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Sustainable behaviour at work: How message framing encourages employees to choose electric vehicles

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Abstract

This paper explores the application of message framing as a management practice to promote change in employee behaviour for corporate sustainability. We conduct a field experiment in a German automotive company to test the effects of three different frames (emotional, normative and gain) on pro-environmental actions in relation to electric vehicle choices of 170 employees. The frames are applied via two communication channels: first, via emails to remind employees about ordering a new car and second, via pop-up notifications appearing in the online system where employees complete their orders. We find that the interventions applied in emails, but not in pop-up notifications, have significant positive effects on electric vehicle adoption. Yet, the durability of the effects is limited. Overall, gain framing in the form of cost saving information has the longest and most powerful impact on electric car choices. Our findings have implications for workplaces where employees might not yet possess strong pro-environmental beliefs, showing that employee sustainable behaviour can be enhanced by emphasising complementary gain motives.

KEYWORDS

message framing, nudging, corporate sustainability, employee sustainable behaviour, workplace interventions, electric vehicles

1 | INTRODUCTION

As the impacts of climate change and environmental degradation mount, firms face growing pressure from stakeholders to adopt sustainable business practices (Howard-Grenville et al., 2014). They increasingly implement corporate sustainability strategies to integrate social and environmental considerations alongside economic performance goals (Rasche et al., 2017). However, after establishing sustainability targets and policies, organisations face the challenge of encouraging employees to align their behaviours with overriding strategies (Pellegrini et al., 2018; Sabbir & Taufique, 2022; Temminck et al., 2015; Uddin et al., 2021; Young et al., 2015). Prior research showed that receptive responses, on the part of employees, are relevant to improving a company's environmental performance in the long-term (del Brío et al., 2007; Paillé et al., 2014).

Employee sustainable behaviour (ESB) refers to responsible workplace actions in various domains that enhance positive organisational outcomes for society and the environment (Pellegrini et al., 2018).

Abbreviations: BEV, battery electric vehicle; CO_2, carbon dioxide; ECC, employee car configurator; ESB, employee sustainable behaviour; EV, electric vehicle; g/km, grams per kilometre; ICEV, internal combustion engine vehicle; IEA, International Energy Agency; LL, log likelihood; PHEV, plug-in hybrid electric vehicle; RCT, randomised controlled trial.

Internal management practices are key to fostering ESB 'by shaping employees' perceptions of organisational commitment to sustainability and expected behaviour in the workplace' (Pellegrini et al., 2018, p. 1229). Whereas the literature acknowledges the relevance of workplace interventions for promoting ESB, studies that empirically test the same relationship are limited (Paillé et al., 2014; Raineri & Paillé, 2016). Moreover, existing evidence showed that conventional management practices, such as trainings and awareness campaigns, have had little effects on ESB (Pellegrini et al., 2018; Young et al., 2015).

In light of these shortcomings, the present study suggests the application of message framing as a novel management practice to encourage the sustainable behaviour of employees. Message framing involves the alternative presentation of information in specific terms to mobilise certain beliefs and motivations that influence the choice of action either automatically or deliberately (Levin et al., 1998; Lindenberg, 2001). From a behavioural science viewpoint, framing can be seen as a form of nudging that relies on modifications in the choice environment to 'alter people's behaviour in a predictable way, without forbidding any options or significantly changing their economic incentives' (Thaler & Sunstein, 2021, p. 8). Because of their frequent success in public policy domains (Kaiser et al., 2020; Reisch et al., 2021), nudges are gaining increasing attention as potential levers to shift the behaviour of employees (Beshears & Gino, 2015; Ebert & Freibichler, 2017; Foster, 2017; Ilieva & Drakulevski, 2018). Yet, despite the growing interest in nudges as organisational management tools, far more field research is needed on which types of nudges work best in this domain (Chapman et al., 2021). This includes the area of message framing, which frequently addresses green consumer choices (Chang et al., 2015). However, there is a lack of research on how the same approach can influence pro-environmental decisions of employees.

We want to address this gap and focus our analysis on the automotive industry and the transition to electric mobility. The transportation sector accounts for 24% of global energy-related CO_2 emissions (International Energy Agency [IEA], 2021), and car companies face rising pressure to move their business focus to electric vehicles (EVs) as less environmentally harmful mobility alternative due to reduced tailpipe emissions (Beak et al., 2020; Held et al., 2018; Wolff et al., 2020). The mobility transition requires the promotion of internal organisational change to gain employees' support for EVs. Ensuring that employees practice what their employers preach, and thus engage in ESB by driving EVs, is crucial for promoting a culture of "walking the talk". Otherwise, there is also a risk of employees becoming cynical about their organisations, which might, in the worst case, result in resistance to change (Brown & Cregan, 2008). People working in an automotive company are car experts with detailed technical knowledge and strong emotional attachment to vehicles. As their skills traditionally evolve around fuel engines (Held et al., 2018), they might identify with internal combustion engine vehicles (ICEVs) and thus be reluctant to make the shift to EVs. Prior research revealed that multiple motives are responsible for changes in environmental behaviour, which can be emphasised through different frames (Lindenberg & Steg, 2007). We seek to explore this topic by asking the following research question: How should message frames be formulated and applied to effectively promote the EV adoption of employees?

To answer the research question, we conducted a field experiment within a sports vehicle company in Germany, namely Porsche, to test the effects of three different frames on employees' adoption of EVs as their company or leasing cars. In line with the regulatory environment in Germany, we consider both battery EVs (BEVs) and plug-in hybrid EVs (PHEVs) as EVs (BMWK, 2022). The first frame seeks to trigger an affective reaction through the association of EVs with Porsche as a brand with strong emotional value. The second frame conveys a normative goal, calling on employees to contribute to a sustainable Porsche future. The third frame focuses on monetary gains, providing cost saving information associated with EVs. Employees received the frames via two different communication channels during the decision process of ordering a car: first via emails to remind them about the upcoming order and second via pop-up notifications, appearing in the online system where employees completed their vehicle orders.

The remainder of this paper is structured as follows. Section 2 presents the theoretical background on the application of message framing to promote ESB. Section 3 describes our methodology. Section 4 presents the results. Section 5 discusses theoretical and practical implications of our findings. Section 6 reflects on limitations and suggests areas for future research.

2 | LITERATURE REVIEW

2.1 | Management practices for ESB

Internal organisational management practices with environmental or social objectives are described to promote ESB by fostering employees' commitment to sustainability (Aguilera et al., 2007). They can influence corporate culture, which represents the shared values, beliefs and norms supported by the employees within an organisation (Schein, 2010). Changes in organisational culture are seen as necessary to align individuals with organisational aspirations in favour of sustainability (Renwick et al., 2013). Once environmental values and norms are internalised by employees, they are assumed to translate into green behaviours (Afsar et al., 2018). The most prominent organisational practices applied to promote ESB are skills development and trainings (Renwick et al., 2013). Whereas such measures signal commitment and might help strengthen corporate sustainability expertise and knowledge (Paillé et al., 2014), there is little evidence that they effectively change employees' workplace behaviours (Pellegrini et al., 2018; Young et al., 2015).

One reason for the limited effectiveness of conventional organisational management tools relates to their neglect of the psychology of human decision making (Bazerman & Tenbrunsel, 2011). Behavioural decision research showed that people engage in two types of processes when making decisions—System 1 and 2 processes.[1] Although the former is characterised as fast, intuitive and often emotional with little

[1]These are also described as cognitive and non-cognitive determinants of ESB (Sabbir & Taufique, 2022).

cognitive effort involved, the latter is described as slow, reflective and analytical with effortful mental activities (Kahneman, 2012). The activation of either type of thinking is context-dependent, with many day-to-day decisions in busy work environments relying on System 1 processes (Beshears & Gino, 2015). This also applies to ESB, especially when employees perform task-related pro-environmental actions (Sabbir & Taufique, 2022), that is, decisions they make as part of their routine jobs and roles (Bissing-Olson et al., 2012). It is important to note that when engaging in System 1 reasoning, people often do not recall the messages conveyed by reward systems and trainings that are typically detached from the moments of actual choices (Bazerman & Tenbrunsel, 2011). This raises a need for interventions that encourage desirable behaviour by connecting the stimuli and the actual choices as closely as possible, through changes in the context in which decisions are made (Beshears & Gino, 2015; Thaler & Sunstein, 2021).

2.2 | Message framing as a management practice for ESB

One type of intervention that works through alterations in the decision situation is message framing (Chang et al., 2015). By carefully structuring how information is presented (Levin et al., 1998), organisations can use message frames as management tools to nudge towards meaningful cultural change, helping to align employee behaviour with corporate sustainability goals (Venema & van Gestel, 2021). A decision frame relates to 'the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice' (Tversky & Kahneman, 1981, p. 453). Depending on which aspects of the decision situation are part of the adopted frame, different motives might drive environmental behaviour (Lindenberg & Steg, 2007). Three of them have been previously identified as particularly relevant: emotional motives ('to feel better right now'), normative motives ('to act appropriately') and gain motives ('to guard and improve one's resources') (Lindenberg & Steg, 2007, p. 119). Whereas emotional motives can trigger fast and affective reactions towards intended behaviour change (Lindenberg & Steg, 2007), thus targeting System 1 processes (Kahneman, 2012), normative and gain motives prompt individuals to engage in more long-term and reflective thinking (Lindenberg & Steg, 2007), thus targeting System 2 processes (Kahneman, 2012). As with many decisions concerning ESB (Sabbir & Taufique, 2022), choosing an employee vehicle in an automotive company probably invokes both systems. On the one hand, people take time for evaluation and reflection to make high-involvement product decisions that do not happen daily (Rezvani et al., 2018). On the other hand, we expect the decision to be affected by emotions that result from close ties with the company and brand. Thus, in the present study, we formulated an emotional message to target System 1 processes as well as normative and gain messages to target System 2 processes. We will explain those framing interventions and their mechanisms in the following.

2.2.1 | Emotional framing

Emotional framing refers to the presentation of information in ways that arouse feelings of alignment 'with the audience's passions, desires and aspirations' (Giorgi, 2017, p. 717). It activates goals that promise to improve the way one feels (Lindenberg & Steg, 2007). Companies can use emotional framing to evoke positive feelings in line with corporate culture, thereby encouraging desirable behaviour change (Giorgi, 2017). The experience of positive emotions has been identified as important yet understudied mechanism that explains ESB (Norton et al., 2015). In automotive companies, the organisational culture is traditionally built around ICEVs: Employees are likely to experience 'car pride', and passion is often paraphrased as 'having fuel in the blood'. Driving an ICEV is thus associated with positive emotions and expresses feelings of group membership (Moody & Zhao, 2019). Whereas this association is increasingly challenged by a climate-conscious public (He et al., 2021), the change is only beginning within most corporate cultures in the car industry. Alternative message frames that arouse positive emotions for EVs could serve as means to shift the feelings of employees in favour of EVs.

Porsche has been using emotional framing in marketing for decades, creating a bond between the brand and customers by appealing to their emotional state, ego, needs and ambitions (with the key slogan 'Follow your dreams'). Equally, Porsche employees have a strong sense of belongingness to the corporate culture and brand. However, so far, they seem to associate the latter with petrol-powered sports cars, thus feeling good by driving ICEVs.[2] We try to change this association through an affective message that relates people's 'hearts' to electricity and their 'souls' to Porsche. We expect that the presentation of this message evokes positive feelings for EVs and thus serves as emotional frame with a positive influence on employee EV adoption.

2.2.2 | Normative framing

Normative framing is another mechanism to promote behaviour change via the activation of beliefs about appropriateness (Lindenberg & Steg, 2007). It may increase the degree to which individuals feel accountable for their actions, thus addressing System 2 reasoning (Beshears & Gino, 2015), by emphasising desirable social norms of an organisational culture. Social norms can be both descriptive, referring to perceptions of what *is done* by others, as well as incjunctive, referring to perceptions of what *ought to be done* according to others (Cialdini et al., 1991). Both descriptive and injunctive social norms are defined by informal social systems and by formal organisational policies and procedures (Sabbir & Taufique, 2022, p. 114). Informal normative influences are strong in organisations as employees typically belong to work groups and closely interact with peers to fulfil their tasks (Goldstein & Cialdini, 2011). Encouraging behaviour in line with formally defined environmental values is not easy when the actions of

[2]Information retrieved from company-internal communication

peers do not correspond to the corporate vision (Norton et al., 2014). One proposed approach to activating desirable normative beliefs and stimulating ESB is the communication of statements and appeals made by important others—that is, by leaders supporting greener choices (Paillé et al., 2014; Sabbir & Taufique, 2022). Leaders can act as role models, and the signals they send may be particularly impactful (Ramus & Steger, 2000). Prior studies revealed the effectiveness of normative messages sent on behalf of management in workplace areas including electricity consumption and waste reduction (Chakravarty & Mishra, 2019; Charlier et al., 2021).

With our study, we test a normative frame that emphasises sustainability, thereby seeking to promote the adoption of EVs as less environmentally harmful choice. Porsche was the first sports car producer to decide to go fully electric back in 2015, working towards becoming net carbon neutral across the value chain in 2030.[3] This far-ranging strategic decision also means that internal values and norms have to change. For a sports car company with successful engineers trained in combustion engine technology, this is not an easy step. However, against the theoretical background, we expect that a normative message sent on behalf of a highly respected management team has the potential to shift organisational norms and the behaviour of employees towards the adoption of EVs.

2.2.3 | Gain framing

The final message frame that we investigate emphasises the perceived gains of a desirable choice (Lindenberg & Steg, 2007). The glorified image of driving ICEVs that may persist in the corporate culture of an established automotive company (Held et al., 2018), may come with negative associations of other more environmentally-friendly transportation options, which can bias people against choosing EVs. Common biases that represent barriers to driving EVs are loss aversion, present bias and status quo bias (Filippini et al., 2021). Loss aversion refers to the observation that people dislike losses more than they like comparable gains (Kahneman et al., 1991). Some losses might be particularly salient. When making a decision about which new car to order, people might place more weight on the anticipated downsides of driving an EV (e.g., lacking charging infrastructure and low EV range) than on the prospective benefits (e.g., energy cost savings). People might also be present-biased by minimising the positive future outcomes of driving EVs (Filippini et al., 2021). Relatedly, status quo bias results from driving habits that people might resist changing because they mainly consider the challenges of switching to EVs (Filippini et al., 2021). To promote EVs as less environmentally harmful choices, employees must thus be able to recognise the opportunity costs of their decisions (Kristal & Whillans, 2020). By increasing the salience of the benefits of a particular choice, gain framing can encourage employees to reconsider the lens through which they are seeing the problem (Lindenberg & Steg, 2007). It can strengthen System 2 reasoning to incorporate a broader range of consequences that people would not consider otherwise (Beshears & Gino, 2015), which might make environmentally preferred choices look more attractive.

In our study, the gain frame relates to energy cost savings of switching to an EV. Even though employee cars at Porsche are subsidised, organisational members partly need to cover the costs of driving by themselves. The share of energy costs can represent up to one sixth of employees' overall monthly operating vehicle costs.[4] However, opportunities for reducing these expenses might go unnoticed and hence prevent behaviour change (Kristal & Whillans, 2020). To encourage employees shifting away from driving emission-intensive ICEVs, highlighting the easily hidden cost savings of opting for EVs should be a powerful approach. Thus, we expect that the presentation of a gain frame has a positive influence on employee EV adoption.

2.2.4 | Time-specific application of framing

Besides testing different types of message frames, our study seeks to determine the optimal timing of their application, which is an important but underappreciated factor of successful behavioural intervention implementation (Behavioural Insights Team [BIT], 2014). According to the theory of planned behaviour (TPB), which has become the main theory in analysing ESB (Renwick et al., 2013; Sabbir & Taufique, 2022), time has a negative effect on desirable behaviour change because of the impact of various personal and external factors of influence that might lead to alterations in original intentions or constrain the ability to act on them (Ajzen, 1985). Although TPB assumes planned, that is, rational decision making, rather than distinguishing between Systems 1 and 2 reasoning (Sabbir & Taufique, 2022), the argument seems relevant for the timing of nudges, including those of message frames (BIT, 2014). Prior studies of 'just-in-time' framing interventions refer to the need to identify 'teachable moments', in which people are receptive to (i.e., able to process and use) the messages conveyed (Van der Laan & Orchloska, 2022). Whereas early messaging allows people to have enough time to act on the information, informing them too early may give them time to delay their actions; the information might become less salient or be forgotten, and people might not act at all (Ericson, 2017; Sunstein, 2014). To identify the optimal timing of the proposed frames, we apply them via two communication channels at different times of the decision process: first, via emails to remind employees that their car order is soon due and second, via pop-up notifications, appearing in the online employee car configurator (ECC) where vehicle orders are placed.

3 | METHODS

3.1 | Experimental design, sample, and data collection

A randomised controlled trial (RCT) was carried out using a final sample of 170 Porsche employees over a three-month period

[3]Information retrieved from company-internal communication

[4]Information retrieved from company-internal communication

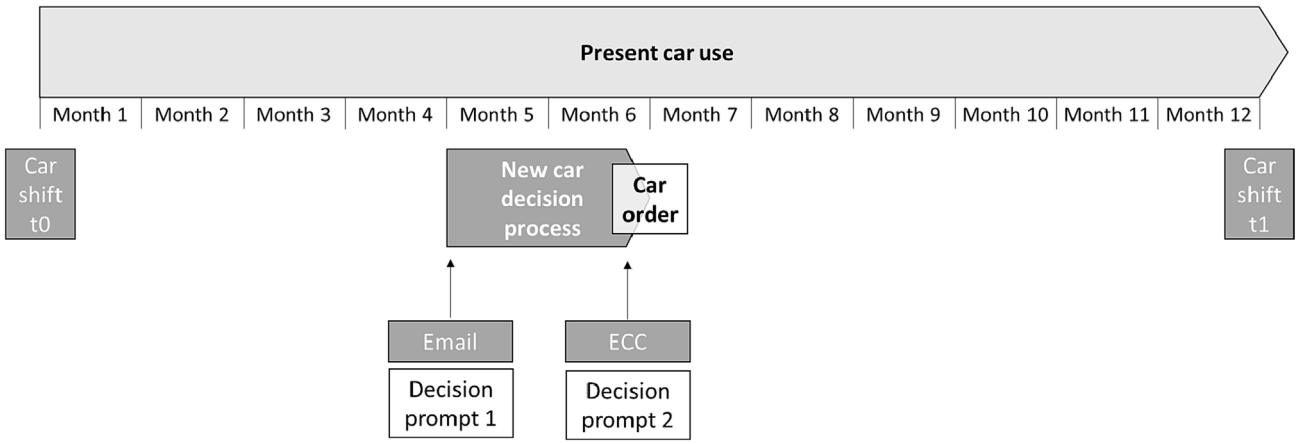

FIGURE 1 Timeline of employees' decision process.

between January and March 2022. To optimise the design of the RCT, improve our intervention material and rule out unforeseen technical or procedural problems, a seven-month pilot field study preceded the actual experiment between June and December 2021. The data collection plan and analytical strategy were preregistered, and the experimental study obtained ethical approval by the Ethics Council of Copenhagen Business School. Although we originally planned to continue the experiment for 6 months until June 2022, we had to terminate the data collection prematurely due to the war in Ukraine, which heavily affected Porsche's supply chain and production possibilities, and hence constrained the availability of employee vehicles as of April 2022. Figure A1 in the appendix provides a step-by-step overview of the research process (Figures A2 and A3).

Figure 1 depicts the timeline of the decision process that we studied. Employees use their company or lease cars for 12 months. After this period, the cars are sold to retail partners, and the eligible employees can choose a new model using an internal ordering system called ECC. To remind employees about ordering a new car, they receive an email 8 months prior to the upcoming car shift. For logistic reasons, employees are encouraged to complete their orders no later than 6 months before the upcoming car shift. We used randomly assigned message frames targeting the decision process of ordering a new car first in emails (decision prompt 1) and second in pop-up notifications, appearing in the ECC (decision prompt 2). The latter implies (and assures) that Porsche employees were treated directly before the final order decision was made, as they had to use the ECC to conclude a vehicle contract online.

Our sample was drawn from a population of 4872 Porsche employees in Germany, either eligible for fully funded company cars (856 employees in managerial positions, starting from the middle management) or leasing cars under favourable conditions (4016 employees working for the company for more than 24 months and having a certain pay grade, or working in the company for more than 25 years). The population was randomly assigned to the experimental conditions based on the employees' identification numbers.[5] To reduce experimental biases, employees did not know that they were part of an experiment, but were informed about the nature of our study following its completion. Figure 2 depicts the experimental design with the number of participants in each condition. It reflects a 4×4 between-subjects design with 16 combinations of control and/or treatment conditions. The first four conditions relate to the email that employees received prior to the upcoming car shift. Participants in the control condition received the email with a neutral message. Participants in the treatment conditions received the same email with one of three message frames (emotional, normative and gain). The second set of randomised conditions concerned the ECC. Participants in the treatment conditions received a pop-up notification with one of the frames that were also included in the emails. Participants in the control condition did not receive a pop-up notification when entering the ECC. In total, 430 employees with an upcoming car shift were identified to receive an email. Of those employees who obtained the email, 170 were considered for the statistical analysis, as they completed their orders after receiving the email and before the end of the study. The remaining observations had to be dropped.

The frames took the form of visual messages with a short written statement included (see Figure 3). The emotional frame associates EVs with Porsche as a brand through the slogan 'the heart electric, the soul Porsche'. The normative frame calls on employees to 'be an ambassador for a sustainable Porsche future'. The gain frame suggests employees could 'exchange gasoline for electricity and reduce their monthly operating costs by EUR 100'. The messages were designed together with the unit responsible for the ordering of employee cars (called Sales Company Cars and Direct Sales). For three reasons, collaborating with this unit was important. First, they could share invaluable inside knowledge of the behavioural barriers that restrain employees from choosing EVs. Second, upon evaluation of the barriers, the unit created visuals in line with and recognisable as brand communication. Third, external researchers would not have been able

[5]The number is attributed to employees in numerical sequence according to their entry date into the firm.

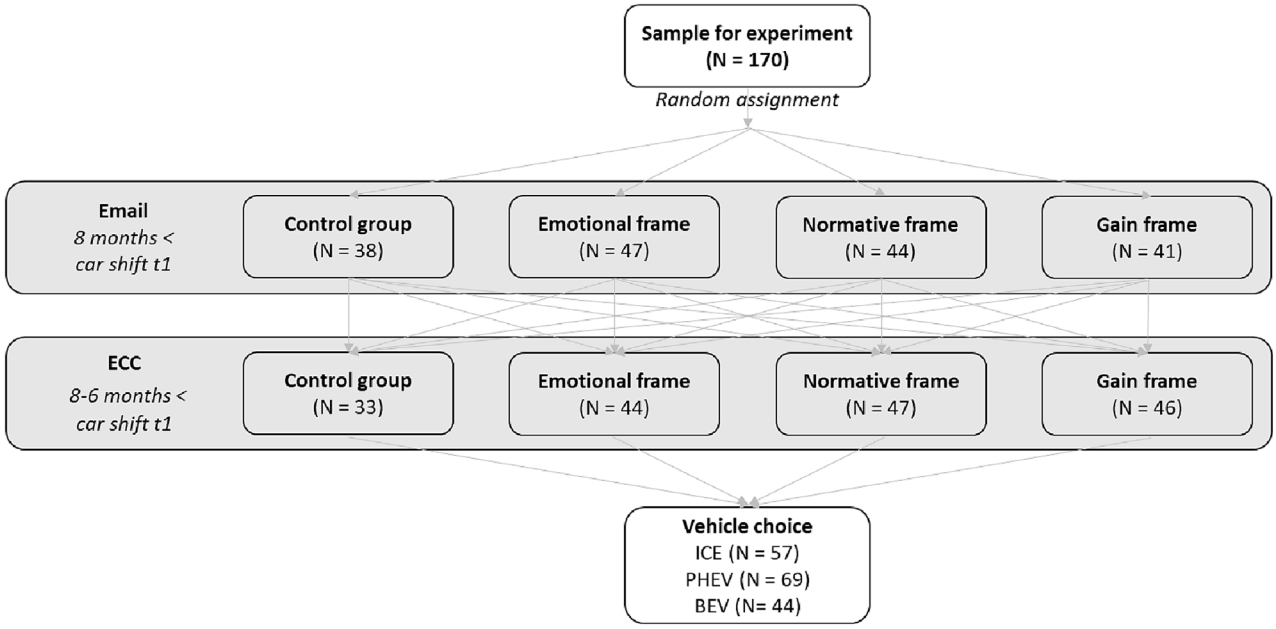

FIGURE 2 Experimental design of the study.

to access internal software and databases, so the unit served as a data collector and gave invaluable feedback on the context.

To execute the interventions, the Sales Company Cars and Direct Sales unit sent the four versions of the experimental emails to employees with an upcoming car shift 8 months later. Emails were sent on a weekly basis, and the dates of sending them were manually entered into the data sheet that contained anonymised information for each participant. Order details concerning the chosen vehicle and the time of the order were automatically captured by the ECC system and subsequently integrated into the data sheet. The pool of cars that employees could choose from consisted of one BEV model (Taycan), two PHEV models (Cayenne and Panamera) and five ICEV models (Cayenne, Macan, Panamera, 718 and 911).[6] All models were available in different versions, both as company and leasing cars.

3.2 | Statistical analyses

Statistical analyses to test the proposed frames were performed using the software package StataSE 17. We used logistic regressions to transform the following (linear) model and estimated its coefficients:

$$E_i = \alpha_i + \sum_{j=1}^{4} \beta_j D_{i,j} + \sum_{k=1}^{4} \gamma_k C_{i,k} + \vec{\delta} \cdot \vec{X}_i + \epsilon_i \quad (1)$$

E_i is the binary dependent variable that indicates whether participant i chooses an EV. In addition to overall EV (PHEV and BEV) choices, we considered a slightly altered dependent variable that only accounted for BEV choices. We did so because the message frames included illustrations of the fully electric Porsche Taycan and thus particularly targeted BEVs. This may have resulted in a stronger nudging effect for BEV orders specifically. D_{ij} reflects a set of dummy variables that denote the email condition j ($j = 1, 2, 3, 4$) of participant i. $C_{i,k}$ relates to a similar set of dummy variables for the ECC condition k ($k = 1, 2, 3, 4$) of participant i. X_i represents a vector for respondent-specific controls.

We included eligibility for company cars as a covariate to control for the differences in vehicle choices due to heterogeneous cost structures between fully funded company cars and chargeable leasing cars. In addition, we controlled for the vehicle type (ICEV, BEV and PHEV) selected in the prior car shift (t_0) to account for habitual vehicle choices that might influence the present car choice. α_i denotes the intercept and ϵ_i the residual. We are interested in the parameters β_j and γ_k, which indicate the estimated values of the average treatment effects.

As recommended for logistic regressions (Mehmetoglu & Jakobsen, 2017), we determined the goodness of fit of the estimated models and confirmed that the models were correctly specified after performing the regressions. We also tested for the absence of multicollinearity.

4 | RESULTS

4.1 | Descriptive results

Table 1 presents the descriptive statistics for our sample. Overall, 66.5% of participants chose EVs[7] in the focal car shift (t_1) compared with 45.9% in the prior car shift (t_0). Of all the participants, 80.6% are

[6] Details of the ECC interface and the available car schemes are included in the Appendix.

[7] 40.6% PHEVs and 25.9% BEVs (Figure A4)

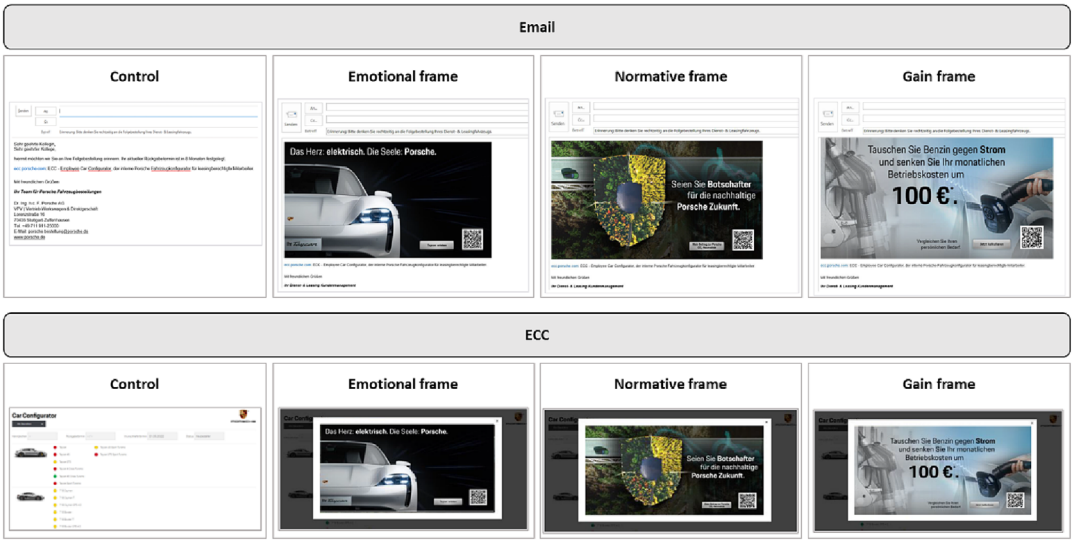

FIGURE 3 Control and treatment conditions in the emails and the employee car configurator (ECC).

TABLE 1 Descriptive statistics.

	Email				ECC				
	Control	Emot. frame	Norm. frame	Gain frame	Control	Emot. frame	Norm. frame	Gain frame	Full sample
EV in t_1	.52 (0.506)	.638 (0.486)	.659 (0.479)	.829 (0.381)	.667 (0.479)	.659 (0.479)	.766 (0.428)	.565 (0.501)	.665 (0.474)
EV in t_0	.421 (0.500)	.511 (0.505)	.432 (0.501)	.463 (0.505)	.515 (0.508)	.500 (0.506)	.426 (0.500)	.413 (0.498)	.459 (0.500)
Male	.763 (0.431)	.787 (0.414)	.955 (0.211)	.707 (0.461)	.818 (0.392)	.800 (0.408)	.766 (0.428)	.848 (0.363)	.806 (0.397)
Comp. Car	.263 (0.446)	.128 (0.337)	.136 (0.347)	.073 (0.264)	.152 (0.364)	.136 (0.347)	.170 (0.380)	.130 (0.341)	.147 (0.355)
Spread	2.921 (1.715)	3.150 (2.167)	2.364 (1.615)	2.854 (2.265)	3.121 (2.147)	2.977 (1.785)	2.872 (2.193)	2.413 (1.759)	2.824 (1.971)
N	38	47	44	41	33	44	47	46	170

Note: Standard deviations are reported in parentheses.
Abbreviations: ECC, employee car configurator; EV, electric vehicle.

male, reflecting the low share of female employees across the organisation (Porsche, 2021). Twenty five participants or 14.7%, are eligible to company cars. The remaining 145 employees are eligible to lease cars. The average spread between the email and the vehicle order is 2.8 weeks. For the email trial, the average share of EV choices is higher in all treatment groups (63.8%, 65.9% and 82.2%) than in the control group (52.6%). For the ECC trial, the direction of the treatment effects is mixed.

4.2 | Main logistic regression results

The results of the logistic regression that test the three frames are reported in columns 1 and 2 of Table 2. Column 1 presents the estimated treatment effects on overall EV choices expressed in logit coefficients. Column 2 displays data of the same model with BEV orders as dependent variables. As we shall soon see, our results mask the importance of intervention timing; but, we begin by describing the aggregate results.

Looking at Columns 1 and 2, evidence in relation to the tested frames is mixed. The effect of the emotional frame is not significant (neither in the email nor in the ECC). For the normative frame, we discover a positive and significant effect on BEV choices when applied in the ECC. However, the effect does not hold for overall EV choices and is thus of limited reach. For the gain frame, we find a positive and significant impact when applied in the email, with the odds of choosing an EV being 3.7 (and a BEV being 4.2) times as high as for the control group (Table A2). Notably, however, its effect is not significant when applied in the ECC. In addition to our main model, we verified the combined impacts of the message frames applied in emails and ECC pop-up notifications across the two times (Table A1), indicating positive coefficients, but non-significant results.

TABLE 2 Effect of nudges on EV uptake of employees reported in logit coefficients.

	(1) EV in t_1	(2) BEV in t_1	(3) EV in t_1	(4) BEV in t_1	(5) EV in t_1 if ICEV in t_0
Email					
Emotional frame	−0.019	0.721	3.104***	2.695**	5.972***
	(0.525)	(0.659)	(0.984)	(1.330)	(2.038)
Normative frame	0.687	1.091	1.862**	2.878**	5.103**
	(0.505)	(0.677)	(0.918)	(1.375)	(2.038)
Gain frame	1.319**	1.415**	3.094***	2.471*	6.470***
	(0.643)	(0.689)	(1.192)	(1.312)	(2.002)
Spread			0.662**	0.407	2.007***
			(0.261)	(0.322)	(0.692)
Email × spread					
Emotional frame × spread			−1.032***	−0.631	−2.108***
			(0.318)	(0.386)	(0.733)
Normative frame × spread			−0.342	−0.676	−1.614**
			(0.325)	(0.528)	(0.748)
Gain frame × spread			−0.627*	−0.341	−1.926***
			(0.346)	(0.358)	(0.707)
ECC					
Emotional frame	−0.113	−0.392	−0.424	−0.648	−1.091
	(0.556)	(0.681)	(0.575)	(0.700)	(0.824)
Normative frame	0.692	1.240*	0.686	1.031	−0.052
	(0.582)	(0.690)	(0.625)	(0.683)	(0.846)
Gain frame	−0.608	0.030	−0.716	−0.221	−1.125
	(0.550)	(0.664)	(0.576)	(0.694)	(0.820)
N	170	170	170	170	92
McFadden's R^2	0.211	0.291	0.266	0.309	0.249
Wald's X^2	34.290***	39.810***	41.810***	38.940***	20.810***
LL	-85.578	-68.851	-79.567	-67.153	-47.905

Note: All results are based on logistic regressions. Additional controls include effects of company cars and vehicle choices (ICEV, PHEV, BEV) in t0. Heteroscedastic robust standard errors in parentheses.

Abbreviations: BEV, battery electric vehicle; ECC, employee car configurator; EV, electric vehicle; ICEV, internal combustion engine vehicle; LL, log likelihood.

*p < 0.1, **p < 0.05, and ***p < 0.01.

4.3 | Exploratory analysis of message frames applied in emails

Our experimental design allowed us to measure the spread (in calendar weeks) between the weeks participants received the emails and the weeks they placed their orders in the ECC across experimental conditions. The spread varied between 0 to 10 weeks. We were interested in estimating the conditional average treatment effect depending on how much time the participants took to complete their orders after receiving the message frame via email. To do so, we included an interaction term between the email condition and the spread in our main model. Columns 3–5 in Table 2 report the regression results in logit coefficients.[8] Columns 3 and 4 present the estimated treatment effects on EV and BEV choices, respectively. Column 5 displays results for the impacts on EV choices for participants who selected an ICEV in the prior car shift. We expected the frames to be particularly powerful for this subsample, as levers to shift choices from ICEVs to EVs.

The results in columns 3–5 show significantly positive coefficients for the three email treatment variables. This finding suggests that all frames increase the odds of choosing an EV if the vehicle

[8]Table A2 reports the results of the same models expressed in odds ratios to give an impression of the effect sizes of the frames applied in emails.

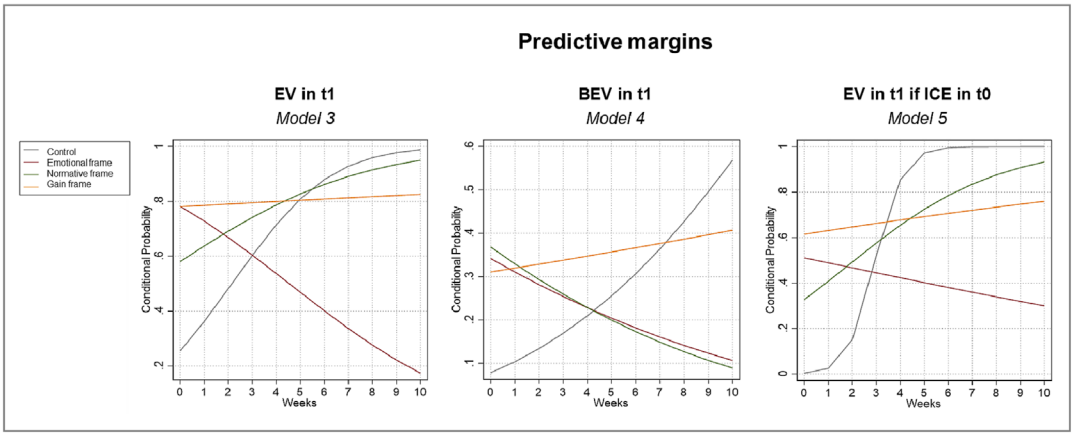

FIGURE 4 Effects of frames applied in emails depending on spread.

order is completed *immediately* after receiving the email. Likewise, the estimated coefficients of the spread variable are significantly positive in columns 3 and 5, indicating that participants who received the control email are more likely to choose an EV the more time they take to make their decisions after receiving the emails. The estimated interaction effects between the frames applied in emails and the spread are negative. This points to the declining impact of the frames applied in emails over time, with highly positive effects immediately after receiving the message frames, but gradually decreasing effects as weeks pass until the vehicle orders are made. No treatment effects of the same frames applied in the ECC can be found in columns 3–5.

To get a better understanding of how the impacts of the three frames applied in emails differ over time, we calculated their marginal effects at the values of the spread following the logistic regression results presented above. Figure 4 displays the predictive margins expressed in probabilities based on the regression results in columns 3–5 in Table 2. The graphs show that under the emotional frame, the probability of choosing an EV is up to three times higher (Model 3) compared with the control group *if the vehicle order is made in the same week as being treated*. This effect decreases sharply over time, with the frame losing its effectiveness compared with the control group after less than 3 weeks for EV choices (Models 3 and 5) and after 4 weeks for BEV choices (Model 4). The probability of choosing an EV under the normative frame is up to 2.4 times higher (Model 3) compared with the control group *when the treated participants complete their vehicle orders in the same week as receiving the email*. Except for BEV choices specifically (Model 4), the impact of this frame has a positive slope, indicating a gradual increase over time in absolute terms. However, in comparison to the control group, the impact gradually diminishes with the intervention losing its effectiveness 5 (Model 3) or 3 weeks (Model 5) after being treated. By contrast, the effect of the gain frame is remarkably persistent over time. Compared with the control group, the probability of choosing an EV is up to three times higher when making an order immediately after receiving the email (Model 3). The positive effect of the gain frame holds up to 7 weeks (Model 4) from the point in time when the email is received. Thereafter, employees in the control group are more likely to choose an EV.

In a nutshell, our results indicate that the tested message frames applied in emails are more likely to lead people to opt for EVs if they make their decisions directly after receiving the email and that the effects of those frames disappear over time. Overall, the effectiveness of the tested frames is thus conditional on two factors. First, the communication channel, and thus the timing of the behavioural stimuli matters, as the frames work better when applied in the emails than in the ECC. Second, the durability of these effects is limited (compared with the control group). Yet, trends evolve differently depending on the types of frames with the gain frame having the most significant impact regardless of the spread.[9] We also find that the investigated frames have longer-lasting effects on BEV orders than on overall EV choices, as anticipated, as the visuals of the applied frames illustrate a BEV (the Taycan).

As a robustness check, we split our sample into two groups to distinguish roughly half of the participants who made their orders in the first 2 weeks after receiving the message frame via emails from those who took more time to complete their orders. Figure 5 displays graphical results from three regressions that accounted for these sample variations. The width of the lines indicates the 95% confidence interval of the parameters. Those lines that do not intersect the null line (in red) reflect significant treatment effects. The illustration confirms our findings above. We see that all frames applied in emails have significantly positive effects on EV choices if orders are made within 2 weeks after being treated. For the full sample (with participants making their orders between 0 and 10 weeks after receiving the email), only the gain frame has a significantly positive effect on employee EV choices and hence, ESB.

[9] Figure A5 in the Appendix visualises the calculated differences in probabilities of choosing an EV between the control and gain frame email conditions over the weeks.

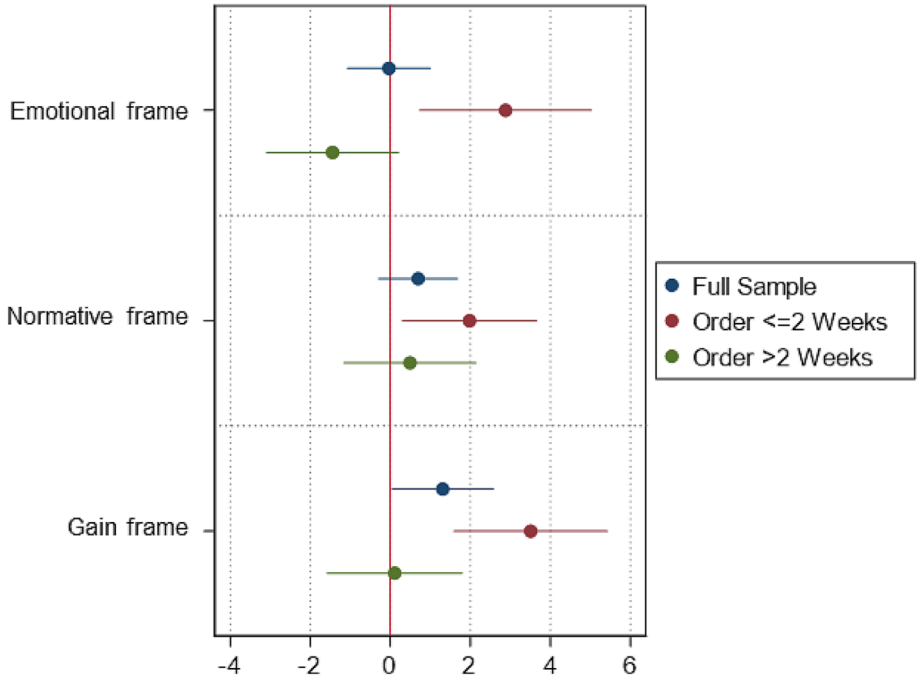

FIGURE 5 Sample splits for effects of frames applied in emails depending on spread.

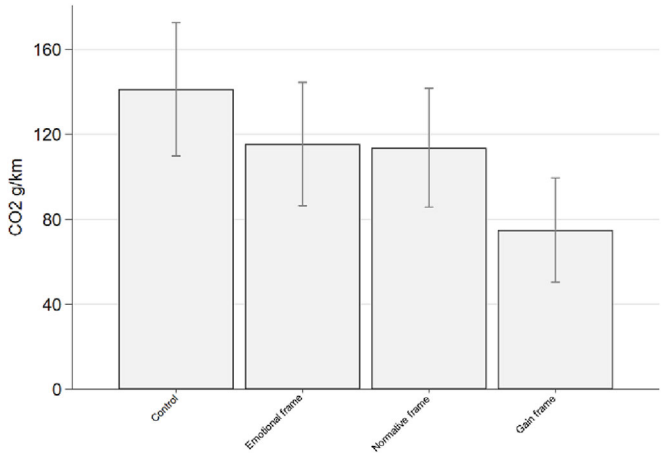

FIGURE 6 Average CO_2 emissions (g/km) of chosen vehicles per email condition.

Finally, to explore the environmental impact of the frames applied in emails, we calculated the average CO_2 emissions associated with the employees' vehicle choices for each of the four email conditions.[10] Figure 6 shows that the average CO_2 emissions per chosen vehicle are 141, 115, 114 and 75 g/km for the control, emotional, normative and gain framing conditions, respectively.

Figure 7 provides further details on the average CO_2 (g/km) reduction rates across weeks for employees in the gain framing condition compared with those in the control condition. Given the probabilities calculated by our regression model, we can assume that, on average, 104 g/km CO_2 are saved per vehicle choice for people making their car choices in the first week after receiving the gain framing email. This rate decreases steadily and becomes negative for employees making their car choices 5 weeks after being treated.

[10]For further details on the calculations, refer to the Appendix.

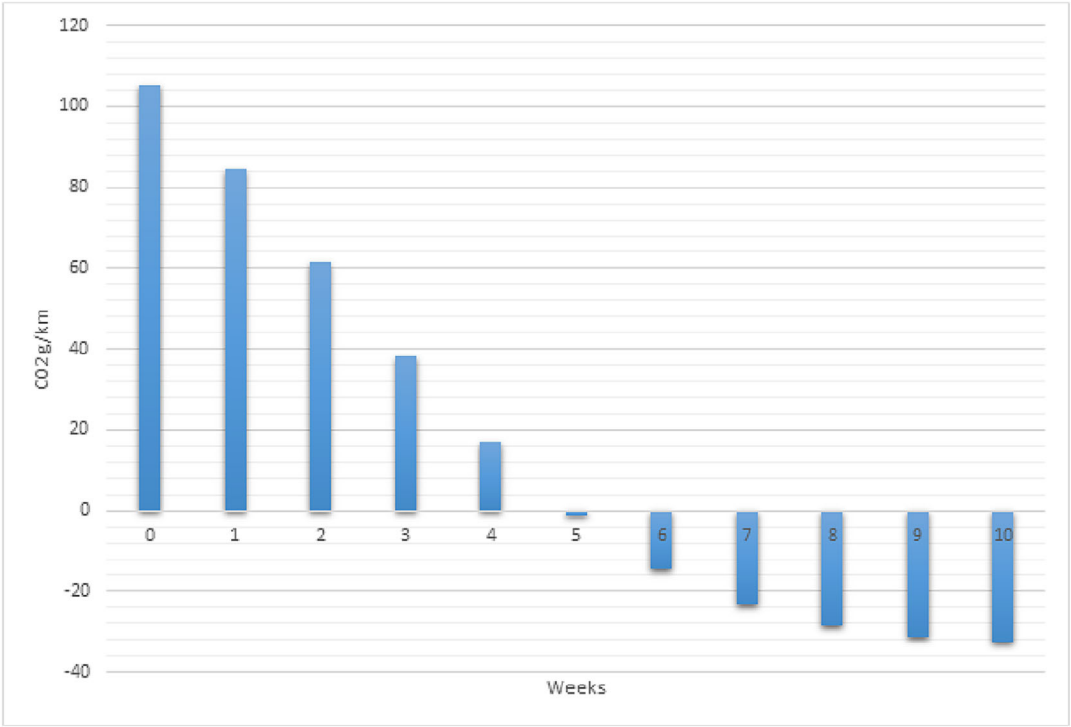

FIGURE 7 Average CO_2 (g/km) reduction across weeks (gain frame vs. control).

5 | DISCUSSION AND CONCLUSIONS

The aim of this study was to assess the application of message framing as a management practice to promote ESB in support of organisational change for corporate sustainability. The effectiveness of all three tested frames could only be confirmed when applied in emails, but not in the ECC. However, the durability of these effects was limited. Overall, the gain frame applied in emails had the strongest and most durable effect on electric car choices and thus the sustainable behaviour of employees.

Our study provides two main contributions to the corporate sustainability and organisational behaviour literature. First, it expands prior research in the field by exploring the application of nudging in the form of message framing as a novel management practice to encourage ESB. To the best of our knowledge, this has not been done previously. Existing studies primarily focus on environmental beliefs as the main determinant of sustainable behaviour in the workplace and emphasise the relevance of organisational policies, such as trainings and awareness campaigns, that make ecological concerns salient to employees (Paillé et al., 2014; Pellegrini et al., 2018; Raineri & Paillé, 2016; Uddin et al., 2021). With our paper, we respond to a call for integrating a broader range of mechanisms driving ESB (Norton et al., 2015). Our data supports the findings of Sabbir and Taufique (2022), suggesting that both Systems 1 and 2 processes of reasoning influence pro-environmental workplace actions. This also confirms the insights of prior framing literature (Flores & Jansson, 2022; Lindenberg & Steg, 2007; Steg et al., 2014; Rezvani et al., 2018; Westin et al., 2020; White & Simpson, 2013), showing that multiple motives can drive green choices. If applied at the right time, we demonstrate that emotional framing can tap System 1 processes, whereas normative and gain framing can tap System 2 processes for sustainable behaviour change. Although the short longevity of the emotional frame reflects the anticipated fast and intuitive nature of System 1 reasoning (Kahneman, 2012; Lindenberg & Steg, 2007), the longer durability of the normative and disclosure frames resonates with their anticipated influence on slower and more deliberative System 2 processes (Kahneman, 2012; Lindenberg & Steg, 2007).

Considering the whole study period and comparing our results with the control group, emphasising cost savings works better than defining sustainability as a salient corporate value through a normative message frame. This partly contradicts previous literature that proposed environmental beliefs as a pre-condition for ESB (Paillé et al., 2014; Pellegrini et al., 2018; Temminck et al., 2015; Uddin et al., 2021). Strengthening normative environmental beliefs may be particularly relevant in those situations where environmental goals and gain goals conflict with each other, that is, where green choices are very costly. Encouraging sustained green behaviour might thus specifically rely on emphasising normative reasons so that people want to act green because they think it is the right thing to do (Steg et al., 2014). By contrast, in the context of our study, we focused on emotional, gain and normative goals that complemented each other. Similar to prior studies on the EV adoption by private consumers (Rezvani et al., 2018), we showed that interventions targeting affective and gain motives are effective means to support the ultimate

normative environmental goal in this case. One explanation for the strong and durable effect of the gain frame in our study could relate to employees' dominant beliefs in a corporate culture that traditionally does not reflect sustainability. Employees may not yet hold deep environmental values and thus respond more frequently to messages that emphasise self-enhancement rather than environmental norms (Steg et al., 2014). The effect of the gain frame may thereby be reinforced by positive emotions associated with the anticipated gains (Flores & Jansson, 2022; Rezvani et al., 2018). Hence, different motives could also relate to and mediate each other. Whereas people sharing strong personal environmental norms may feel good by following the messages conveyed by normative frames (Rezvani et al., 2018), those sharing self-enhancement norms may rather experience positive emotions in response to gain framing.

The second main contribution of our study relates to the revealed importance of the context in applying interventions for encouraging ESB. Thereby, we address a gap in existing research, which mainly focuses on influencing the person rather than their environment (Norton et al., 2015). Beyond individual characteristics, we find that people respond differently to identical message frames depending on when they occur, thus providing insights into the contextual conditions under which people are receptive to behaviour change. We generated these insights thanks to our experimental methodology, which allowed us to operationalise and control for the context. This is rare among studies investigating ESB (Norton et al., 2015). As experiments permit inferences about causality and thus allow measuring actual treatment effects, they ensure high internal validity (Aguinis & Bradley, 2014). At the same time, we guarantee high external validity of our research design by using real behavioural data from field observations rather than self-reported evidence. The latter concerns a frequent limitation of studies investigating ESB, which might lead to gaps between subjective measures and the objective actions of employees (Chaudhary, 2020; Paillé et al., 2014; Pellegrini et al., 2018; Raineri & Paillé, 2016). Drawing causal inferences from observational data, we find that the timing of interventions matters. Whereas the evaluated frames had positive effects on ESB when targeting the focal decision process at an early stage, they did not work when addressing the same process at a later point. Comparing our results with the insights from prior literature (Van der Laan & Orchloska, 2022), we infer that the optimal timing of behavioural interventions in the workplace depends on the choices they address. On the one hand, frequently recurring decisions with short-term impacts, such as selecting sustainable food choices in workplace canteens, may be influenced at a late stage of the decision process, prompting people to revise their choices just before they pay. On the other hand, less frequent high-involvement decisions with long-term consequences, like selecting an employee car once per year, may only be influenced at an early stage of reasoning, before intention formation initially takes place.

Our findings have managerial implications for organisations tasked to encourage their employees to 'walk the talk' and achieve organisational change for corporate sustainability. Most importantly, we show that the application of message framing can be a powerful approach to promote green choices of employees, who may not already possess strong pro-environmental beliefs and attitudes. This is relevant for organisations in many industries that increasingly move towards corporate sustainability although their business models and associated workplace cultures traditionally do not reflect strong pro-environmental concerns (Sroufe, 2017). Ensuring that employees act in alignment with overarching sustainability strategies is crucial for delivering towards public expectations and preserving the credibility of corporations (del Brío et al., 2007; Paillé et al., 2014). In this regard, our results reveal the power of message frames that resonate with the feelings and beliefs of employees. First, our findings support the success of emotional frames to target System 1 processes. Considering their short longevity, they should best be applied in contexts where employees tend to act quickly and affectively upon a prompt. In a fast-moving work environment, frequently recurring and habitually performed choices, on which employees do not spend much time, such as switching on the lights or throwing out garbage (Sabbir & Taufique, 2022), seem suited to be addressed by such frames.

By contrast, high-involvement decisions of environmental relevance, for which employees take time for reflection, like eco-innovation processes (Buhl et al., 2016), might rather be addressed by frames that target System 2 reasoning with more durable effects. In this regard, our study specifically implies the power of emphasising monetary benefits associated with ESB. The practical relevance of this finding should be interpreted with caution though. Gain framing can provide a cost-efficient way to encourage green behaviour in those specific areas where overarching environmental objectives come along with individual benefits, such as situations where employees use their employers' products and technologies at a private share of operating costs. Managers could, for example, encourage employees to make decisions in favour of environmentally-friendly workplace equipment, such as business laptops and phones that are partly used and charged at home (George & Jayakumar, 2017), by disclosing easily hidden cost-saving opportunities. Yet, the implications of this finding are limited for the many domains, where pro-environmental actions do not offer individual benefits (Lindenberg & Steg, 2007). For example, strategic decisions on energy-efficient corporate production practices most likely do not come with any self-interested gains for employees (Russel et al., 2016). Whereas managers could address this problem through the implementation of conventional reward schemes, this would be an expensive measure to pursue (Renwick et al., 2013). In addition, steering attention exclusively to monetary gains may risk crowding out intrinsic motivations to behave desirably (Frey & Jegen, 2001) and hence push environmental goals into the background (Lindenberg & Steg, 2007).

Ultimately, it is the normative decision lens that needs to be strengthened to create a green workplace culture in the long-term (Renwick et al., 2013). As our experiment has shown, employees react positively to the normative message frame that emphasises sustainability if targeting the decision-process at an early stage, before intention formation initially takes place. Practitioners should thus continue to focus on conveying normative sustainability concerns, especially in those domains where normative and gain goals conflict with one another. Yet, this should be done in a context-oriented way to

connect the behavioural stimuli with the targeted decision at the right time. Whenever the circumstances allow, managers may apply emotional and gain framing as complements to support normative goals (Lindenberg & Steg, 2007; Steg et al., 2014). Based on our findings, the latter may be particularly effective when employees do not yet have strong environmental beliefs. If closely linked to environmental goals, ecological attitudes could develop indirectly over time. Once sustainable choices become habitually performed, people tend to experience more positive feelings toward the behaviour, which can eventually transform into pro-environmental attitudes and sustainable norms (Sabbir & Taufique, 2022).

6 | LIMITATIONS AND FUTURE RESEARCH

Our paper has several limitations that point to potential directions for future research. First, all participants in our study are employees in a single automotive organisation, operating in the high-end car segment with strong corporate branding. The message frames we tested were tailored to the organisational context and their transferability to other organisational settings might be questioned. Future studies should build on the insights gained from our results and design and test organisation-specific framing interventions suited to address ESB in other workplaces and industries.

A second limitation concerns the short intervention period of our main study. Due to the production interruption of vehicles at the target company, resulting from the war in Ukraine, we had to terminate the data collection after 3 months. This led to a smaller than initially expected sample size, which compromised the statistical power of our results and constitutes a clear limitation. It also prevented us from studying the combined impacts of different frames, as the number of participants in the respective groups was too small to draw statistically significant inferences. Future research should envision larger sample sizes and explore the relations among frames. It would also be interesting to further experiment with the immediate and over-time effects of other nudging types.

Finally, our study focused exclusively on the impact of message frames as management tools to promote ESB. However, organisations typically rely on a complex package of different measures to promote responsible behaviours of employees (Norton et al., 2015). Future research could explore the effects of message frames in combination with other types of nudges and choice architecture as well as more conventional management tools, such as trainings and awareness campaigns that focus on the knowledge aspect of sustainable behaviour. Gaining insights into the complementarity of different policies is critical for managers to design effective workplace-intervention packages that promote organisational change for corporate sustainability.

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DISCLOSURE

Lucia Reisch is the Speaker of the Porsche Sustainability Council. The present study has been supported by the Porsche Company by providing access to anonymised data from the company's ECC as well as being available for clarifying interviews before and throughout the study.

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APPENDIX A

Method for calculation of CO_2 emissions

We base our calculation of CO_2 emissions (g/km) on the data provided by Porsche for each vehicle type available under the following link: https://www.porsche.com/international/fuel-consumption/. Porsche reports fuel consumption and CO_2 emissions based on the Worldwide Harmonised Light Vehicle Test Procedure (WLTP), which relies on real driving data with different average speeds: low, medium, high and extra high. We used the lowest and highest value provided by Porsche to calculate the average CO_2 emissions for each of the chosen vehicle type for further estimations. For plug-in hybrid vehicle models, the reported CO_2 emissions by Porsche are based on weighted consumption values (fuel consumption in L/100 km and electricity consumption in kWh/100 km). According to the WLTP, electricity consumption is assumed to be based on renewable sources of energy. In line with this definition, Porsche's internal charging infrastructure is based on certified green electricity. Yet, we cannot control for the energy mix that employees use at home to charge their vehicles. This infers that our calculations may be slightly more optimistic than actual emission values, which constitutes a limitation of our study.

Method for estimation of CO_2 savings

We use the results of our primary model (see specification (3) in Table 2) to calculate the expected difference in CO_2 emissions

between the gain frame and control group over time. Formally, this difference in averages can be expressed as follows

$$\Delta\mathbb{E}(\boldsymbol{CO_2}|\boldsymbol{T}=\boldsymbol{t}) \equiv \mathbb{E}(\boldsymbol{CO_2}|\boldsymbol{Group}=\boldsymbol{gain\ frame},\boldsymbol{T}=\boldsymbol{t}) - \mathbb{E}(\boldsymbol{CO_2}|\boldsymbol{Group}=\boldsymbol{control},\boldsymbol{T}=\boldsymbol{t}). \quad (1)$$

According to the law of iterated expectations, we can rewrite the two terms on the right-hand side of equation (1) as follows

$$\begin{aligned}&\mathbb{E}(\boldsymbol{CO_2}|\boldsymbol{Group}=\boldsymbol{gain\ frame},\boldsymbol{T}=\boldsymbol{t})\\&=\boldsymbol{P}\left(\boldsymbol{Car}=\boldsymbol{BEV}\bigvee\boldsymbol{PHEV}|\boldsymbol{Group}=\boldsymbol{gain\ frame},\boldsymbol{T}=\boldsymbol{t}\right)\mathbb{E}\left(\boldsymbol{CO_2}|\boldsymbol{Group}\right.\\&\left.=\boldsymbol{gain\ frame},\boldsymbol{T}=\boldsymbol{t},\boldsymbol{Car}=\boldsymbol{BEV}\bigvee\boldsymbol{PHEV}\right)+\boldsymbol{P}(\boldsymbol{Car}\\&=\boldsymbol{ICEV}|\boldsymbol{Group}=\boldsymbol{gain\ frame},\boldsymbol{T}=\boldsymbol{t})\mathbb{E}\left(\boldsymbol{CO_2}|\boldsymbol{Group}\right.\\&\left.=\boldsymbol{gain\ frame},\boldsymbol{T}=\boldsymbol{t},\boldsymbol{Car}=\boldsymbol{ICEV}\right)\\&\equiv\boldsymbol{a}\end{aligned} \quad (2)$$

$$\begin{aligned}&\mathbb{E}(\boldsymbol{CO_2}|\boldsymbol{Group}=\boldsymbol{control},\boldsymbol{T}=\boldsymbol{t})\\&=\boldsymbol{P}\left(\boldsymbol{Car}=\boldsymbol{BEV}\bigvee\boldsymbol{PHEV}|\boldsymbol{Group}=\boldsymbol{control},\boldsymbol{T}=\boldsymbol{t}\right)\mathbb{E}\left(\boldsymbol{CO_2}|\boldsymbol{Group}\right.\\&\left.=\boldsymbol{control},\boldsymbol{T}=\boldsymbol{t},\boldsymbol{Car}=\boldsymbol{BEV}\bigvee\boldsymbol{PHEV}\right)\\&+\boldsymbol{P}(\boldsymbol{Car}=\boldsymbol{ICEV}|\boldsymbol{Group}=\boldsymbol{control},\boldsymbol{T}=\boldsymbol{t})\mathbb{E}\left(\boldsymbol{CO_2}|\boldsymbol{Group}\right.\\&\left.=\boldsymbol{control},\boldsymbol{T}=\boldsymbol{t},\boldsymbol{Car}=\boldsymbol{ICEV}\right)\\&\equiv\boldsymbol{b}.\end{aligned} \quad (3)$$

In addition, we assume that CO_2 emissions depend only on the selected vehicle type, that is, the level of emissions is conditionally independent of time and the different intervention and control groups, given the type of car.

$$\begin{aligned}&\mathbb{E}\left(\boldsymbol{CO_2}|\boldsymbol{Group}=\boldsymbol{gain\ frame},\boldsymbol{T}=\boldsymbol{t},\boldsymbol{Car}=\boldsymbol{BEV}\bigvee\boldsymbol{PHEV}\right)\\&=\mathbb{E}\left(\boldsymbol{CO_2}|\boldsymbol{Group}=\boldsymbol{control},\boldsymbol{T}=\boldsymbol{t},\boldsymbol{Car}=\boldsymbol{BEV}\bigvee\boldsymbol{PHEV}\right)\\&=\mathbb{E}\left(\boldsymbol{CO_2}|\boldsymbol{BEV}\bigvee\boldsymbol{PHEV}\right)\equiv\boldsymbol{c}\end{aligned} \quad (4)$$

$$\begin{aligned}&\mathbb{E}(\boldsymbol{CO_2}|\boldsymbol{Group}=\boldsymbol{gain\ frame},\boldsymbol{T}=\boldsymbol{t},\boldsymbol{Car}=\boldsymbol{ICEV})\\&=\mathbb{E}(\boldsymbol{CO_2}|\boldsymbol{Group}=\boldsymbol{control},\boldsymbol{T}=\boldsymbol{t},\boldsymbol{Car}=\boldsymbol{ICEV})=\mathbb{E}(\boldsymbol{CO_2}|\boldsymbol{ICEV})\equiv\boldsymbol{d}.\end{aligned} \quad (5)$$

Putting it all together, Equation (1) can be expressed in a much simpler way, where (a−b) is the difference in predicted probabilities given time *t*, as shown in Figure A4, and (c−d) is simply a constant (the difference in average CO_2 emissions between BEV and/or PHEV and ICEV, as given by Porsche).

$$\Delta\mathbb{E}(\boldsymbol{CO_2}|\boldsymbol{T}=\boldsymbol{t})=\boldsymbol{a}\times(\boldsymbol{c}-\boldsymbol{d})-\boldsymbol{b}\times(\boldsymbol{c}-\boldsymbol{d})=(\boldsymbol{a}-\boldsymbol{b})\times(\boldsymbol{c}-\boldsymbol{d}).$$

TABLE A1 Effect of pooled message frames in emails and ECC on the EV uptake of employees.

Dependent variable: EV in t_1				
	(1) Logit coefficient	(2) Odds ratio	(3) Logit coefficient	(4) Odds ratio
Email	.571 (0.421)	1.771 (0.744)	−.470 (0.863)	.625 (0.540)
ECC	.066 (0.481)	1.068 (0.513)	−.912 (0.815)	.402 (0.327)
Email × ECC			1.387 (0.978)	4.004 (3.917)
N	170		170	
McFadden's R^2	0.161		0.169	
Wald's X^2	24.500*		26.790*	
LL	-91.025		-90.087	

Note: All results are based on logistic regressions. Heteroscedastic robust standard errors in parentheses.
Abbreviations: ECC, employee car configurator; EV, electric vehicle; LL, log likelihood.
*$p < 0.01$.

TABLE A2 Effect of message frames on EV uptake of employees reported in odds ratios.

	(1) EV in t_1	(2) BEV in t_1	(3) EV in t_1	(4) BEV in t_1	(5) EV in t_1 if ICEV in t_0
Email					
Emotional frame	.967	2.158	22.295***	14.805**	392.389***
	(0.507)	(1.474)	(21.947)	(19.685)	(799.578)
Normative frame	2.006	2.927	6.436**	17.770**	164.462**
	(1.009)	(1.981)	(5.908)	(24.435)	(335.197)
Gain frame	3.726**	4.196**	22.074***	11.831*	645.388***
	(2.400)	(2.955)	(26.319)	(15.523)	(1292.325)
Spread					
			1.939**	1.502	7.440
			(0.507)	(0.484)	(5.147)***
Email × spread					
Emotional frame × spread			.356***	.532	.121***
			(0.113)	(0.205)	(0.089)
Normative frame × spread			.710	.509	.199**
			(0.231)	(0.269)	(0.149)
Gain frame × spread			.534**	.711	.146***
			(0.185)	(0.255)	(0.103)
ECC					
Emotional frame	.893	.660	.654	.523	.336
	(0.499)	(0.443)	(0.376)	(0.366)	(0.277)
Normative frame	2.013	3.322*	1.985	2.804	.949
	(1.163)	(2.296)	1.240	(1.915)	(0.803)
Gain frame	.552	.988	.489	.802	.325
	(0.301)	(0.642)	(0.281)	(0.557)	(0.266)
N	170	170	170	170	92
McFadden's R^2	0.211	0.292	0.266	0.309	0.249
Wald's X^2	34.400***	39.58***	41.81***	38.94***	20.81**
LL	-85.539	-68.854	-79.567	-67.153	-47.905

Note: All results are based on logistic regressions. Heteroscedastic robust standard errors in parentheses.
Abbreviations: BEV, battery electric vehicle; ECC, employee car configurator; EV, electric vehicle; ICEV, internal combustion engine vehicle, LL log likelihood.
*p < 0.1, **p < 0.05, and ***p < 0.01.

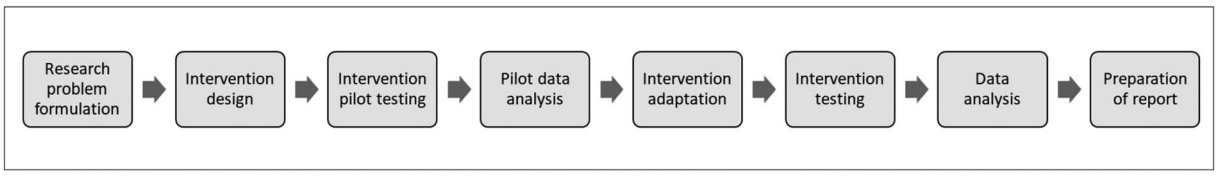

FIGURE A1 Flowchart of the research process.

PORSCHE DIENST-/ LEASINGFAHRZEUGE	FAHRZEUGMODELLE
	718 Boxster
	718 Boxster T
	718 Boxster GTS
	718 Cayman
	718 Cayman T
	718 Cayman GTS
	911 C2 Coupé / C2 Cabriolet
	911 C2 S Coupé / C4 S Coupé
	911 C2 S Cabriolet / C4 S Cabriolet
	911 C2 GTS / C2 GTS Cabriolet
	911 C4 GTS / C4 GTS Cabriolet
	911 Targa 4S / Targa 4 GTS
	Macan
	Macan S
	Macan GTS
	Cayenne E-Hybrid Plat. Edition / E-Hybrid Coupé Plat. Edition
	Cayenne GTS / GTS Coupé
	Panamera 4 E-Hybrid Plat. Edition / 4 E-Hybrid ST Plat. Edition
	Panamera 4S E-Hybrid
	Panamera GTS / GTS Sport Turismo
	Taycan / Taycan 4 Cross Turismo
	Taycan 4S / Taycan 4S Cross Turismo
	Taycan Sport Turismo / Taycan 4S Sport Turismo
	Taycan GTS / Taycan GTS Sport Turismo

FIGURE A2 Overview of available employee car models.

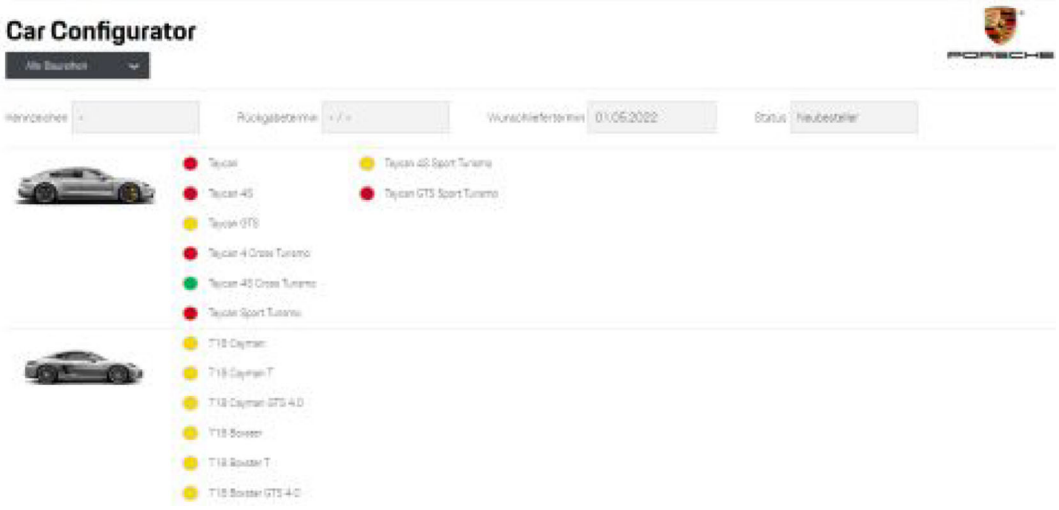

FIGURE A3 ECC interface.

FIGURE A4 Share of vehicle types per car shifts.

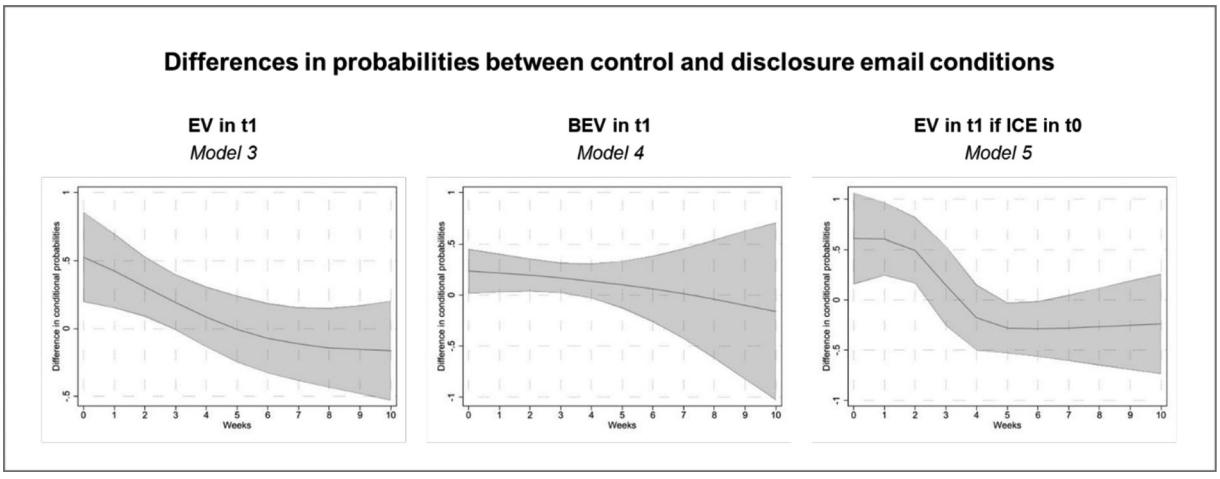

FIGURE A5 Difference in predicted probabilities of choosing an EV between gain frame email and control email conditions.