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Testing the effectiveness of increased frequency of norm-nudges in encouraging sustainable tourist behaviour: a field experiment using actual and self-reported behavioural data

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ABSTRACT

Norm-nudges are effective in encouraging sustainable consumer behaviour in various settings, by raising the salience of the target behaviour *via* social norms. Tourism presents a highly hedonic context, in which behaviour is primarily framed by self-oriented goals as opposed to normative ones related to the good of the environment and society. While the existing literature provides insights on the appropriate content of norm-nudges to raise the salience of normative goals, less is known about an appropriate frequency of nudges. It is important to address this gap in tourism because tourists need to be aware of desired sustainable behaviours, while overly obtrusive nudges may backfire. A field experiment was conducted to test the extent to which an increased frequency of norm-nudges has a backfiring effect on sustainable tourist behaviour, using donations for mountain-biking trails as the target behaviour. Results show that increasing the frequency of norm-nudges does not diminish their positive uptake, which suggests that they can be used more to encourage sustainable behaviour and enhance tourists' experiences. Using actual and self-reported behavioural data, this study provides new empirical evidence on the effectiveness of increased frequency of norm-nudges in a real tourism setting, contributing to knowledge on norm-nudges and backfiring effects.

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Introduction

The sustainable development of tourism destinations requires effort by all stakeholders. What remains elusive, however, is how to encourage tourists to engage in behaviours that contribute to the long-term social, environmental, and economic well-being of destinations (Juvan & Dolnicar, 2014). In recent years, behavioural interventions that propose positive reinforcement and indirect suggestions to influence behaviour have gained increasing attention in the field of sustainable consumer behaviour (Dolnicar, 2020; Lehner et al., 2016). These so-called nudges generally take the form of design changes or messages that target the salience of the given sustainability issue and associated behaviour. That is, they draw attention to the behaviour or aspects that drive the behaviour and make it important to individuals (Noggle, 2018; Thaler & Sunstein, 2008). One way to achieve this is through “norm-nudges” that imply the social norms

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of the desired behaviour (Bicchieri & Dimant, 2022). In tourism, providing an indication of what is accepted and how others behave in the given context appears particularly significant. Not only are tourists unfamiliar with the local environment, but their behaviour is also predominantly framed by hedonic goals rather than normative ones related to the good of others and the environment (Juvan & Dolnicar, 2014; Lindenberg, 2012). While promising in engendering sustainable tourist behaviour, the effectiveness of norm-nudges varies between contexts. In some instances, norm-nudges have proven to be ineffective or even to backfire, leading to undesirable or opposite effects to what was intended (Bicchieri & Dimant, 2022).

It remains unclear under which conditions norm-nudges work, particularly in tourism (Hummel & Maedche, 2019). Existing studies in the field have primarily investigated how the content of norm-nudges influences their effectiveness; for instance, regarding towel reuse (Goldstein et al., 2008), and soliciting donations for national parks (Alpizar et al., 2008) and cross-country skiing tracks (Heldt, 2005). These studies confirm that social norms based on the local context along with the credibility of the nudge message are influential aspects in encouraging the desired behaviour (Bicchieri & Dimant, 2022). Individuals also need to be sufficiently aware and reminded of the nudge to enable positive uptake among a large share of the target population. Yet, the literature shows that tourism providers often consciously limit their sustainability appeals out of fear that these might induce guilt and reactance among consumers, which could negatively impact their tourism experience (Ettinger et al., 2021; Font et al., 2017). However, studies have not addressed whether sustainability-oriented norm-nudges backfire in tourism contexts when their frequency is increased.

Given the significance of tourists' contribution to sustainable destination development and the potential of norm-nudges to encourage more sustainable behaviours, it is relevant to address this gap. Accordingly, the present study investigates the extent to which an increased frequency of norm-nudges has a backfiring effect on sustainable tourist behaviour. Considering that the aim of this research is to unobtrusively measure the effects of different treatments on behaviour, the lack of field experiments in tourism, and the study's practical significance, a field experimental approach is taken (Viglia & Dolnicar, 2020). The target behaviour used to explore this is visitors' donations for mountain biking (MTB) trails in Sweden. The research contributes to the literature by providing an improved understanding of the backfiring effects of norm-nudges in the underexplored context of tourism. This also adds to our theoretical understanding of the drivers and barriers to sustainable tourist behaviour. The practical implications concern more effective behavioural intervention design at destinations, contributing to their sustainable development and positive tourist experiences. The remainder of the paper is structured as follows. First, it reviews the literature on consumer behaviour in tourism and goal-framing theory, to provide an understanding of the conflict between hedonic tourism consumption and sustainable behaviour. It then discusses how norm-nudges may help to address this conflict, followed by possible reasons for backfiring effects. Following this and an introduction of the case, the experimental design for this study is outlined. Next, the results are presented and discussed. The paper concludes with the theoretical and practical implications of the study and avenues for future research.

References review

Consumer behaviour in tourism

Tourist behaviour is distinct from other consumer behaviour in the sense that it is a hedonic-driven behaviour outside one's usual home environment, undertaken with the primary purpose of obtaining positive experiences (Gnoth, 1997; Juvan et al., 2017). Prior research suggests that this focus on satisfying the self, along with unfamiliarity with the local environment, presents

specific challenges to encouraging sustainable behaviour among tourists (Juvan & Dolnicar, 2014; Miao & Wei, 2013). Various models have been developed and applied to explain tourist behaviour (Cohen et al., 2014; Juvan et al., 2017). Central to many of these models, and important for understanding the possible conflict between hedonic tourism consumption and sustainable behaviour, is the relationship among goals, values, and norms of tourism consumers.

Goals or motives understood as “lasting dispositions” that emerge when stimulated by needs or wants, act as the main criteria for expectations when individuals engage in a behaviour and are fundamental for assessing the experiential values obtained from the resulting experience (Holbrook, 1999; Lindenberg, 2000). While experiential values depend on the situation and a person’s goals therein, they derive their importance from satisfying more stable, higher-order personal values (Crick-Furman & Prentice, 2000). Personal values can be understood as positive or negative ideals about desirable end-states of behaviours that transcend situations (Schwartz, 1977). Closely related to personal values are personal and social norms. Personal norms reflect internalised personal values and are experienced as moral obligations to perform certain behaviours (Schwartz, 1977). Social norms are antecedents to personal norms and refer to what one perceives to be common behaviour (descriptive norms) or expected behaviour (injunctive norms) (Bicchieri & Dimant, 2022; Cialdini, 2009). When activated, norms drive behaviour because of peoples’ internal desire to fit in and be accepted (Cialdini, 2009) or to act in line with one’s moral standards (Festinger, 1975).

While theoretical research on tourist behaviour states that tourists have multiple and dynamic goals, one of which may be to act in line with one’s norms, it is widely recognised that the main purpose of tourism consumption is to obtain hedonic experiential value (Crick-Furman & Prentice, 2000; Malone et al., 2014). As a commonly accepted characteristic motivator within tourism for experiencing enjoyment, escapism is often directly linked with hedonism (Sánchez-Fernández et al., 2020). Specifically, motivated by escapism, consumers seek to obtain intrinsic value from a state of escape from everyday responsibilities and problems in their touristic activities (Mannell & Iso-Ahola, 1987).

Another value dimension, which does not appear so obviously in the scope of tourism consumption, is ethics (Sánchez-Fernández et al., 2020). Ethical motives guide behaviour that entails concern for how one’s own consumption affects others and are therefore highly relevant to sustainable behaviour (Font & McCabe, 2017). However, the link between ethical and hedonic or escape values has been largely underexplored in general tourism contexts (Gallarza et al., 2022). An exception is a study by Sánchez-Fernández et al. (2020), which provides some support for a positive linkage between escapism and ethics in a hospitality setting. Their results show that the higher the perceived opportunities to escape during the tourist’s hospitality experience, the more likely it is that they will believe in the provider’s ethical behaviour, which in turn affects consumer satisfaction. However, this does not address whether consumers desire ethical value in their experiences, whether they derive value from ethical behaviour enacted by them, and whether there are positive linkages between hedonism and ethics.

There is strong support for the argument that hedonic goals often hinder tourists’ engagement in sustainable behaviours, even among those that hold sustainability norms and engage in sustainable consumption behaviour at home (Juvan & Dolnicar, 2014; Miao & Wei, 2013). Linked back to the contextual nature of goals, this finding suggests that although a person might be motivated by sustainability-related goals at home, and derive value from enacting sustainable behaviour, they might not be motivated and derive the same value when on holiday.

Goal-framing theory

An influential theory that explains how goals are framed and influence behaviour in different contexts is goal-framing theory (GFT) (Lindenberg, 2012). GFT proposes that people’s information

processing and behaviour are modularly organised, based on normative, gain and hedonic goals (Lindenberg, 2000, 2012). The hedonic goal-frame stimulates focus on pleasurable experiences and avoiding negative emotions. Similarly focused on individual interest is the gain goal-frame, which relates to personal benefits and resources. The normative goal-frame posits that individuals behave in line with social norms and moral standards. The goal that is focal for an individual can dominate several subgoals and change what preferences are salient, what one attends to, what knowledge one draws on, and how one defines goal achievement (Lindenberg, 2012).

Some recent survey and qualitative studies have applied the GFT in tourism, mostly with regard to pro-environmental behaviour in hospitality (Liu et al., 2022; Rodriguez-Sanchez et al., 2020; Shin & Kang, 2021). Existing research shows that the normative goal-frame is the most influential in sustainable behaviour, but generally also the lowest in salience (Lindenberg & Steg, 2007; Shin & Kang, 2021). This means that other goals, especially those of the hedonic frame, override normative ones if these goals are not compatible (Lindenberg, 2012). Given that tourism is marked by hedonic goals and presents a time for people to escape their daily obligations, while sustainable behaviours are often associated with everyday responsibilities and personal sacrifices, it appears to be particularly problematic to achieve this compatibility in tourism (Miao & Wei, 2013).

Having said this, GFT also proposes that, at any given time, normative goals operate in the background and can be strengthened or made compatible with hedonic goals to raise their salience and influence sustainable behaviour (Lindenberg & Papies, 2019). Existing research indicates that, to increase the salience of normative goals, individuals need to be aware of the sustainability issue, believe that their engagement will matter and that others also engage (Bicchieri et al., 2021; De Groot & Steg, 2009). The deliberate placement of cues in the environment, so-called nudges, can help to convey these information and trigger normative frames (Lindenberg, 2000).

Norm-nudges

Given that appealing solely to tourists' personal responsibility has largely been unsuccessful in encouraging sustainable behaviour, social norm-nudges (simply norm-nudges), have received increasing attention in the field (Dolnicar, 2020; Goldstein et al., 2008; Kallbekken & Sælen, 2013). Norm-nudges are defined as nudges "relying on eliciting social expectations with the intent of inducing desirable behaviour, under the assumption that individual preferences for performing the targeted behaviour are conditional on social expectations" (Bicchieri & Dimant, 2022, p.2). To elicit social expectations, norm-nudges may provide descriptive information that most people engage in the desired behaviour and/or injunctive information that not engaging is disapproved of, generally *via* written messages. While the literature suggests that the type of normative information presented has a different influence on behaviour (Schultz et al., 2007), behaviour is in many cases conditional on both, descriptive and injunctive influence. Particularly in cases where collective action is required, it is important that information on what ought to be done is supported by evidence of congruent behaviour (Bicchieri & Dimant, 2022). Norm-nudges are thus applicable when aiming to encourage sustainable behaviours in tourism since tourists often have a limited understanding of sustainability issues and local norms at destinations (Miller et al., 2010).

Laboratory and field studies involving norm-nudges have evidenced that the behaviour of most people is conditional upon the (perceived) expectations and behaviour of others, also in tourism contexts (Fischbacher et al., 2001; Goldstein et al., 2008; Heldt, 2005). In a hotel setting, Goldstein et al. (2008) and Mair and Bergin-Seers (2010) for instance found that informing guests how many other guests have reused their towels can increase towel reuse. Kallbekken and Sælen (2013) furthermore showed that providing hotel guests with social cues that it is

acceptable to go back to the buffet repeatedly prevents food waste. However, to the best of our knowledge, none of the existing studies on the effect of norm-nudges has applied GFT as a framework and their research contexts are mostly limited to pro-environmental behaviour in hospitality (Souza-Neto et al., 2022). Only a few researchers have experimentally tested the potential of norm-nudges with regard to donations to public goods in a tourism or recreation context. Alpizar et al.'s field experiment (2008) demonstrated positive effects of social information on the amount visitors donated to a national park. Heldt (2005) evidenced a similar effect in his field experiment, where skiers were more likely to contribute financially to cross-country tracks when they received the information that many others contributed. While these studies show promising results for norm-nudges in sustainable tourist behaviour, others point to challenges associated with such interventions (Hardeman et al., 2017; Osman, 2020). These studies emphasise that norm-nudges need to be developed with a refined approach in terms of the message content, as well as their frequency according to the given context. Otherwise, such interventions risk failing, either by producing only partial success, having no net effect, or even backfiring (Bicchieri & Dimant, 2022).

Backfiring

Backfiring means that the intervention effect is opposite to the intended effect (Brough et al., 2020). Understanding the contextual and psychological factors that lead to backfiring effects of norm-nudges is critical to prevent unintended outcomes. However, research on this topic is limited, especially in tourism (Bicchieri & Dimant, 2022; Brough et al., 2020). One closely related psychological term that has been studied in relation to persuasive messages more generally is reactance (Font & Hindley, 2017; Richter et al., 2018). Reactance is used to describe an unpleasant motivational reaction to persuasion, due to perceived threats to one's freedom of choice. This may cause the individual to develop an attitude contrary to what was intended and increase resistance to persuasion to restore freedom (Brehm, 1966). Reactance has been reported in diverse behavioural interventions (Osman, 2020), and in tourism primarily related to pro-environmental messages (Hardeman et al., 2017; Wang et al., 2017). Existing research highlights several socio-psychological factors that may spur reactance.

Regarding environmental awareness-raising campaigns, Font and Hindley (2017) suggested that interventions induce reactance among tourists when the desired behaviour is perceived as a threat to the status quo; that is, hedonistic holiday choices. Therefore, to increase their effectiveness, interventions should complement expected self-interest benefits and norms, such as by framing the benefits of sustainable behaviour in relation to the attributes tourists seek in their experiences (Font & Hindley, 2017). Kronrod et al. (2012) also highlighted that if the perceived importance of the sustainability issue for individuals is low, they may see assertive messages as coercion rather than encouragement, while the opposite occurs when perceived importance is high. Concerning social norms, the literature indicates that the effectiveness of interventions depends particularly on pointing to examples of positive behaviour and using reference groups that the target group feels similar to, such as fellow tourists at the destination (Bicchieri & Dimant, 2022; Hardeman et al., 2017). Another factor that may spur reactance is an inadequate effort by the communicator in contributing to the cause, as perceived by the recipient. In turn, if consumers view the organisation's sustainability efforts as credible, this engenders a sense of obligation to do their part (Wang et al., 2017). This reinforces that perceived social norms are important, regarding the contributions that both fellow tourists and providers make.

A further factor that has not been explored in tourism so far is nudge frequency. In a humanitarian donation context, Damgaard and Gravert (2018) found that individuals receive benefits of warm-glow from donating, but also incur an annoyance cost every time they receive a reminder to donate. Whilst frequent reminders increased contributions by bringing the

donation possibility to recipients' attention, they increased the psychological costs and consequent dropouts by a similar degree. However, the authors focused on a standard solicitation email rather than norm-nudges, thus considering less how the nudge content influenced donation behaviour.

Evidently, the effectiveness of nudges in tourism depends on the existing norms that individuals hold towards the issue, the perceived credibility of the message, and the extent to which it highlights the benefits of behaviour change for their experience. In cases where these aspects are considered in the message design and a lack of engagement may be attributed to low norm salience, the questions remain as to what degree a higher frequency of norm-nudges encourages higher engagement, or whether sustainability-oriented norm-nudges at some point interfere with tourists' primary hedonic goals and backfire. Existing studies on the appropriate level of sustainability communication in tourism have not focused on norm-nudges and their frequency specifically. However, they do indicate that tourism providers often deliberately under-communicate their sustainability efforts precisely because of the fear that this interferes with the customers' experience. In the context of environmental sustainability, this is often referred to as "greenhushing" and stifles sustainable behaviour among consumers (Ettinger et al., 2021; Font et al., 2017).

Considering that most failed interventions are not published, greater testing of the ways in which norm-nudges may backfire in different settings is necessary to determine how these could be optimised (Brough et al., 2020).

Methodology

Research context

The effect of increased frequency of norm-nudges on sustainable tourist behaviour was tested in the MTB destination Rörbäcksnäs in Sweden. Sweden presents a country where coherent funding mechanisms for infrastructure in nature areas are lacking, largely due to the legal and political conditions associated with the right of public access. These pose barriers to the implementation of fiscal policies, such as entrance fees. While the right of public access is widely supported by the public, as it allows visitors to freely pursue activities in nature, the lack of funding hinders the development of trails and facilities necessary to make nature areas available for tourism consumption and to enable socio-economic diversification in rural communities (Fredman et al., 2012).

Rörbäcksnäs is a small community in Dalarna County, which has received rising numbers of MTB tourists over the last decade and is now considered to be one of Sweden's main MTB hubs. Driven by local MTB enthusiasts and the non-profit sports association Rörbäcksnäs Idrottssällskap, the management of the nine marked trails at the destination is done on a voluntary basis. To fund material for the trails, the sports association collects donations from bikers via Swish (Swedish mobile payment system) in a "Karma account". A signpost at the main trailhead invites visitors to donate via a Swish QR code for the Karma account and provides basic information about the use of donations. The message also emphasizes the importance of individual contributions to achieve the collective goal of maintaining the trails and includes an average donation amount and share of donators (descriptive norms) based on the preceding season's numbers. Nowak and Heldt (2023) found in a previous experiment in Rörbäcksnäs that the norm-nudge seems to have a positive effect on the donation amount and the share of donators compared to a message without social information. However, awareness of the message provides potential for development: Approximately, one-quarter of bikers are currently unaware of the possibility to donate, and over half of these reported that they would contribute had they known about the possibility (Nowak & Heldt, 2023).

While it is important to increase donations for the continued development of the destination, local stakeholders are concerned that visitors become annoyed by the messages if they become

increasingly frequent. Stakeholders fear that this could reflect negatively on Rörbäcksnäs’ uncommercialized image, which differentiates it from larger MTB destinations in the region. Thus, a dilemma seems to exist between the need to persuade bikers to donate and the need to preserve their undisturbed MTB experience in Rörbäcksnäs.

The nature of the destination and the right of public access are contextual conditions that may impact the effect of norm-nudges in Rörbäcksnäs. Nevertheless, Rörbäcksnäs presents a tourism setting that involves a conflict between hedonic tourism consumption and sustainable behaviour. This makes it a suitable case in view of the overall research aim to study the impact that an increased frequency of norm-nudges has on sustainable tourist behaviour.

Following the above, we conducted a field experiment with two treatments to test to what extent an increased frequency of donation signs has a backfiring effect on donation behaviour. Our hypothesis was that the share of mountain bikers who donate increases as the frequency of donation signs increases in Treatment 1. We also hypothesize that the share of donors remains the same/declines as this increased further in Treatment 2

Experimental design

The field experiment was carried out over 68 days during the MTB high season (June–September) 2021. Prior to that, meetings with local MTB stakeholders were conducted to determine their goals and concerns regarding the funding of trails in Rörbäcksnäs and to define the most suitable research instruments and timing for the experiment. It was jointly decided to collect three types of data.

- a. Bike counter data, to measure the total number of bikers on the trails/day.
- b. Donation data from the payment system Swish to measure the total amount donated/day.
- c. Survey data to get visitor characteristics and allow for creating a model to explain donation behaviour.

The field experiment is involved three conditions: Baseline (25 days), Treatment 1 (T1, 18 days), and Treatment 2 (T2, 24 days). [Table 1](#) shows the wording and frequency of donation signs in each condition ([Appendix 1](#)).

Table 1. Experimental conditions.

		Donation sign (Large)	Donation sign (Small)	Total number of signs
Donation sign message		KarmaKontot All work on the trails is non-profit. You, along with all other mountain bikers, are important to make this possible! Thanks to your contribution, we can enjoy MTB experiences in Rörbäcksnäs’ unique trail system together! Last season, two out of three visitors contributed an average of SEK 78/ €7 per person. Everything is reinvested in the trails. Have a nice ride. *Swish QR code* With kind regards Rörbäcksnäs sports club	KarmaKontot We hope you are enjoying your MTB experience here in Rörbäcksnäs! *Swish QR code* Last season, two out of three visitors contributed an average of SEK 78/ €7 per person. Everything is reinvested in the trails. With kind regards Rörbäcksnäs sports club	
Donation sign frequency	Baseline	x1		1
	T1	x3		3
	T2	x3	x3	6

The purpose of the baseline was to measure current donation behaviour and bikers' perceptions of the donation message, with one existing sign at the main trailhead. For T1, two additional signs with the same message and size were added at two other trailheads. For T2, the number of signs was increased further by adding three smaller signs along the trails. The number and location of signs were decided upon in collaboration with the stakeholders and with consideration of the main places bikers might stop or slow down. Based on insights from the stakeholders, field observation of visitors by the Authors during data collection, and the fact that the primary parking space is at the main trailhead, it can be assumed that most bikers passed the sign at the main trailhead, as well as one or both additional signs. The T2 message included the key elements of the norm nudge, namely the descriptive norms, the purpose of the donations and the name of the organisation. We decided to reduce the size and text of the T2 messages to allow bikers to process the message while passing them on the trails.

The main strength of the study is that it was carried out in a field setting studying actual behaviour. However, the research design also comes with limitations. Ideally, the baseline would have been implemented again after T2, to verify the treatment effect. Due to field conditions, such a design was not possible, without compromising the period for each condition. While including a survey question asking participants if they saw the signs, it was also not possible to do a manipulation check to verify that bikers spotted the signs and to test for information overload, where the volume of information presented may be greater than the ability of visitors to process it (McKercher & Prideaux, 2011).

Further, some participants may have been exposed to more than one condition, since tracking individual participants was not possible. However, considering that most bikers across conditions visited either for the first time or no more than 1–2 times per year, the likelihood of this happening is low. Lastly, ideally, a higher number of signs would have been chosen for T2. Concerns among local stakeholders that the signs would become overly “pushy”, and practical difficulties in adding them in time along the trails, hindered us from putting up more than six signs.

Research instruments – bike counter, Swish donations, and survey

A modern measurement device (EcoCounter Easy Zelt) was used to count the number of bikes in the area. The device was dug down in the ground at the main trailhead to capture the electromagnetic signature of each bicycle wheel. The use of a standard photoelectric counter was ruled out because this approach would also count non-bikers, such as joggers and wildlife passing by, while the EcoCounter Easy Zelt only captures bikers.

Thanks to the sports association we got access to visitors' actual donations to the Karma account. Due to GDPR, we could only get daily bank statements of the total amount coming in *via* Swish to the account. This was not a substantial problem for the field experiment since the analysis was not made on an individual but on an aggregate level.

The survey data was collected by two researchers on different days and times between 10 am and 5 pm throughout the field experiment. Visitors were approached after they had finished biking for the day, briefly informed about the research, and if they agreed to participate, given the choice to fill out the survey on paper or online. To minimise sampling bias, every third biker was selected to participate when possible. To reduce social image influences, participants filled out the surveys on their own while the researchers continued survey collection. Since field experiments occur in a natural setting to measure natural occurring behaviour of a natural pool of subjects, participants were not informed about the different treatments (Al-Ubaydli & List, 2019, p. 34). While participation in the survey may have impacted the donation behaviour of respondents, the same effect could have appeared throughout the three conditions. The survey included socio-demographic characteristics (age, gender, place of residence and income level), questions about their typical biking behaviour (kilometres biked, biking frequency) and

satisfaction with the trails. The survey also included an open-ended question where respondents could write their reasons for not donating if applicable, to filter out those that did not have Swish. While the donation signs were only available in Swedish, the results of the survey showed that all participants were Swedish speakers. The survey addressed different aspects related to the impact of increased norm-nudge frequency on donation behaviour; that is, whether participants donated and how much, and awareness/perception of the donation messages.

Personal norms and perceived social norms related to donating were also measured due to their previously evidenced importance in driving such behaviour (Heldt, 2005; Nowak & Heldt, 2023), and to assess their consistency across conditions. To assess personal norms, participants rated their agreement with four statements (De Groot & Steg, 2009; Han et al., 2015). Perceived social norms were measured in terms of the descriptive norm (how much percentage of mountain bikers they believed donated) and injunctive norm (whether they thought others expect them to donate, measured on a five-point scale) (Appendix 2). Awareness of the signs was assessed in a question asking participants whether they had seen the signs. To measure how bikers perceived the salience of the donation message, they were first asked to rate their perception of the number of signs on a scale from 1 (too few to be noticed) to 5 (far too many). Participants were then asked to rate how eye-catching, convincing, credible, and annoying the signs were. The aspects “credible” and “convincing” were included as factors that are likely to influence the uptake of the message across conditions (salience in terms of importance) (Kim & Kim, 2014; Scott et al., 2003). Assessing them was important to ensure that the content of the nudge itself was suitable, and that possible backfiring effects could be attributed to increased frequency rather than higher awareness of an (unconvincing and non-credible) message. The measures of the perceived number of signs, and how annoying they were, were directly related to the treatments (salience in terms of frequency). An increase in these variables was expected to drive a decrease or stagnation in donations at some point, specifically in T2.

Results

During the field experiment, the bike counter registered a total of 17 520 bikes and a total of 204 917 SEK (€18 389) was donated to the Karma account. Figure 1 displays the time series for the bike count data and donation data. The blue line shows the daily bike count and the yellow line the amount of daily donations. The two red bars indicate the dates on which T1 and T2 were introduced. As expected, the figure shows that there seems to be a correlation between the number of bikes and the donation amount.

Table 2 provides an overview of the total bike count and the total amount of donations for the three conditions. While the total bike count and donation amount are higher in the baseline condition, the average donation per bike is higher in T1 compared to the baseline, and higher in T2 than in T1. This suggests that the average donation per bike increased when the treatments were introduced.

Figure 2 displays the graph of the daily average for a donation per bike count. While there seems to be no significant change in the pattern after the introduction of T1, there is a clear change in the T2 condition, represented in the yellow area.

We used a one-way ANOVA to test if there was a difference between the three conditions. According to the results, we can reject the null hypothesis of equality between groups, and conclude that there is a significant difference between at least one pair of the data ($F(2,65)=17.39$, $p<.001$). In sum, the analysis of the actual donations and the counts of bikes shows that the average donation per bike increases when the number of signs is increased. There appears to be no immediate backfiring effect of the increased number of signs on average donation per

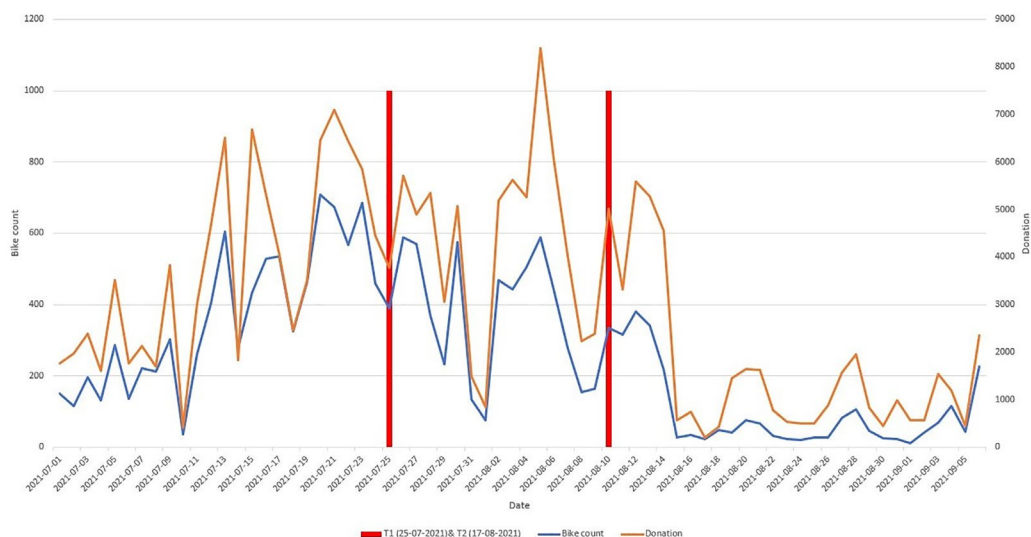


Figure 1. Donations and bike counts during the field experiment.

Table 2. Total of bike count, donations, and average donation/bike for the experiment conditions.

Conditions	Bike count, total	Donation total (€)	Average (donation/bike)
Baseline	9 102.0	8 362.4	0.9
T1	5 925.0	6 337.7	1.1
T2	2 493.0	3689.3	1.5
Total	17 520	18 389.4	1.1

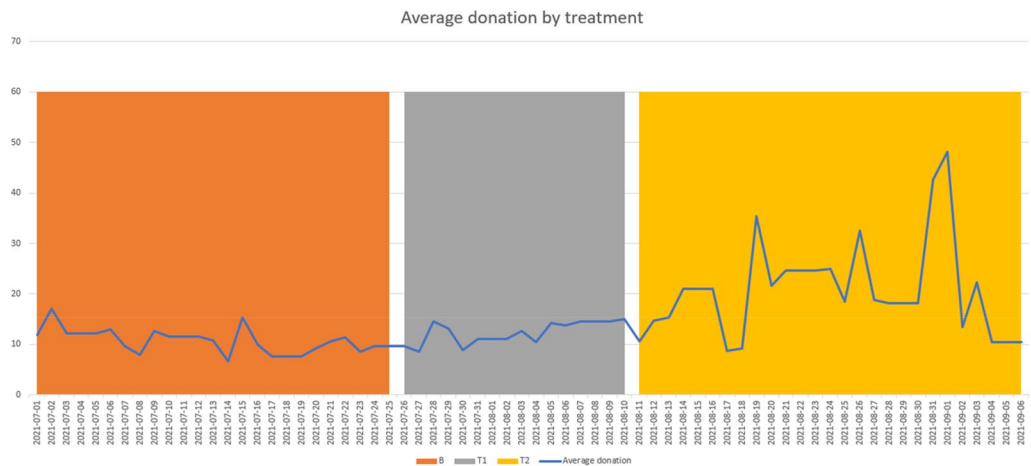


Figure 2. Average donation for each condition.

bike. To gain more insights into the treatment effects and visitors’ donations behaviour, the survey data was analysed.

Survey data analysis

A total of 246 valid surveys entered the analysis (*Baseline* $n=67$; *T1* $n=81$; *T2* $n=98$). The response rate was above 90 per cent. Most of the participants stayed overnight in nearby

accommodation and only 17 per cent stated that they biked in Rörbäcksnäs more than twice per year. This indicated that visitors travelled to the destination primarily to bike but did not use the trails frequently. None of the participants was from Rörbäcksnäs. Overall, bikers were highly satisfied with the quality of MTB trails in Rörbäcksnäs, rating them on average 4.5 out of 5 points. The descriptive characteristics of the sample are provided in Table 3. There was no significant difference in the characteristics across the conditions.

Previous research indicates that individuals in a hedonic goal-frame tend to be more strongly guided by pleasure-seeking than other-oriented motives (Lindenberg & Papies, 2019). As tourism presents a highly enjoyment- and escape-focused context, individuals partaking in touristic activities are likely to operate under this frame (Mannell & Iso-Ahola, 1987). Specifically, research on MTB has shown that bikers seek a sense of individualism and freedom from the stresses of everyday life in these activities (Dodson, 1996; Skår et al., 2008). While raising the salience of norms *via* nudges may encourage other-oriented, sustainable behaviour of tourists, it also appears likely that they might perceive this as interfering with their tourism experience. Thus, it was hypothesised that an increased frequency of norm-nudges might, at some point, become obtrusive to mountain bikers' tourism experiences. This was expected to be negatively reflected in their decision to follow the norm-nudge and donate in T2. However, the results of the field experiment did not evidence such a backfiring effect.

In the survey, mountain bikers' perception and awareness of the sign were assessed to confirm a link between the norm-nudges and the decision to donate. The measures concerned with the perceived credibility and convincingness of the message scored on average high across conditions (*credible* $m=4$; $SD\ 0.9$; *convincing* $m=3.5$; $SD = 0.9$). Thus, the content of the norm-nudge itself was deemed suitable for encouraging donations and for testing the nudge frequency instead as a possible deterrent.

Concerning awareness, 76 per cent of participants stated they saw the sign in the baseline compared to 71 per cent in T1 and 85 per cent in T2. A Chi-square test showed that there is a significant increase in awareness for T2 but not between the baseline and T1. While awareness of the signs was high, the number of signs was perceived as relatively low, with a mean score of 2.3 across conditions, which only increased minimally after the treatments. The scores concerned with how annoying participants perceived the message to be were also noticeably low ($m=1.5$), which increased insignificantly between conditions. On average, 76 per cent of participants stated that they donated for the day or for the season. The share of self-reported donators differed across conditions as follows: about 70 per cent in the baseline, 80 per cent in T1 and 75 per cent in T2. Based on a one-way ANOVA, there was no significant difference in self-reported donation behaviour between conditions. Therefore, in line with the findings of the bike count and actual donation data, it could be concluded that increased nudge frequency did not negatively impact donation behaviour in this setting.

To analyse potential reasons for the lack of backfiring and to determine what factors formed behavioural drivers, a model for donation behaviour was created using a Partial Least Square (PLS) model.

Table 3. Descriptive characteristics of the survey sample.

	Baseline $N=67$	Treatment 1 $N=81$	Treatment 2 $N=98$
Age	46	43	47
Female	37%	36%	34%
Male	63%	64%	65%
Income	€52 160	€52 687	€48 241
Kilometres biked	20.5	16.6	20.9
Satisfaction with trails	4.45	4.48	4.50

Model to explain donation behaviour

Based on the survey data, Table 4 shows the results for a PLS model explaining the decision to donate as a discrete yes/no decision.

The highest accuracy (85%) and kappa (0.51) is achieved if single component is used. Figure 3 shows the variance explained by each variable in the final model and the importance of each contributing factor. As shown in Table 4, the q3, q4, q8, q12a, q12c, q12d, q13 and q14 variables are statistically significant and relevant for the model, since each of these variables has a *p*-value which is less than the significance level (0.05) at a 95% confidence level. The next section reports on the statistically significant relationships.

Explanations for the lack of backfiring in this setting may be linked to the proposition that, to engage in normative behaviour, people have to push their hedonistic goals to the background *if these are not compatible with their normative ones* (Lindenberg, 2000). The findings of this study show not only that bikers held generally strong norms in favour of donating, but that these formed significant drivers for donating, suggesting compatibility between their hedonic and normative goals.

Regarding social norms, the perceived descriptive norm ranged from 5 per cent to 100 per cent (STD 22.4) but was on average similar across conditions and above 50 per cent (*baseline* 60 per cent; T1 59 per cent; T2 56 per cent). As shown in the findings of the model, the descriptive social norm variable (q8) was significant in the decision to donate. Furthermore, in line with previous studies that found that personal norms are key drivers of sustainable behaviours (Han et al., 2015; Rodriguez-Sanchez et al., 2020), the personal norm variables (Q12a, Q12c, Q12d) significantly and positively influence the bikers' decision to donate.

The perceived number of signs (q13) and awareness of signs (q14) also have significant positive relationships with the decision to donate. This supports the finding from the field experiment that the salience of the norm-nudge had a positive effect on visitors' donation behaviour and that its frequency has not reached a point at which backfiring may occur.

Lastly, biking frequency (q3, q4) significantly affected bikers' decision to donate. A reason for this may be that the more individuals bike on the trails, the more exposed they are to the

Table 4. Model to explain donation behaviour (dummy variable 1= yes, 0=no, PLS model).

Variable	Deviance	Df	Residual dev	pr (>Chi)
q1 Kilometres bikes	0.214	197	217.35	0.6437
q2 Rounds biked	0.571	196	216.78	0.4501
q3 Biking frequency (in Rörbäcksnäs)	5.983	195	210.79	0.0144*
q4 Biking frequency (in general)	6.392	194	204.40	0.0115*
q7 Satisfaction with trails	0.020	193	204.38	0.8882
q8 Perceived descriptive norm	36.910	192	167.47	1.237e-09***
q13 Perception of the number of signs	5.943	191	161.53	0.0148*
q14 Awareness of the signs	5.109	190	156.42	0.0238*
Q16 Income	1.253	189	155.17	0.2630
Q18 Gender	3.366	188	151.80	0.0665
Q12a Personal norm	8.768	187	143.03	0.0031**
Q12b Personal norm	0.614	186	142.42	0.4333
Q12c Personal norm	8.789	185	133.63	0.0030**
Q12d Personal norm	8.657	184	124.97	0.0033**
Q12e Perceived injunctive norm	0.601	183	124.37	0.4381
Q12f Perceived injunctive norm	2.663	182	121.71	0.1027

Note: significance at ***: 0.001, **: 0.01, and *: 0.05 level, respectively.

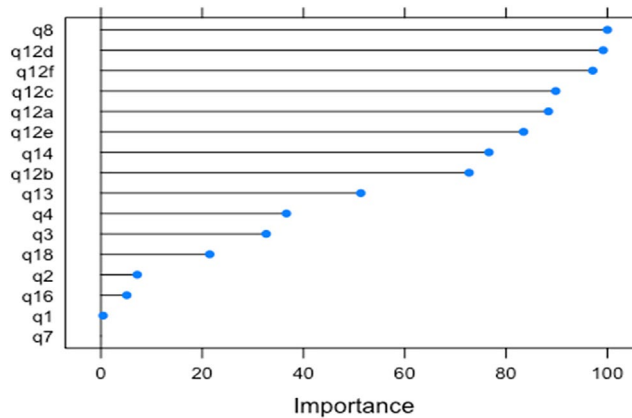


Figure 3. Graphs to show importance of including variables of the PLS model.

donation signs. Frequent bikers are also more likely to feel close to the cause of donations and to experience the benefits of their donations in form of continued trail upkeep and development.

Discussion

To maximise the effectiveness of norm-nudges in influencing sustainable tourist behaviour, they need to be designed in a way that draws attention to the desired behaviour and makes it important to the target individuals (Noggle, 2018). However, existing research on the effectiveness and adverse effects of norm-nudges has primarily focused on the message content, rather than their frequency (Bicchieri & Dimant, 2022). Thus, the present study aimed to test the extent to which an increased frequency of norm-nudges has a backfiring effect on sustainable tourist behaviour.

Firstly, the research findings add to our understanding of the backfiring effect of norm-nudges by providing insights on this effect in the so-far-underexplored context of tourism. This is of relevance given that the effectiveness of norm-nudges is highly context-dependent and that tourism presents a uniquely hedonistic consumption setting, which is often perceived as being at odds with appeals to engage in sustainable behaviour (Font & McCabe, 2017; Juvan & Dolnicar, 2014). Contrary to our initial hypothesis, the present study empirically demonstrated that an increased frequency of norm-nudges does not lead to backfiring effects in the setting of this research. Instead, the findings from the field experiment indicate that the average donation per bike increases when the number of norm-nudges is increased. The lack of negative reactions to an increased nudge frequency contradicts the concerns of tourism providers in the current and prior research, that the nudge may become obtrusive to the tourist's experience and reflect negatively on the image of the providers (Ettinger et al., 2021; Font et al., 2017). Moreover, the results do not support previous findings in a humanitarian donation context that an increase in donation reminders induces psychological costs to the extent that the reminders become ineffective in motivating people to donate (Damgaard & Gravert, 2018). The results need to be considered in view of the fact that the increase in the number of norm-nudges was only small. Nevertheless, the conclusion that frequent norm-nudges did not lead to backfiring effects is important, because frequent reminders can heighten recipients' attention to the nudge and induce behavioural change when the salience of the sustainability issue is low (Noggle, 2018).

The lack of backfiring effect in this setting compared to existing literature suggests that the particular tourism context itself played an important role in strengthening, rather than diminishing, the positive impact of frequent nudges. Specifically, one possible influential difference

to the study by Damgaard and Gravert (2018) and research on persuasive environmental messages (Font & Hindley, 2017) is that the primary benefits of the donations targeted in this research do not only concern others or the environment. The desired behaviour contributes directly to the achievement of collective goals associated with the sustainable upkeep of the trails, and the destination more broadly. As such, tourists may feel closer to the cause for donations, making them more likely to comply with assertive messages promoting that cause (Kronrod et al., 2012; Scott et al., 2003). Adding to this general contextual factor, findings of the survey data point to several social-psychological factors that appeared to influence the lack of treatment effect. These add to our understanding of the drivers and barriers to sustainable tourist behaviour and highlight the conjoint importance of nudge frequency and content in influencing behaviour.

The findings from the model reinforce the significance of personal and social norms in sustainable tourist behaviour. Other tourism studies have noted the importance of designing behavioural change messages according to recipients' norms (Hardeman et al., 2017). However, the influence of personal and social norms in sustainable tourist behaviour has not yet been tested in combination with nudge frequency and has only been sparsely examined in contexts other than pro-environmental behaviour in hospitality (Tölkes, 2018). Both norm variables positively influenced individuals' self-reported donation behaviour in our model. Combined with the findings that awareness and perceived number of signs have a significant relationship with donation behaviour, and that awareness and donations increased with an increase in the number of signs, this suggests that the norm-nudges made individuals more susceptible to donating by activating their norms. In particular, the inclusion of descriptive norms in the messages may have played an influential role in this, as previous studies have found that descriptive norms are significant drivers of donation behaviour (Heldt, 2005). Communicating such norms, adapted to the specific context, provides recipients with behavioural guidance in situations that are new or uncertain, as is often the case in tourism (Cialdini, 2009; Goldstein et al., 2008). Following insights from literature, social norms also help to form or activate personal norms (Schwartz, 1977; Shin & Kang, 2021). In contexts like the present study, where recipients generally hold favourable personal norms towards the desired behaviour, frequent norm-nudges may remind people about their normative standards or enable them to form self-expectations of this behaviour. Normative reminders seem particularly relevant in an open-access setting like MTB, where tourists partake in long individual activities during which it is easy to forget about one's responsibility to contribute to the upkeep of the destination.

Though not included in the final model, it can be assumed that the perceived credibility of the norm-nudge further contributed to its effectiveness. As prior literature has indicated, message credibility not only offers assurance that the communicated norms reflect the behaviour of fellow consumers but also ensures that communicators do their part in addressing the sustainability issue at hand (Bicchieri & Dimant, 2022; Scott et al., 2003). This trust was also reflected in participants' high satisfaction with the trails, under the assumption that high trail quality demonstrates the ethical behaviour by providers to reinvest the donations in the tourism resources at the destination, as promised in the nudge message (Sánchez-Fernández et al., 2020).

The present study contributes to the theoretical understanding of the link between sustainable behaviour and hedonic tourism consumption. More precisely, it points to the intrinsic benefits and added experiential value that tourists may receive when their normative and hedonic goals are made compatible *via* norm-nudges. This offers a somewhat different view to existing behavioural change literature, which often assumes that appealing to tourists' norms may fail to trigger other-oriented behaviour *because* of their primary aim of increasing enjoyment (Dolnicar, 2020; Dolnicar et al., 2019). According to the Goal-Framing Theory, following the behaviour of others and doing what one believes to be morally right may present normative sub-goals of individuals during their tourism experience. As normative goals need support from the environment, nudging directed at raising the salience of normative goals may increase the

individual's ability to translate their intentions into action (Lindenberg & Papies, 2019). Specifically, individuals are provided with the possibility to act in line with their norms, to fulfil their moral self-expectations and, consequently, to derive ethical value from their touristic activity (Holbrook, 1999).

Moreover, norm-nudges may not only provide individuals with the ability to obtain immediate intrinsic benefits but also realise how engagement in the desired behaviour may allow them to gain future experiential value. Previous research has shown that sustainability messages that highlight personal benefits for consumers have a higher chance of triggering the desired behaviours (Hardeman et al., 2017). As shown in the findings of the model, frequency of biking played a significant role in donation behaviour. The norm-nudge in the present study clearly indicated that the donations would be reinvested in the trails and the perceived credibility of the message was high. Combined with the knowledge that others also contribute to the trails, reflected in the social norms measure, this may have assured bikers that their donation matters in enabling positive biking experiences for them in the future. Following this assumption, the nudges complemented tourists' self-interest behaviours, rather than posing a threat to their hedonistic tourism choices as sustainability appeals in other contexts may do (Font & Hindley, 2017). While such foreseeable benefits are particularly relevant for individuals with revisit intentions, they may also encourage others to return to the destination they invested in.

In terms of practical implications, the findings highlight the need for tourism providers to investigate how sustainability nudges are perceived by consumers and to adapt the nudges accordingly, rather than assuming an appropriate design and frequency. As also evidenced in the present study, providers often under-communicate their sustainability appeals out of fear that these might induce reactance among visitors (Ettinger et al., 2021; Font et al., 2017). This limits their ability to leverage the full potential of norm-nudges and to engender more sustainable behaviour among tourists. While prior research has already indicated that insights on customer-relevant sustainability content enhance providers' confidence in communicating sustainability appeals (Hardeman et al., 2017), the present study adds that insights on an appropriate frequency may be just as important. Providers' concern that increased frequency of norm-nudges may backfire was not only unwarranted in this setting, but participants still considered the number of messages to be low. Moreover, the open-ended survey question revealed that some participants still claimed that they "forgot" to donate. While this may have been stated out of a sense of social desirability, it suggests that the donation message could be pushed more to remind individuals and maximise the effectiveness of the nudge. The results need to be contextualised by the nature of the destination and target groups, which differs from the more commercialised, environmentally focused hospitality settings in which many of the existing studies on persuasive sustainability messages have been conducted (Tölkes, 2018). However, the findings reinforce that norm-nudges need to be designed according to the context, not only regarding their content but also their frequency. Particularly in cases where the desired behaviour aligns with attributes of the destination that are highly valued, such as public access and community-based management in this study, frequent nudges may reinforce these aspects to tourists and enhance their experience. Reminding tourists about the sustainability issue on hand and the desired behaviour *via* norm-nudges may be a valuable approach to encourage more such behaviour.

Conclusion and future research

Following recent studies concerned with the adverse effects of norm-nudges, this study investigated the extent to which such interventions might backfire in a tourism context. A field experiment was conducted to test whether norm-nudges aimed at encouraging donations for MTB trails backfire as their frequency is increased. The study makes several contributions to theoretical knowledge.

Firstly, this is the first study testing the impact of increased frequency of norm-nudges in a tourism context and it uses actual as well as stated behavioural data. This expands theoretical knowledge on the backfiring effects of norm-nudges in tourism. The results show that positive uptake of norm-nudges does not diminish after their frequency is increased in two treatment conditions. On the contrary, our findings suggest that the increase in norm-nudges had a positive effect on average donations per bike which indicates that the point at which backfiring may occur had not been reached, due to the small number of norm-nudges used in this study.

Secondly, by including theory-driven variables in the model with stated behaviour, this study provides additional empirical evidence to verify their impact on sustainable tourist behaviour. The results corroborate previous findings that social norms and personal norms are significant drivers for donation behaviour. Overall, the present research demonstrates that norm-nudges can, in some cases, be pushed more to maximise their effectiveness in encouraging sustainable tourist behaviour. As participants did not indicate any negative reactions to the norm-nudges, and extant literature highlights the intrinsic benefits one may receive by enacting sustainable behaviours, encouraging such behaviours may even allow individuals to obtain additional experiential value. When aiming to achieve this, it is important to consider that the nudge message is credible, includes social norms, that the target audience is generally supportive of the behaviour, and that it complements the attributes they value in their touristic experience. With this in mind, it may be beneficial for providers, tourists and the destination's sustainability to further test and increase the salience of sustainability nudges rather than settling at an assumed level of acceptance.

The research findings have provided insights for stakeholders in Rörbäcksnäs helping them change the way they communicate with tourists to enhance the development of the destination. The local sports association has kept the number of norm-nudges introduced in T2 of this study and intends to increase the number of signs further. By demonstrating that the increased frequency of norm-nudges does not backfire, our findings offered evidence-based recommendations encouraging stakeholders to embrace norm-nudges as an effective tool for promoting sustainable behaviour. This contributes to sustainable tourism development as visitors become more aware of and actively participate in the collective goals associated with the upkeep of the destination.

Important to consider is that norms change over time and that social information should be adapted accordingly in nudges. This is important since an accurate reflection of current behaviour ensures that norm-nudges are credible, and since changes to the communicated norm can have significant impacts on behaviour. More research should investigate how actual norms and responses to norm-nudges change over time to provide insights into their long-term effects.

Using a PLS model to examine the variables that drive donation behaviour precluded us from testing the relationships between the different variables in detail. Future research could test logical sequencing, using for example a SEM (structural equations modelling) approach, to better understand linkages between for example descriptive norms and injunctive norms.

The assumption that participants in this study operated in a hedonic frame during their touristic activity was based on existing literature. Future research could apply the GFT to provide empirical evidence on the goals that tourists seek during their activity, and the way nudges influence these.

This is the first study to investigate how increased frequency of norm-nudges impacts the target behaviour in a tourism context. However, it is important to note that the field experimental design we applied has limitations regarding internal validity. A field setting cannot control for all external factors that impact the outcome. Further research is needed to ensure internal and external validity of our findings. Similar studies should be conducted in different tourism settings to develop an understanding of the factors that induce undesired effects of nudges. This may help to facilitate greater uptake of effective nudges by providers and enable them to encourage more sustainable behaviours among their consumers.

In this regard, the authors join the call for greater collaboration between practitioners and tourism researchers by use of field experimental methods, particularly regarding sustainability-related interventions. This not only enhances the external validity of findings but may also offer direct, practical insights into the benefits of behavioural interventions, which is particularly relevant in cases where there is hesitance to change.

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Appendix 1

Donation sign (Large)

Karma Account

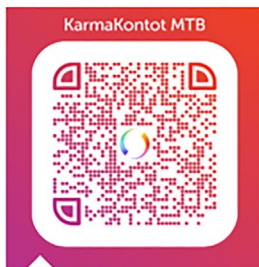
All work on the trails is non-profit.

You, along with all other mountain bikers, are important to make this possible! Thanks to your contribution, we can together enjoy MTB experiences in Rörbäcksnäs unique trail system!

Last season, two out of three visitors contributed an average of SEK 78 per person.

Everything is reinvested in the trails.

Have a nice ride.



Swish. Betala enkelt.

Swish nr: 1234 170 593

**With kind regards,
Rörbäcksnäs sports association**

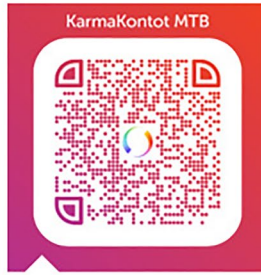


Rörbäcksnäs MTB

Donation sign (Small)

Karma Account

**We hope you are enjoying your MTB
experience here in Rörbäcksnäs!**



Swish. Betala enkelt.

**Last season, two out of three visitors
contributed an average of SEK 78/person**

Everything is reinvested in the trails

**With kind regards,
Rörbäcksnäs sports association**

Appendix 2

Mountain biking in Rörbäcksnäs

This study is part of an ongoing research project on nature tourism at X in collaboration with X and the Rörbäcksnäs community association.

The study is carried out by X within the framework of a doctoral project in tourism science.

Your response will be treated anonymously.

Further contact information can be found on the last page.

Part A. Your visit to Rörbäcksnäs

1. About how many kilometres have you mountain biked today? _____ km

2. How many times did you pass the counter at the trail entrance? (located by the forest edge)

3. How often do you mountain bike on the trails in Rörbäcksnäs per year?

This is the first time	1-2 times	3-5 times	5-10 times	More than 10 times
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. How often do you mountain bike during a season in general?

Rarely or about once a month	Several times a month	Once per week	2-3 times per week	4 or more times per week
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Please indicate the type of your visit:

- | | |
|--|---|
| <input type="checkbox"/> Overnight at rented accommodation in Sälenfjällen | <input type="checkbox"/> Day visitor from another part of Dalarna |
| <input type="checkbox"/> Overnight at rented accommodation in Rörbäcksnäs | <input type="checkbox"/> Day visitor from Malung-Sälen |
| <input type="checkbox"/> Overnight at own cabin in Sälenfjällen | <input type="checkbox"/> Overnight at a campsite in a caravan/mobile home |
| <input type="checkbox"/> Other _____ | |

6. What is your place of residence?

- | | |
|---------------------------------------|---|
| <input type="checkbox"/> Malung-Sälen | <input type="checkbox"/> Other municipality or country (zip-code or country): _____ |
|---------------------------------------|---|

Part B. The MTB trails and MTB system

7. In general, how satisfied are you with the quality of the mountain biking trails and related facilities in Rörbäcksnäs? (1 means “unsatisfied” and 5 means “completely satisfied”)

1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. What percentage of the trail users in Rörbäcksnäs do you believe donate to the Karma account? ____%

9. Are you aware who is taking care of the mountain biking trails in Rörbäcksnäs?

☐ Yes ☐ No

10. The MTB trails here in Rörbäcksnäs are maintained on a non-profit basis by the local sports association. However, the trail upkeep and the work to keep the area clean and tidy is costly. How do you think the funding for the trail upkeep should be distributed? Distribute 100 points between the following in a way you think is fair (note, you do not have to give points to all):

Municipality	____p	Bike rental	____p.
Me as a mountain biker	____p	The state	____p.
Stores in the area	____p	Accommodation businesses in the area	____p.
The sports association in Rörbäcksnäs	____p	Other (who?)	____p.

11. Have you made a voluntary contribution to the Karma account?

☐ Yes → ☐ I donated SEK ____ for today.
☐ I donated SEK ____ for the entire season.

☐ No → ☐ I did not donate, because ____
☐ Now that I am aware, I would donate SEK ____ for today.
☐ Now that I am aware, I would donate SEK ____ for the entire season.

12. How strongly do you agree with the following statements?

a) *Regardless of what other people do, because of my own values I feel that I should contribute to the upkeep of mountain biking trails.*

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

b) *I have a moral responsibility to contribute to the upkeep of mountain biking trails.*

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

c) *It feels good for the conscience to contribute to the upkeep of mountain biking trails.*

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

d) *I get a bad conscience when I do not contribute to the upkeep of mountain biking trails.*

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

e) *I think that many people expect me to support the trail upkeep.*

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

f) *I think that many people who are close to me contribute to the upkeep of mountain biking trails.*

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. How do you perceive the number of signs with the Karma Account message?

Too few to be noticed		Just right		Far too many
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. To what extent do you agree with the following statement about the Karma account signs?

☐ I have not seen any signs about the Karma account.

The message on the signs is eye-catching

Not at all	To a small extent	To a moderate extent	To a large extent	Fully agree
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The message on the signs is convincing

Not at all	To a small extent	To a moderate extent	To a large extent	Fully agree
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The message on the signs is credible

Not at all	To a small extent	To a moderate extent	To a large extent	Fully agree
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The signs are annoying

Not at all	To a small extent	To a moderate extent	To a large extent	Fully agree
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part C. General information about yourself**15. How did you get to Rörbäcksnäs?**☐ By bike☐ Own car

Including yourself, how many of you were in the car and how many of you were riding MTB today?

____ in the car, of which

____ are children under 18 years

____ mountain biked

16. How much do you estimate your annual income to be before tax this year 2021?**(Tick the field that applies to you, your answer will be treated anonymously)**

<input type="checkbox"/> I receive student allowance	<input type="checkbox"/>	560 000 kr – 659 999 kr	<input type="checkbox"/>
<input type="checkbox"/> Under 150 000 kr	<input type="checkbox"/>	660 000 kr – 759 999 kr	<input type="checkbox"/>
<input type="checkbox"/> 150 000 – 259 999 kr	<input type="checkbox"/>	760 000 kr – 859 999 kr	<input type="checkbox"/>
<input type="checkbox"/> 260 000 – 359 999 kr	<input type="checkbox"/>	860 000 kr – 999 999 kr	<input type="checkbox"/>
<input type="checkbox"/> 360 000 – 459 999 kr	<input type="checkbox"/>	Over 1 000 000 kr	<input type="checkbox"/>
<input type="checkbox"/> 460 000 kr – 559 999 kr	<input type="checkbox"/>	Don't want to say/Don't know	<input type="checkbox"/>

17. I am☐ Female☐ Male☐ Other☐ Prefer not to say**Thank you for your participation!**

If you have other suggestions or comments, please leave them below. For example: What did you like best during today's cycling? What could enhance your MTB experience in Rörbäcksnäs?

Should you have any questions about this research, please contact: