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What explains citizen support for transport policy? the roles of policy design, trust in government and proximity among Swiss citizens

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ABSTRACT

Conventional wisdom holds that climate policies imposing substantial costs on individuals only receive little public support. Policymakers are thus reluctant to implement such policies because they fear a political backlash. However, the specific mechanisms driving low support levels are widely understudied, and experimental evidence is scarce. We argue that support for policies depends on three mechanisms: (i) the policy instrument design, (ii) attitudes towards government, and (iii) individual proximity towards the policy issue. We test our arguments by comparing seven mobility-related policy measures, for which we explain the differences in support due to these three factors. We utilise a nationally representative sample of 2034 Swiss citizens and assess the role of the three mechanisms for public policy support measured in a conjoint experiment. The results suggest that all three mechanisms, policy design, attitudes towards government, and proximity, affect public support. First, we find that respondents show the least support for coercive market-based policies with usage dependent costs. Second, those who trust the government are inclined to support environmental and climate policies. Third, respondents who are the most affected will oppose policies the most. The explorative assessment also suggests that the dimensions are mostly independent of each other. However, proximity and policy measures with usage dependent costs reinforce their adverse effects. Implications for policymakers are manifold: First, considering the backlash from those affected most is of utmost importance to avoid public outcries against policy proposals in times of widespread anti-elitist sentiments. Second, compensations for those affected most might be one way to mitigate the problem at hand.

1. Introduction

The scholarly community (and more recently, politicians and the broader public) has emphasised the need to mitigate climate change actively. It has warned of dire consequences for humans and ecosystems if current commitments to limit global warming fall short [1].[a] Citizens' support for climate mitigation policies is essential for their successful implementation [5–8]. Citizens can influence implementation directly (through elections and ballots) or indirectly (through participation in political processes). Conventional wisdom holds that the implementation of far-reaching policies hinges on the broader public's attitudes towards these policies and might backfire because citizens tend to oppose costly measures that affect them directly or indirectly. Within the context of global warming, the term 'far-reaching policies' addresses measures that aim to change collective behaviour to limit carbon emissions by 2030 and thereby make a valuable contribution to climate change mitigation (and adaptation). Generally, there is a broad consensus that (i) policy design [9,10], (ii) attitudes towards the government [11–14], and (iii) proximity to the policy intervention, and thus how much an individual is affected by it [for example, see NIMBYism literature, e.g., [15,16]], drive support levels. These three mechanisms highlight the central dimensions that affect public support for far-reaching climate and environmental policies (e.g., policy measures that focus on motorised individual transport in the case of this paper).

A close examination of the protests of the *gilet jaunes* or 'Yellow vests' in France unveils three central narratives that are in line with the aforementioned mechanisms. First, the yellow vests movement emerged spontaneously against rising fuel prices due to a newly implemented

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[a] For example, the commitments set forth under the 2015 Paris Agreement, even if fully implemented, are insufficient to prevent global warming by more than 1.5°C in the second half of the 21st century [2–4].

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carbon tax intended to foster an ecological transition. The movement criticises unjust 'green taxes' that overly expose the working class to new costs. Hence, the protesters' opposition is firmly rooted in the government's chosen policy instrument. According to the protesters, this carbon tax is too intrusive and unfair [17]. Second, French President Emmanuel Macron's style of government fuelled opposition. He has been accused of being a 'president for the rich' [18] and criticised for neglecting the average citizens [19]. Fitting the general trend of anti-politics movements around Europe [20], the yellow vests demanded political representation and manifested their distrust in the current government. Finally, the movement shifted the responsibility to take action for climate mitigation away from them to other actors and claimed that they were hit especially hard by the policy measures that lead to the protests [21]. Fuelled by perceived disenfranchisement, the dissenters argue that rising fuel prices primarily affect workers who depend on cars and that policymakers neglect citizens' living conditions [22–25].[b]

The yellow vest movement case shows that all three aforementioned mechanisms capture crucial barriers to public support for transportation policies. This article aims to investigate these mechanisms simultaneously by empirically testing them against each other. Until now, the scholarly discussion of these three mechanisms has been disjoint and has only analysed them in isolation to the best of our knowledge. First, substantial attention has been given to the effects of policy design and the different classifications of policies. Recent work [27], also see [28] has assessed whether specific policies are especially popular or unpopular. This literature notably focuses on push/pull and command-and-control/market-based distinctions for deriving expectations about the effect of policy design on support [29–31] but also on more specific design aspects, such as the level of carbon taxes [32] or changes in energy costs [10]. Generally, this literature suggests that more costly policies and market-based policies garner lower support [also see [33]].

Second, the literature also addresses attitudes towards the government and these attitudes' relation to policy support, although this strand of literature focuses on trust in government. Existing research finds that there is a positive association between trust in government and activism [12], willingness to support governmental policies [13], and willingness to pay for far-reaching climate and environmental policies [11,34,35]. More recently, the literature has delved into a more specific concept, populism, which is expected to relate to trust in government negatively. In return, this distrust leads to more opposition to climate change and related policies. Hence, this literature suggests that trust in government is an essential predictor of policy support [36,37].

Third, there is also research on how individual proximity to a policy issue and exposure to policies affect public support. Risk perceptions can significantly explain policy attitudes [38–40,13]. However, our argument is more closely related to the 'Not in my Backyard (NIMBY)' argument. According to this literature, citizens mobilise against policies that affect their local communities but do not oppose these policies elsewhere. We do not necessarily focus on the differences between local and national policies and acknowledge potential conceptual issues in the literature [15,41,42]. However, this literature nonetheless contains an essential element for our argument: we expect citizens to react to climate policies depending on how strongly it affects their current behaviour and daily life.

Recently, the public mood for environmental regulation is improving and movements, like Fridays for Future, induce new optimism for far-reaching climate policies. At least in the short-run, it appears that protests have had a substantial impact on political debate, citizens' awareness and even public policy [43]. Simultaneously, the economic consequences of climate policies have attracted attention [44–46] and have even led to social unrest, causing a decline in support for political leaders, as in the case of the yellow vest movement in France [47].

Nevertheless, the question remains whether this backlash, as seen in France, is a function of (i) the specific policy design [17,31], (ii) a general disregard of climate policy potentially induced by populism [36,37,48] and a lack of trust in government [49], or (iii) a function of individuals' proximity to these policies in the form of individuals' car dependence [38–40,13]. This article seeks to determine which of these three mechanisms drive policy opposition and to what extent they reinforce each other.

We aim to address this research question by experimentally comparing seven realistic policy measures: *road pricing*, *admission tax*, *car ban*, *parking spaces for environmentally friendly cars*, *environmental bonus*, *information campaign*, and *stricter energy labels*. We explain the differences in public support for these policy measures by assessing the three mechanisms' role in encouraging or inhibiting public support. To do so, we survey a nationally representative sample of 2034 Swiss citizens. Specifically, we aim to develop a transportation sector framework based on survey data collected in Switzerland.

Empirically, we focus on the transportation sector in Switzerland and, more specifically, individual motorised transport. Using public opinion towards transportation policies in Switzerland in 2017, we analyse public support for different policy schemes. Switzerland thereby constitutes a hard but representative case for our research question regarding preferences for redistribution because the implementation of such policies due to the relatively high wealth is unlikely to endanger individuals' livelihood. This setting is ideal for studying public support for far-reaching energy policies.

The transportation sector is of particular interest for two reasons. On the one hand, emissions in this sector grow steadily in contrast to other sectors [50], making it a key policy issue in climate mitigation. On the other hand, citizens' attitudes towards transportation are remarkably emotionalised [51,52] and particularly tough to address in policy-making. Presumably, transportation's negative externalities create more substantial incentives for policymakers to develop counteracting strategies [53–56]. Implementing policies, such as taxes and road pricing, fails due to a lack of public support [31,33,57–59].

As in many other countries, the Swiss case is compelling, given its rapid urbanisation and increased spatial mobility [60] and the fact that the vast majority of individual mobility occurs by car. Additionally, like several European countries, Switzerland faces severe challenges reaching the Paris Agreement targets [see, for example, [61,62]]. Daily travel distance per person per day has increased in Switzerland by 18% (5.5 km) from 1994 to 2015. Moreover, as the population approaches ten million inhabitants [63], the transport system reaches its capacity limit. It performs the worst among all European countries regarding the emission levels of newly registered cars [64,65]. Finally, Switzerland's direct democratic system allows citizens to challenge governmental policies and propose alternatives, meaning that citizens hold highly relevant veto power in decision-making processes [33,66]. As hurdles for these challenges are relatively low, challenges are likely and thus, purely accepting polices is insufficient as the political system demands active support. At the same time, we expect that distributional consequences will be least pronounced in Switzerland, which is amongst the wealthiest European countries. As a result, Switzerland is undoubtedly a particularly tough test for our argument, and it is a suitable country case study.

The article is structured as follows: We first discuss the existing literature and derive expectations about the three different mechanisms. We then present our research design, including the three mechanisms' measurements and the choice experiment providing our dependent variable. We then test our expectations and conclude by discussing the results' implications.

[b] While the carbon tax sparked the debate and specific protests, the movement follows broader objectives. The movement's use of violence delegitimizes them at the same time [26].

2. Decarbonisation policies and support for them

Public support is essential for far-reaching and long-lasting policy implementation. Far-reaching efforts to mitigate climate change have the potential to dampen economic growth [67], which, in return, endangers the electoral position of those who implement them [68,69]. This anticipation of backlash often motivates policymakers to adopt strategies that the majority of people in society prefer [5,59], even if such policies are insufficient to reach ambitious climate targets and become progressively expensive in the long-run [70,71]. For example, transportation economists believe pricing schemes are the 'obvious solution' [72] to congestion and environmental problems within the transportation sector. However, a majority of citizens does not support internalizing costs of transportation [31].

A key challenge to enacting effective policy is public acceptance: while coercive policy measures may be more effective, the public is less likely to accept them [31,73]. Knowledge of the causal mechanisms that lead to public support is crucial for effectively steering intended behavioural change. Thus, revealing a more accurate picture of public acceptance and understanding different factors that affect public opinion could increase new policies' quality and contribute to more sustainable policy solutions [74]. However, these specific mechanisms that lead to public support or rejection remain widely understudied, and experimental evidence is scarce. For that reason, we argue that support for policies depends on (i) the policy instrument design, (ii) attitudes towards government, and (iii) individual proximity. This article adds to the literature on public support for different policies by further scrutinizing the underlying mechanisms that lead to public support or opposition. It scrutinises these three mechanisms by providing rigorous empirical evidence that allows for a comprehensive policy support assessment.

2.1. Policy instrument design

Extensive literature has emerged over the last decades to explain public support for different policy types and their specific design. Pricing schemes have arguably received the most scholarly attention so far [61], forasmallselection, see [64–69]. However, other policies, such as speed limits [81] or parking provisions [75–82], have also been investigated in the literature.

Empirical studies thoroughly establish the importance of policy design for public support [83–85]. For example, in the case of environmental policies, the public is more likely to accept pull measures (measures that alter behaviour by making sustainable behaviour attractive, e.g., subsidies) than push measures (measures that make unsustainable behaviour unattractive, e.g., bans) [30,86]. Cherry, Kallbekken and Kroll [87] find a trade-off between support for and the efficiency of three environmental policy instruments. Similar results can be seen in other policy fields. For example, Diepeveen et al. [88] show that support for health-related policies varied as a function of the type of intervention, with less intrusive interventions receiving relatively more support.

Analyzing policies offers various possibilities for structuring, categorizing and differentiating between the large number of possible policy instruments based on formal and content-related criteria. An often-cited typology by Vedung [89], also see [90] categorises policies according to their mechanism, which results in three distinct categories: First, information-based instruments (also known as sermons), which update individuals' beliefs and can therefore induce behavioural change. Second, command-and-control measures (also known as sticks) regulate behaviour, for example, by banning or limiting the use of private cars. Third, market-based instruments (also known as carrots), which (dis-) incentivise specific behaviour without limiting options but rather by using price mechanisms to make unsustainable behaviour more costly [91,92]. Such market-based instruments tend to encounter greater political feasibility problems than command-and-control or information-based measures [93,94]. For the yellow vest movement, for example, a representative survey by Douenne and Fabre shows that the French population rejected a carbon tax with uniform redistribution given that they overestimate their net monetary loss, think that the policy is regressive and do not perceive the policy as environmentally effective [17]. Compared to non-market-based measures (e.g., green investments and regulations), French citizens show higher opposition towards taxes and dividends [95]. Similarly, Rhodes et al. show that carbon taxes receive the highest citizen opposition levels among Canadian citizens [96].

$H_{Policy1}$: Market-based policies receive lower support than non-market based measures.

Another well-known categorisation distinguishes policies according to whether they aim to reduce unwanted behaviour or promote desired behaviour. On the one hand, pull measures (e.g., subsidies) make sustainable behaviour more attractive [97]. On the other hand, push measures (e.g., bans) attempt to alter behaviour by, for example, making unsustainable behaviour unattractive. Push measures tend to lower public support levels more than pull measures [96,98],

$H_{Policy2}$: Pull measures receive more support than push measures.

2.2. Trust in government

Existing literature suggests that support for a policy measure also stems from an individual's evaluation of the policy's attributes regarding trust in government [99–103] and trust in general [104,105]. Trust in government is the belief in politicians' sincere willingness and ability to fulfil their promises [106]. A lack of trust in government officials can contribute to social traps such as tax evasion. Such traps occur because people have little interest in supporting policies when they believe the government is not trustworthy [101].

There is manifold research on the relationship between political attitudes and political activism. For example, political trust is a precondition for successful policy reforms in the USA [107] and comparative contexts [108]. Trust in government is also positively associated with activism [12], willingness to support governmental policies [13], as well as willingness to pay for these policies [11,34,35]. In their paper using data from 42′401 individuals from 23 European countries, Fairbrother et al. show that trust in their country's political system and politicians is highly related to attitudes towards environmental taxes [109]. These findings are in line with Hammar and Jagers' study, which expects that trust in government negatively relates to climate change and related policies [110]. Hence, this literature suggests that trust in government is an essential predictor of policy support. At the same time, this research suggests that populists view climate policies as an international elitist agenda [36,37]. Therefore, from a populist perspective, these policies are detached from their real life. Consequently, social protests, such as the yellow vest movement, exhibit the wide-ranging challenges governments face when implementing climate policies.

H_{Trust}: Higher levels of trust in government yields higher policy support.

2.3. Proximity

Proximity to a policy objective can significantly explain policy attitudes [38–40,13,111]. Proximity to a policy describes how directly a policy affects individuals [73,112]. Thus, this strand of literature connects with the concept of behavioural control – a central variable in several models of behavioural change, such as the theory of planned behaviour [113].

Specifically, the costs of pricing schemes and taxes depend on prior individual behaviour and lead to an unequal distribution of impacts with severe redistributive consequences within society and the threat of social protests [114,115]. As potential costs and benefits are essential decision-making heuristics [116], individual policy support arguably depends on how costly it is for an individual to change its prior

behaviour. Therefore, policies with varying costs receive substantially less support from those who are most affected. Thus, the latter may threaten to exhibit strong public opposition resulting in potential implementation failure. This line of argumentation somewhat contrasts recent findings that individuals overestimate their net monetary losses for non-regressive policies [17].

Conventional wisdom holds that green taxes, similar to consumption taxes, also unevenly impact households [117–119]. Low-income households are more affected than others because they spend proportionally more on energy consumption [120]. Unsurprisingly, scholars have assumed low-income limits alternatives to private car travel and inflame opposition to fuel policies [80].

In general, individuals who rely on a car for professional reasons are much more affected by government restrictions than individuals who do not. Hence, this group is more likely to oppose governmental policies [120] significantly. Not surprisingly, respondents' average distance travelled decreases their willingness to reduce car usage [121]. Simultaneously, individuals who have access to suitable alternative travel modes are systematically more likely to support far-reaching fuel taxes and higher parking fees. However, they do not necessarily support pricing schemes [75]. Rhodes et al.'s study, including a survey of 1306 Canadian citizens, shows that households that rely on a single-occupancy vehicle are more opposed to (new) low carbon fuel standard policies [111].

To avoid this risk and ensure that the decarbonisation process moves forward with strong social support, governments must institute policies that the public perceives as fair [33]. Consequently, policymakers need to consider the distributional consequences of different policies and how they influence public support. Otherwise, the risk of a social backlash against decarbonisation is likely to develop. In this article, we are specifically interested in assessing how individuals' car dependence moderates policy support for different types of policies. Until now, we have known little about how support for policy types is conditional on material predispositions. However, such knowledge is essential for policymakers to anticipate and understand potential public backlash and mitigate potential public outcries via policy design (for example, via policy packaging) that directly targets prominently affected groups.

$H_{Proximity}$: Higher levels of individual proximity towards the policy issue yields lower policy support.

3. Data and methods

To test our hypotheses, we relied on original and unique survey data from Switzerland. We embedded an experiment in a nationally representative non-probability, online survey [122] of 2034 Swiss citizens. We applied a quota-based sampling approach with interlocked *hard* quotas on age (six categories), gender, region (seven categories), as well as a parallel quota on living conditions (with three categories: urban, agglomeration and rural). In other words, our sample is representative of the population of Switzerland according to these quotas.[c] Thus, aligned with the general population, 48% of our respondents are female, the average age is 47.2, and 64% of respondents are from German-speaking regions.

Additionally, we applied a parallel quota for participants' living situations. Sixty-three per cent of our respondents live in urban centres, whereas 21% reside in agglomerations and 16% in rural areas. The authors designed the survey, and Ipsos conducted the data collection from 8 to 21 December 2017. The median response time was approximately 20 min.[d] The survey was carried out in all 26 of Switzerland's cantons in three languages (French, German, and Italian). This focus is of particular interest as Switzerland is a laggard country in Europe about reducing its vehicle emissions [123,124].

The survey begins by asking for standard demographics, such as age, gender and education. The subsequent section asked participants about their mobility behaviour. This section is essential for capturing how much respondents rely on their car and which alternative modes of transportation are available. We randomly assigned participants into two different frames to assess the robustness of our findings to particular framing. These frames were a) promotion of electric vehicles (EV frame) and b) reduction of emissions from cars (emission reduction frame). We employed these two policy frames because transportation policy usually focuses on one or the other. That is, the two frames present participants with the same policy proposals but frame them differently. Balancing of the treatments ascertained that quotas are met in both framing groups. The respondents were then introduced to and asked to complete the conjoint experiment to capture our dependent variable. To ascertain internal validity, we described all attributes in the experiment beforehand [125]. Some final questions, such as income, followed the conjoint experiment.

4. Dependent variable

The outcome of the conjoint experiment provided us with our dependent variable. Previous studies assessing public support for environmental policies in the realm of transportation predominantly relied on observational data. However, asking respondents whether they support or desire specific policies notoriously results in responses affected by social desirability and rationalisation. To overcome this challenge, we use an experimental stated-choice approach to capture policy support.

Respondents received two policy proposals. These proposals consisted of a policy instrument (one selected from the seven policies mentioned above) and its implementation date. This setup follows the design outlined by [33]. Respondents compared both proposals and indicated whether they support either policy proposal. Our dependent variable is 0 (if respondents opposed a proposal) or 1 (if respondents supported a proposal). The unit of analysis is one proposal.

This setup mirrors a peculiarity in the Swiss political system: initiatives with counter-proposals. An initiative is a proposal for a constitutional amendment that must be put to a national vote if signed by 100,000 eligible Swiss voters (this mechanism is called 'Initiative'). However, Parliament can submit a counter-proposal to citizens (Art. 139b of the Swiss constitution). Citizens then vote on each proposal (initiative, counter-proposal) separately (they can also agree or disagree with either or both) and on a tiebreaker question. The latter determine which proposal will enter into effect if both proposals receive a majority [for more information, see [22]. We focus on the agreement to each proposal.

5. Independent variables

To assess the literature's central arguments, we included three sets of variables in our analyses. In terms of specific policy design, we compared individual public support for seven different policy instruments that encourage the switch from conventional cars to more environmentally friendly cars: *road pricing*, *admission tax*, *car ban*, *parking spaces for environmentally friendly cars*, *environmental bonus*,

[c] Please note that the policies were presented in two frames. One frame (EV frame) portrays the policies as policies supporting electric vehicles. The other frame portrays them as reducing emissions (Emission reduction frame). The frames function as a fourth interlocked quota, ensuring that the distribution of age, gender and region is similar in each frame.

[d] Consult Appendix A2 for specific question wordings and more information on the survey. Table A4 in the Appendix provides a detailed description of all quota and the reached respondents.

information campaign and *stricter energy label.* We included these seven policy instruments within a stated-choice experiment (see the dependent variable section for more details) [e].

We categorised policies as market-based policies with usage-dependent or fixed costs, command-and-control policies (reference category), enablers, and information policies. Following Vedung's categorisation [89], also see [90] we categorised our policies as shown in Table 1 (column Policy type). Road pricing charges car drivers depending on their car usage. Thus, it is a market-based instrument with higher costs for heavy users. The second category of policies is market-based instruments with fixed costs or incentives. Admission taxes on cars, while potentially intrusive measures, nonetheless impose the same costs on users regardless of their usage. Following a similar logic, instruments can provide positive incentives for pro-environmental behaviour. Rather than punishing conventional cars' users, these instruments encourage pro-environmental behaviour by providing allowances or subsidies. The environmental bonus policy thus is a market-based policy with fixed incentives. The next category includes command-and-control measures. These measures, in our case a car ban, do not imply any costs but regulate the usage of cars. Enabler policies provide the infrastructure that facilitates behavioural change. In our case, this includes parking spaces for environmentally friendly cars. The last category of measures does not impose any costs. Information campaigns and stricter energy labels affect individuals' behaviour by updating their beliefs about carbon emissions from transportation. In addition, we code whether policies encourage (pull) or discourage behaviour (push) (see Table 1, column Push/Pull).

The last column in Table 1 highlights the support for each policy. All policies but road pricing receive a majority. The energy label is not particularly popular and receives just above 50% of support, whereas all other policies receive at least 54%. The environmental bonus is the most preferred measure. Thus, purely on this descriptive evidence, it seems that policymakers can choose from various policies.

The second mechanism seeks to investigate citizens' attitudes towards government. To this end, we measured the extent to which citizens (dis-)trust the government. We asked respondents to indicate their trust in government on a scale ranging from 1 (no trust at all) to 4 (a lot of trust).

Regarding the proximity of policies, we used a question capturing the extent to which an individual perceives it as problematic not to use a car. Given that all of the policies discussed in the survey directly focus on car use, it seems plausible that this perception directly captures the proximity of policies and their effects. We specifically asked respondents, 'How problematic would it be to not use your car' on a scale from very problematic, to rather problematic, rather unproblematic and very unproblematic.

Table 1
Policy instruments.

Specific policy example	Policy type	Push/ Pull[f]	Support in percent
Road Pricing	Market-based (usage dependent)	Push	40.4%
Admission tax	Market-based (fixed)		57.1%
Car Ban	Command-and-control		56.9%
Parking spaces for environmentally friendly cars	Enabler	Pull	56.6%
Environmental bonus	Market-based (fixed)		59.9%
Information campaign	Information		54.2%
Stricter energy label		Push	50.8%

fCosts are monetary and non-monetary, e.g. through limiting options.

[e] See table A2 in the Appendix for a description of all policy proposals.

6. Control variables and estimation

Overall, we enter the following core variables in the regression model. First, we include the policy type and estimate the effect of different types of command-and-control measures. We, second, include whether a measure follows a push or pull logic. Pull measures serve as the reference category. Third, we include trust in government as a numeric variable. Finally, we include proximity and treat it as if it was numeric.

In addition, we included several control variables in addition to our core predictors. First, we included core demographic variables: age, gender, education, left–right self-placement and income. These variables are predictors of climate and environmental attitudes [126]. Second, we included whether respondents live in urban centres, agglomerations or rural areas. This classification is based on the official spatial typologies by the Swiss confederation. This spatial variable is important as individuals' mobility profile differs substantially depending on settlement types. Third, we portray policies in two ways. The first frame emphasises that the policy supports electric vehicle uptake (EV frame). The other frame focuses on reducing emissions from transport (Emission frame; the reference category for our analyses). Fourth, we controlled for citizens' general attitudes towards democracy by including a question on support for direct and representative democracy. We captured the support for direct and representative democracy in two separate variables that captured whether respondents want citizens and representative to make major decisions. Finally, we controlled for other individual-level variables by using linear mixed effect models. Individuals function as groups. Despite our dichotomous dependent variable (0 is opposition, 1 is support), we can use a linear model assuming linear probabilities. This approach's key advantage is that coefficients can directly be interpreted as a change in support in percent. This approach follows the recommendations for the analyses of such choice experiments [127]. Using a regression-based approach is useful here to disentangle the different variables and their relationship to policy support. Hence, the regression coefficients provide insights into how policy features (type and pull vs push), trust in government and proximity relate to individuals policy support.

7. Empirical results

The analyses' main aim is to test three competing mechanisms against each other: policy design, trust in government, and individual proximity. We argue that all three mechanisms affect support for transport/environmental policies.

Table 2 shows the regression results (consult Table 1 for the categorisation). The dependent variable represents respondents' support or opposition to a policy proposal. Therefore, we can interpret coefficients as the change in support for this agreement in per cent. Starting with the policy instrument design, we see that pull policies garner 1% more support among citizens than push policies. The analyses indicate that citizens most support command-and-control measures (the reference category) and market-based policies with fixed costs. At the same time, they support enabler policies (by 2%) and information policies (by 5%) less. Finally, citizens reject market-based policies with usage dependent costs, and on average, these measures receive 17% less support. All in all, these results indicate that policy design allows for various responses, as long as policymakers rely on standard market-based and command-and-control policies because market-based policies with usage dependent costs and information policies garner little support.

In the case of citizens' attitudes towards government, we observe that trust in government is a strong predictor of proposal support. Support increases by approximately seven per cent for each step on a scale from the category 'no trust at all' (1) in the government to 'a lot of

Table 2
Policy design, trust in government, proximity and policy support.

Dimension	Variable	Main Model
Policy Design	Push policy	−0.01 (0.01)
	Enabler	−0.02 (0.02)
	Information	−0.05 (0.01)***
	MB fixed	0.00 (0.01)
	MB usage dependent	−0.17 (0.01)***
Trust in gov't	Trust in gov't	0.07 (0.01)***
Proximity	Proximity	−0.04 (0.01)***
Control variables	Age	−0.00 (0.00)
	Gender	−0.03 (0.01)*
	Education (other)	0.10 (0.08)
	Education (secondary)	−0.02 (0.03)
	Education (tertiary)	0.02 (0.03)
	Household income	−0.00 (0.01)
	Rural area	0.02 (0.02)
	Urban area	0.02 (0.02)
	Support for direct democracy	−0.01 (0.01)
	Support for representative democracy	0.02 (0.01)*
	Left-right self-placement	−0.00 (0.00)
	EV-Frame	−0.01 (0.01)
	(Intercept)	0.55 (0.06)***
Goodness of fit	AIC	21775.45
	BIC	21944.81
	Log Likelihood	−10865.72
	Num. obs.	16,290
	Num. groups: id	1629
	Var: id (Intercept)	0.04
	Var: Residual	0.20

Note: ***p < 0.001, **p < 0.01, *p < 0.05. Entries are unstandardised entries from linear mixed-effects models. Standard errors are in parentheses. Pull measures are the reference category for push measures. Command-and-control measures are the reference category for enabler information and both types of market-based policies. Primary education is the reference category for education. Agglomeration areas are the reference category for urban and rural areas.

trust' (4). This increase is a sizeable effect. By-and-large, these results also indicate that political attitudes matter substantially when individuals evaluate policy proposals.

Finally, we look at citizens' proximity to the policy issue of transportation. The regression suggests that citizens who face considerable problems when they cannot use their car view the policy proposals substantially less favourably. Specifically, one step in this four-point scale decreases support by four per cent. This decrease suggests that proximity towards a policy objective is a significant obstacle that needs to be considered in policymakers' response to mobility challenges.

The control variables do not yield any notable results. Age, education, living conditions, support for direct democracy, left–right self-placement are unrelated to policy support. Women were less supportive of policies, and individuals who support representative democracy are also more supportive of policies.

In the next step, we investigate the extent to which the three mechanisms (policy instrument design, attitudes towards the government, and proximity towards the policy issue) interact. A significant interaction would indicate that the different dimensions are not independent of each other. Such interdependence is vital information for policymakers who need to understand whether addressing problems in one of the three areas potentially indirectly affects public support through these interactions. Brambor et al. [128] suggest that visualizing the interaction helps to judge its statistical significance. Following their advice, we thus plot all combinations of interactions in Figures 1 and 2. On the x-axis, we show the interacting variable (proximity for Figure 1 and trust in government for Fig. 2). The y-axis shows the average marginal effect of the respective variable. The regression tables are available in the Appendix (Table A1 for Figure 1 and Table A2 for Fig. 2).

Figure 1 shows the findings for interactions with proximity. On the x-axis, we see the extent to which individuals believe they rely on their car. It suggests that the correlation between trust in government and policy support is mostly independent of proximity to the policy

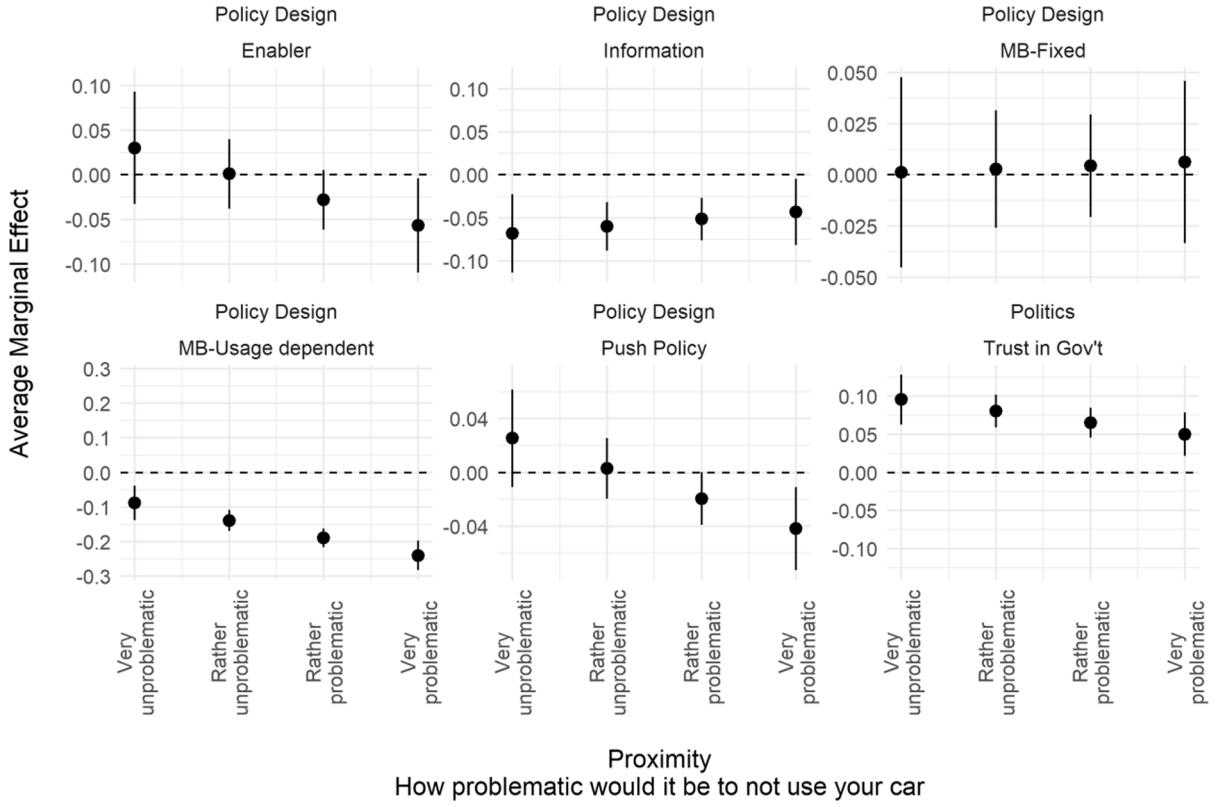

Fig. 1. Marginal effects from interactions with proximity. Note: Ranges represent 95 per cent confidence intervals. Table A1 in the Appendix provides the regression results.

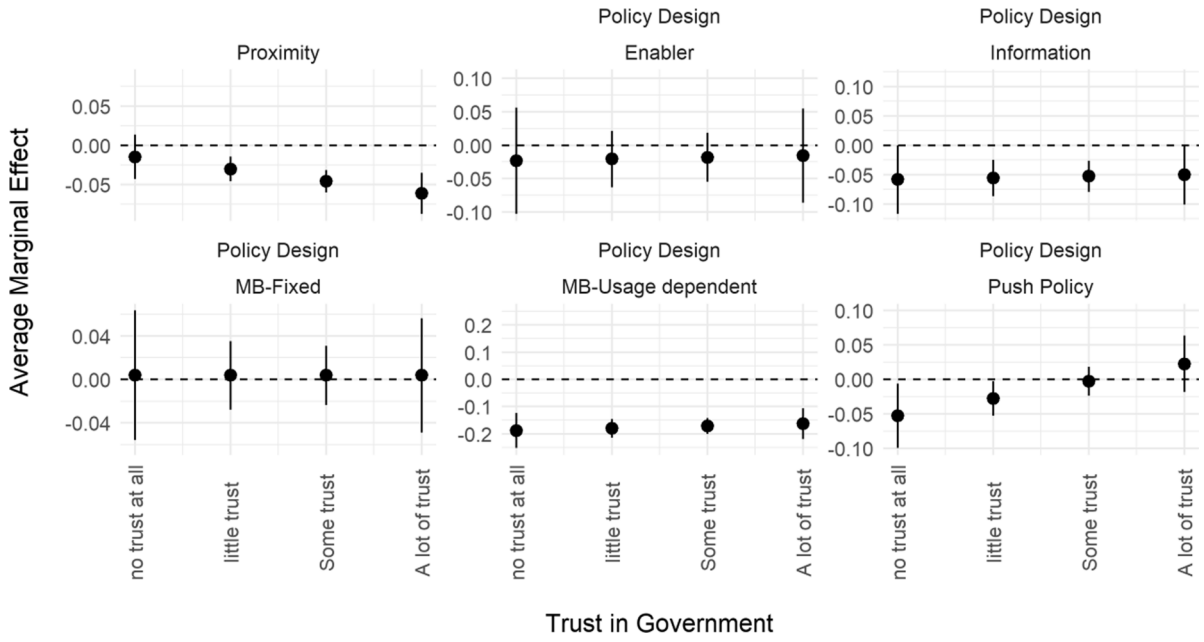

Fig. 2. Marginal effects from interaction with trust in government. *Note: Ranges represent 95 per cent confidence intervals.* Table A2 *in the* Appendix *provides the regression results.*

objective. Trust in government positively relates to support for mobility policy, regardless of whether citizens believe to be affected by these policies or not. Thus, while the interactions are limited, there is a trend for push policies and proximity.

The picture looks substantially different when assessing the interaction of policy design and proximity. As one would anticipate, the effect of market-based policy designs with fixed costs is by-and-large constant. As these costs are one-time upfront costs, heavy users are not punished for their behaviour. In contrast, market-based policies with usage dependent costs are already unpopular for those who can easily cease using their car. However, this policy design is substantially less popular amongst those who cannot image ceding their car. Similar effects, while of a lesser magnitude, are also visible for push policy measures.

Interestingly, push policies seem to increase support (albeit not being statistically significant) for individuals who do not rely on a car at all. The more individuals perceive it as problematic to not use a car, the more negative the average marginal effect of push policies (compared to pull policies). The difference in push policies' effects is statistically significant (when comparing respondents who say it is very unproblematic to those who say it is very problematic not to use the car). We observe that enabler policies decrease support amongst those with high levels of proximity. We observe the opposite trend for information policies: opposition to these policies slightly decreases with higher proximity levels. However, these trends fail to reach conventional levels of statistical significance.

Fig. 2 shows the interaction of proximity and policy design with trust in government. Overall, we observe no meaningful interaction. In other words, proximity and policy design have constant effects, regardless of whether citizens trust or distrust the government. There is a mild trend that the negative correlation of proximity and policy support increases with more trust in government. However, this change is clearly not statistically significant.

8. Conclusion and policy implications

This paper uses an integrated framework that combines three distinct strands of literature. First, extensive literature discusses the importance of policy design for public support. Citizens tend to oppose market-based policies [66] and policies that are perceived to be fair, effective and just [33]. Second, a large body of the literature focuses on attitudes towards the government. Building on Pechar and colleagues [49], we anticipated that high trust in government would lead to higher support for climate and environmental policies. The last strand of literature concerns individual proximity to policy issues. Individuals' living situation is of consequence for how they perceive policy proposals. If individuals perceive that policies hurt their everyday lives, i.e., because they rely heavily on their car, they will be less likely to support those types of policies that restrict car use. Integrating and contrasting these three potential mechanisms is essential for obtaining a comprehensive picture of potential policy opposition to far-reaching transportation policies.

Our findings are consistent with arguments from all three strands of literature. Starting with the policy design, our findings suggest that various policy responses are possible. We find no difference between market-based or command-and-control measures. However, citizens heavily oppose market-based policies with usage dependent costs, in essence, road pricing.

Moving on to trust in government, we observe that it substantially matters for the support of transportation policies. Essentially, citizens who trust the government generally trust it in implementing appropriate measures in transportation. Hence, these citizens support different policy proposals.

Finally, there is a direct effect of proximity, indicating that citizens who rely on a car are less supportive of transportation policies. Additionally, we observe that policy design interacts with proximity. In essence, this means that some policy designs receive more or less support, depending on whether citizens are particularly reliant on their car. This indicates that policymakers should consider proximity and potential distributional consequences of policies when crafting a policy response in the transportation sector.

Wicki et al. [31] explore one potential solution to these issues in policy packaging. Proponents argue that packages increase political feasibility by mitigating the adverse side effects of far-reaching policies and potentially compensating losers directly or via other ancillary measures in the package. One key challenge for policymakers is knowing which ancillary measures to include. Our findings suggest that proximity offers one dimension that ancillary measures can address to increase public support. In policy terms, one way to mitigate the outcry of

individuals who rely most on their cars – as happened in France with the yellow vest movement – is to combine compensation mechanisms with pricing schemes. Our findings suggest that pricing policies, which consider usage when formulating a price, might not be particularly well suited to extensive climate mitigation, as those who are affected the most also have the most substantial incentives to mobilize against these policies. Compensation mechanisms could thus be used for redistributive purposes; increasing support amongst those most affected, and at the same time, effectively mitigating climate change in the transportation sector. Similar arguments have been made for carbon pricing [32]. Additionally, policies that function in urban centres [129] do not necessarily work in rural areas that face substantially different challenges [130,131].

Alternatively, other policies, such as those with usage-independent costs, might garner more public support and be better suited to address climate mitigation. Our data shows that Swiss citizens support policies equally, independently of how much it affects them. This includes support for measures such as higher admission taxes for cars with higher emissions or even car bans. In other words, while the economic logic of internalizing the costs of climate change via road pricing is impeccable, citizens do not necessarily support it.

The study is not without limitations. First, our study puts forward hypothetical policies. These policies are intentionally vague regarding specific design choices, such as the explicit height of the environmental bonus or the extent to which emissions are factored into road pricing. This is naturally a trade-off between specificity and the comparative scope at the essence of this paper. Future research could pick specific policies and vary their design [for a starting point, see 30]. For example, researchers could vary the environmental bonus height to understand when the bonus is too high or too low and fails to garner support. Second, as mentioned above, policy-package may help overcoming feasibility hurdles. Given that our results suggest that proximity is an important moderator of policy design, packages could explicitly address this point. Examples of such specific measures are financial compensation or reduced rates for public transportation. Further research could investigate whether specific measures designed to compensate the most affected groups affect public opposition.

To summarise, our results indicate that it is important to alleviate these policies' negative consequences and reflect on potential drawbacks of some policies. Given the importance of climate mitigation, failure to implement such policies is not an option. Instead, future policymakers should assess potential compensations for those most affected by climate and environmental policies.

Declaration of Competing Interest

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

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.erss.2021.101973.

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