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Status Quo Bias Impedes Active Travel Policy by Changing the Process of Opinion Formation

Ylva Andersson[a], Shane Timmons[a,b], Féidhlim McGowan[a,c] and Pete Lunn*[a,c]

a) Economic and Social Research Institute, Dublin, Ireland
b) School of Psychology, Trinity College Dublin, Dublin, Ireland
c) Department of Economics, Trinity College Dublin, Dublin, Ireland

*Corresponding Author:
Pete Lunn
Economic and Social Research Institute,
Whitaker Square, Sir John Rogerson's Quay,
Dublin, Ireland
Email: pete.lunn@esri.ie

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Status Quo Bias Impedes Climate Policy by Changing the Process of Opinion Formation

Ylva Andersson[a], Shane Timmons[a,b], Féidhlim McGowan[a,c] & Peter D. Lunn[a,c*]

[a]Economic and Social Research Institute, Dublin, Ireland
[b]School of Psychology, Trinity College Dublin, Dublin, Ireland
[c]Department of Economics, Trinity College Dublin, Dublin, Ireland

*Address for Correspondence:
Pete Lunn
Economic and Social Research Institute,
Whitaker Square, Sir John Rogerson's Quay,
Dublin, Ireland
Email: pete.lunn@esri.ie

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Abstract

This paper demonstrates how status quo bias (SQB) constitutes a strong psychological obstacle to climate policy and investigates the psychological mechanisms behind it. Four experiments measure the strength of SQB, illuminate likely causes, and test ways to mitigate it. Large, nationally representative samples evaluated town layouts designed to promote cycling and walking instead of driving, where the layout was either planned or already in place. The identical layout was evaluated more negatively when planned. This SQB effect was stronger than the influence of being a cyclist or motorist. SQB was unrelated to psychological scales measuring general resistance to change, loss aversion, and uncertainty aversion. Measures of participant's information search and thought processes during opinion formation were instead consistent with a Query Theory account of SQB. This insight informed tests of alternative descriptions of plans, one of which partially mitigated SQB by emphasising the restoration of previously lost benefits. The findings have implications for pro-climate policies and speaks to the importance of understanding the psychological mechanisms behind societal acceptance of change.

1 Introduction

Policy to combat climate change and to promote climate action will benefit from improved psychological understanding of when and why people embrace, or resist, change. To mitigate climate change, radical and rapid reductions in greenhouse gas emissions are required across multiple sectors (Schipper et. al, 2022). These will require not only decarbonisation of technological processes, but changes to everyday behaviour and lifestyles, including how we travel, how land is used and the design of localities. However, when faced with change, resistance is often the immediate human response. In a seminal paper, Samuelson and Zeckhauser (1988) demonstrated that merely indicating which of a set of options is currently in place biases people towards that option, even if they have no reason to think it good or bad. Over 30 years later, "status quo bias" (SQB) has been recorded by hundreds of scientific papers across disciplines and subject domains (Godefroid et al., 2022).

Researchers have previously hypothesised that SQB is likely to be an important impediment to climate policy (Rabaa, Geisendorf and Wilken, 2022; Weber 2017) and it is known that controversial policies like congestion charging often become more popular post-implementation (Nilsson et al., 2016; van Wee et al., 2023). However, little empirical work has directly investigated the issue, for instance by demonstrating SQB for climate policy, measuring its strength relative to other factors, isolating underlying psychological mechanisms, or designing and testing interventions based on those mechanisms. An exception, with respect to measurement, is an experiment by Lang et al. (2021), who reported much lower willingness to increase electricity bills to fund a new emissions reduction policy than to maintain one already enacted. If SQB is a strong barrier to climate action, identifying relevant psychological mechanisms is a priority, not only for designing effective interventions to accelerate climate action, but also for understanding when it might be appropriate or otherwise to intervene.

This latter point can be clarified by considering some of the many explanations advanced for SQB. For example, the endowment effect refers to how people display a strong preference for what they already own (Knetsch, 1989; Kahneman, Knetsch and Thaler, 1990). Other explanations of SQB include loss aversion (Kahneman, Knetsch and Thaler, 1991), general resistance to change (RTC) (Hofman et al., 2022), aversion to uncertainty (Ortoleva, 2010) and Query Theory (cite)., which was devised to explain the endowment effect (Johnson et al., 2007) and inter-temporal choice (Weber et al., 2007). Suppose unwillingness to make a pro-climate change is linked to loss and uncertainty aversion. Government must then decide whether it is right to force the population to shoulder the losses and uncertainty, or find ways to reduce them. , By contrast, Query Theory underlies unwillingness to embrace climate action. According to Query Theory, options are evaluated via a process of memory retrieval that is biased by the questions individuals first ask themselves, given limited cognitive capacity. When people consider something they own, they look for positive attributes before negative ones, but when they consider something they might obtain, the order reverses, biasing both evaluations. If Query Theory underlies antagonism to climate action, how government pursues change might need to be different, perhaps focusing instead on how it communicates the benefits of reform.

We present four experiments to measure SQB for a current pro-climate reform, uncover the psychological mechanism behind it, then design and test potential interventions to reduce it. We demonstrate that SQB is highly relevant to the climate policy context is in a vital policy context, by providing evidence about its cause and give insight into how it might be overcome.

The four experiments focus specifically on SQB towards transport policy. Transport is an attractive domain for investigating SQB because the link to lower emissions is clear (Nieuwenhuijsen, 2020; Brand et al., 2021), yet in multiple countries changes to transport infrastructure often face intense public opposition (Vreugdenhil & Williams, 2013; Field et al., 2018). Opposition is often assumed to reflect self-interest, as when motorists are unwilling to concede traffic lanes or parking spaces to make way for active travel (walking and cycling) infrastructure (Timmons et al., 2024). Our experiments elicited evaluations of a town described either with active travel infrastructure already in place or with a plan to put in place the identical infrastructure. We compare the resulting disparity in evaluations to the influence of being a regular driver or cyclist. We also recorded trait measures of loss aversion, RTC and uncertainty aversion, to test whether these constructs differentially affect evaluations of existing versus planned infrastructure. In addition, we tested for differential responses via a novel behavioural measure, which recorded which of a set of FAQs participants most wanted to read to inform their evaluations.

Study 1 establishes the effect of SQB and relates it to the process of opinion formation. Study 2 replicates Study 1 and tests a hypothesised mechanism of opinion formation generated from Study 1. Study 3 again replicates while adding further tests of opinion formation and associated ways to mitigate SQB. Study 4 replicates and extends study 3, incorporating data from a second country. Finally, we combine results across study conditions to provide best estimates for our effects. Preregistrations and study materials can be found on the Open Science Framework: https://osf.io/dsug8/?view_only=59a256eb6b1a4db894235af99485f72b.

All studies complied with institutional ethics policy, including data protection procedures.

2 Study 1: Experimental Investigation of SQB for Climate Policy

An online survey experiment displayed descriptions (c.140 words) of a town layout. We manipulated whether active travel infrastructure was in place (‘Existing’) or merely proposed (‘Planned’) in a between-groups design. The underlying description was developed in collaboration with the National Transport Authority to match reforms contained in national climate policy. The primary outcome was evaluation of the layout. We fielded psychological scales to measure loss aversion and RTC, and recorded participants’ search behaviour for additional information.

2.1 Methods

The experiment was hosted on the Gorilla platform (Anwyl-Irvine et al., 2020). Data were collected between March 13th and 23rd, 2023. Prior to the main study 100 participants undertook a pilot study where they responded to open text questions following the experimental manipulations. The pilot served to test the town description and to ensure that no information of interest to participants was missing from the FAQs provided. Participants from the pilot were not included in the main analyses.

2.1.1 Participants

Participants (N = 800) were recruited by a market research company in [redacted] to be nationally representative of the adult population by age, gender, socio-economic status and living area. The experiment was badged as a 15-minute study on opinions about town designs and participants were paid €3. A sample size of approximately 400 per group allows reliable detection of effect sizes of 0.2 (Cohen’s d) or larger at 80% power with an alpha of .05. The sample was representative of the national population based on quota sampling of observable characteristics: 48% male, mean age 48 (range 18 to 82), 52% with a degree, 61% employed (Table S1). In total, 123 participants (15%) failed one of the two checks, and just 20 (2.5%) failed both. We retained all participants for analyses but present robustness checks excluding attention check failures in the Supplementary Material (SM).

2.1.2 Procedure

After reading general study information and consenting to participate, all participants read a brief description of a town which began as follows:

> "Please imagine a mid-sized town in [redacted]. On the main street there is a mix of shops, restaurants, office buildings, pubs and residential buildings. There is a local school and library close to the town centre. Families, students, business owners and retirees all live in the town."

Participants were then randomised by the software to read one of two paragraphs describing the layout in more detail. They could not move on from this page within the first 30 seconds, prompting them to read thoroughly. The median time spent reading the vignette was 58 seconds. In the Existing condition, participants (*n* = 395) read the following:

> "The town has a layout that makes it easy to walk and cycle to most places people need to go. Pedestrians and cyclists are prioritised over motor traffic. Instead of two-way car traffic on the main street, there is a one-way car lane with segregated lanes for cycling on each side. There are bike parking facilities outside most shops and businesses together with wide pavements for pedestrians. There are three disabled car parking spaces on the main street. The town square is open only to pedestrians and has benches, a fountain, and trees."

In the Planned condition, participants (*n* = 405) read the following (differences from Existing condition underlined):

> "There is a proposal for a new layout of the town to make it easy for people to walk and cycle to most places they need to go. Pedestrians and cyclists would be prioritised over motor traffic. The plan is to change the main street, which currently has two-way car traffic, into a one-way car lane with segregated lanes for cycling on each side. Car parking spaces outside shops and businesses would be turned into bike parking facilities together with wide pavements for pedestrians. Three disabled parking spaces would remain on the main street. The town square would be pedestrianised with benches, a fountain, and trees."

Participants were then asked what they thought of the layout on 1 (Strongly dislike) - 7 (Strongly like) rating scales, with each point on the scale enumerated. Note that the question did not ask them to rate the policy, but to evaluate the town layout, which was identical between the two conditions. Only the end points of the numbered scale were labelled and hence this outcome variable is treated as an interval scale.

The following page informed participants that they could read more detailed information to inform their judgement. We generated twelve FAQs relevant for opinions about active travel infrastructure, based both on known drivers of SQB (e.g., Hofman et al., 2022) and discussions with transport authorities about commonly raised concerns. The FAQs constituted two sets of six. The first set contained FAQs about different outcomes/ impacts of the layout (*What are the effects on the local environment?, What are the effects on community health?, What are the effects on local businesses?, What are the effects on traffic and parking?, What are the effects on necessary services (e.g., emergency services, bin lorries)?, What are the effects on people with disabilities and the elderly?*). The second set related to the process around and context of the layout (*What does the local community think of the layout?, Who proposed the layout?, Is this type of layout common in similar towns?, What is the history of the town's layout?, Were locals consulted about the layout?, How long does it take to build this type of layout?*).

The two sets were presented on separate pages, each of which told participants that they would be asked to evaluate the layout a second time and to select the three FAQs that they most want to read more about. They had to select three FAQs in the first set before moving on to the second set. FAQs were presented in a randomised position on screen to mitigate any order effects.

After selecting their six FAQs, participants were then asked to rank them according to which they most wanted to read more about. We opted for participants to rank their chosen six rather than all twelve to reduce the complexity of the task. On the next page they were shown the three FAQs they had ranked highest and could click on each FAQ to read the additional information. After this, they were asked to evaluate the layout again.

The study ended with questions measuring loss aversion (Li et al., 2021), RTC (Oreg, S. 2003), driving and cycling frequency (regularly, occasionally, rarely, never), and recording socio-demographic information (age, gender, educational attainment, living area, etc.). We included two attention check questions, one asking participants to select "7" from a list of options and a second asking participants to select what was stated as the main motivation for the town layout (i.e., to make it easier for people to walk and cycle; other options were to make it easier for emergency services to gain access, for drivers to find parking and for children to be dropped off at school).

2.1.3 Hypotheses and Analysis Plan

Our primary hypothesis was that participants who read about the active travel infrastructure described as existing will rate the layout more favourably than those who read about it described as a plan (H1). We pre-registered to regress town evaluations onto experimental condition using an OLS model, with controls for age, gender, living area, driving frequency (never or rarely vs. occasionally or regularly) and cycling frequency (never vs. at least rarely).

We also report exploratory analyses to test whether SQB is explained by loss aversion or RTC. For clarity, we pre-registered to regress evaluations onto scores for loss aversion and RTC, with the same controls as above, separately by experimental condition rather than including multiple interaction terms. The logic is that differences in the strength or significance of loss aversion or RTC coefficients between models would indicate that the trait explains SQB.

Finally, we report exploratory analyses testing for differences in FAQ selection between the conditions. We report pre-registered logistic regressions for whether the participant selected a given FAQ, with the same predictors as above, including evaluations, and we repeat this for average FAQ ranking.

2.2 Results

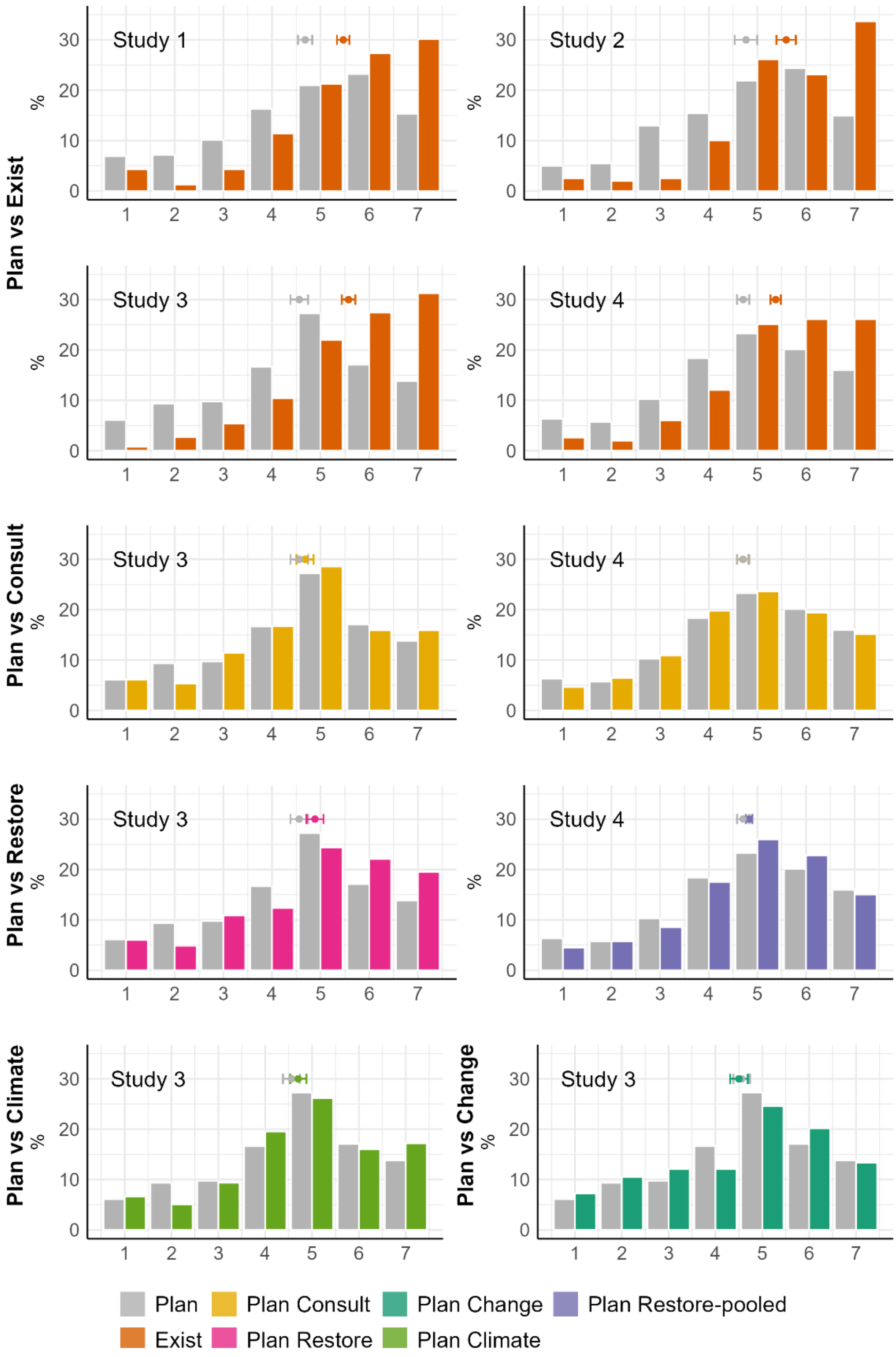
2.2.1 Demonstrating SQB

Participants' first evaluations of the town layout were generally positive (M = 5.07, SD = 1.69) but more so in the Existing condition (M = 5.47, SD = 1.53) than the Planned condition (M = 4.68, SD = 1.75). Figure 1 shows the two distributions. The proportion of ratings implying opposition to the layout (scores below 4) was below 10% in the Existing condition but almost 25% in the Plan condition. The OLS regression (see Model 1 in Table 1) revealed a statistically significant difference between conditions, b = 0.78, 90% CI = [0.59, 0.97], $p < .001$. The simple effect size is moderate, Cohen's d = 0.48, 90% CI = [0.36, 0.59] (Sullivan & Feinn, 2012). Robustness checks excluding those who failed an attention check and using ordered logistic regression show stronger effects (Models 1 and 2, Table S2). We thus found support for H1.

Model 1 (Table 1) further show that, as could be expected, motorists (64.1% of participants) gave lower ratings than non-motorists, b = -0.38, 95% CI = [-0.65, -0.11], p = .005. By contrast, cyclists (37.6%) gave higher ratings than non-cyclists, b = 0.49, 95% CI = [0.25, 0.73], p <

.001. We ran tests of coefficient equality to compare the SQB effect with the effect of being a motorist or cyclist. The coefficient for motorist was significantly smaller than the coefficient for experimental condition: $F(792)_{\text{drives}} = 40.88$, $p < .001$. The coefficient for cyclists was also smaller, but not significant: $F(792)_{\text{cycles}} = 2.89$, $p = .091$. Including interactions between condition and driving or cycling status showed no significant effects: $b_{drives} = 0.36$, 95% CI = [-0.15,0.89], $t(789) = 1.37$, $p = .17$; $b_{cycles} = -0.11$, 95% CI = [-0.57,0.35], t(789) = -0.48, $p = .635$, implying that the SQB effect is independent of transport habits.

We lastly explored whether loss aversion (M = 4.59, SD = 1.00) or RTC (M = 4.01, SD = 0.96) could explain the differences in rating between conditions. We first included them as additional controls to Model 1. RTC was negatively associated with ratings, $b = -0.32$, 95% CI = [-0.46, -0.17], $p < .001$, and loss aversion was positively associated with ratings, $b = 0.33$, 95% CI = [0.19, 0.47], $p < .001$. However, interaction terms between condition and these psychological measures were non-significant: $b_{RtC} = -0.02$, 95% CI = [-0.25,0.21], $p = .862$; $b_{LA} = 0.01$, 95% CI = [-0.21,0.24], $p = .897$.



Note: Ratings of the town layout displayed on the x-axes. Error bars represent 90% confidence intervals around the mean.

Figure 1. Distributions of town evaluations across studies.

Table 1. OLS models of town evaluations by condition across studies

	Study 1	Study 2	Study 3	Study 4	
	Model 1	Model 2	Model 3	Model 4 - pooled restore	Model 5 - separate restore
Intercept	4.91	4.95	4.87	4.92	4.91
	[4.63, 5.19]	[4.67, 5.24]	[4.59, 5.15]	[4.74, 5.10]	[4.71, 5.10]
	<.001	<.001	<.001	<.001	<.001
Condition (ref: Plan)					
Existing	0.78	0.82	0.99	0.63	0.63
	[0.59, 0.97][a]	[0.51, 1.12]	[0.75, 1.22][a]	[0.47, 0.80][a]	[0.47, 0.80][a]
	<.001[b]	<.001	<.001[b]	<.001[b]	<.001[b]
Plan consult			0.11	-0.02	-0.02
			[-0.13, 0.35][a]	[-0.18, 0.15][a]	[-0.18, 0.15][a]
			.234[b]	.572[b]	.572[b]
Plan restore pooled				0.12	
				[-0.01, 0.26][a]	
				.063[b]	
Plan restore			0.26		0.16
			[0.03, 0.50][a]		[0.00, 0.33][a]
			.034[b]		.049[b]
Plan restore-past					0.10
					[-0.06, 0.26][a]
					.151[b]
Plan restore-correct					0.10
					[-0.06, 0.27][a]
					.145[b]
Plan climate			0.06		
			[-0.18, 0.30][a]		
			.336[b]		
Plan change			-0.10		
			[-0.34, 0.14][a]		
			.761[b]		
Male	-0.15	-0.24	-0.17	-0.04	-0.04

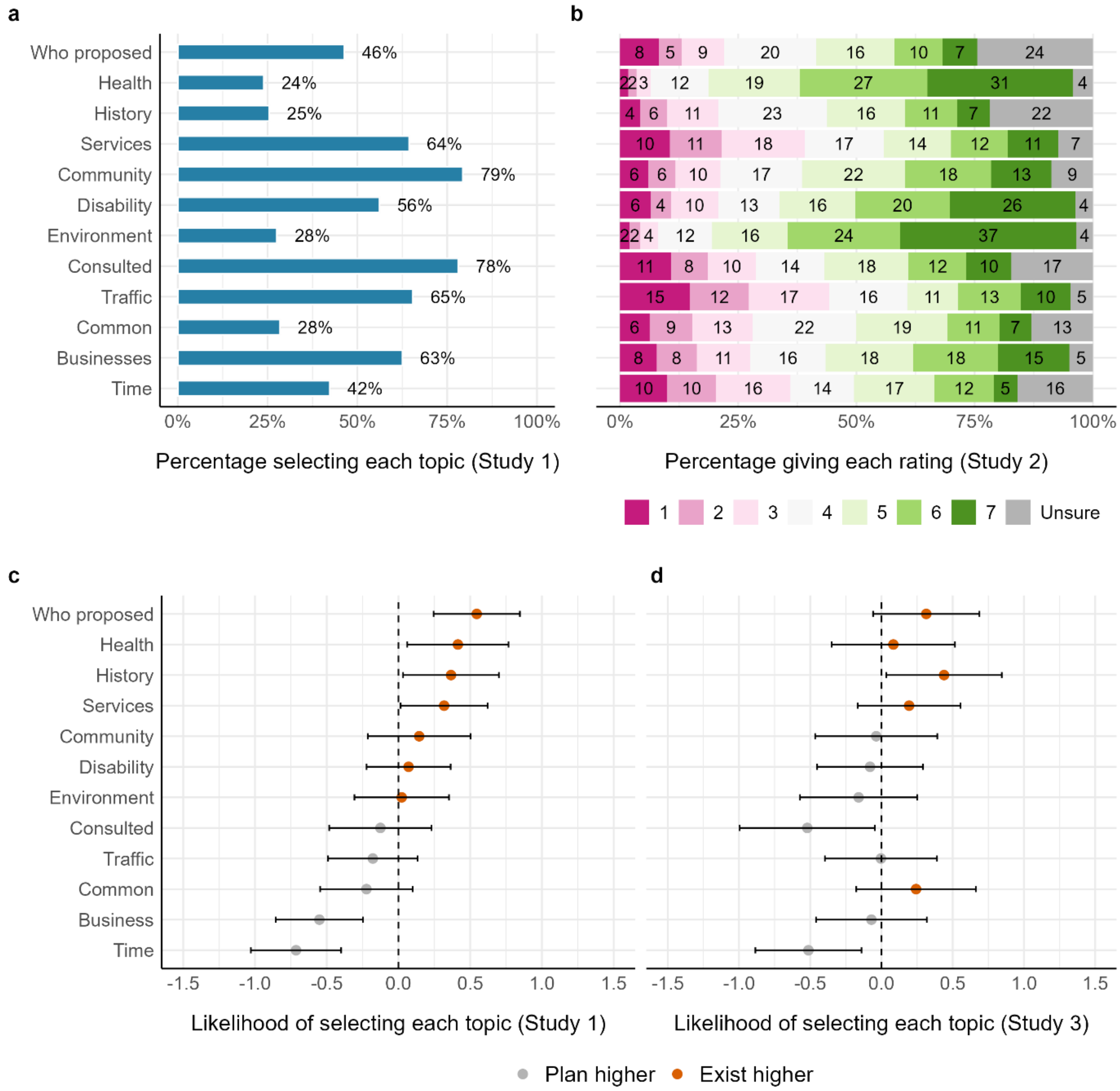
	Study 1	Study 2	Study 3	Study 4	
	Model 1	Model 2	Model 3	Model 4 - pooled restore	Model 5 - separate restore
	[-0.38, 0.08]	[-0.54, 0.07]	[-0.34, 0.00]	[-0.15, 0.08]	[-0.15, 0.08]
	.210	.127	.054	.539	.539
Age	0.05	0.07	0.18	0.06	0.06
	[-0.07, 0.17]	[-0.08, 0.22]	[0.09, 0.26]	[0.00, 0.12]	[0.00, 0.12]
	.396	.365	<.001	.042	.042
Rural	-0.15	-0.18	-0.03	-0.03	-0.03
	[-0.40, 0.10]	[-0.50, 0.14]	[-0.20, 0.14]	[-0.15, 0.10]	[-0.15, 0.10]
	.235	.264	.742	.657	.657
Drives	-0.38		-0.59	-0.50	-0.50
	[-0.65, -0.11]		[-0.80, -0.39]	[-0.63, -0.36]	[-0.63, -0.36]
	.005		<.001	<.001	<.001
Cycles	0.49		0.68	0.48	0.48
	[0.25, 0.73]		[0.51, 0.85]	[0.36, 0.60]	[0.36, 0.60]
	<.001		<.001	<.001	<.001
Observations	800	400	1521	3017	3017

Note: Unstandardised betas and log odds, [95% CI] and p-values displayed. [a] 90% CI, [b] one-tailed p-values. Drives = regularly or occasionally versus rarely or never. Cycles = At least rarely versus never. Coefficient for "other" gender omitted.

2.2.2 Differences in Information Search

The most commonly selected FAQs were 'What does the community think of the layout?' (79%), and 'Were locals consulted about the layout?' (78%), followed by 'What are the effects on traffic and parking?' (65%). The three least selected FAQs were 'What are the effects on community health?' (24%), 'What is the history of the town's layout' (25%) and 'What are the effects on the environment?' (28%) (Panel a, Figure 2).

Logistic regression models of FAQ selection show significant differences between conditions (Panel c, Figure 2; Table S4). Participants in the Planned condition were less likely than those in the Existing condition to select 'What are the effects on community health?' (19% vs 29%, Log Odds = -0.41, 95% *CI* = [-0.77, -0.06], p = .021), 'What are the effects on necessary services?' (61% vs 68%, Log Odds = -0.32, 95% *CI* = [-0.62, -0.02], p = .039), 'Who proposed the layout?' (43% vs 50%, Log Odds = -0.55, 95% *CI* = [-0.85, -0.25], p <.001), and the 'What is the history of the town's layout' (21% vs 29%, Log Odds = -0.37, 95% *CI* = [-0.70, -0.03], p = .031). They were significantly more likely to select 'What are the effects on local businesses?' (70% vs 55%, Log Odds = 0.55, 95% *CI* = [0.25, 0.86], p <.001) and 'How long does it take to build this type of layout?' (47% vs 37%, Log Odds = 0.71, 95% *CI* = [0.40,1.03], p <.001). Randomisation tests comparing this pattern of differences to what could be expected due to random variation suggest that the pattern we observe is not explained by noise (Figures Figure S2 and Figure S3). Results are similar if FAQ rankings are used instead of selections (Table S5).



Note: Topics are displayed in the same order in all panels. Panels c) and d) depicts coefficients from logistic regression models predicting likelihood of selecting each FAQ by condition (Table S4 and Table S9). Error bars represent 95% CI. Models control for town evaluation, age, gender, living area and driving and cycling frequency.

Figure 2. **a)** Proportion of participants selecting each topic in Study 1, **b)** positivity ratings of topics in Study 2, **c)** likelihood of selecting each topic between conditions in Study 1 and **d)** Study 3.

2.3 Discussion

Study 1 shows that people view active travel infrastructure much more negatively when it is planned compared to identical infrastructure that already exists, supporting H1. This SQB is not explained by individual disposition for previously proposed mechanisms, such as loss aversion, RTC, and self-interest (i.e., being a motorist or cyclist). We further observed different search behaviours between conditions, providing the first evidence that SQB may be embedded in the psychological process of opinion formation. In the Planned condition, participants tended to seek information about potential downsides, such as business impacts and construction time, while those in the existing condition were more likely to also seek out positive aspects, such as public health benefits. Study 2 aimed to replicate the main effect and investigate whether the pattern of search behaviour reflects differences in the expected valence of information sought.

3 Study 2: Investigating perceived valence of FAQs

Our aim was to measure the perceived valence of the FAQs, to confirm the conjecture that participants in the Plan condition in Study 1 sought information they expected to be more negative. To do so, we replicated Study 1, but instead of selecting FAQs to read, participants reported the expected valence of each FAQ.

3.1 Methods

3.1.1 Participants and Procedure

We recruited 400 new participants through a market research company in [redacted], again to be broadly representative of the adult population. This sample size allowed for sufficient power to detect the effect size observed in Study 1, with two groups of approximately 200. Sample characteristics are shown in Table S1 and randomisation was again effective. Data were collected between September 5th and 11th, 2023 and participants were paid €3 for completing the 15-minute study. Twenty-five participants failed the attention check.

As in Study 1, participants were randomised to read the Existing (*n* = 199) or Plan (*n* = 201 version of the vignette and then evaluated the town on the same 1 to 7 rating scale. However, instead of selecting FAQs to read, participants were instead shown all FAQs and rated each one on a seven-point scale on whether they expected the information to be more negative (1) or more positive (7) or to select an off-scale option that they didn't know.

3.1.2 Analysis Plan

This study was not pre-registered, as our main goal was to measure perceived valence of the FAQs for exploratory comparison with the study 1 data already collected, but we tested whether the SQB effect from Study 1 would replicate using the same model as before (except we did not record transport behaviour).

To test whether the FAQs selected more often by the Plan condition participants would be rated more negatively, we report summary statistics of these ratings and use OLS models of the mean rating for each FAQ with experimental condition and socio-demographic controls as predictors.

To test whether the FAQs selected more often by the Plan condition participants would be rated more negatively, we report summary statistics of these ratings. Next, we use the mean rating for each FAQ to assign participants from Study 1 a 'positive score' based on the FAQs they selected. We model this positivity score with predictors for experimental condition and socio-demographic controls. In addition, one possibility is that participants in the Plan condition in Study 1 sought more negative information because they had given a more negative evaluation, and thus were seeking to justify their evaluation. To test this possibility we also include their evaluation of the town as a predictor.

3.2 Results

3.2.1 Study 1 Replication

Analysis of evaluations replicates the SQB effect from Study 1. An OLS model of evaluations, with controls for age, gender and living in an urban area, showed that participants in the Existing condition rated the layout more favourably than those in the Plan condition, $b = 0.82$, 95% $CI = [0.52, 1.12]$, $p < .001$. The simple effect size is closely similar to study 1, Cohen's $d = 0.53$, 95% $CI = [0.33, 0.73]$.

3.2.2 Perceived positivity of FAQs

The FAQs most likely to be rated as negative (given a score below 4) across all participants were impacts on traffic (44%), services (39%), and construction time (36%), whereas the FAQs with the least negative ratings were impacts on health (6%) and the environment (8%), Panel b, Figure 2. Table S6 shows mean positivity scores of all topics.

3.2.3 Effects of SQB on positivity ratings

Exploratory OLS models predicting valence ratings for each FAQ, with controls for age, gender and living in an urban area, showed that those in the Plan condition expected most FAQs to be more negative than those in the existing condition. The largest coefficients are observed for the effects on business, b = -0.94, 95% CI = [-1.33, -0.55], p < .001; community consultation, b = -0.84, 95% CI = [-1.24, -0.44], p < .001; traffic effects, b = -0.77, 95% CI = [-1.75, -0.38], p < .001; effects on those with disabilities, b = -0.70, 95% CI = [-1.10, -0.31], p < .001; and time to construct, b = -0.68, 95% CI = [-1.10, -0.27], p < .001. Three of these five were the topics disproportionately selected by those in the planned condition in study 1.

3.2.4 Positivity of information sought after in Study 1

Models 1 and 2 in Table 2 presents the OLS model predicting positive scores of participants from Study 1. Those in the Existing condition sought out FAQs with a higher positivity score (M = 4.42, SD = 0.18) than those in the Plan condition (M = 4.38, SD = 0.17), b = 0.22, 95% CI = [0.08, 0.35], p < .001 (Model 1, Table 2). Model 2 shows that the effect remains significant, even after controlling for their evaluation of the infrastructure (b = 0.14, 95% CI = [0.00, 0.28], p = .047), suggesting that differences in information-seeking are unlikely to be fully explained by participants seeking to justify their evaluation.

Table 2. OLS models on positivity score of FAQs selected in Study 1 and 3 (based on positivity scores assigned in Study 2) by condition.

	Study 1		Study 3	
	Model 1	Model 2	Model 3	Model 4
Intercept	0.11	-0.38	0.15	-0.53
	[-0.06, 0.28]	[-0.64, -0.11]	[-0.02, 0.32]	[-0.75, -0.31]
	.197	.005	.088	<.001

	Study 1		Study 3	
	Model 1	Model 2	Model 3	Model 4
Existing	0.22	0.14	0.14	0.00
	[0.08, 0.35]	[0.00, 0.28]	[-0.01, 0.28][a]	[-0.14, 0.14][a]
	.002	.047	.057[b]	.496[b]
Plan restore			0.06	0.02
			[-0.09, 0.20][a]	[-0.12, 0.16][a]
			.253[b]	.401[b]
Plan consult			-0.08	-0.10
			[-0.23, 0.06][a]	[-0.24, 0.05][a]
			.820[a]	.867[b]
Plan change			-0.09	-0.08
			[-0.24, 0.05][a]	[-0.22, 0.06][a]
			.858[b]	.825[b]
Plan climate			0.06	0.05
			[-0.08, 0.21][a]	[-0.09, 0.19][a]
			.242[b]	.268[b]
First evaluation		0.10		0.14
		[0.06, 0.14]		[0.11, 0.17]
		<.001		<.001
Male	0.11	0.12	0.01	0.03
	[-0.03, 0.25]	[-0.02, 0.26]	[-0.10, 0.11]	[-0.07, 0.13]
	.136	.085	.891	.551
Age	0.02	0.02	0.05	0.02
	[-0.05, 0.09]	[-0.05, 0.09]	[0.00, 0.10]	[-0.03, 0.07]
	.513	.601	.075	.388
Rural	0.03	0.04	-0.04	-0.03
	[-0.12, 0.17]	[-0.11, 0.19]	[-0.14, 0.07]	[-0.13, 0.07]
	.741	.594	.506	.545
Drives	-0.44	-0.41	-0.33	-0.25
	[-0.61, -0.28]	[-0.57, -0.24]	[-0.46, -0.21]	[-0.37, -0.13]
	<.001	<.001	<.001	<.001
Cycles	0.15	0.10	0.26	0.16
	[0.00, 0.30]	[-0.05, 0.25]	[0.15, 0.36]	[0.06, 0.27]
	.045	.178	<.001	.002
Observations	794[c]	794[c]	1521	1521

Note: Unstandardised betas, [95% CI], and p-values displayed. Drives = regularly or occasionally versus rarely or never. Cycles = At least rarely versus never. Age is standardised. Positivity score is standardised. [a] 90% CI, [b] One-tailed, [c] Six observations missing out of 800 due to missing values due to error in the software programme.

3.3 Discussion

Results from Study 2 support the idea that, when people form opinions about a proposed change from the status quo, they prioritise thinking about potential negatives over thinking about the benefits. This tendency leads them to judge proposals more negatively than they would if the change were already in place. This account of SQB is consistent with Query Theory (Johnson et al., 2007).

One possibility, however, is that participants in the Planned conditions of Studies 1 and 2 did not spontaneously consider negatives but were simply drawn to them after forming a more negative opinion. Our analysis in Table 2, which controls for initial evaluation, provides some evidence against this conjecture, but we test this possibility further in Study 3 by recording participants' thoughts immediately after they evaluate the town. We also test whether interventions informed by Query Theory can mitigate SQB.

4 Study 3: Mitigating SQB

Study 3 had three pre-registered aims. First, we aimed to further test this Query Theory account using the 'aspect listing task' (e.g. Johnson et al., 2007). In the task, participants are asked simply to list the thoughts they consider when forming an opinion, and the valence of these thoughts are then assessed. For a Query Theory account of SQB to hold, participants who read about the Existing town would list positive thoughts before they list negative ones, and vice-versa for those in the Planned condition.

Second, we test whether participants differ in the type of information they seek out, as we found in Study 2.

Third, we aimed to test whether SQB can be mitigated by shifting the status quo in the vignette (in two additional versions) or by disrupting the tendency to search for negatives by providing positive information upfront in the vignette (in a further two additional versions). Finally, although in Study 1 SQB was not explained by loss aversion or trait RTC, others have previously argued that SQB can be explained by an aversion to the uncertainty that is inherent in change (Ortoleva, 2010). As such, in Study 3 we explored whether SQB can be explained by trait uncertainty aversion.

4.1 Methods

4.1.1 Participants

We determined the sample size based on our aim to mitigate SQB, using effect sizes observed in the previous studies. The pooled main effect of SQB across the pilot study and Studies 1 and 2 was d = 0.51. We powered the study to detect a reduction of 50% in this effect (d = 0.26), with 80% power and an alpha of .05 on a one-tailed test. We thus aimed for a minimum sample of 200 participants in each of the six experimental groups. A representative sample of 1,521 adults in [redacted] who had not completed any of the previous studies were recruited between 27th October and 20th November, 2023. Participants were paid €3 for the 15-minute study. Table S1 reports sample characteristics. In total, 102 participants (7%) failed the attention check question.

4.1.2 Materials and Procedure

The materials and procedure were similar to Study 1, such that participants were randomised by the software to read different versions of a vignette about a town which they subsequently rated on the same seven-point scale. We included the same Existing (n = 259) and Plan (n = 246) versions as before, but added four additional versions of the planned change.

In two of these versions, we sought to reframe the status quo. The first reframed the status quo as one of continued change, by beginning the vignette with "over the years, the town has made changes to its layout…" and adding that the proposal was merely a change "in the next phase" (hereafter, we refer to this version as "Plan Change"; n = 248). The second described the change as a restoration process following previous changes that had negative effects (hereafter "Plan Restore"; n = 267): "For many years, motor traffic has been prioritised… resulting in much less walking and cycling" and that the proposal aimed to make the town "more like it used to be."

In the other two versions, we aimed to disrupt the search for negatives by justifying the proposal with benefits upfront in the vignette. Since community consultation was the most selected FAQ in Study 1, the "Plan Consult" version (n = 245) led with the reassurance that locals had been consulted on the plan ("Following consultations with local families, businesses… about how to best design the town"). Lastly, given evidence for high levels of concern about climate change in [redacted], "Plan Climate" (n = 256) led with the motivation of reducing greenhouse gas emissions ("To reduce carbon emissions from motor traffic…"). Importantly, each of the four versions are realistic communications that could be issued to communities about proposed changes.

After reading the descriptions, participants rated the town layout as before and then completed the aspect listing task, writing in a free text box anything that came to mind when considering the layout. They could write up to 10 thoughts in separate open text boxes. The following page then displayed the thoughts participants had written and asked them to indicate for each whether it was mainly positive, negative, or neither. In addition, two coders blind to experimental condition and participant's own coding manually coded all thoughts as relevant or irrelevant (42 participants wrote only irrelevant thoughts, e.g., "hi", "NA"). Coders agreed on 98.2% of entries with disagreements resolved through discussion.

As in Studies 1 and 2, participants then completed the FAQ selection and ranking tasks. At the end of the study, participants completed the 12-item Intolerance of Uncertainty scale (Carleton et al., 2007), in which participants rate their agreement on seven-point scales to statements about uncertainty (e.g., "unforeseen events upset me greatly") before reporting on their transport behaviour and socio-demographics.

4.1.3 Hypotheses and Analysis Plan

We pre-registered the following primary hypotheses:

> *H2:* Participants who read about the active travel infrastructure described as already existing will rate the layout more favourably than those who read about it described as a planned change (i.e., replicating Studies 1 and 2).
>
> *H3:* Participants in the *(a)* Plan Change, *(b)* Plan Restore, *(c)* Plan Consult, and *(d)* Plan Climate conditions will rate the layout more favourably than those in the Plan condition.

To test these hypotheses, we planned to run the same OLS models as Studies 1 and 2. Similar to Study 1, we also explored whether uncertainty aversion interacted with the experimental conditions.

We also pre-registered the following secondary hypotheses:

> *H4:* Participants in the Existing condition will list positive thoughts about the layout earlier than those in the Plan condition.

> *H5:* Participants in the *(a)* Plan Change, *(b)* Plan Restore, *(c)* Plan Consult, and *(d)* Plan Climate conditions will list positive thoughts about the layout earlier than those in the Plan condition.

We analyse the valence of participants' thoughts using the Standardised Median Rank Difference (SMRD, Johnson et al., 2007). SMRD is defined as $2*(MR_{pos} - MR_{neg})/n$, where MR_{pos} is the median rank of positive thoughts in the participant's sequence, MR_{neg} is the median rank of negative thoughts, and n is the total of positive or negative thoughts. SMRD values range from 1 (all positive thoughts listed before any negative thoughts) to -1 (all negative thoughts listed before any positive thoughts). If participants list only positive (or only negative) thoughts, they are given an SMRD of 1 (or -1). Thoughts coded as "neither" are excluded. We had pre-registered to run OLS models of these scores, but noted that we would transform SMRD into a binary or trinary variable depending on its distribution and then run appropriate logistic or ordinal logistic models. As a binary transformation was necessary, we report as tests for H4 and H5 logistic regressions with the binary SMRD as outcome (0 = SMRD less than zero, 1 = SMRD zero or above) predicted by experimental condition and with the same covariates as before. We report models with and without town evaluation as a control. Following our pre-registration, we exclude from these analyses participants who code all their thoughts as "neither" (n = 103). As a robustness check, we run an analysis where these participants are instead assigned a SMRD of 0. In addition, we deviate from our pre-registration in that we exclude participants based on blind coding of their thoughts as irrelevant (n = 42).

We further pre-registered hypotheses regarding the FAQ selection task:

> *H6:* Participants in the Existing condition will seek out more positive information compared to those in the Plan condition (replicating Study 1).

> *H7:* Participants in the *(a)* Plan Change, *(b)* Plan Restore, *(c)* Plan Consult, and *(d)* Plan Climate condition will seek out more positive information than those in the plan condition.

We pre-registered that we would test H6 and H7 by running the OLS model of participant positivity scores from Study 2.

4.2 Results

4.2.1 Demonstrating SQB

Model 3 in Table 1 again replicates the SQB effect from Studies 1 and 2, supporting H2. Participants in the Existing condition (*M* = 5.58, *SD* = 1.37) rated the layout more positively than those in the Plan condition (*M* = 4.56, *SD* = 1.71), *b* = 0.99, 90% *CI* = [0.75, 1.22], *p* <.001. The effect size is marginally larger than the previous studies, Cohen's *d* = 0.66, 90% *CI* = [0.51, 0.81]. As in Study 1, we compared the SQB effect with the effect of being a motorist or cyclist. The coefficient for motorist was significantly smaller than the coefficient for Existing condition: $F(1509)_{\text{drives}} = 80.41$, $p < .001$. The coefficient for cyclists was also smaller, but not significant: $F(1509)_{\text{cycles}} = 8.53$, $p = .07$. Including interactions between Existing condition and driving or cycling status showed no significant effects: $b_{drives} = 0.56$, 95% *CI* = [-0.15,1.27], $t(1503) = 1.54$, $p = .124$; $b_{cycles} = 0.30$, 95% *CI* = [-0.27,0.88], t(1503) = 1.04, *p* = .299, implying that the SQB effect is independent of transport habits, Models 3 and 4, Table S7.

4.2.2 Mitigating SQB

Turning to the alternative Plan versions, only those in the Plan Restore condition (*M* = 4.88, *SD* = 1.72) rated the layout significantly more positively than the Plan condition, *b* = 0.26, 95% *CI* = [-0.02, 0.54], *p* = .034, one-tailed, supporting H3b. The effect size was small, Cohen's *d* = 0.19, 90% *CI* = [0.04,0.33]. We found no differences between the Plan Change (*M* = 4.50, *SD* = 1.79), Plan Consult (*M* = 4.68, *SD* = 1.67), or Plan Climate (*M* = 4.70, *SD* = 1.69) conditions and the Plan condition, lending no support for *H3a,c,* or *d*, Model 3, Table 1.

4.2.3 Uncertainty Aversion

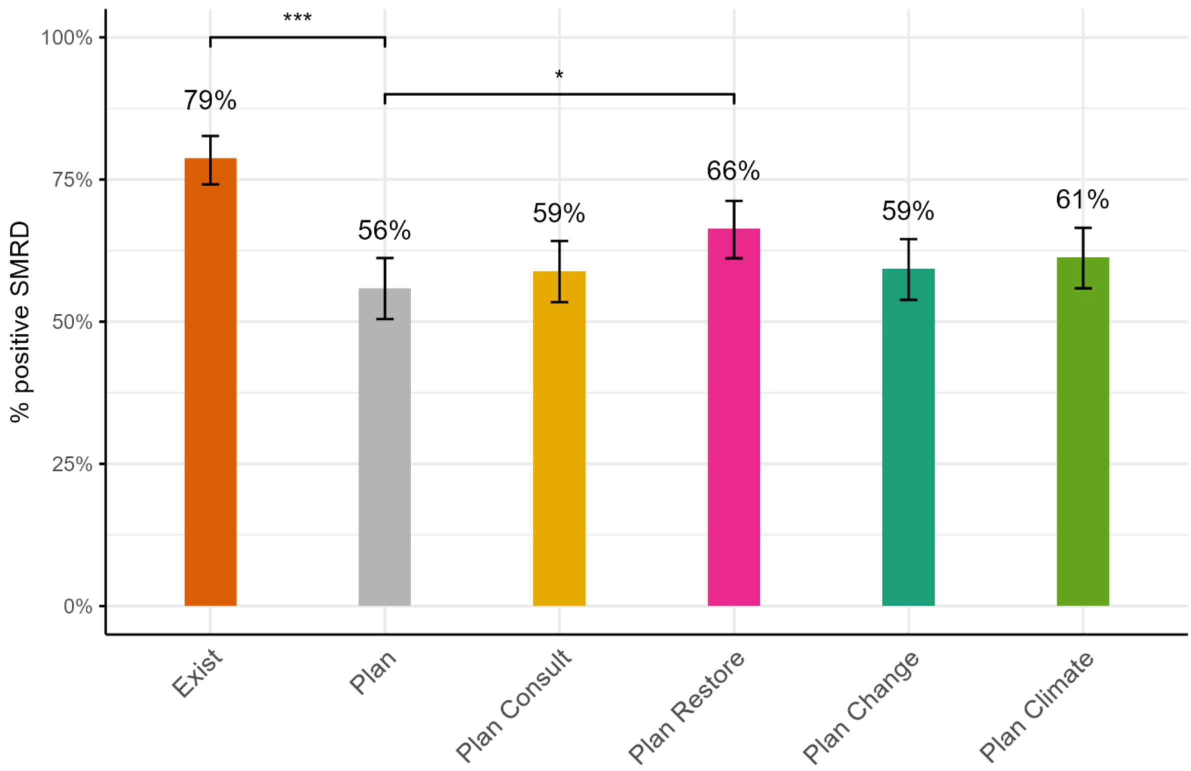
Responses to the 12 items on the Intolerance of Uncertainty scale were averaged, with scores normally distributed around the approximate midpoint (*M* = 4.31, *SD* = 1.09). We first added uncertainty aversion as an additional predictor, Model 1. Table S7. Perhaps surprisingly, those with higher levels of trait uncertainty gave more positive evaluations of the town layout, *b* = 0.11, 95% *CI* = [0.03, 0.18], *p* = .006. Again, however, uncertainty aversion did not interact with condition, implying that it cannot explain the SQB effect we observe, Model 2, Table S7.

4.2.4 Thought order and content

As described above, we use the SMRD to analyse thought valence. We excluded from the analysis 42 participants who wrote only irrelevant thoughts and an additional 91 participants who coded all of their thoughts as neither positive nor negative. SMRD scores were strongly trimodal, with peaks at -1 (34.7% of the sample), 0 (0.1%) and 1 (60.9%). As such, we categorised participants with an SMRD of zero or above as 1, and below zero as 0 and used a logistic regression model to test for the effects of vignette version. SMRD was strongly associated with first evaluations: b = 2.26, 95% CI = [2.12, 2.40], t(1380) = 31.28, p < .001, OLS regression.

Figure 3 presents the percentage of participants in each condition who had neutral or positive SMRD scores (i.e., who listed only positive thoughts or who listed positive thoughts before negative ones). Figure 3 shows that neutral or positive SMRD scores were most common among those in the Existing condition (79%) and least common among those in the Planned condition (56%). Model 1 in Table 3 presents the logistic regression model and shows that participants in the Existing condition were significantly more likely to have neutral or positive SMRD scores than those in the Planned condition, Log Odds = 1.09, 90% CI = [0.75, 1.43], p <.001, one-tailed., supporting *H4*. Including participants who indicated only writing about something else than the layout did not alter results, Model 2, Table 3. This finding provides further support for the Query Theory account of SQB.

In support of *H5b*, participants in the Plan Restore condition were also more likely to list positive thoughts before negative ones than those in the Planned condition, Log Odds = 0.39, 90% CI = [0.08, 0.72], p = .020, one-tailed, Model 1, Table 3. Including participants who indicated only writing about something else than the layout reduced the coefficient slightly and it was no longer significant. No other comparisons were statistically significant. Models 3 and 4, Table 3 repeat the same analyses with town evaluation added as a control. All coefficients for condition were reduced, which could be expected as initial evaluation was strongly associated with SMRD.



Note: Error bars represent 90% *CI*. Significant comparisons are one-tailed tests.

Figure 3. SMRD scores between the conditions

Table 3. Logistic regression models on thought order between conditions.

	Excluding town evaluation		Including town evaluation	
	Model 1. ex. neither	Model 2. inc. neither	Model 3. ex. neither	Model 4. inc. neither
Intercept	0.44	0.41	-5.41	-4.98
	[0.05, 0.82]	[0.04, 0.79]	[-6.24, -4.62]	[-5.74, -4.25]
	.027	.031	<.001	<.001
Existing	1.09	1.11	0.36	0.45
	[0.75, 1.43][a]	[0.78, 1.44][a]	[-0.07, 0.80][a]	[0.04, 0.86][a]
	<.001[b]	<.001[b]	.086[b]	.037[b]
Plan consult	0.12	0.08	0.05	0.01
	[-0.20, 0.44][a]	[-0.23, 0.39][a]	[-0.37, 0.46][a]	[-0.38, 0.40][a]
	.273	.332	.425	.486
Plan restore	0.40	0.28	0.34	0.09
	[0.08, 0.72][a]	[-0.03, 0.58][a]	[-0.09, 0.77][a]	[-0.31, 0.48][a]
	.020[b]	.068[b]	.096[b]	.358[b]
Plan change	0.09	0.04	0.32	0.21
	[-0.23, 0.41][a]	[-0.27, 0.35][a]	[-0.12, 0.75][a]	[-0.19, 0.61][a]

	Excluding town evaluation		Including town evaluation	
	Model 1. ex. neither	Model 2. inc. neither	Model 3. ex. neither	Model 4. inc. neither
	.316[b]	.412[b]	.114[b]	.193[b]
Plan climate	0.17	0.02	0.18	-0.02
	[-0.15, 0.49][a]	[-0.28, 0.33][a]	[-0.24, 0.60][a]	[-0.40, 0.37][a]
	.189[b]	.448[b]	.244[b]	.529[b]
First evaluation			1.21	1.12
			[1.08, 1.35]	[1.00, 1.24]
			<.001	<.001
Male	-0.03	-0.03	0.17	0.16
	[-0.27, 0.20]	[-0.25, 0.20]	[-0.14, 0.49]	[-0.13, 0.45]
	.787	.810	.283	.271
Age	0.12	0.12	-0.04	-0.03
	[0.00, 0.24]	[0.01, 0.23]	[-0.20, 0.12]	[-0.17, 0.11]
	.042	.038	.605	.677
Rural	-0.11	-0.14	-0.16	-0.20
	[-0.35, 0.12]	[-0.36, 0.08]	[-0.47, 0.15]	[-0.48, 0.09]
	.355	.220	.308	.177
Drives	-0.50	-0.57	0.00	-0.15
	[-0.79, -0.20]	[-0.86, -0.29]	[-0.39, 0.38]	[-0.51, 0.20]
	<.001	<.001	.990	.398
Cycles	0.70	0.67	0.26	0.23
	[0.46, 0.95]	[0.44, 0.90]	[-0.07, 0.58]	[-0.06, 0.53]
	<.001	<.001	.119	.118
Observations	1388	1479	1388	1479

Note: Log Odds, [95% CI], and p-values displayed, [a] = 90 % CI, [b] = one-tailed. Age is standardised. Drives = regularly or occasionally versus rarely or never. Cycles = At least rarely versus never. All models exclude 42 participants who wrote irrelevant thoughts. Models 1 and 3 exclude an additional 91 participants who coded all their thoughts as not being about the layout. Models 2 and 4 include these participants, assigning them an SMRD score of 0.

4.2.5 Differences in information search

Similar to Study 1, the most commonly selected FAQs were ‘What does the local community think of the layout?’ (76.1%), ‘impacts on traffic’ (67.1%), and ‘What are the impacts on local businesses?’ (66.4%), Figure S4. Based on the average positivity ratings of the FAQs from Study 2, we again calculated the average positivity score of the six selected FAQs for each participant. Although we replicate the finding that more positive evaluations are associated with selecting more positive FAQs, we fail to replicate the finding that those in the Existing condition selected more positive FAQs when initial evaluation is controlled for (Model 4, Table 2). This may be due to the smaller sample size or because the transition between evaluation and FAQ selection was interrupted by the aspect listing task in this study. We also found no differences in any of the other conditions, which is not consistent with H6 or H7.

4.3 Discussion

Study 3 again replicates the effect of SQB on policy evaluations and provides further support for the Query Theory explanation; participants in the Existing condition listed more positive thoughts than those in the Planned condition. We also rule out the possibility that SQB is explained by uncertainty aversion.

Of the attempts to mitigate SQB, just one of the additional conditions had an effect. Describing the proposed change as a shift back to a previous status quo (as in Plan Restore) had a small mitigative effect on evaluations which was further observed in the increased likelihood of listing positive thoughts about the plan before negative ones. The effect, however, was significant only using a one-tailed test and without any correction for multiple comparisons. Although our analysis plan was pre-registered, in Study 4 we sought to replicate this effect. Moreover, we aimed to disentangle whether the mitigative effect of the Restore vignette was indeed driven by a correction of a previous error or if simply driven by nostalgia for the past.

5 Study 4: Mitigating SQB for Climate Policy - Replication

Study 4 had three principle aims. First, we sought to replicate the reduction in SQB using the Restore rationale for the proposal. Second, we sought to replicate SQB among a sample collected from a different county. Third, we aimed to disentangle the effect of nostalgia from the Restore condition. Additionally, we included a re-test of the Consult condition, as it generated the second largest effect in Study 3.

5.1 Methods

5.1.1 Participants

We determined the sample size to detect the small reduction (d = 0.19) in SQB observed in Study 3. The pre-registered power analysis indicated a sample size of 250 per condition, and as such we aimed to collect 1500 in each county. We planned to pool participants from both countries unless we observed strong country difference and to pool variations of the Restore vignette unless we observed version differences. Participants (*N* = 3017) were recruited in [redacted] (*n* = 1500) and [redacted] (*n* = 1517) by two market research companies. They were paid €1/£1 for participating in the five-minute study. Table S1 describes the sample. In total, 186 participants (6%) failed an attention check. We opt to retain all participants for analyses but present robustness checks with exclusions in SM. Data collection took place between 19th March and 2nd April, 2024.

5.1.2 Materials and Procedure

Descriptions of the town were presented as before. Participants were randomised by the software to read one of six versions. The Existing (*n* = 498), Plan (*n* = 507), Plan Consult (*n* = 495), and Plan Restore (*n* = 504) conditions were the same as those in Study 3. Two additional Plan Restore conditions had slight variations (differences underlined). In the “Plan Restore-Past” condition, participants (*n* = 508) read the following:

> “For many years motor traffic has been prioritised over other forms of transport. There used to be much more walking and cycling in the town and far less traffic congestion. There is now a proposal for a layout designed to make the town more like it used to be before. The layout would…”

In the “Plan Restore-Correction” condition, participants (*n* = 505) read the following:

> “For many years motor traffic has been prioritised over other forms of transport. This has resulted in much less walking and cycling in the town and far more traffic congestion. There is now a proposal for a layout designed to correct this, by helping people to walk and cycle again and decreasing congestion. The layout would…”

All participants then rated the town layout on the same 7-point scale before responding to questions on transport behaviour and socio-demographics.

5.1.3 Hypotheses and Analysis Plan

We hypothesised that those in the Existing (H8), Plan Restore Conditions (H9), and Plan Consult condition (H10) would rate the layout more highly than the Planned condition, and that there would be differences between the three Plan Restore conditions (H11). We pre-registered to use the same OLS models on evaluations with age, gender, living area, and driving and cycling status as controls.

5.2 Results

Models 1 and 2 in Table S10 shows that the SQB effect replicated again in [redacted]: *b* = 0.69, 95% CI = [0.41,0.97], *p* <.001, and also [second country]: *b* = 0.60, 95% CI = [0.32,0.87], *p* <.001. Additional models showed no country-condition interactions on evaluations, Table S11. As such, we pool participants from both countries for subsequent analyses.

As pre-registered, we first used an OLS model to replicate Study 3 with the three Restore condition pools. Model 4 in Table 1 shows the SQB effect between the Existing (M = 5.38, SD = 1.46) and Plan (M = 4.71, SD = 1.70) condition, *b* = 0.63, 90% *CI* = [0.47, 0.79], *p* <.001, again with a moderate effect size Cohen's *d* = 0.42, 90% *CI* = [0.32,0.53], in support of H8. The pooled Restore conditions (M = 4.83, SD = 1.60) was not significantly different to the Plan condition, *b* = 0.12, 90% *CI* = [-0.01, 0.25], *p* = .063, one-tailed, Cohen's d = 0.08, 90% *CI* = [-0.01, 0.16], contra H9. We also replicate the lack of effect of the Plan Consult condition (M = 4.70, SD = 1.64), *b* = -0.02, 90% *CI* = [-0.18, 0.16], *p* = .572, one-tailed, Cohen's d = -0.004, 90% *CI* = [-0,11,0.09], contra H10.

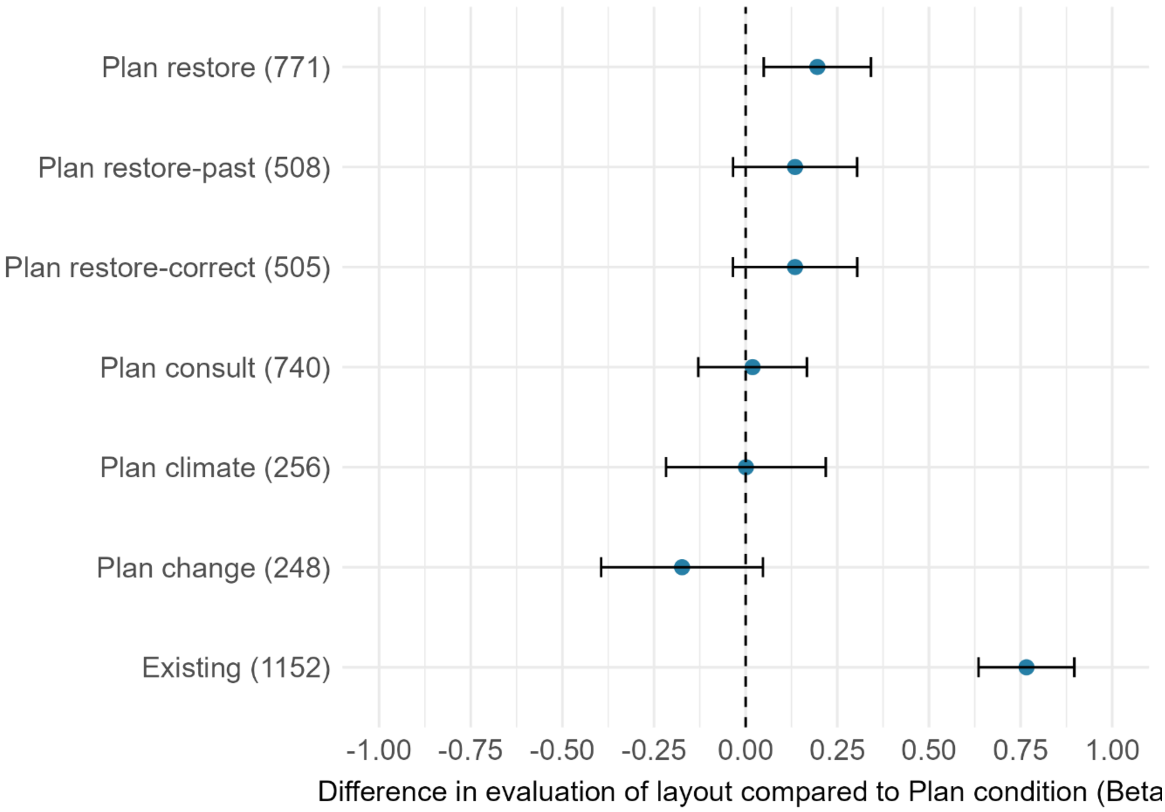
Taking the three restore conditions separately, Model 5, Table 1, the Plan Restore condition used in Study 3 (M = 4.86, SD = 1.55) was the only of the restore conditions that were significantly different from the Plan condition, *b* = 0.16, 95% *CI* = [0.00, 0.33], *p* = .049, one-tailed, Cohen's d = 0.09, 90% *CI* = [-0.01,0.19]. Conducting tests of coefficient inequality, we found no differences between this condition and the new Restore conditions: Plan Restore vs. Plan Restore-Past: *F*(3004) = 0.39, *p* = .533, Plan Restore-Correction vs Plan Restore-Past: *F*(3004) = 0.00, p = .979, Plan Restore vs Plan Restore-Correct: *F*(3004) = 0.36, *p* = .551,

6 Combined Estimates

To generate more precise estimates of SQB and ways to mitigate it, we combining samples for the same conditions across studies 1, 3 and 4. This resulted in 1,152 participants in the Existing condition, 1158 in the Plan condition, 771 in the Planned Restore condition, 508 in the Plan restore-past, 505 in the Plan restore-correct, 740 in the Plan consult, 256 in the Plan climate and 248 in the Plan change condition, Table S12 presents an OLS of evaluations by each condition, with the same socio-demographic controls. Note: Number of observations in each group displayed in brackets. Error bars represent 95% CI.

Figure 4 shows estimates from these models. Compared to the Planned condition, we estimate an effect size of d = 0.49, 95 % CI = [0.42,0.57] for the Existing condition (i.e., SQB). This effect is in line with identity-based characteristics which might produce self-interest incentives for or against the plan (i.e., driving regularly or cycling at least some of the time). Comparing the coefficients between driving and cycling status and Existing showed that the SQB effect was stronger: $F(5323)_{\text{drives}} = 226.58$, $p < .001$, $F(5323)_{\text{cycles}} = 7.82$, $p = .005$.

The pooled Plan restore conditions shows a small mitigative effect of d = 0.09, 95% CI = [0.02, 0.17]. The original Plan restore condition shows an effect of d = 0.11, 95% CI = [0.02,0.20]. None of the other alternatives resulted in significant mitigation of SQB.



Note: Number of observations in each group displayed in brackets. Error bars represent 95% CI.

Figure 4. Combined coefficient estimates on rating of the layout compared to plan condition (Studies 1, 3, and 4).

7 General Discussion

Our results suggest that SQB is a greater barrier to change than holding a clear vested interest. In four studies of reforms to facilitate active travel (walking and cycling), SQB had a stronger influence than being a motorist or cyclist. While here we focus on active travel, SQB is likely to influence multiple other aspects of pro-climate policy, given the ubiquity of the bias (Godefroid et al., 2022) and the extent to which policy aims to alter everyday behaviours and decisions.

SQB is not opposition to specific changes; it is differential opposition when change is proposed compared to when it has already taken place. In our studies, measures of RTC, loss aversion, and uncertainty aversion were associated with participants' evaluations, but these associations were consistent across conditions and hence not the source of SQB. This raises a broader question of whether relationships previously reported between these (or similar) measures and willingness to change indicate causes of SQB or merely drivers of general dislike (e.g., Li et al., 2016, Putra et al., 2022).

Our investigations suggest that SQB is embedded in the process of opinion formation, in a manner consistent with Query Theory. When evaluating a plan, people appeared to ask an internal question that led them to search for negatives, as if asking "What could go wrong here?". By contrast, those evaluating an existing layout were more inclined to look for positives as well, as if asking "What are the pros and cons of this?". Armed with this diagnosis of the underlying psychological mechanism, we tested four potential ways to mitigate SQB, of which one proved effective. Although the mitigative effect was only partial, it is worth noting that it was achieved via a single short description; repetition might increase the mitigative effect. Moreover, to the best of our knowledge, previous research has not managed to undermine the strength of SQB by changing the rationale provided for a policy yet to be enacted, as we managed to do here.

The precise psychological mechanism involved in SQB is important. It is a different matter for policymakers to use findings from psychological science to promote unbiased evaluations of a policy than to use scientific findings, for instance, to sell a policy that runs counter to unambiguous public preferences. Reasonable people might find the latter approach to be less fair or to lack legitimacy. Of course, faced with a policy problem as serious as climate change, government efforts to change public preferences may well be regarded as legitimate. The point is a broader one. Insight into the psychological mechanism not only informs more effective policy, it gives greater clarity to the relationship between government and citizen, allowing better assessment of the fairness and legitimacy of policy.

Further research might examine how much the mechanisms that drive SQB are consistent or differ across policy domains. In our studies, a plan to move towards a previous state led to more positive evaluations and the production of more positive initial thoughts. We note that nostalgia is a well-established tactic in political messaging. Alluding to a “golden past” is particularly prevalent on the political far right and has been linked to conservatism and nationalism (Elgenius & Rydgren, 2019; 2022; Bonikowski & Stuhler, 2022; Lammers, 2023). The tactic is echoed in the slogan “Make America Great Again” and in the UK Brexit campaign slogan “Take Back Control”. Our findings suggest that combining such nostalgia with an articulation of what had been lost and needed to be restored can reduce SQB.

Our findings offer some additional insights for climate policy. The simple fact that community opinions and consultation processes emerged as the most sought-after information indicates how social norms and fairness concerns matter for public attitudes toward climate policy (Alló & Loureiro, 2014; Bergquist et al., 2022). As well as responding to community concerns, consultative approaches help to avoid misperceptions of imposition. It was also notable that the pro-climate reform we tested was evaluated more positively by people with greater trait loss and uncertainty aversion. Future work might be able to shed more light on these relationships.

We hope this paper draws attention to SQB as an underappreciated impediment to climate policy. Given the scale and speed of change required, it is important to find ways to mitigate biased thinking and enable constructive debate.

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8 Supplementary

Table S1 Socio demographic breakdown of the samples

		Study 1		Study 2		Study 3		Study 4	
		N	%	N	%	N	%	N	%
Sex	Male	410	51.2	203	50.8	820	53.9	1566	51.9
	Female	387	48.4	195	48.8	694	45.6	1431	47.4
	Other	3	0.4	2	0.5	7	0.5	20	0.7
Age	< 40	277	34.6	141	35.2	613	40.3	1114	36.9
	40-59	297	37.1	153	38.2	570	37.5	1081	35.8
	60+	226	28.2	106	26.5	338	22.2	822	27.2
Education	Degree	413	51.6	198	49.5	624	41.0	1507	50.0
	No Degree	387	48.4	202	50.5	897	59.0	1510	50.0
Living area	Urban	548	68.5	256	64.0	945	62.1	2057	68.2
	Rural	252	31.5	144	36.0	576	37.9	960	31.8
Drives	Never	155	19.4	-	-	230	15.1	563	18.7
	Occasionally	132	16.5	-	-	243	16.0	502	16.6
	Rarely	40	5.0	-	-	85	5.6	152	5.0
	Regularly	473	59.1	-	-	963	63.3	1800	59.7
Cycles	Never	499	62.4	-	-	878	57.7	1729	57.3
	Occasionally	102	12.8	-	-	212	13.9	511	16.9
	Rarely	143	17.9	-	-	337	22.2	583	19.3
	Regularly	56	7.0	-	-	94	6.2	194	6.4
Observations		800		400		1521		3017	

Table S2 Robust models of town evaluation (1-7) between conditions.

	Study 1		Study 2		Study 3		Study 4	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	OLS ex. attention	Ordered logit	OLS ex. attention	Ordered logit	OLS ex. attention	Ordered logit	OLS ex. attention	Ordered logit
Intercept	4.84		4.97		4.92		4.91	
	[4.53, 5.14]		[4.68, 5.26]		[4.63, 5.21]		[4.73, 5.10]	
	<.001		<.001		<.001		<.001	
Condition (Ref: Plan)								
Existing	0.86	0.87	0.85	0.95	1.00	1.09	0.65	0.74
	[0.65, 1.06][a]	[0.66, 1.08][a]	[0.59, 1.11][a]	[0.65, 1.25][a]	[0.75, 1.24][a]	[0.83, 1.36][a]	[0.48, 0.82][a]	[0.55, 0.92][a]
	<.001[b]	<.001[b]	<.001[b]	<.001[b]	<.001[b]	<.001[b]	<.001[b]	<.001[b]
Plan consult					0.09	0.09	-0.07	-0.06
					[-0.16, 0.34][a]	[-0.18, 0.35][a]	[-0.24, 0.10][a]	[-0.24, 0.13][a]
					.271[b]	.294[b]	.750[b]	.688[b]
Plan restore					0.22	0.29		
					[-0.02, 0.46][a]	[0.03, 0.55][a]		
					.069[b]	.032[b]		
Plan restore pooled							0.13	0.12
							[-0.01, 0.27][a]	[-0.03, 0.27][a]
							.061[b]	.092[b]
Plan climate					0.03	0.03		
					[-0.22, 0.27][a]	[-0.23, 0.29][a]		
					.433[b]	.418[b]		
Plan change					-0.16	-0.06		
					[-0.41, 0.09][a]	[-0.32, 0.20][a]		
					.855[b]	.651[b]		
Male	-0.11	-0.16	-0.23	-0.27	-0.13	-0.17	-0.01	0.01
	[-0.36, 0.14]	[-0.41, 0.10]	[-0.54, 0.08]	[-0.63, 0.08]	[-0.31, 0.04]	[-0.36, 0.02]	[-0.13, 0.11]	[-0.12, 0.14]
	.399	.231	.149	.129	.133	.072	.815	.925

	Study 1		Study 2		Study 3		Study 4	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	OLS ex. attention	Ordered logit	OLS ex. attention	Ordered logit	OLS ex. attention	Ordered logit	OLS ex. attention	Ordered logit
Age	0.05	0.07	0.10	0.09	0.19	0.20	0.08	0.08
	[-0.07, 0.18]	[-0.05, 0.20]	[-0.06, 0.26]	[-0.09, 0.26]	[0.10, 0.28]	[0.11, 0.29]	[0.02, 0.14]	[0.01, 0.14]
	.395	.266	.220	.334	<.001	<.001	.007	.018
Rural	-0.18	-0.16	-0.21	-0.21	0.03	-0.04	-0.01	-0.05
	[-0.45, 0.09]	[-0.43, 0.11]	[-0.53, 0.11]	[-0.57, 0.16]	[-0.15, 0.20]	[-0.23, 0.14]	[-0.14, 0.12]	[-0.19, 0.09]
	.181	.234	.205	.267	.759	.648	.841	.469
Drives	-0.41	-0.43			-0.69	-0.68	-0.54	-0.55
	[-0.70, -0.12]	[-0.73, -0.13]			[-0.90, -0.47]	[-0.91, -0.45]	[-0.68, -0.40]	[-0.71, -0.40]
	.006	.005			<.001	<.001	<.001	<.001
Cycles	0.54	0.54			0.66	0.74	0.48	0.56
	[0.28, 0.81]	[0.27, 0.81]			[0.49, 0.84]	[0.55, 0.93]	[0.36, 0.61]	[0.42, 0.69]
	<.001	<.001			<.001	<.001	<.001	<.001
Observations	677	800	375	400	1419	1521	2831	3017

Note: Unstandardised beta/ log odds, [95% CI] and p-values displayed. [a] 90% CI, [b] one-tailed p-values. Age is standardised. Drives = regularly or occasionally versus rarely or never. Cycles = At least rarely versus never.

8.1 Study 1

8.1.1 Tables

Table S3. OLS Regression Models Predicting First Evaluation of the Layout by RTC and LA

	Model 1	Model 2	Model 3
Intercept	4.66	4.62	4.69
	[4.01, 5.31]	[3.81, 5.42]	[3.86, 5.53]
	<.001	<.001	<.001
Existing (ref: Plan)	0.79	0.87	0.72
	[0.56, 1.01]	[-0.09, 1.83]	[-0.33, 1.77]

	<.001	.076	.180
Resistance to Change	-0.32	-0.31	-0.32
	[-0.46, -0.17]	[-0.50, -0.12]	[-0.46, -0.17]
	<.001	.002	<.001
Loss Aversion	0.33	0.33	0.32
	[0.19, 0.47]	[0.19, 0.47]	[0.14, 0.50]
	<.001	<.001	<.001
Male	-0.08	-0.08	-0.08
	[-0.31, 0.15]	[-0.31, 0.15]	[-0.31, 0.15]
	.482	.477	.486
Age	0.03	0.03	0.03
	[-0.09, 0.14]	[-0.09, 0.14]	[-0.09, 0.14]
	.664	.663	.666
Rural	-0.17	-0.16	-0.17
	[-0.41, 0.08]	[-0.41, 0.08]	[-0.41, 0.08]
	.185	.187	.186
Drives	-0.41	-0.41	-0.41
	[-0.67, -0.14]	[-0.67, -0.14]	[-0.68, -0.14]
	.003	.003	.003
Cycles	0.48	0.48	0.47
	[0.23, 0.72]	[0.23, 0.72]	[0.23, 0.72]
	<.001	<.001	<.001
Existing*Resistance to change		-0.02	
		[-0.25, 0.21]	
		.862	
Existing*Loss aversion			0.01
			[-0.21, 0.24]
			.897
Observations	800	800	800

Note: RtC = Resistance to Change, LA = Loss Aversion. Drives = regularly or occasionally versus rarely or never. Cycles = At least rarely versus never.

Table S4. Logistic regression models on likelihood of selecting each FAQ by condition.

Model	Intercept	Plan	Evaluation	Male	Age	Rural	Drives	Cycles
1. Environment	-2.31	-0.02	0.26	0.26	-0.12	0.16	-0.43	0.38
	[-3.09, -1.56]	[-0.35, 0.31]	[0.15, 0.37]	[-0.07, 0.59]	[-0.29, 0.05]	[-0.19, 0.51]	[-0.80, -0.06]	[0.04, 0.72]
	<.001	.892	<.001	.121	.156	.368	.022	.027
2. Health	-2.15	-0.41	0.30	0.19	-0.16	-0.36	-0.72	0.25
	[-3.00, -1.35]	[-0.77, -0.06]	[0.18, 0.43]	[-0.16, 0.54]	[-0.34, 0.02]	[-0.76, 0.04]	[-1.10, -0.34]	[-0.11, 0.62]
	<.001	.021	<.001	.293	.075	.080	<.001	.169
3. Business	0.79	0.55	-0.18	0.36	0.03	0.12	0.26	-0.09
	[0.13, 1.46]	[0.25, 0.86]	[-0.27, -0.08]	[0.06, 0.66]	[-0.12, 0.19]	[-0.20, 0.45]	[-0.09, 0.61]	[-0.41, 0.23]
	.019	<.001	<.001	.021	.659	.456	.141	.571
4. Traffic	1.14	0.18	-0.20	-0.26	-0.15	0.19	0.84	-0.21
	[0.47, 1.83]	[-0.13, 0.49]	[-0.31, -0.11]	[-0.57, 0.06]	[-0.30, 0.01]	[-0.15, 0.53]	[0.49, 1.19]	[-0.53, 0.12]
	.001	.261	<.001	.108	.068	.269	<.001	.214
5. Services	1.29	-0.32	-0.07	-0.24	0.03	-0.35	0.09	-0.09
	[0.65, 1.95]	[-0.62, -0.02]	[-0.16, 0.02]	[-0.54, 0.06]	[-0.12, 0.18]	[-0.67, -0.03]	[-0.26, 0.44]	[-0.41, 0.22]
	<.001	.039	.155	.124	.723	.031	.614	.556
6. Disability	0.40	-0.07	0.03	-0.23	0.28	0.16	-0.18	-0.15
	[-0.22, 1.02]	[-0.36, 0.22]	[-0.06, 0.11]	[-0.52, 0.06]	[0.13, 0.42]	[-0.15, 0.47]	[-0.52, 0.16]	[-0.46, 0.16]
	.209	.635	.540	.127	<.001	.323	.311	.334
7. Community	2.47	-0.14	-0.20	0.00	0.05	0.36	-0.05	-0.22
	[1.66, 3.32]	[-0.50, 0.21]	[-0.32, -0.08]	[-0.36, 0.36]	[-0.13, 0.24]	[-0.03, 0.77]	[-0.47, 0.36]	[-0.59, 0.16]
	<.001	.428	.001	.999	.565	.077	.825	.251
8. Who proposed	1.58	-0.55	-0.28	0.11	0.07	-0.02	-0.13	0.05
	[0.94, 2.23]	[-0.85, -0.25]	[-0.37, -0.19]	[-0.19, 0.41]	[-0.07, 0.22]	[-0.34, 0.29]	[-0.47, 0.22]	[-0.26, 0.36]
	<.001	<.001	<.001	.464	.332	.891	.473	.742

9. Common	-1.93	0.22	0.14	-0.14	-0.07	0.07	0.12	0.28
	[-2.66, -1.23]	[-0.10, 0.55]	[0.04, 0.25]	[-0.47, 0.18]	[-0.23, 0.09]	[-0.27, 0.41]	[-0.25, 0.50]	[-0.05, 0.61]
	<.001	.174	.005	.379	.377	.680	.537	.100
10. History	-1.22	-0.37	0.11	-0.10	0.02	-0.08	-0.15	-0.21
	[-1.95, -0.51]	[-0.70, -0.03]	[0.01, 0.22]	[-0.43, 0.23]	[-0.15, 0.18]	[-0.44, 0.28]	[-0.53, 0.23]	[-0.57, 0.14]
	<.001	.031	.033	.558	.852	.670	.431	.241
11. Consulted	2.21	0.13	-0.16	-0.01	0.35	-0.18	0.22	-0.58
	[1.42, 3.04]	[-0.23, 0.48]	[-0.28, -0.04]	[-0.36, 0.35]	[0.17, 0.54]	[-0.56, 0.20]	[-0.19, 0.62]	[-0.94, -0.22]
	<.001	.489	.008	.971	<.001	.346	.290	.002
12. Time	-2.65	0.71	0.34	0.10	-0.32	-0.10	0.02	0.47
	[-3.39, -1.95]	[0.40, 1.03]	[0.24, 0.44]	[-0.21, 0.41]	[-0.48, -0.17]	[-0.43, 0.23]	[-0.34, 0.38]	[0.15, 0.78]
	<.001	<.001	<.001	.535	<.001	.550	.915	.004

Note: Each row represents a separate model. Log Odds, [95% CI] and p-values displayed. Drives = regularly or occasionally versus rarely or never. Cycles = At least rarely versus never. Models 1-6 run on 798 observations and models 7-12 run on 794 observations due to errors with the software resulting in missing data.

Table S5. Ordered Logistic Regressions of rank score given to each FAQ by condition.

Model	Plan	Evaluation	Male	Age	Rural	Drives	Cycles	N
1. Environment	-0.10	0.27	0.29	-0.13	0.17	-0.47	0.42	
	[-0.42, 0.22]	[0.17, 0.38]	[-0.03, 0.61]	[-0.30, 0.03]	[-0.18, 0.51]	[-0.83, -0.11]	[0.09, 0.75]	798
	.542	<.001	.076	.113	.345	.010	.012	
2. Health	-0.46	0.28	0.10	-0.17	-0.31	-0.76	0.30	
	[-0.81, -0.12]	[0.16, 0.40]	[-0.24, 0.44]	[-0.35, 0.01]	[-0.70, 0.08]	[-1.13, -0.39]	[-0.05, 0.66]	798
	.009	<.001	.571	.062	.124	<.001	.092	
3. Business	0.48	-0.13	0.27	0.09	0.07	0.09	-0.10	
	[0.22, 0.74]	[-0.20, -0.05]	[0.01, 0.53]	[-0.04, 0.22]	[-0.20, 0.34]	[-0.22, 0.39]	[-0.37, 0.18]	796
	<.001	.001	.040	.180	.601	.587	.487	
4. Traffic	0.12	-0.19	-0.18	-0.20	0.15	0.81	-0.19	
	[-0.14, 0.38]	[-0.26, -0.11]	[-0.43, 0.08]	[-0.33, -0.07]	[-0.12, 0.42]	[0.50, 1.12]	[-0.46, 0.08]	797

	.367	<.001	.177	.003	.283	<.001	.170	
5. Services	-0.34	0.00	-0.21	-0.03	-0.22	0.05	-0.13	
	[-0.60, -0.09]	[-0.08, 0.07]	[-0.47, 0.04]	[-0.16, 0.09]	[-0.50, 0.05]	[-0.25, 0.34]	[-0.40, 0.14]	797
	.009	.916	.104	.613	.109	.752	.356	
6. Disability	-0.10	0.02	-0.26	0.25	0.17	-0.21	-0.10	
	[-0.36, 0.16]	[-0.06, 0.10]	[-0.52, 0.01]	[0.13, 0.39]	[-0.11, 0.45]	[-0.52, 0.10]	[-0.38, 0.17]	796
	.461	.629	.056	<.001	.225	.182	.463	
7. Community	0.08	-0.05	-0.11	0.13	0.40	-0.08	-0.05	
	[-0.17, 0.33]	[-0.12, 0.03]	[-0.37, 0.14]	[0.00, 0.26]	[0.13, 0.66]	[-0.38, 0.21]	[-0.32, 0.22]	794
	.543	.226	.383	.050	.004	.585	.695	
8. Who proposed	-0.44	-0.28	0.22	0.08	-0.14	-0.12	0.04	
	[-0.71, -0.16]	[-0.36, -0.20]	[-0.05, 0.50]	[-0.06, 0.22]	[-0.44, 0.15]	[-0.45, 0.20]	[-0.25, 0.33]	793
	.002	<.001	.113	.264	.346	.449	.798	
9. Common	0.23	0.13	-0.14	-0.09	0.03	0.12	0.29	
	[-0.09, 0.54]	[0.03, 0.23]	[-0.45, 0.18]	[-0.25, 0.07]	[-0.30, 0.36]	[-0.25, 0.49]	[-0.04, 0.62]	793
	.153	.009	.387	.267	.859	.514	.081	
10. History	-0.31	0.10	-0.08	0.00	-0.08	-0.12	-0.17	
	[-0.64, 0.02]	[0.00, 0.20]	[-0.41, 0.24]	[-0.17, 0.16]	[-0.43, 0.27]	[-0.49, 0.25]	[-0.52, 0.18]	793
	.067	.061	.619	.971	.657	.527	.348	
11. Consulted	0.12	-0.06	-0.05	0.23	-0.14	0.18	-0.22	
	[-0.13, 0.38]	[-0.14, 0.01]	[-0.30, 0.20]	[0.11, 0.36]	[-0.40, 0.13]	[-0.11, 0.48]	[-0.49, 0.05]	793
	.339	.110	.709	<.001	.320	.224	.117	
12. Time	0.67	0.36	0.12	-0.41	-0.08	0.05	0.49	
	[0.38, 0.97]	[0.26, 0.46]	[-0.17, 0.40]	[-0.56, -0.26]	[-0.39, 0.23]	[-0.27, 0.39]	[0.20, 0.79]	793
	<.001	<.001	.432	<.001	.610	.753	.001	

Note: Log Odds, [95% CI], and p-values displayed. *Dri*ves = regularly or occasionally versus rarely or never. Cycles = At least rarely versus never. Models run on less than full sample due to errors with the software resulting in missing data.

8.1.2 Figures

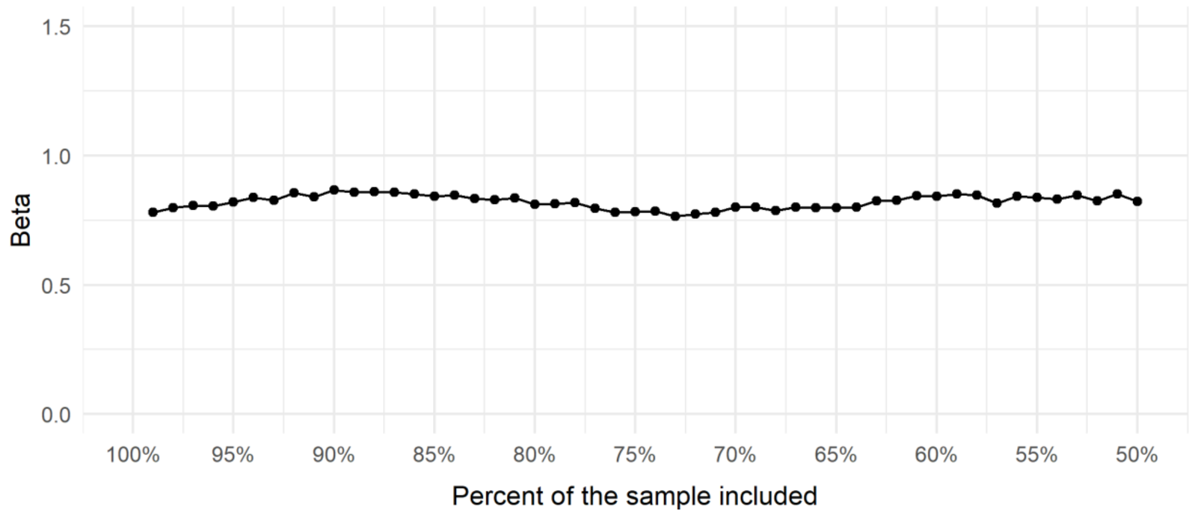
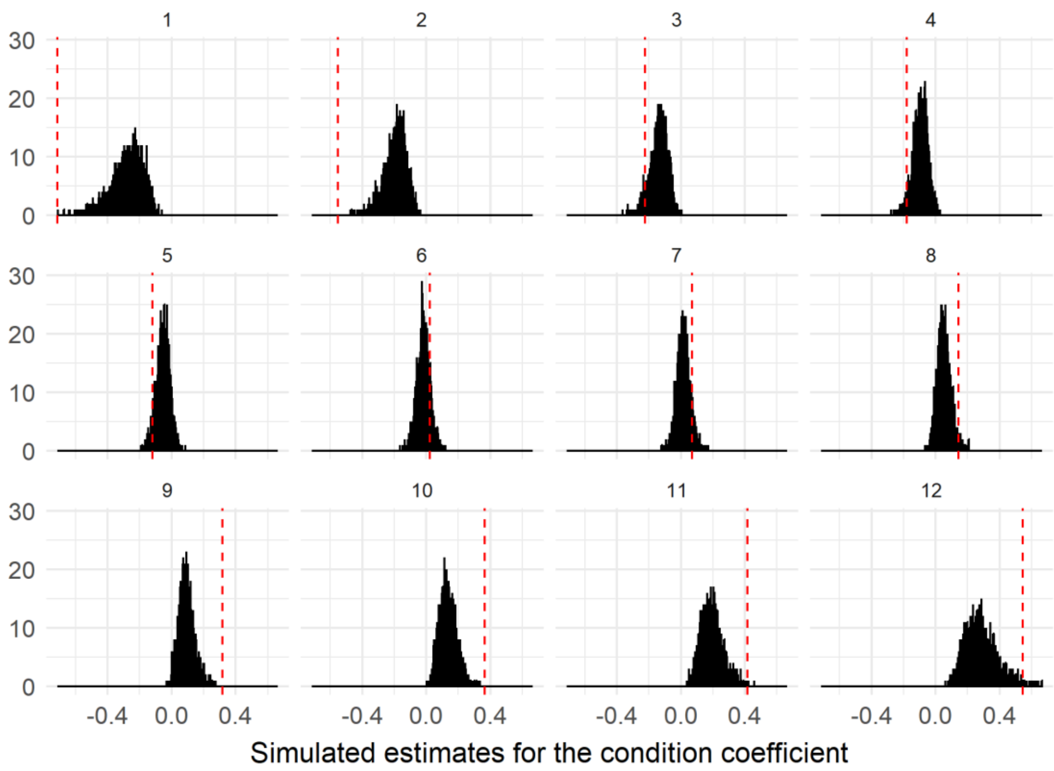
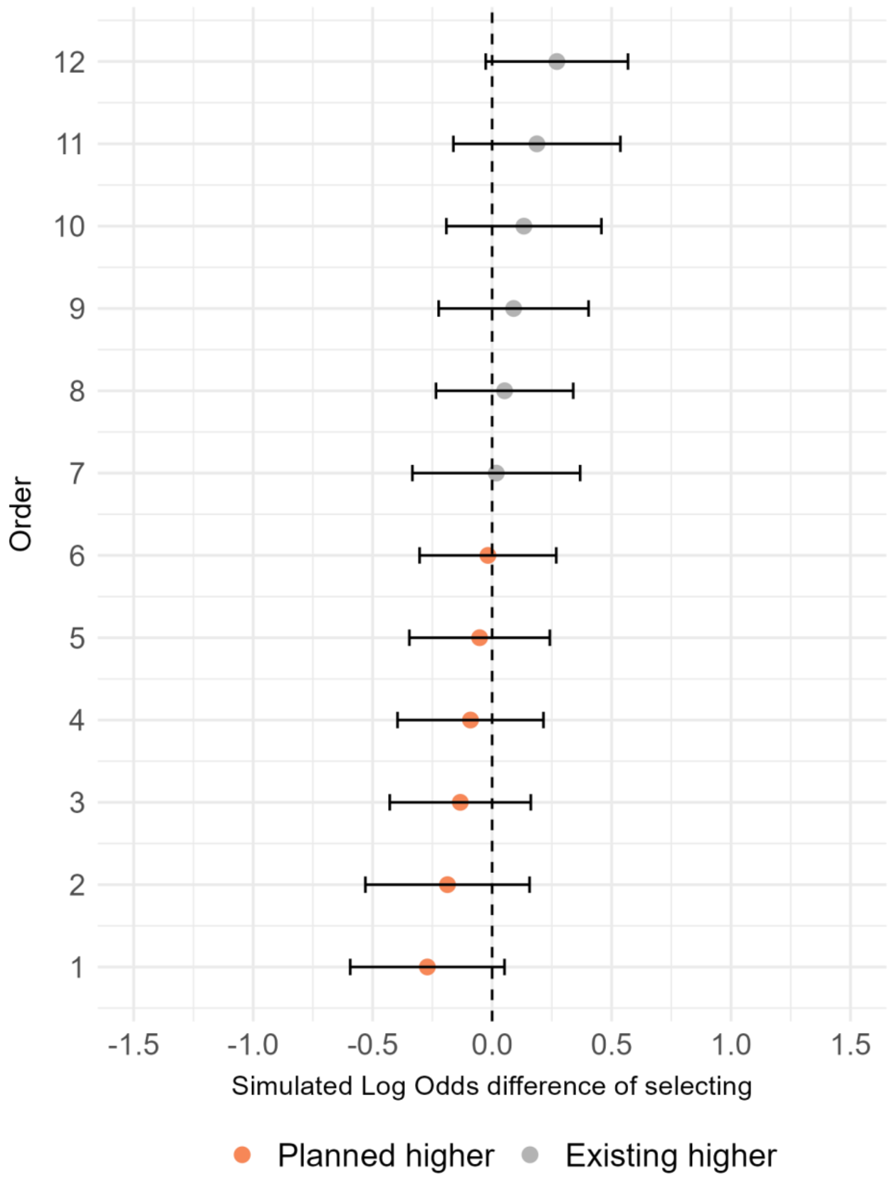


Figure S1 Beta coefficient change when modelling H1 and excluding different percentiles of the sample based on completion time (Study 1).



Note: For each iteration, estimates from the 12 models were categorised according to order ranging from most negative (1) to most positive (12). Red lines represent observed betas from models in ordered from most negative to most positive.

Figure S2. Distributions of simulated estimates for the Log Odds difference of FAQ selection between conditions using randomisation tests on 5000 iterations (Study 1).



Note: For each iteration, estimates from the 12 models were categorised according to order ranging from smallest (1) to largest (12). Points represent average estimates for the most negative (1) ranging to the most positive (12) coefficients across the 5000 simulations. Error bars represent 95% CI. See https://osf.io/dsug8/ for simulation code.

Figure S3. Simulated average estimates for the Log Odds difference of FAQ selection between conditions using randomisation tests on 5000 iterations (Study 1).

8.2 Study 2

Table S6. Average positivity score assigned to each FAQ (Study 2).

	Mean	SD	% Negative	% Don't know
Environment	5.67	1.47	8.0	3.5
Health	5.61	1.38	6.5	4.2
Businesses	4.51	1.83	27.5	5.0
Traffic	3.82	1.93	44.2	4.8
Services	3.99	1.85	39.0	7.2
Disability	5.01	1.83	20.8	3.8
Community	4.63	1.69	21.2	8.8
Who proposed	4.21	1.72	22.0	24.5
Common	4.14	1.62	28.0	13.0
History	4.31	1.55	20.8	21.8
Consulted	4.15	1.87	28.8	17.2
Time	3.89	1.75	36.0	16.0

8.3 Study 3

8.3.1 Tables

Table S7. OLS models on first evaluation including interactions between condition and uncertainty aversion and socio-demographics

	Model 1 UA	Model 2 UA x condition	Model 3 Drives x condition	Model 4 Cycles x condition
Intercept	4.38	4.39	4.41	4.47
	[3.92, 4.83]	[3.53, 5.24]	[3.82, 5.01]	[3.99, 4.95]
	<.001	<.001	<.001	<.001
Uncertainty Aversion	0.11	0.11	0.11	0.11
	[0.03, 0.18]	[-0.08, 0.29]	[0.04, 0.19]	[0.03, 0.18]
	.006	.254	.004	.006
Condition (ref: Plan)				
Existing	0.98	0.71	0.54	0.86
	[0.70, 1.26]	[-0.48, 1.90]	[-0.10, 1.18]	[0.50, 1.22]
	<.001	.243	.097	<.001
Plan change	-0.11	0.00	0.08	-0.16
	[-0.39, 0.18]	[-1.17, 1.17]	[-0.57, 0.72]	[-0.53, 0.22]
	.464	1.000	.813	.417
Plan restore	0.11	-0.34	0.26	0.13
	[-0.18, 0.39]	[-1.45, 0.77]	[-0.35, 0.88]	[-0.24, 0.50]
	.461	.551	.401	.482
Plan consult	0.05	1.26	-0.27	0.02
	[-0.24, 0.33]	[0.10, 2.43]	[-0.94, 0.40]	[-0.35, 0.39]
	.745	.033	.431	.925
Plan climate	0.27	-0.19	0.24	-0.12
	[-0.01, 0.55]	[-1.35, 0.97]	[-0.39, 0.86]	[-0.50, 0.26]
	.058	.749	.456	.532
Male	-0.16	-0.16	-0.15	-0.16
	[-0.33, 0.01]	[-0.33, 0.01]	[-0.32, 0.01]	[-0.33, 0.01]
	.068	.068	.073	.068
Age	0.19	0.20	0.19	0.19
	[0.11, 0.28]	[0.11, 0.28]	[0.11, 0.28]	[0.11, 0.28]
	<.001	<.001	<.001	<.001
Rural	-0.02	-0.03	-0.03	-0.02
	[-0.19, 0.15]	[-0.20, 0.14]	[-0.20, 0.14]	[-0.19, 0.15]
	.794	.690	.727	.808
Drives	-0.56	-0.57	-0.64	-0.56
	[-0.76, -0.35]	[-0.78, -0.37]	[-1.16, -0.11]	[-0.77, -0.35]
	<.001	<.001	.017	<.001
Cycles	0.69	0.69	0.70	0.46

	Model 1 UA	Model 2 UA x condition	Model 3 Drives x condition	Model 4 Cycles x condition
	[0.52, 0.86]	[0.52, 0.86]	[0.53, 0.87]	[0.04, 0.87]
	<.001	<.001	<.001	.031
UA x Existing		0.06		
		[-0.21, 0.33]		
		.644		
UA x Plan change		-0.02		
		[-0.29, 0.24]		
		.854		
UA x Plan restore		0.14		
		[-0.11, 0.40]		
		.265		
UA x Plan consult		-0.27		
		[-0.53, -0.01]		
		.044		
UA x Plan climate		0.05		
		[-0.20, 0.31]		
		.687		
Drives x Existing			0.56	
			[-0.15, 1.27]	
			0.124	
Drives x Plan change			-0.23	
			[-0.95, 0.48]	
			.522	
Drives x Plan restore			0.00	
			[-0.69, 0.70]	
			.994	
Drives x Plan consult			0.46	
			[-0.28, 1.20]	
			0.225	
Drives x Plan climate			-0.25	
			[-0.95, 0.45]	
			.476	
Cycles x Existing				0.30
				[-0.27, 0.88]

	Model 1 UA	Model 2 UA x condition	Model 3 Drives x condition	Model 4 Cycles x condition
				.299
Cycles x Plan change				0.13
				[-0.44, 0.71]
				.653
Cycles x Plan restore				0.33
				[-0.23, 0.90]
				.250
Cycles x Plan consult				0.22
				[-0.37, 0.80]
				.465
Cycles x Plan climate				0.39
				[-0.18, 0.96]
				.185
Observations	1521	1521	1521	1521

Note: Unstandardised betas, 95% CI and p-values displayed.

Table S8. FAQ selection percentages by condition (Study 3)

	All	Plan	Existing	Plan change	Plan restore	Plan consult	Plan climate
Environment	29.0	27.2	30.9	28.2	27.7	29.0	30.9
Health	23.4	21.5	27.8	16.5	26.2	21.6	26.2
Businesses	66.4	70.3	63.7	64.1	74.2	58.8	66.8
Traffic	67.1	68.3	61.0	72.2	64.8	73.1	64.1
Services	55.6	53.7	58.3	56.0	48.3	62.4	55.1
Disability	58.5	58.9	58.3	62.9	58.8	55.1	57.0
Community	76.2	78.5	76.8	75.0	74.5	74.7	77.7
Who proposed	41.6	43.1	42.1	42.7	34.8	46.5	40.6
Common	27.1	21.1	27.4	25.0	30.3	30.2	28.1
History	26.1	22.8	32.8	23.4	28.1	23.7	25.4
Consulted	79.9	85.0	76.4	82.7	80.9	76.3	78.1
Time	49.2	49.6	44.4	51.2	51.3	48.6	50.0

Table S9. Logistic regression models on FAQ selection by condition (Study 3).

Model	Intercept	Existing	Plan change	Plan restore	Plan consult	Plan climate	First evaluation
1. Environment	-3.44	-0.16	0.07	-0.10	0.11	0.14	0.43
	[-4.07, -2.83]	[-0.57, 0.25]	[-0.35, 0.49]	[-0.51, 0.31]	[-0.30, 0.53]	[-0.27, 0.55]	[0.34, 0.52]
	<0.001	.444	.742	.638	.595	.510	<0.001
2. Health	-2.76	0.08	-0.37	0.14	0.02	0.18	0.35
	[-3.41, -2.14]	[-0.35, 0.52]	[-0.85, 0.10]	[-0.28, 0.58]	[-0.43, 0.47]	[-0.25, 0.62]	[0.26, 0.44]
	<0.001	.705	.122	.508	.943	.415	<0.001
3. Businesses	1.74	-0.07	-0.29	0.32	-0.52	-0.10	-0.25
	[1.21, 2.27]	[-0.46, 0.32]	[-0.68, 0.10]	[-0.08, 0.72]	[-0.91, -0.14]	[-0.49, 0.28]	[-0.32, -0.18]
	<.001	.722	.143	.118	.008	.600	<.001
4. Traffic	1.50	0.00	0.24	0.00	0.31	-0.08	-0.32
	[0.96, 2.05]	[-0.40, 0.39]	[-0.17, 0.66]	[-0.39, 0.39]	[-0.10, 0.73]	[-0.47, 0.32]	[-0.40, -0.25]
	<.001	.985	.247	.996	.140	.697	<.001
5. Services	0.69	0.19	0.08	-0.23	0.36	0.04	-0.02
	[0.22, 1.17]	[-0.17, 0.55]	[-0.27, 0.44]	[-0.58, 0.12]	[0.00, 0.72]	[-0.32, 0.39]	[-0.08, 0.05]
	.004	.290	.642	.194	.052	.843	.580
6. Disability	1.23	-0.08	0.14	-0.06	-0.24	-0.13	-0.04
	[0.74, 1.73]	[-0.45, 0.29]	[-0.23, 0.51]	[-0.43, 0.30]	[-0.61, 0.13]	[-0.50, 0.23]	[-0.11, 0.02]
	<.001	.672	.457	.729	.205	.484	.216
7. Community	1.90	-0.04	-0.21	-0.22	-0.24	-0.06	-0.09
	[1.34, 2.48]	[-0.47, 0.39]	[-0.64, 0.21]	[-0.64, 0.19]	[-0.66, 0.18]	[-0.48, 0.37]	[-0.17, -0.02]
	<.001	.866	.318	.296	.269	.799	.019
8. Who proposed	1.06	0.31	-0.02	-0.26	0.21	-0.05	-0.33

Model	Intercept	Existing	Plan change	Plan restore	Plan consult	Plan climate	First evaluation
	[0.57, 1.55]	[-0.06, 0.69]	[-0.39, 0.35]	[-0.63, 0.11]	[-0.16, 0.59]	[-0.42, 0.32]	[-0.40, -0.26]
	<.001	.098	.907	.175	.259	.802	<.001
9. Common	-2.05	0.24	0.23	0.47	0.47	0.39	0.12
	[-2.62, -1.50]	[-0.17, 0.66]	[-0.19, 0.66]	[0.07, 0.88]	[0.06, 0.89]	[-0.02, 0.81]	[0.05, 0.19]
	<.001	.255	.280	.022	.024	.065	.001
10. History	-1.67	0.44	0.02	0.26	0.05	0.11	0.09
	[-2.23, -1.13]	[0.04, 0.85]	[-0.40, 0.44]	[-0.14, 0.67]	[-0.37, 0.47]	[-0.31, 0.52]	[0.01, 0.16]
	<.001	.033	.927	.209	.816	0.615	.022
11. Consulted	2.68	-0.52	-0.17	-0.28	-0.65	-0.45	-0.13
	[2.05, 3.34]	[-1.00, -0.05]	[-0.66, 0.32]	[-0.76, 0.19]	[-1.13, -0.18]	[-0.93, 0.02]	[-0.21, -0.04]
	<.001	.031	.506	.249	.007	.061	.004
12. Time	-1.43	-0.51	0.08	-0.02	-0.04	-0.02	0.31
	[-1.93, -0.93]	[-0.88, -0.14]	[-0.29, 0.45]	[-0.39, 0.34]	[-0.41, 0.33]	[-0.39, 0.35]	[0.24, 0.38]
	<.001	.007	.672	.900	.847	.912	<.001

8.3.2 Figures

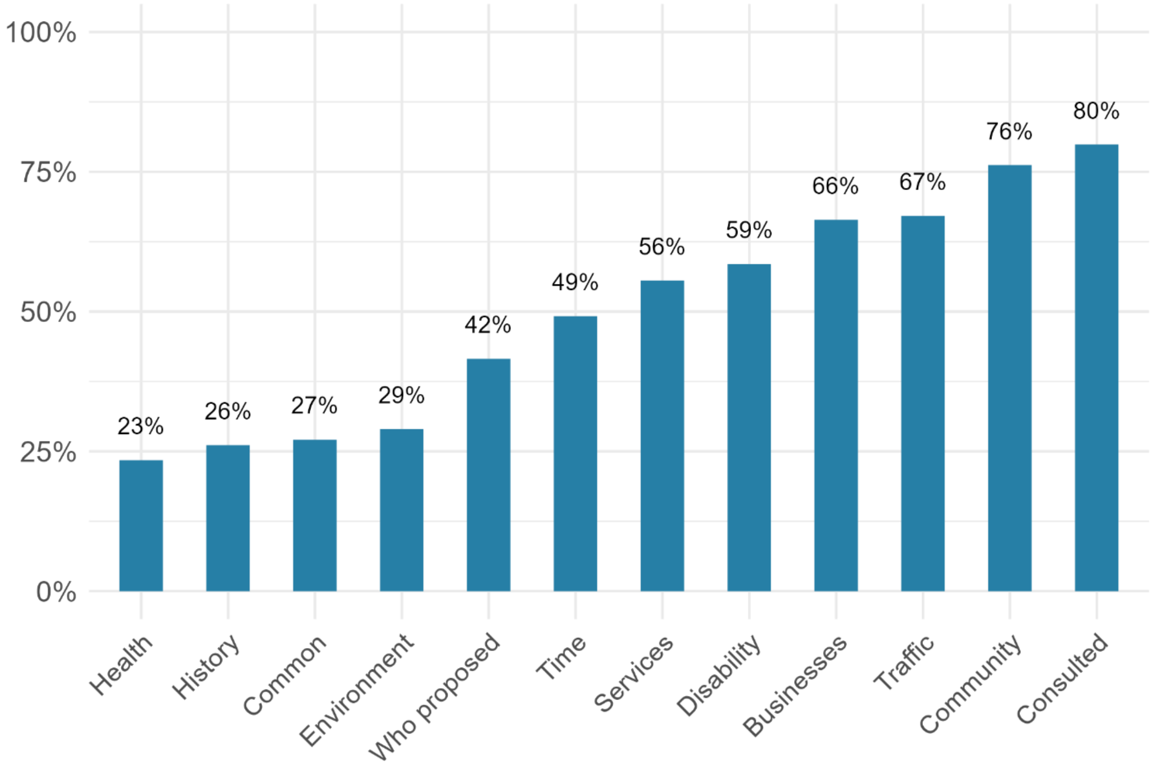


Figure S4. Percentage of times each FAQ was selected (Study 3).

8.4 Study 4

8.4.1 Tables

Table S10. OLS models on first evaluation split by country (Study 4).

	Pooled restore conditions		Separate restore conditions	
	Model 1 Country 1	Model 2 Country 2	Model 3 Country 1	Model 4 Country 2
Intercept	4.96	4.91	4.96	4.91
	[4.68, 5.23]	[4.67, 5.16]	[4.68, 5.23]	[4.67, 5.16]
	<.001	<.001	<.001	<.001
Existing	0.69	0.60	0.69	0.60
	[0.41, 0.97]	[0.32, 0.87]	[0.41, 0.97]	[0.32, 0.87]
	<.001	<.001	<.001	<.001
Plan consult	0.06	-0.07	0.06	-0.07
	[-0.22, 0.34]	[-0.34, 0.20]	[-0.22, 0.34]	[-0.34, 0.20]
	.667	.591	.668	.591
Plan restore-pool	0.12	0.13		

	Pooled restore conditions		Separate restore conditions	
	Model 1 Country 1	Model 2 Country 2	Model 3 Country 1	Model 4 Country 2
	[-0.11, 0.35]	[-0.09, 0.35]		
	.311	.236		
Plan restore			0.18	0.16
			[-0.10, 0.46]	[-0.11, 0.43]
			.207	.244
Plan restore-past			0.07	0.14
			[-0.21, 0.35]	[-0.13, 0.41]
			.627	.294
Plan restore-correct			0.10	0.09
			[-0.18, 0.38]	[-0.18, 0.36]
			.464	.494
Male	0.06	-0.13	0.06	-0.13
	[-0.12, 0.23]	[-0.29, 0.03]	[-0.11, 0.23]	[-0.29, 0.02]
	.519	.102	.499	.098
Age	0.09	0.03	0.09	0.03
	[0.01, 0.18]	[-0.05, 0.11]	[0.01, 0.18]	[-0.05, 0.11]
	.036	.485	.037	.484
Rural	-0.01	-0.01	-0.01	-0.01
	[-0.19, 0.16]	[-0.19, 0.17]	[-0.19, 0.16]	[-0.19, 0.17]
	.903	.915	.876	.915
Drives	-0.60	-0.44	-0.60	-0.44
	[-0.81, -0.39]	[-0.62, -0.26]	[-0.81, -0.39]	[-0.62, -0.26]
	<.001	<.001	<.001	<.001
Cycles	0.40	0.55	0.40	0.55
	[0.22, 0.57]	[0.38, 0.71]	[0.22, 0.57]	[0.38, 0.71]
	<.001	<.001	<.001	<.001
Observations	1517	1500	1517	1500

Note: Unstandardised betas, 95% CI and p-values displayed.

Table S11. OLS models interactions with country and conditions for first evaluation (Study 4).

	Model 1. Pooled restore conditions	Model 2. Separate restore conditions
Intercept	4.89	4.89
	[4.66, 5.12]	[4.66, 5.12]
	<0.001	<0.001
Existing	0.68	0.68
	[0.40, 0.95]	[0.40, 0.95]

	Model 1. Pooled restore conditions	Model 2. Separate restore conditions
	<0.001	<0.001
Plan consult	0.05	0.05
	[-0.23, 0.33]	[-0.22, 0.33]
	.715	.715
Plan restore-pool		0.12
		[-0.10, 0.34]
		.290
Plan restore	0.18	
	[-0.10, 0.45]	
	.201	
Plan restore-past	0.07	
	[-0.20, 0.34]	
	.622	
Plan restore-correct	0.12	
	[-0.16, 0.39]	
	.409	
Existing x Country 2	-0.08	-0.08
	[-0.47, 0.30]	[-0.47, 0.30]
	.670	.669
Plan consult x Country 2	-0.14	-0.14
	[-0.53, 0.25]	[-0.53, 0.25]
	.489	.488
Plan restore-pool x Country 2		0.01
		[-0.31, 0.32]
		.971
Plan restore x Country 2	-0.03	
	[-0.42, 0.36]	
	.883	
Plan restore-past x Country 2	0.07	
	[-0.32, 0.46]	
	.731	
Plan restore-correct x Country 2	-0.02	
	[-0.41, 0.37]	
	.914	

	Model 1. Pooled restore conditions	Model 2. Separate restore conditions
Drives	-0.50	-0.50
	[-0.63, -0.36]	[-0.63, -0.36]
	<.001	<.001
Cycles	0.48	0.48
	[0.36, 0.60]	[0.36, 0.60]
	<.001	<.001
Male	-0.04	-0.04
	[-0.15, 0.08]	[-0.15, 0.08]
	.544	.536
Age	0.06	0.06
	[0.00, 0.12]	[0.00, 0.12]
	.044	.045
Rural	-0.03	-0.02
	[-0.15, 0.10]	[-0.15, 0.10]
	.685	.706
Country 2	0.05	0.05
	[-0.22, 0.33]	[-0.22, 0.33]
	.697	.695
Observations	3017	3017

Note: Unstandardised betas, 95% CI and p-values displayed.

8.5 Combined

Table S12. OLS regressions on first evaluation by combined conditions across studies 1,3, and 4.

	Model 1 Pooled restore conditions	Model 2 Separate restore conditions
Intercept	4.90	4.90
	[4.77, 5.04]	[4.77, 5.04]
	<.001	<.001
Existing	0.77	0.77
	[0.64, 0.90]	[0.64, 0.90]
	<.001	<.001
Plan change	-0.17	-0.17
	[-0.39, 0.05]	[-0.39, 0.05]
	.119	.122

	Model 1 Pooled restore conditions	Model 2 Separate restore conditions
Plan consult	0.02	0.02
	[-0.13, 0.17]	[-0.13, 0.17]
	.796	.802
Plan climate	0.00	0.00
	[-0.22, 0.22]	[-0.22, 0.22]
	.998	.995
Plan restore-pool	0.16	
	[0.04, 0.28]	
	.008	
Plan restore		0.20
		[0.05, 0.34]
		.008
Plan restore-past		0.13
		[-0.03, 0.30]
		.117
Plan restore-correct		0.13
		[-0.03, 0.30]
		.118
Male	-0.09	-0.09
	[-0.18, 0.00]	[-0.18, 0.00]
	.049	.050
Age	0.09	0.09
	[0.05, 0.13]	[0.05, 0.13]
	<.001	<.001
Rural	-0.04	-0.04
	[-0.13, 0.05]	[-0.13, 0.05]
	.379	.372
Country	-0.01	-0.01
	[-0.11, 0.09]	[-0.11, 0.09]
	.787	.857
Drives	-0.51	-0.51
	[-0.61, -0.40]	[-0.61, -0.40]
	<.001	<.001
Cycles	0.54	0.54

	Model 1 Pooled restore conditions	Model 2 Separate restore conditions
	[0.45, 0.63]	[0.45, 0.63]
	<.001	<.001
Observations	5338	5338

Note: Unstandardised betas, 95% CI and p-values displayed. Age is standardised. Drives = regularly or occasionally versus rarely or never. Cycles = At least rarely versus never.