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Nudge plus in tourism: reflexive behaviours and reflective attitudes

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ABSTRACT

This research explores the potential application of nudge+in a tourism context. Nudge+is an intervention that aims to influence consumer decisions and promote long-term behavioural change by facilitating reflexive actions alongside reflective processes. Nudge+is conceptualised as a hybrid approach incorporating elements from green nudging and transformative experiences. In a laboratory simulation of a visit to an animal park, nudge+is used to explore how combining successive reflection-inducing messages and menu manipulations influences participants' food choices and pro-environmental attitudes. The process of designing the simulation constitutes a constructive step in developing and learning how to utilise nudge+in tourism activities. Our interpretation of nudge+entails a purposeful and comprehensive rethinking of the tourism experiencescape and customer journey to maintain enjoyment, engage visitors and ensure a cohesive stance towards reducing visitors' onsite climate footprint. Interventions and reflective elements can be incorporated as sequential interactions that set local norms. The results indicate that nudge+can boost participants' pro-environmental attitudes and behavioural intentions. Moreover, the interventions do not disturb participants, and nudging is perceived as an acceptable strategy for reducing tourists' climate footprint.

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Introduction

Choice architecture and contextual interventions are effective tools for changing consumer behaviour and reducing tourism's environmental harm while maintaining the hedonic value of vacation experiences (Dolnicar, 2020). A particularly popular manifestation of behavioural economics-based interventions is nudging, which aims to alter people's behaviour without forbidding options or significantly changing economic incentives (Thaler & Sunstein, 2008). Governments (e.g. in the US, UK, Denmark and Australia), large international organisations (e.g. the World Bank, the EU and the OECD), consultancies and research centres support and apply contextual interventions to manipulate a wide range of behaviours (Lehner et al., 2016). Also,

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in tourism contexts, practitioners and researchers quickly identified nudging as an efficient strategy for promoting various climate-friendly behaviours, such as reducing food waste and meat consumption, increasing recycling and saving energy and water (Souza-Neto et al., 2023).

One withstanding critique of choice architecture and nudging is that these interventions fail to promote long-term behavioural change (Avineri, 2012). This means that while nudging could effectively mitigate tourists' harmful behaviours onsite, these interventions might not affect their knowledge and values towards more pro-environmental consumer choices in the future. This is critical since any possibility for a more climatically sustainable tourism system urgently requires a paradigm shift that involves fundamental social and cultural changes (Higham et al., 2022; Scott & Gössling, 2022; Ullström et al., 2023). Notions of change in values and attitudes feature heavily in the literature on transformative tourism experiences (e.g. Pung et al., 2020; Walter, 2016). The guiding premise is that tourism is an effective context for altering one's mindset (Neuhofer et al., 2021). Tourist transformation is promoted by peak experiences that lead individuals to reflect on their sense of self in relation to the world and adapt values and behaviours, such as environmentally friendly practices (Wolf et al., 2017). Nevertheless, changing tourists' behaviour using attitude-based interventions is difficult (Dolnicar & Demeter, 2023). Moreover, transformation is a demanding cognitive process, and tourism businesses and destinations might be reluctant to put their visitors in such challenging situations.

Our research is guided by the overall research question of how to design tourism experiencescapes that reduce visitors' onsite climate footprint and promote change in their pro-environmental behavioural intentions and attitudes. Accordingly, our purpose is to explore the potential of nudge+as an approach for choice architecture design. Nudge+is an intervention that incorporates an element of reflection. It aims to influence consumer behaviours and foster new perspectives (Banerjee & John, 2021; John & Stoker, 2019). At its core, nudge+maintains that self-awareness enhances autonomy and facilitates commitment, thus improving the effectiveness of nudging (Banerjee, 2022). Since it is a fairly novel concept, we build on ideas from both nudging and transformative experiences to explore the potential application of nudge+in tourism contexts. In a 360-degree audiovisual simulation laboratory, we replicate a visit to an animal park. The laboratory environment allows us to experiment with the design of the tourism experiencescapes. Specifically, we incorporate reflective elements (+) along the visit route and manipulate the menu to influence participants' food choices at the simulated animal park's restaurant.

Our study joins the ongoing scholarly effort to identify, develop and test behavioural interventions that can help reduce tourism's climate footprint (Dolnicar & Demeter, 2023; Olya et al., 2024). Our utmost contribution is introducing nudge+. Specifically, the process of designing the laboratory simulation constitutes a constructive step in conceptualising nudge+and how tourism businesses, destination organisations, and researchers might use it in tourism contexts.

Literature review

Choice architecture and green nudging

Choice architecture builds on the notion that people's decision-making is contextually influenced and is concerned with manipulating behaviour by designing decision situations (de Visser-Amundson & Filimonau, 2022; Thaler & Sunstein, 2008). Choice architecture is an application of behavioural science ideas. Among these is the dual-system theory, which concerns two human cognitive processes, the reflexive and intuitive System 1 and the reflective and deliberative System 2 (Kahneman, 2011; Sunstein, 2016). In the context of choice architecture, the dual-system theory translates into designing interventions that provoke automatic responses to familiar situations and cues, or, in other words, interventions that activate System 1 rather than the more cognitively demanding System 2 (Kahneman, 2011; Münscher et al., 2016). This,

however, suggests that when faced with alternatives, people often resort to heuristics, biases, and habits rather than calculative reflective thinking (Grayot, 2020; Kahneman, 2011). Subsequently, people are liable to act against their best interests or values, for example, when it comes to dietary habits or pension plans (Thaler & Sunstein, 2008). To help people make better decisions, especially when choices are complex or lack prompt feedback, Thaler and Sunstein (2008) propose "Nudging."

Nudges are meant to be low-cost changes to the choice architecture that predictably alter people's behaviour without forbidding options or changing incentives (Thaler & Sunstein, 2008). Behavioural economics, in general, and the nudge concept in particular, provide accessible, albeit simplistic, narratives of human decision-making that are easy to adopt and implement (Grayot, 2020). To assist researchers and practitioners in designing interventions, Münscher et al. (2016) classified choice architecture techniques into three categories: Decision information, Structure, and Assistance. The former maintains that the way information is presented influences related decisions. Therefore, nudges are effective if they simplify or frame information and provide prompt feedback and social reference points. Structure, the second category, focuses on the arrangement of options and decision context. This includes setting a no-action default, making the less-harming alternatives more available or simply changing the order of available options. Finally, the third category comprises interventions aimed at assisting in decision-making scenarios by providing reminders and facilitating commitments.

Nudge was conceptualised as a means to improve the individual's welfare (Sunstein, 2015). Nevertheless, it could also be used to encourage socially desirable behaviours and reduce negative externalities (Lehner et al., 2016). Hence, green nudges are choice architecture interventions that exploit heuristics and biases to promote pro-environmental behaviour (Carlsson et al., 2019; Schubert, 2017). Carlsson et al. (2019) propose a distinction between cognitive and moral green nudges. The former relies on people's bounded rationality and includes simplifying information, changing the physical environment and setting green alternatives as a default. For example, strategically positioning vegetarian food at the top of the menu or the front of the fridge at eye level affects people's likelihood of choosing the more available and accessible alternative (UNEP, 2020). Similarly, setting renewable energy as the default option for electricity supply builds on people's tendency to stick with the status quo and not make active decisions (Schubert, 2017).

Conversely, moral green nudges reward "doing the right thing" and draw on people's inclination to follow norms and desire to achieve status and a positive self-image (Carlsson et al., 2019). Examples include encouraging the adoption of pleas and commitments, such as reusing towels during a hotel stay (Baca-Motes et al., 2013), drawing comparisons to peers' energy consumption (Nielsen et al., 2017), and providing opportunities to enhance one's self-identity by purchasing eco-labelled products (Schubert, 2017). Several observers are strong advocates for using green nudges. For detailed reviews of empirical studies, see Grilli and Curtis (2021) and Byerly et al. (2018), while for case studies and examples of green nudges in practice, see the United Nations Environment Programme's "Little Book of Green Nudges" (United Nations Environment Programme & GRID- Arendal & Behavioural Insights Team, 2020), and Nielsen et al. (2017).

Recent research examples demonstrate the potential use of green nudging in tourism contexts. For instance, setting a reference sum of money (anchoring) increases the amount of green taxes passengers are willing to pay (Kim & Hyun, 2021). Likewise, a default voluntary eco-fee embedded in other services (e.g. accommodation or transport) increases donations to coastal conservation (Nelson et al., 2019). Similarly, the demand for housekeeping is significantly reduced when guests need to ask (opt-in) for their hotel rooms to be cleaned. (Cvelbar et al., 2020). Another notable example demonstrates that food waste at hotels' breakfast buffets can be reduced by as much as twenty per cent by simply changing the physical environment, for example, by using smaller plates (Kallbekken & Sælen, 2013). Providing instant feedback is another effective tool to minimise waste and moderate guests' water and energy consumption

(Tiefenbeck et al., 2018; Warren et al., 2017). Furthermore, the effectiveness of feedback is enhanced when coupled with comparisons to how others behave, which is a way to link cognitive and moral green nudges.

Moral green nudges, such as positive normative messages, encourage visitors to emulate others and, for example, donate money for trail maintenance (Dustin et al., 2019; Nowak & Heldt, 2023). Another approach is inviting guests to pre-commit to certain environmentally friendly behaviours, such as reusing towels (Baca-Motes et al., 2013) or saving energy (Warren et al., 2017). Similarly, pledges, which have become common in nature-based tourism destinations, encourage visitors to adhere to local codes of conduct and "house rules" (Albrecht & Raymond, 2021; Warren et al., 2017). Notably, pledges are distinct from other interventions since they connect with visitors' emotions and inspire them to become more aware of their actions and decisions (Albrecht & Raymond, 2021). This notion corresponds to recent calls to involve consumers in the co-creation of value associated with green behaviours (Font et al., 2021) and design tourism experiencescapes that create mindful tourists and promote long-term changes in behaviour (Slocum et al., 2022).

Transformative tourism experiences

As noted in the introduction, tourism can be an advantageous context for altering one's mindset (Neuhofer et al., 2021). Tourism inherently involves being, physically and mentally, away from one's home environment. This liminoid dimension constitutes the foundation for transformative experiences (Pung et al., 2020). Tourist transformation is a process that involves intense stimuli at the destination, leading visitors to restructure their value system or develop new knowledge, resulting in a positive change in their awareness, attitudes and behaviours regarding, for example, the environment and other social issues (Pung et al., 2020).

Tourist transformation happens through active interpretation and interaction with the destination. Therefore, the contextual environment is highly significant (Neuhofer et al., 2021). For example, natural settings, such as parks and wildlife tourism, drive self-exploration and are ideal for gaining a new appreciation of nature (Ballantyne et al., 2011; Wolf et al., 2017). Similarly, intimate encounters with indigenous people in their home environments stimulate learning, reflection and cultural awareness (Walter, 2016). Other facilitating factors are strong emotions, social interactions, visual aesthetics, active participation and immersion (Neuhofer et al., 2021; Wolf et al., 2017). In addition, cultural shocks and other disturbing experiences, such as witnessing the destruction of natural environments, also facilitate tourist transformation (Walter, 2016).

Tourism businesses and destination managers are encouraged to intentionally create contextual conditions that increase the chances for transformative experiences (Neuhofer et al., 2021; Pung et al., 2020). The literature suggests designing the experiencescapes in ways that facilitate visitor engagement and foster reflection. In practice, this involves using interpretive commentaries, signage, imagination and dialogues (Ballantyne et al., 2011). Walter (2016) advises implementing "non-active" moments reserved for reflection along the customer journey, adding that connecting the content to the visitor's prior knowledge and experiences is vital. Such connection is strengthened by providing clear examples of how visitors can implement the new knowledge in everyday life (Ballantyne et al., 2011). Finally, it is vital to reinforce the transformative experience in ways that extend it beyond the liminal moment by providing tourists with resources to pursue particular interests and maintain their motivation to act (Ballantyne et al., 2011; Neuhofer et al., 2021).

Bridging the gap: nudge+

In a sense, green nudging and transformative experiences complement each other (see Table 1 for comparison). Green nudging effectively manipulates *in-situ* decisions by exploiting heuristics

and making decisions more effortless, but it does little to facilitate long-term change in attitudes and values. Conversely, the effect of transformative experiences lasts beyond the liminal vacation context. However, it is conditioned by the ability of tourists to deal with demanding cognitive processes. Furthermore, transformative experiences might involve shocks, dilemmas and other challenging situations that are not always desired in tourism contexts. Green nudging, by contrast, is inconspicuous and does not disturb tourists' enjoyment. Concurrently, the concealed nature of nudging has invoked accusations that changing the choice architecture is paternalistic and reduces the individual's autonomy. When using nudging, one must be aware of this critique (Sunstein, 2015).

Another way to make sense of green nudging vis-à-vis transformative experiences is to position the two approaches on each side of the attitude-behaviour gap, which is perceived as one of the main barriers to sustainable tourism consumption (ETC, 2021). Concerning peoples' climate footprint, the attitude-behaviour gap describes the inconsistency between what people say regarding their environmental concerns and what they do in practice (ElHaffar et al., 2020). Respectively, transformative experiences address attitudes and green nudging behaviours. We propose nudge+ (Banerjee & John, 2021; John & Stoker, 2019) as a hybrid approach that facilitates reflexive actions alongside reflective processes to link the two approaches and bridge the gap.

Nudge + is defined as "an intervention that has a reflective strategy embedded into the design of a nudge" (Banerjee & John, 2021, p. 2). Nudge + aims to tackle the shortcomings of nudge interventions in sustaining behaviour change or dealing with major problems, such as climate change (Banerjee & John, 2021). Nudge + takes a critical stance towards the prevalent dual System 1 and System 2 framework within behavioural sciences, which rigidly separates slow and fast thinking processes. Instead, nudge + emphasises their interconnected nature, advocating for a more integrated approach (Richardson & John, 2021). The central idea is that a strategic and balanced combination of both forms of reasoning is more feasible and mirrors how individuals naturally behave in their daily lives (Richardson & John, 2021). Thus, nudge + retains the attractive simplicity of nudging while adding a deliberative instrument that prompts individual reflection (Banerjee et al., 2022).

Nudge + is a recent advancement in behavioural studies. Thus, there are only a few demonstrations of possible applications or empirical investigations of the efficiency or longevity of nudge+. For example, Hume et al. (2021) tested nudge + as an intervention technique to increase compliance with Covid-19 public health regulations. Their experiment exposed participants to different mock-up messages. The results indicate that participants who were invited to relate to a close person reported higher intentions to follow safety instructions. Nevertheless, the study could not confirm long-term effects. Banerjee et al. (2022) tested how different interventions promote climate-friendly diets. Of all the administered interventions, a two-part sequential nudge + that presents a pledge followed by an opt-out default menu resulted in food choices with the smallest carbon footprint. Accordingly, Banerjee et al. (2022) suggest that nudge + is most effective when providing participants the opportunity to commit to a desired course of action.

Table 1. Characteristics of green nudging, transformative experiences and nudge+.

	Green nudging	Transformative experiences	Nudge+
Activates	System 1 - Reflexive	System 2 - Reflective	Hybrid approach
Addresses	Actions	Values	Actions and values
Impact/change	Immediate but short-lasting impact	Long-lasting change	Immediate impact and long-lasting change
Intervention is	Concealed	Transparent	Transparent
Impact on enjoyment	Maintains enjoyment	It might involve guilt and burden	Maintains enjoyment
Autonomy	Comprised	Empowered	Empowered

Nudge + has the potential to contribute to more pro-environmental behaviour within a framework where locals participate more actively in shaping behavioural public policies, thus challenging the conventional top-down approach to policy formulation (Richardson & John, 2021). Furthermore, nudge + confronts the perceived paternalistic aspects often associated with nudges. With the "+" factor, nudges become transparent. Thus, nudge + empowers and respects the autonomy of individuals, enables them to contemplate the intention and significance of the nudge, and facilitates a deeper understanding of their decision-making and how it aligns with the choices of others (John & Stoker, 2019; Richardson & John, 2021).

Methods

Research context

Becoming more environmentally friendly is on the agenda of many Swedish tourism destinations and visitor attractions. In late 2021, Järvsö, a small rural Swedish community located about 300 kilometres north of Stockholm, became the first destination in the country to be eco-certified by the Global Sustainable Tourism Council. Järvsö is an established destination for outdoor activities like downhill skiing, mountain biking, and hiking, and it is also known for its unique rural culture and traditions. Alongside these tourist attractions, one of the cornerstones of the destination is the animal park Vildriket (formerly Järvzoo), which attracts 80,000 visitors annually. Vildriket is a wildlife conservation centre and zoo specialising in Nordic animals. It operates year-round, and in addition to animal-related experiences, it offers accommodation, conference and event facilities, and several catering options.

For this research, we cooperated closely with Vildriket. For several reasons, the animal park constituted an excellent case for exploring how nudge + could be implemented. For starters, Vildriket is a complete tourism destination, offering a main attraction and supporting accommodation and food services. Furthermore, the animal park is an enclosed area where the operating company has extended control over the different touch points along the customer journey. Another important reason is that Vildriket, in line with global trends, aims to shift away from a traditional "zoo identity" and become more of a sustainability education, biodiversity conservation and wildlife rehabilitation centre. Finally, zoos are an essential and unique venue for environmental education to raise awareness of climate change and biodiversity decline, which are inextricably linked to global problems (Pörtner et al., 2021). Encounters with nature and a focus on biodiversity provide excellent conditions for transformative experiences that facilitate long-term behavioural change and reinforce existing pro-environmental values (Ballantyne et al., 2018; Norton, 2005; Staus, 2019).

Research design

We sought to explore the potential use of nudge + to reduce visitors' climate footprint at the destination and promote a change in visitors' pro-environmental behavioural intentions and attitudes. Accordingly, we opted to conduct a laboratory simulation and a series of questionnaires. Laboratories provide researchers with extended control over the environment and the possibility to collect additional information on participants (Viglia & Dolnicar, 2020). Therefore, laboratory simulations are particularly useful for proof of principle studies and identifying psychological processes (Meier et al., 2022). Further, the laboratory setting allowed us to implement and control interventions by redesigning various elements of a typical visit to Vildriket without disturbing their regular operation. Throughout the project, we have consulted with researchers from both behavioural and psychology studies to ensure the relevance and validity of the experimental design.

We conducted our simulation at the Risk and Crisis Research Centre laboratory at Mid Sweden University in Östersund, Sweden. The laboratory is a 64-square-meter room equipped to create 360-degree sound and vision simulations. In our study, we simulated a visit to Vildriket using videos, sounds and images recorded at the animal park and other original materials from Vildriket, including the restaurant's menu, signboards, pictures from their social media and excerpts from their website. For the nudge + treatment, we also used texts from the World Wildlife Fund (WWF) and the United Nations Development Programme (UNDP) websites. All texts in the simulation were in Swedish. Our study included three treatments (for distinction, treatment groups' names are capitalised): Control; Nudge, in which changes to the choice architecture target a specific behaviour; and Nudge+, which builds on the nudge intervention and includes further manipulations to the customer journey to promote self-reflection. The interventions and differences between the treatments are detailed in subsection "Interventions."

In the months before the simulation, we visited Vildriket three times to understand better what a visit to the animal park entails. We experienced the park as visitors, observed how other visitors interacted with the experiencescape and talked with employees. This experience, alongside using original material recorded at the animal park, helped to create a more realistic representation of a visit to Vildriket in the laboratory simulation (Kim et al., 2023). Furthermore, we conducted a pilot study with seven volunteers (university students and employees) to try the laboratory setting, recorded materials, designed manipulations and questionnaires. After the simulation, we interviewed the participants about their experiences. Based on the pilot, we implemented several adjustments to the laboratory setting, duration of the various segments and audiovisual inputs to improve the simulation.

The simulation began at Vildriket's reception, where a research team member (acting as an employee) welcomed the participants to the animal park. Afterwards, the participants visited the muskox, moose, wolf and reindeer animal enclosures. In each enclosure segment, a 360-degree video of the animals was projected on the laboratory's walls, and a large digital signboard in the room's corner displayed information about the respective animal. Between segments, in a way that replicates the actual design of the animal park, a video simulated walking on a trail in a forest-like environment. The signboard in the corner displayed a different message along each trail section. Three-quarters of the way into their visit, participants arrived at the restaurant, where they ordered food from a menu displayed on the signboard by writing down their selected dish number on a piece of paper. The entire simulated visit lasted 16 min. It comprised a welcome speech, six segments (360-degree simulation of a specific place in Vildriket), six trail sections, five signboard messages and one decision-making scenario. Pictures from the laboratory simulation are available in the appendices (the people in the pictures did not participate in the simulation). Figure 1 illustrates the simulation sequence in the Nudge + treatment. Note that the Nudge treatment simulation did not include reflective interventions and that the Control treatment simulation was without reflective interventions or menu manipulation.

The decision-making scenario took place in the restaurant segment. The dependent variable in our study was the type of food participants chose from the menu. The interventions were the menu design, the welcome speech and the signboard messages along the trail (a discussion of the interventions follows). We must stress that our study is not about manipulating food choices *per se* but that we perceive food choice as an appropriate proxy for measuring pro-environmental behavioural intention in this research context. Our foremost reason is that, as constituted by the Intergovernmental Panel on Climate Change (IPCC), adopting plant-based diets and reducing meat consumption is crucial for mitigating climate change (Schiermeier, 2019). Moreover, catering is an integral part of tourism, and altering visitors' food choices is a viable means towards reducing their carbon footprint (Babakhani et al., 2020). Another important reason for studying food choice is that the restaurant is the only instance where visitors to Vildriket face an obvious decision-making scenario. Respectively, redesigning restaurant menus

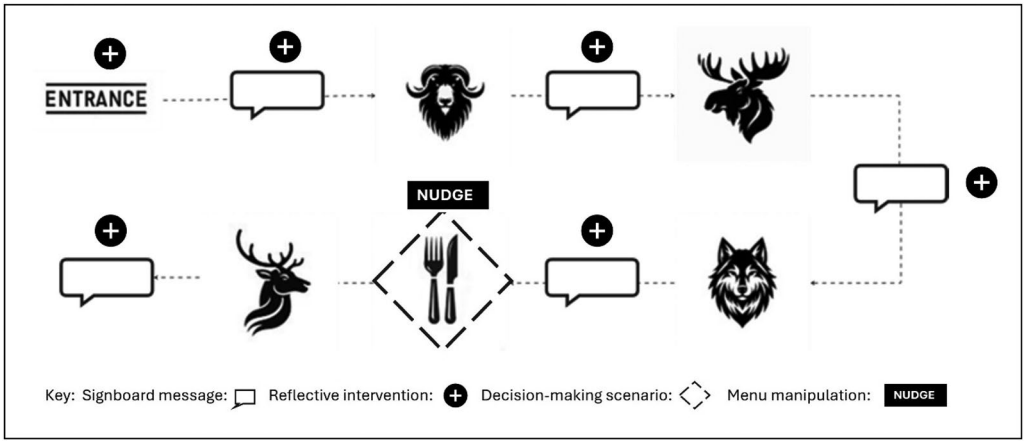

Figure 1. Simulation sequence and elements.

is a natural way to nudge more environmentally friendly food choices (Banerjee et al., 2022; Filimonau et al., 2017; Reisch et al., 2021).

Interventions

In our simulation, we used the actual menu of Vildriket's "Forest Hut" restaurant. The menu offered three meat dishes: a hotdog, a cheeseburger and a children's hamburger; and two plant-based alternatives: a soy-protein hot dog and a pea-protein "Beyond" burger. The original menu's graphics, the dishes' descriptions and prices were used in all three treatments. For the Nudge and Nudge + treatments, the menu was re-designed following common choice architecture principles. We manipulated the menu by shifting the order of the dishes and placing the vegan alternatives at the top, targeting consumers' tendency to choose the first available option (Kurz, 2018). In addition, we used a "traffic light" labelling to indicate the dish's climate footprint. This common practice builds on the assumption that consumers instantly recognise the traffic light colours and intuitively associate green with good (Banerjee et al.,2022; Filimonau et al., 2017). Finally, we also inserted a message encouraging consumers that their little change makes a big difference. Such message-based nudges aim to generate a so-called warm glow effect associated with the feeling of doing good (Reinholdsson et al., 2023). Here, it is imperative to clarify that we did not investigate which type of menu manipulation nudge was most effective. Therefore, we combined the three manipulations and considered them one intervention. The menus are available in the appendices.

We wished to understand how reflective "+" elements could be implemented in tandem with nudges in tourism experiences. Accordingly, we installed reflection-provoking messages throughout the simulated visit to change the context of participants' decisions and promote environmental awareness. These messages act as the "+" elements to the nudge and aim to enhance the menu manipulation by setting norms, providing information, and eliciting commitment and self-reflection. The first "+" element was implemented in the welcome speech at the reception segment. For the Control and Nudge treatments, the speech was based on the information visitors typically receive when they arrive at Vildriket, such as the length of the visit and what to expect will happen along the way. The participants were also notified about the restaurant and instructed on how to place their orders. In addition, the participants were informed about the park's efforts to provide the animals with living conditions that resemble those in the wild and thus made aware that they might not see all the animals during their visit.

For the Nudge + treatment, we added three sentences to the speech. The first sentence informed participants about Vildriket's goal of increasing visitors' knowledge about biological diversity and humans' responsibility to preserve it. The second sentence explained that the trail is designed to allow visitors time to reflect on their climate footprint. The third sentence invited visitors to join and help to stop the climate crisis and preserve biological diversity. The nudge + speech was designed to enhance participants' environmental awareness and promote agency and reflection while maintaining a positive tone. Moreover, informing participants that the trail is designed with a purpose made the interventions more transparent.

The second "+" element was a series of messages that appeared on the signboard during the simulated trail walks between segments. We perceived the trail as a particularly suitable instance to implant reflective messages because it provides excellent conditions for promoting transformative experiences; it takes place in a natural setting, and it is a moment of "non-activity" that does not distract attention from the main attraction. Thus, this allows plenty of room for reflection. Furthermore, the trail design and function are true to Vildriket's actual setup, making it a natural part of the simulated visit. The messages for the Control and Nudge treatments were based on material from Vildriket's website and real signboards in the park. The messages provided tips for an enjoyable visit, facts about wolves and information about Vildriket's education centre. To maintain compatibility between the Nudge + and these treatments, we used a readability index tool to ensure the messages have similar difficulty levels.

The Nudge + treatment messages were based on material from the websites "Tips and Inspiration for Earth Hour" (WWF Sweden) and "Is the world getting better?" (UNDP Sweden). The messages maintained a positive tone and used a first-person voice to promote a sense of stewardship and agency (Kusmanoff et al., 2020). The messages built on the welcome speech and constructed a storyline that began with the importance of biodiversity and its links to climate change and human actions. It proceeded with Sweden's historic role as a leader in environmental issues and called the participants to show they could measure up to it. Message four, which preceded the restaurant segment, informed about the dire situation caused by human consumption, stressed that it is still possible to act, called participants to challenge themselves and asked, "What could you do better?" The messages featured pictures (from Vildriket's social media) of people interacting with nature in empathic and caring ways. Table 2 details the post-test-only control-group design and which interventions were used in the treatments.

Participants and procedures

We recruited participants by inviting them to experience nature in a lab. The invitation stated that the study was concerned with nature-based tourism. However, it did not disclose the study's aim and focus. The invitation was distributed around the campus of Mid Sweden University in Östersund and at strategic locations in the city, including the train station, museums and libraries. In return for participating, we promised a free meal. Using lunch coupons was an attempt to make the decision-making scenario less hypothetical. While we cannot proclaim that this practice has increased the simulation's external validity, it did link the studied behaviour with a relevant reward.

Table 2. Treatments and interventions.

	Control	Nudge	Nudge+
Welcome speech	–	–	+
Signboard messages	–	–	+
Menu	–	Nudge	Nudge

Key: No Intervention –; + Reflective messages +; Menu manipulation Nudge.

One had to be over 18 years old, understand Swedish, and complete an online registration form to participate in the study. The registration form was designed to ensure randomisation and avoid selection bias. The form collected information about participants' age, gender, dietary preferences, and pro-environmental attitudes (see section "Questionnaires" for details). Moreover, participants could select when to participate, though they did not know which treatment they would be subjected to (allocation concealment). Randomisation was statistically tested before the simulation and proved successful. There were no statistically significant differences between the groups regarding demographics, dietary preferences, environmental attitudes and behaviours, or any other parameter. All this was attended to during the preparatory stage of the study.

We conducted nine trials in three days during the last week of October 2022, one trial per day for each treatment. To minimise bias across study groups, we alternated the order of the treatments. The size of the groups in the trials ranged from seven to twelve participants. Each participant was only exposed to one treatment. In total, 91 people participated in the laboratory simulation (Control $N = 27$, Nudge $N = 30$ and Nudge+ $N = 34$).

The average age of the participants was 36 (SD= 15.4), nearly two-thirds (64%) were females, and 76% had a high school or university education. Furthermore, 15.4% of the participants declared themselves vegan or vegetarian. For comparison, the percentage of people who are vegan or vegetarian in Sweden is 9% of the general population and 14% of people aged 16-34 (Vegobarometern: Klimat och miljö allt viktigare när vegetariskt fortsätter öka, 2022). We acknowledge that these participants might not represent the typical Vildriket visitors, mainly Swedish families with younger children. However, animal parks are perceived as attractive to a broad public, and indeed, participants have, on average, visited zoos 1.4 times in the past five years ($SD = 3.5$) and expressed a relatively neutral attitude towards zoos ($M = 2.9$; $SD = 0.9$). Concerning the simulation itself (where 5 is the highest rating on the Likert scale), participants reported that it was interesting ($M = 4.2$; $SD = 0.8$), easy to understand ($M = 4.1$; $SD = 1.2$), that they felt safe ($M = 4.8$; $SD = 0.5$) and did not experience the simulation to last too long ($M = 1.7$; $SD = 0.9$).

Ethical considerations

The study followed the guidelines of the Swedish Ethical Review Authority and GDPR. Furthermore, we regularly consulted about ethical procedures with a member of this authority who was in the study's reference group. Participation was voluntary and involved no risk of harm to the participants. All the participants were above 18 years old and underwent a three-step procedure related to expressing their informed consent. First, during the online registration process, the participants consented to participate in the study and voluntarily provided their email addresses for further communication. Second, in person, before entering the lab, the participants read the detailed description of the simulation procedure and signed the statement that they understood what the study entailed and explicitly agreed to participate (by filling out the standard consent form of the Swedish Ethical Review Authority). The participants could leave the lab at any moment. Finally, after the simulation, the participants actively expressed their written consent and provided their emails to be contacted after three months. The emails were stored per GDPR guidelines to Swedish public agencies (Karlsson Alverhill, 2023) and erased three months after the study ended.

Questionnaires

With the laboratory simulation, we have explored how to implement nudge+in tourism experiencescape design and how interventions influence decisions. However, much of our interest in nudge+derives from its potential to promote changes that last beyond the immediate choice situation. Accordingly, we complemented the study with a series of questionnaires (available in

the appendices) designed to detect differences in participants' pro-environmental behaviours and attitudes three months after the simulation. The first questionnaire (Q1) was administered online and was filled out during each participant's registration for the study. Q1 ensured randomisation and collected information about participants' age, gender, dietary preferences, and pro-environmental attitudes. Participants' attitudes were measured using the New Environmental Paradigm (NEP). The NEP measures agreement with 15 statements concerning humans' place within the Earth's ecosystem. The NEP is an established tool to assess people's pro-environmental views, and it is widely used and acknowledged in tourism research (Prayag et al., 2022).

The second questionnaire (Q2) was administered immediately after the simulation and focused on participants' pro-environmental behaviours. We asked participants about their recycling behaviour, transportation and shopping habits and energy use. We articulated the questions according to recent recommendations for measuring pro-environmental behaviours (Lange & Dewitte, 2019). In addition, we asked participants about their experience in the simulation, attitude towards zoos, familiarity and acceptance of nudging, and whether they suspect they were nudged during the simulation. The final questionnaire (Q3) concerned changes in attitudes or reported behaviours. Q3 was administrated online three months after the simulation to the 91 participants, and it was composed of the 15 NEP statements (same as in Q1) and the behaviour questions from Q2. We received 53 valid responses for Q3 (a 58.2% response rate). These were relatively evenly distributed across the three groups, with 16 responses for each of the Control and Nudge groups and 21 responses from participants in the Nudge + group. Table 3 details the questionnaires' administration and focus.

Results

Food choice

The dependent variable in our study was the participants' food choices. We excluded the 14 participants who reported a vegan or vegetarian diet from the subsequent analysis, as their menu choices would be pre-determined regardless of the intervention. Thus, our working sample constitutes 77 cases (Control $N = 21$, Nudge $N = 26$ and Nudge+ $N = 30$). For the analysis, we organised the five menu dishes into two discrete groups, Meat and Plant-based. The percentage of participants who opted for a non-meat choice was 33% in the Control treatment, 42% in the Nudge treatment, and 57% of the participants exposed to Nudge + interventions chose plant-based food from the menu. For comparison, the percentage of people who are "flexitarian" (often have meat-free meals) in Sweden is 30% of the general population and 37% of people younger than 35 (Vegobarometern: Klimat och miljö allt viktigare när vegetariskt fortsätter öka, 2022).

We used IBM SPSS Statistics, Version 29.0, to analyse the data and conducted a Pearson's chi-square test to examine the relationship between treatments and menu choice (meat or plant-based). The results suggest an overall non-significant association at the $p < 0.05$ level (X^2 (2) = 4.0, $N = 77$). However, given the small sample, significant linear-by-linear association, and adjusted residuals, further post-hoc investigation was made. A Pearson's chi-square test showed a statistically significant difference between the food choices of the Control and Nudge + groups (X^2 (1) = 3.84), $p \leq 0.05$, $N = 51$, $V = 0.275$ (small to moderate effect size). Participants in the

Table 3. Questionnaires.

	Administration	When	Focus	Additional questions
Q1	Online	On registration	Attitudes	Demographics; Vegan/Vegetarian
Q2	In laboratory	After simulation	Behaviours	Demographics; Simulation; Zoo; Nudging
Q3	Online	Three months after simulation	Attitudes & Behaviours	

Nudge + group chose more plant-based dishes from the menu than participants in the Control group. Notably, the statistically significant effect could only be detected when comparing the Control and Nudge + groups (i.e. excluding the Nudge group). Given the small sample and in line with Cohen's (1992) criteria of effect size, we suggest that our sample size was only suitable for detecting the most pronounced difference between the Nudge + and Control groups but was insufficient for detecting more nuanced differences between Control and Nudge, and Nudge and Nudge + groups. Moreover, although smaller effects were impossible to capture statistically with our sample size, the results suggest that the nudge + interventions (the welcome speech and signboard messages) amplified the menu manipulation and influenced participants' food choices. Figure 2 compares food choices by treatment.

Pro-environmental behaviours and attitudes

We set out to explore the potential of nudge + to promote changes that last beyond the decision-making instance. The questionnaires were designed to detect possible differences in participants' pro-environmental behaviours and attitudes (based on the NEP) three months after the simulation. A series of ANOVA tests (assumptions of normality not violated) showed no statistically significant differences in attitudes or behaviours (tested for Q1 and Q2, respectively) among the three groups. Nonetheless, when tested again in Q3, participants exposed to the nudge + treatment expressed attitudes and reported behaviours that were more pro-environmental than participants in the other two groups. However, these results do not surpass the statistically significant threshold for most tested items. We interpret this as an indication that there is a small to medium effect that would be detectable with a larger sample size. The data from the questionnaires are available in the appendices.

Notably, we did detect statistically significant differences between the groups for two NEP statements and one pro-environmental behaviour. Post-hoc tests (Tukey's) suggest that the Nudge + group reported on average significantly higher than the Control for the items "Humans are seriously abusing the environment" ($F\ (2,49) = 3.79$, $p \leq 0.05$) and "How often do you cut back on driving a car for environmental reasons?" ($F\ (2,47) = 3.0$, $p \leq 0.05$). However, for the statement "Plants and animals have as much right as humans to exist" ($F\ (2,49) = 3.2$, $p \leq 0.05$), it was, in fact, the Control group that scored highest.

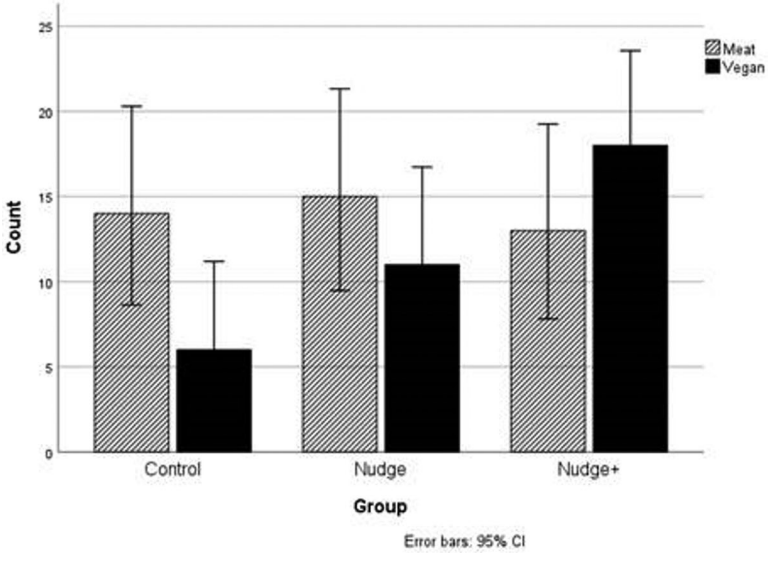

Figure 2. Participants' food choices by treatment.

Acceptance of nudging

In the questionnaire administered immediately after the simulation (Q2), we explained nudging and asked the participants, among other things, about their familiarity with, acceptance of, and interest in nudging. Half of all participants were familiar or partially familiar with nudging. Moreover, participants believe that nudging is an acceptable strategy for reducing the climate footprint of visitors ($M = 4.2$; $SD = 0.9$; where 5 is the highest rating on the Likert scale), and they expressed some interest in that on their next vacation, tourism companies will show them how they use nudging to influence consumer behaviour ($M = 3.7$; $SD = 0.9$). Finally, even the participants exposed to the Nudge + interventions did not find the climate messages obtrusive ($M = 2.5$; $SD = 1.6$).

Discussion

The focal point of this research was the potential application of nudge + in a tourism context. We wish to underline that the primary purpose of the laboratory simulation was to explore nudge + as a means to influence visitors' behaviours to reduce their onsite climate footprint while promoting the uptake of pro-environmental attitudes. The small sample size and possible biases associated with a laboratory environment mean that the study's empirical results are secondary in importance to the insights we developed while designing and conducting the laboratory simulation. In the following discussion, we interpret the results of the empirical investigation and provide some guiding principles for implementing nudge+.

Nudge + interventions incorporate reflective elements. The results of this study support that a reflective element enhances the nudge, making it advantageous for reducing visitors' onsite climate footprint (Banerjee et al., 2022). We interpret that incorporating reflective nudge + elements in the simulated visit facilitated participants' awareness, thus increasing their pro-environmental behavioural intentions. Moreover, we are particularly encouraged to learn about participants' approval of nudging in tourism contexts and that the explicit environmental messages did not disturb their simulated experience. This suggests that even with transparent interventions and a somewhat challenging call for action displayed on the signboards, the application of nudge + did not derogate from the functional and emotional value of the simulated visit. This is particularly critical, considering that interventions should avoid diminishing the hedonic essence of tourism experiences (Dolnicar, 2020).

Furthermore, we argue that nudge + can enhance the tourism experience by addressing multiple value dimensions (Prebensen, 2014). Nudge + can empower visitors and provide opportunities to generate social value and improve their self-identity. Moreover, nudge + can induce epistemic value by inviting visitors to learn, for example, about pro-environmental behaviours. In addition, our participants seemed to be interested in tourism companies showing them how they use nudging to influence consumer behaviour on their next vacation, and we are excited by the idea that disclosed interventions could help tourists better understand their cognitive biases.

In contrast to typical choice architecture studies, we reiterate that our main concern was not determining which nudges were most effective (undeniably an imperative task). Hence, although the menu manipulation consisted of three interventions, we could regard it as a single nudge. Our primary interest was conceptualising nudge + and understanding how reflective elements could be implemented in symbiosis with nudges in tourism experiences. In this sense, the laboratory simulation was a constructive step in learning how nudge + could be utilised. Not least, the process of designing the laboratory simulation, which involved observing how visitors interact with the experiencescape at the animal park (e.g. behaving on the trail, reading signboards and conversing with the receptionist), was paramount for our understanding of nudge + and its potential applications in tourism. We realised that nudge + could be composed of sequential interactions that create the conditions to influence decisions and perceptions.

This notion extends Banerjee and John (2021) idea of nudge+as a fixed and focused instrument. Especially in a tourism context, where experiences typically last for some duration, and businesses have some control over the design of the place, there are opportunities to incorporate nudge+sequentially along the customer journey as a series of interactions that set local norms.

The design of nudge+should embody contextual considerations. In line with the framework for designing tourism services and experiencescapes to be more environmentally sustainable (Dolnicar, 2020), we assert that the point of departure is to identify which tourists' behaviours are to be targeted and understand the driving forces behind these. Furthermore, in nudge+, the unique characteristics of the place and activity constitute the context for the targeted attitudes and norms. For example, in our simulation of an animal park, the importance of biodiversity served as a pertinent background story. Conversely, for destinations with arid climates or in congested cities, an adequate approach could be to focus, for example, on saving water or using public transportation.

Importantly, such background stories aim to elicit the reflective processes that facilitate attitude change. To be effective, stories should consist of successive messages and interactions (Warren et al., 2017). The messages ought to be positive, engaging and empowering, suitable for a particular audience, and provide actionable information that links the tourist experience with their daily lives (Fernández-Llamazares et al., 2020; Kusmanoff et al., 2020; Mann et al., 2018). Concurrently, these messages must be implemented with the utmost consideration so as not to divert attention from the main attraction or conflict with the purpose of the visit. For the design of Nudge+interventions, we, therefore, recommend adopting the customer journey perspective to identify touch points and slow-paced segments that are particularly suitable for reflections and undertaking pledges (Albrecht & Raymond, 2021; Walter, 2016; Yachin, 2018).

Our study design and results highlight that the concept of nudge+entails a purposeful and comprehensive rethinking of the tourism experiencescape and customer journey to maintain enjoyment, engage visitors and ensure a cohesive stance towards reducing the climate footprint. Such an effort requires dedicated attention and investments by tourism businesses and destinations. We propose that such a holistic approach can also strengthen the business or destination's core values and brand identity in ways that can spill over and inspire staff, stakeholders and other actors along and across the supply chain. We noted in the introduction that we are interested in the actions that individual tourism businesses can take to reduce the climate footprint. In this regard, nudge+should be part of a greater effort that includes, for example, carefully choosing suppliers, upgrading to energy-efficient appliances, and a systematic assessment of direct and indirect emissions associated with the business (Demeter et al., 2021; Wolske & Stern, 2018).

It is crucial to emphasise that choice architecture interventions, including nudge+, are no substitute but rather complementary instruments for laws, regulations or education (Lehner et al., 2016). Nevertheless, small interventions can influence norms and induce social tipping processes (Otto et al., 2020). Considering the scale and duration of our study, it would be careless to proclaim any long-term effects. As far as we know, this has been a limitation common to empirical investigations of nudge+ (e.g. Hume et al. (2021). Nonetheless, we should remember that nudge+is a recent advancement that was particularly conceptualised to enhance agency and climate citizenship (Banerjee et al., 2022). In this regard, this study contributes to developing and learning how to use nudge+. To put it in a tourism context, we envision that with the guiding principles of nudge+, tourism experiences can become platforms to influence attitudes and behavioural norms and contribute to facilitating large-scale social changes.

Conclusion

Our study aimed to contribute to the ongoing scholarly effort to understand better how to utilise nudging and other behaviour interventions to make tourism more sustainable. This research was guided by asking how to design tourism experiencescapes that reduce visitors'

onsite climate footprint and promote change in their pro-environmental behavioural intentions and attitudes. We introduced nudge+as an intervention that aims to influence consumer decisions and promote long-term behavioural change by facilitating reflexive actions alongside reflective processes. We simulated a visit to an animal park in a laboratory to explore nudge+and its applicability to tourism experiences. While inconclusive, the results suggest that the nudge+interventions enhanced the menu manipulation and influenced participants' food choices, which can be considered a proxy for pro-environmental behavioural intention. Likewise, participants exposed to the nudge+interventions reported behaviours and expressed attitudes that were more pro-environmental than participants in the Control and Nudge groups.

The uncertainty of the results can be attributed to the small sample size. Furthermore, our research design does not allow for determining the relative effectiveness of the different intervention components because the study did not include a "+" only treatment (excluding the nudge) and because the manipulated menu consisted of three interventions. Other limitations to our empirical investigation are biases associated with a laboratory environment, participants' demographics and possible social desirability tendencies. Furthermore, our results are based on participants' food choices in a simulated situation, not their actual behaviours. The same applies to the questionnaires, where the analysis is limited to data generated by participants' self-reporting. Moreover, we would have liked to prolong the study and test for long-term changes in attitudes and behaviours. It is possible that a study period longer than three months would have yielded additional insights and contributed to our understanding of the potential long-term effects of nudge+.

An essential contribution is the guiding principles for applying nudge+in tourism contexts outlined in the discussion section. These are directed towards researchers and practitioners alike. We hope to inspire future research to further develop our propositions and test nudge+interventions in various field experiments and longitudinal studies of changes in attitudes and behaviours. Research could, for example, explore and test how to implement reflective elements in tandem with nudges to promote climate-friendly behaviours, such as reducing food waste, increasing recycling and saving energy and water. Finally, for tourism businesses and destination managers, we propose that nudge+is pertinent for mitigating externalities and a means to generate value for visitors and assume a meaningful role in promoting social change.

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