5. Treatment message

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