Transportation Research Part A 203 (2026) 104759

Contents lists available at ScienceDirect

Transportation Research Part A

journal homepage: www.elsevier.com/locate/tra

Social acceptance factors of mobility-related policy packages

Marvin Helferich [a,b,*], Josephine Tröger [a]

[a] Fraunhofer Institute for Systems and Innovation Research ISI, Breslauer Strasse 48, 76139 Karlsruhe, Germany

[b] Faculty of Psychology, Department of Social, Environmental, and Economic Psychology, RPTU University of Kaiserslautern-Landau, Fortstrasse 7, 76829 Landau, Germany

ARTICLE INFO

Keywords:
Mobility transitions
Policy packages
Automobility engagement
Social norm framing
Single-indicator latent variable models

ABSTRACT

The transport sector, including motorized individual transport, contributes 22 % to Germany's greenhouse gas (GHG) emissions and is struggling to reduce them. Therefore, it is crucial to design and implement policies that shift people's mobility behavior toward climate neutrality. Incentives are generally well-accepted but have limited potential to bring about long-term behavioral change. Restrictive measures are more effective at reducing GHG emissions but tend to be less well-accepted. Research has therefore suggested combining incentives and restrictive measures in policy packages. In this study, we compiled three different policy packages (one including only incentives, one including only restrictive measures, and one combining incentives and restrictive measures) and tested the (in)direct effects of policy package properties, political and ideological views, structural and socio-demographic variables, as well as "automobility engagement" (AE) facets on policy package acceptance using single-indicator latent variable (SILVA) models. In addition, we tested whether acceptance of the package consisting of incentives and restrictive measures could be increased by adding a social norm message (fourth group). We surveyed 2,275 German residents between November 2023 and January 2024. Our results showed that the patterns of significant predictors differ between the four groups. Policy appraisal was the most important predictor for the acceptance of the incentive, restrictive and combined packages, while environmental concern was key for the acceptance of the combined package including the framing message. Contrary to our hypothesis, the social norm framing message did not influence acceptance of the combined package. We discuss these findings with a view to designing and communicating policy packages including both incentives and restrictive measures to accelerate a just transition in the field of mobility.

1. Introduction

The transport sector is Germany's second biggest GHG emitter. In 2023, transport-related GHG emissions accounted for 22 % of total German GHG emissions. In addition, the transport sector has only cut its emissions by 11 % compared to 1990. This is a much smaller reduction than other sectors, which have cut their emissions by 30 % or more (Federal Environment Agency, 2024b). Consequently, current projections show that the transport sector is not on track to achieving climate neutrality by 2045 and project a cumulated gap of 180 Gt between target and actual emissions in 2030 (Federal Environment Agency, 2024b). Individual motorized transport is a major contributor to the transport sector's GHG emissions, with three-quarters of person-kilometers traveled by car

* Corresponding author.
E-mail address: marvin.helferich@isi.fraunhofer.de (M. Helferich).

https://doi.org/10.1016/j.tra.2025.104759
Received 14 January 2025; Received in revised form 14 October 2025; Accepted 3 November 2025
Available online 17 November 2025

(Federal Environment Agency, 2023). These figures show that more action, particularly regarding individual mobility, is needed to achieve climate neutrality in the transport sector. Although the current legislation in Germany no longer includes sector-specific emission reduction targets, scenario studies show that switching to zero-emission vehicles alone will not suffice to reach climate neutrality in the transport sector (Arnz et al., 2024; Arnz and Krumm, 2023). Instead, modal shifts and an overall reduction of travel demand are needed (Arnz et al., 2024; Arnz and Krumm, 2023). Consequently, "a sustainability transition in the transport sector equals a disruption of current trends" (Ruhrort and Allert, 2021, p. 2), i.e., the ongoing trend of ever-growing numbers of cars and increasing travel demand needs to be stopped and reversed to achieve sustainable mobility. Policy measures set the framework for individual and collective behavior. Therefore, it is essential that transport-related policy measures be designed in a way that steers behavior toward climate neutrality. Research has shown that wealthy countries, in particular, are perceived to have a responsibility to implement structural (vs. individual-level) change policies and spearhead structural transformations (Klebl and Jetten, 2023). Such policies then set a new framework within which individual and collective behavior takes place, and which may in turn help to create and enforce (new) social norms around a certain behavior. This is evidenced, for example, by speed limits and text-and-drive laws (Mulder et al., 2024).

However, implementing more restrictive policies aimed at reducing transport-related GHG emissions is currently difficult in Germany. Until very recently, German road traffic law stipulated that the safety and ease of traffic should be the main goal of any transport policy. If at all, climate protection aspects could only be considered after the safety and ease of traffic (Federal Government, 2024). Although the Federal Government has recently recast the relevant legislation to make it easier to orient transport policy toward climate change mitigation (Federal Government, 2024), it will take some time for these changes to take effect.

There is a long history of studying the acceptance factors of (transport) policy (Bergquist et al., 2022). Much of this research has focused on individual policy instruments. However, policy measures very rarely work in isolation, but instead are dependent on the context in which they are implemented and on their interactions with existing and/or future policy measures (Givoni, 2014). This is where policy packages come into play, which are defined as "a combination of policy measures designed to address one or more policy objectives, created in order to improve the effectiveness of the individual policy measures, and implemented while minimizing possible unintended effects, and/or facilitating interventions' legitimacy and feasibility in order to increase efficiency" (Givoni et al., 2013, p. 3).

As we discuss in Section 2.2, so far, the research on policy packages has mostly focused on how these are constructed, i.e., which policy instruments people prefer as part of a policy package. Very little research exists on the acceptance factors, let alone the social acceptance factors, of such policy packages (Baumgartner et al., 2025; Hössinger et al., 2023; Schade and Schlag, 2003). In addition, no study has investigated the social acceptance factors of policy packages consisting of different types of policy instruments, i.e., incentives, restrictive measures, or a combination of both. We aim to address this gap by answering the following two research questions:

RQ1: What are the predictors of the acceptance of mobility policy packages?

To answer this research question, we focus on socio-economic factors, political and ideological views, policy package properties, and automobility engagement (AE) facets as outlined in Section 3.4.

RQ2: Can social norm framing increase the acceptance of a policy package consisting of both incentives and restrictive policy instruments?

This study is particularly important for policymakers as it reflects the reality they are facing, i.e., looking at combinations of policy instruments and acceptance factors of such policy packages rather than studying individual instruments. It may also help policymakers to identify the most important social factors that shape policy package acceptance so they are able to steer their policymaking and communication efforts in the most promising direction.

The next chapter summarizes the existing research on policy acceptance and lays the foundation for our study.

2. Literature review

2.1. Acceptance of single policy measures and policy packages

Research suggests that tailoring a policy to local conditions instead of a "one-size-fits-all solution" can be beneficial for the acceptance and perceived fairness of a given measure (Creutzig et al., 2020), the latter being one of the main predictors of policy acceptance (Bergquist et al., 2022). Other researchers have argued that societal support for governmental action to protect collective wellbeing (i.e., a "social mandate") is important to achieve low-carbon mobility in a planned, inclusive and less disruptive way (Howarth et al., 2020). This could, for example, be achieved by including citizen assemblies or juries in policy development (Howarth et al., 2020).

While this strand of research suggests that acceptance is important for the success of a policy prior to its implementation, other studies have shown that acceptance is lowest before implementation and then begins to rise as people experience the policy in place (van Wee et al., 2023) and shift their focus from transition-induced personal losses to societal gains (Granulo et al., 2025). This was the case, for example, with the congestion charge systems in Gothenburg (Nilsson et al., 2016) and Stockholm (Schuitema et al., 2010).

We know from previous research that policy measures incentivizing a given behavior are quite well accepted (Steg, 2003; Thaller et al., 2024). However, their potential to change behavior in the long term is limited (see Rogge and Johnstone, 2017 for an example in the energy transition). This is because changes in the behavioral context (i.e., structural changes) are at least as important as incentives to bring about long-term behavioral change (Whitmarsh et al., 2021). Therefore, recent research suggests combining incentives with more restrictive measures in policy packages (Axsen et al., 2020; Thaller et al., 2021).

Restrictive policy measures tend to be more effective at reducing GHG emissions, but are less accepted than incentives (Steg, 2003;

Thaller et al., 2024). As Givoni (2014, p. 3) puts it, “the most effective policies will in most cases be the most difficult to implement, while the policies that are easiest to implement will likely not be very effective.” In addition, policies to change travel behaviors generally tend to be less supported than policies in other areas (Poortinga, 2025). For instance, restricting personal car use through policy measures can have particularly negative consequences if people feel dependent on their cars. It has been shown that perceived car dependence is associated with higher car use (Helferich et al., 2024) and lower acceptance of policies to reduce car use (Huber and Wicki, 2021). It is therefore recommended that people can access alternatives and are aware of them so that they do not feel restricted in their individual choices. In addition, restrictive policies tend to be more accepted if accompanied by incentives that boost the acceptance of the policy package as a whole (Eriksson et al., 2008; Thaller et al., 2024).

A range of previous studies have investigated consumers’ and experts’ preferences in compiling policy packages in the transport sector (e.g., Hössinger et al., 2023; Thaller et al., 2021; Thaller et al., 2024; Wicki et al., 2019; Wicki et al., 2020). On a general level, these studies find that people prefer incentives to restrictive measures and that incentives can help increase the acceptance of restrictive measures in a policy package. Less research has been done on the factors that predict the acceptance of policy packages. However, two studies by Moeinaddini and Habibian (2023, 2024) identified more expensive cars and higher-priced houses as well as driving time and having parking at the workplace as positive predictors of a policy package consisting of a cordon entrance fee, increased parking prices and reduced public transport access times. They also identified years of residence, working full-time and owning a motorcycle as negative predictors of that policy package. The authors studied more objective, socio-economic, and trip-related variables as predictors of policy package acceptance and suggest “to study the effects of subjective variables such as perceived behavioral control, subjective norms, intentions, and pro-environmental attitudes for future studies” (Moeinaddini and Habibian, 2023, p. 329). Three studies have already applied this approach. One investigated the role played by car affinity, self-concern, solidarity and transparency, political trust, and climate concern in preferences for push policies alone or for a mix of pull and push policies (Hössinger et al., 2023). The second one found that social norms, personal outcome expectations and perceived effectiveness were positively associated with the acceptance of pricing strategies (Schade and Schlag, 2003). The third one identified perceived effectiveness and perceived distributive fairness as positive predictors of the acceptance of a parking policy package (Baumgartner et al., 2025). We expanded this approach by studying three different policy packages (including a fourth group where one of the three packages is extended by a framing message) and the subjective factors that might predict their acceptance, as well as adding AE facets to the set of predictors.

Some instruments included in the policy packages in our study already exist in practice (e.g., the flat-rate public transport ticket in Germany, the so-called “Deutschlandticket”), while others were taken from important policy documents such as the Alternative Fuel Infrastructure Regulation AFIR on the European level (European Parliament & Council of the European Union, 2023) or the Charging Infrastructure Masterplan II on the national level (Federal Ministry for Digital and Transport, 2023). Other instruments were inspired by Germany’s Federal Environment Agency (2024a). For the status quo of all included policy instruments, see Table 1. We consulted with a group of young and senior scientists to discuss and decide which and how many instruments to include in digestible and easy-to-remember policy packages for the purpose of our study. This process considered several aspects. First, we wanted to include measures targeting different transport modalities (i.e., motorized individual transport, walking and cycling, and public transport). Second, we wanted to include existing measures (e.g., “Deutschlandticket”), ones that used to exist (e.g., purchase premium for BEVs), and those that do not yet exist but would be useful to reduce GHG emissions in the transport sector. Third, we took Miller’s (1956) “magical

Table 1
Overview of policy instruments, targeted transport modes and status quo of these policy instruments within Germany.

Policy instrument	Transport mode targeted	Status quo in Germany/examples for successful implementation (up to July 2025)	Reference
Purchase premium for battery-electric vehicles (BEVs)	Motorized individual transport (MIT)	Existed until December 17, 2023, but is no longer in place	Federal Ministry for Economic Affairs and Energy (2023)
Free parking for BEVs while recharging	MIT	Introduction of new traffic signs, now possible to make parking free for BEVs while recharging	AFIR (European Parliament & Council of the European Union, 2023) Charging Infrastructure Masterplan II (Federal Ministry for Digital and Transport, 2023) ADAC (2025)
Priority for pedestrians and cyclists at traffic lights	Walking and cycling	Initial projects in several cities across Germany	Federal Environment Agency (2024a), City of Karlsruhe (2022)
Public transport flat rate with Germany-wide validity (“Deutschlandticket”)	Public transport	Has existed since May 1, 2023	Federal Ministry of Transport (2025)
CO_2 emissions-oriented registration fee for passenger cars	MIT	Not in place, but yearly car tax partly linked to CO_2 emissions since 2021	Federal Environment Agency (2024a), Federal Ministry of Finance (2025)
Higher fees for residential and occasional parking	MIT	Occasional court decisions against excessive fees	Federal Environment Agency (2024a), Federal Administrative Court (2023)
Rededication of car lanes to lanes exclusively for pedestrians and cyclists	MIT, walking and cycling	Some projects realized, e.g., as part of “Kombilösung Karlsruhe”	Federal Environment Agency (2024a), City of Karlsruhe (2021)
Introduction of a CO_2 emissions-oriented road toll for passenger cars	MIT	Not in place	Federal Environment Agency (2024a)

number seven, plus or minus two" as orientation when deciding how many instruments to include in each package. A study by Fesenfeld (2022) indicated that increased policy package complexity may undermine the supportive effects of incentives included in the package. Our combined package therefore consisted of a total of eight measures, four incentives and four restrictive measures, to ensure a manageable cognitive load for our participants in the combined and framing groups. Although this is by no means a complete list of possible policy instruments in the transport sector and the selection was arbitrary to a certain extent, we believe it represents a good mix of instruments, keeps the respondents' cognitive load manageable, leverages the positive effects of supportive measures and manages the negative effects of increased complexity. We acknowledge that previous research has presented a comprehensive process for designing policy packages (e.g., Justen et al., 2014). However, our focus is on acceptance factors of policy packages rather than the package compilation process per se, which is why we took a more simplistic approach to designing the policy packages.

The first policy package consisted of four mobility-related policy instruments that aim to incentivize the shift away from cars with internal combustion engines toward low-carbon transport. These measures included:

- a purchase premium for battery-electric vehicles (BEVs),
- free parking for BEVs while recharging,
- priority for pedestrians and cyclists at traffic lights, and
- a public transport flat rate with Germany-wide validity ("Deutschlandticket").

The second policy package consisted of four mobility-related policy instruments that aim to disincentivize the purchase and use of cars with internal combustion engines. These measures included:

- a CO_2 emissions-oriented registration fee for passenger cars,
- higher fees for residential and occasional parking,
- the rededication of car lanes to lanes exclusively for pedestrians and cyclists, and
- the introduction of a CO_2 emissions-oriented road toll for passenger cars.

The third policy package comprised all eight mobility-related policy instruments listed above. For the fourth group, we made use of the same policy package comprising all eight policy instruments, but it was framed by an additional social norm message that participants received before the policy package was presented. This message was intended to imply that the policies presented were well-accepted by citizens. This was achieved by emphasizing that randomly selected citizens had been involved in designing this particular policy package (see Sections 2.3 and 3 below). Table 1 gives an overview of the selected policy instruments, the targeted transportation mode, as well as the status quo of each policy in Germany.

2.2. Predictors of policy acceptance

Previous studies have identified several factors that are relevant for people's acceptance of policies or policy packages in the field of mobility and other fields. First, age is a negative predictor of policy acceptance as shown in a meta-analysis across 33 countries (Bergquist et al., 2022). Research conducted in Germany found that car owners reacted more negatively to proposed on-street parking policies than those who do not own a car (Baumgartner et al., 2025; Kirschner and Lanzendorf, 2020). Income has also been positively related to policy acceptance (Bergquist et al., 2022; Player et al., 2023). While gender was not found to be predictive of the acceptance of low-emission zones (Player et al., 2023) or climate change taxes and laws (Bergquist et al., 2022), we decided to keep it as a control variable. Lastly, the degree of urbanization of a person's home has not been studied in relation to policy acceptance. However, we argue that those living in more rural areas with fewer alternatives to privately-owned cars are more skeptical toward policies restricting car use because of their perceived or objectively greater car dependence (Helferich et al., 2024).

Second, certain properties of policy instruments can positively predict their acceptance according to the literature (see Table 2 for definitions). These properties include perceived fairness (Canada: Hoyle and Rhodes, 2025; meta-analysis: Isaacson et al., 2024; Austria: Thaller et al., 2023), perceived effectiveness[1] (Sweden: Eriksson et al., 2008; Hoyle and Rhodes, 2025; Switzerland: Huber et al., 2020; meta-analysis: Isaacson et al., 2024), consistency, and coherence (indirect via policy credibility in a German sample; Rogge and Dütschke, 2018). Negative effects of policy properties on acceptance are also possible, such as for perceived comprehensiveness (negative effect of stringency perception; Player et al., 2023; negative indirect effect via credibility; Rogge and Dütschke, 2018). Lastly, perceived policy efficiency,[2] i.e., if people think the policy would improve (macro)economic efficiency, was positively related to policy acceptance in Germany (Haferkamp et al., 2009).

[1] Note that we are focusing on perceived effectiveness in this study. Objective effectiveness may show a negative relationship with policy acceptance, see, e.g., Thorpe et al. (2000).

[2] Note that we are focusing on perceived efficiency in this study. Objective efficiency may be negatively related to policy acceptance, see, e.g., Vieira et al. (2007).

Table 2
Definitions of key concepts.

Concept	Definition
Policy credibility	"The extent to which the policy mix is believable and reliable (Newell and Goldsmith, 2001)[a] both overall and regarding its elements and processes" (Rogge and Reichardt, 2016, p. 1627).
Consistency	"Captures how well the elements of the policy mix are aligned with each [other], thereby contributing to the achievement of policy objectives. It may range from the absence of contradictions to the existence of synergies within and between the elements of the policy mix" (Rogge & Reichardt, 2016, p. 1626).
Coherence	"Synergistic and systematic policy making and implementation processes contributing – either directly or indirectly – towards the achievement of policy objectives" (Rogge & Reichardt, 2016, p. 1626).
Perceived efficiency	"The extent to which [public policies] are keeping costs down, especially monetary costs, as indicated by either total costs or a ratio that involves both benefits and costs" (Nagel, 1986, p. 99).
Comprehensiveness	Extensiveness and exhaustiveness of a policy package (Rogge and Reichardt, 2016)
Perceived fairness	"A multicomponent construct referring to the extent that people, a process or a distribution are treated or implemented equally or according to a criteria [*sic*] such as need or merit" (Bergquist et al., 2022, p. 236).
Perceived effectiveness	People's beliefs that a policy can fulfil a specific aim (Ejelöv and Nilsson, 2020, p. 9), in our case, the reduction of transport-related GHG emissions.
Environmental identity	"The extent to which you see yourself as a type of person who acts environmentally-friendly" (van der Werff et al., 2013, p. 56).

[a] "According to the American Heritage Dictionary of the English Language (Davies, 1980, p. 169), someone who is credible is "believable", "plausible" and "reliable" (Newell and Goldsmith, 2001, p. 236, quotation marks in original). Transferred to policy mixes, people need to believe in and rely upon a policy mix (as a whole as well as in its elements and processes) for it to be credible (Rogge and Reichardt, 2016). This is reflected in the items we used to operationalize credibility (see Appendix A).

Third, it has been shown that positive perceptions of the functionality of the state, such as trust in the state (Bergquist et al., 2022; Grelle and Hofmann, 2024; Switzerland: Huber and Wicki, 2021; Germany: Rinscheid and Koos, 2023), ascription of competence to the state (Grelle and Hofmann, 2024), and credibility of overall mobility politics (Rogge and Dütschke, 2018) are important positive predictors of policy acceptance. Policy credibility is part of the policy mix framework[3] by Rogge and Reichardt (2016), where it is presented as (one of) the main link(s) between policy processes and technological change. Subsequent studies identified policy credibility as an important predictor of low-carbon investments (Nemet et al., 2017) and innovation expenditure (Rogge and Schleich, 2018). Rogge and Dütschke (2018) also found that the remaining policy mix characteristics presented by Rogge and Reichardt (2016) were predictors of policy credibility. Therefore, our model also includes policy credibility to capture the partially indirect effects between the policy package properties and policy package acceptance.

Fourth, different political and ideological beliefs have been shown to be relevant predictors of policy acceptance in previous research. These include environmental identity (positive; Player et al., 2023), climate change denial (positive as climate change belief; Bergquist et al., 2022), and political orientation (higher acceptance towards the left of the political spectrum; Bolte et al., 2024 (Austria); Ejelöv and Nilsson, 2020 (Sweden); see also Whitmarsh and Corner, 2017 (UK)).

In addition, we argue that the way in which people interact with automobility may impact their views of policy measures aimed at reducing private car ownership. This aspect has not been investigated in previous research and will be explored in this study. AE has been introduced as a multi-faceted psychological concept exploring "consumer perceptions of and engagement with car ownership and use as components of the automobility system" (Gauer et al., 2022, p. 2) and will be linked to acceptance of policy instruments in the mobility sector in this study. Originally developed and validated in a Canadian and a German sample, the concept consists of seven facets (Gauer et al., 2022; see also Helferich et al., 2024; Kelber, 2021): Perceived car dependence captures to what extent a person feels the need to own and use a car to fulfil their daily obligations. Car identity captures whether a person identifies with their car and wants it to represent their personality. Sustainable travel norms capture the social norm of travelling sustainably, i.e., without a car. House ownership preferences capture whether a person prefers living in a detached home outside city centers over other housing situations. Environmental concern captures a person's awareness of the negative environmental effects of car use. Empowerment captures positive feelings associated with driving, while driving aversion captures negative feelings. For car dependence, car identity, and empowerment, we expect a negative relationship with policy acceptance because these factors capture a person's positive relationship with or their dependence on a car, which implies that this person might not like policies aimed at reducing car use. For driving aversion, sustainable travel norms and environmental concern, we expect a positive relationship with policy acceptance because these factors capture a person's negative feelings toward driving and their environmental orientation (see Kaiser et al., 2023 for the interplay of pro-environmental orientation and policy support in a German-speaking sample). The relationship between the last factor, house ownership preferences, and policy package acceptance will be investigated exploratively.

[3] While the focus of this paper is on policy packages, i.e., bundles of policy instruments, the term "policy mix" is used in some places because we draw on the corresponding framework by Rogge & Reichardt (2016) to define and operationalize key concepts for this study. However, the policy mix concept according to Rogge & Reichardt (2016) is much broader than the policy packages considered in this paper and includes a strategic component, policy processes and further characteristics.

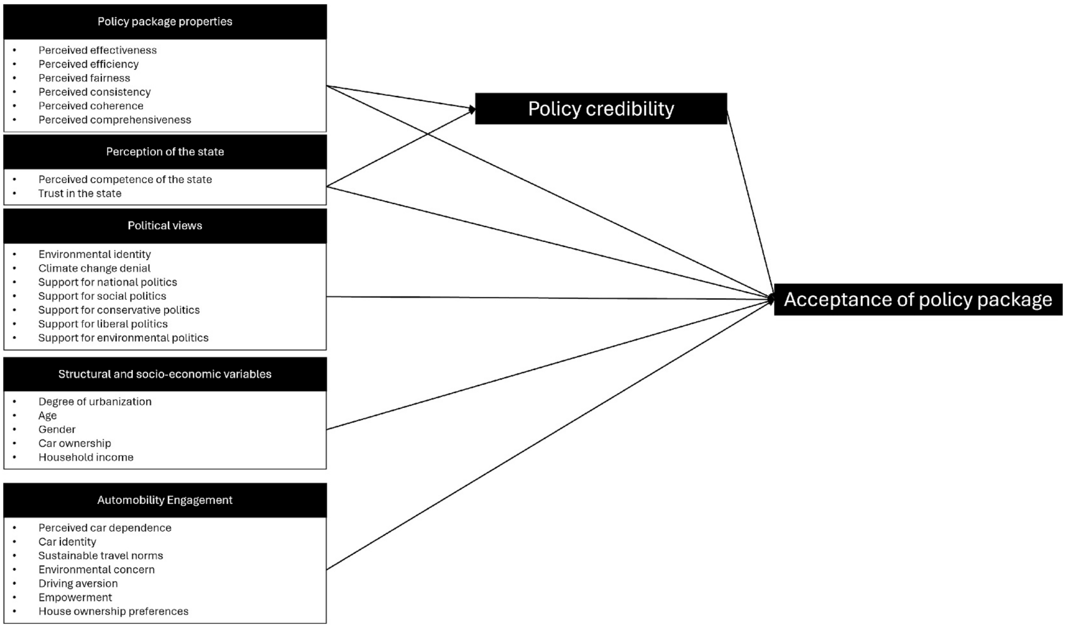

Fig. 1. Research framework.

2.3. The influence of social norms on policy acceptance

"Individual actions and policy support are social processes – they are intimately linked to expectations about the actions and beliefs of others," (Constantino et al., 2022, p. 50). Norms, at their core, are a person's or a collective's beliefs of the right action to take in a certain situation (Mundaca et al., 2022). Given the necessity to reduce emissions from the transport sector and mitigate climate change, social norms that underscore these goals are very important (Javaid et al., 2020). Establishing different norms is therefore considered an important part of decarbonization policies as they can accelerate or strengthen the impacts of demand-side measures (Constantino et al., 2022). Previous empirical research has shown that strong social norms for policy support are associated with higher policy acceptance. That is, when a majority is perceived to support a certain policy, individual acceptance tends to be higher. This effect was found for both incentives and restrictive measures (UK: de Groot and Schuitema, 2012). Social norm enforcement can be strengthened by the presence of mandates or laws, as Mulder and colleagues (2024) showed in the UK, the US and the Netherlands, or can even be induced via inclusive messages. Schorn (2024) reviewed different social norm appeals and showed that they can even foster behavior that is currently only performed by a minority. This works particularly well with injunctive and dynamic descriptive social norm appeals, i.e., highlighting what people think or that ever more people behave in a certain way. Schorn (2024) argues that activating injunctive majority norms can be particularly effective because they are often underestimated. Therefore, "for practitioners, emphasizing ongoing social change toward the desired behavior and highlighting majority approval seem to be simple strategies with great potential to induce compliance […]" (Schorn, 2024, p. 10). While some studies found no effect of social norm framing (Germany: Gossen et al., 2023; UK: Thorman et al., 2020), other studies and research projects have, in fact, found a positive effect (Germany: Klein et al., 2022; Sweden: Mundaca et al., 2022). In this study, we operationalized injunctive social norm influence by designing a framing message (see Section 3). This message was intended to highlight widespread acceptance and thus also indicate that the selected policy package had a certain degree of legitimacy (for the link between acceptance and legitimacy, see Alsheimer et al., 2025).

3. Methods

3.1. Research framework and hypotheses

Based on the literature reviewed in the previous section, we constructed the research framework presented in Fig. 1. As we outlined in the literature review, we integrated elements from different theoretical backgrounds (e.g., policy mix, automobility engagement) into our framework and did not test one specific theoretical framework. While our approach can be considered explorative in this regard, we were able to formulate hypotheses for the directionalities of the effects included in the framework. Table 3 presents all hypotheses alongside the relevant literature on which they are based.

Table 3
Overview of hypotheses.

Hypothesis	Independent variable	Hypothesized direction of association with policy package acceptance	Literature backing hypothesis
H1	Age	–	(Bergquist et al., 2022)
H2	Car ownership	–	(Baumgartner et al., 2025; Kirschner and Lanzendorf, 2020)
H3	Income	+	(Bergquist et al., 2022; Player et al., 2023)
H4	Gender	?	n.a.
H5	Living in rural vs. urban areas	–	(Helferich et al., 2024)
H6	Perceived fairness	+ (partially indirect via credibility)	(Eriksson et al., 2008; Isaacson et al., 2024; Thaller et al., 2023)
H7	Perceived effectiveness	+ (partially indirect via credibility)	(Eriksson et al., 2008; Huber et al., 2020; Isaacson et al., 2024)
H8	Perceived consistency	+ (partially indirect via credibility)	(Rogge and Dütschke, 2018)
H9	Perceived coherence	+ (partially indirect via credibility)	(Rogge and Dütschke, 2018)
H10	Perceived comprehensiveness	– (partially indirect via credibility)	(Player et al., 2023; Rogge and Dütschke, 2018)
H11	Perceived efficiency	+ (partially indirect via credibility)	(Haferkamp et al., 2009)
H12	Trust in the state	+ (partially indirect via credibility)	(Bergquist et al., 2022; Grelle and Hofmann, 2024; Huber and Wicki, 2021; Rinscheid and Koos, 2023)
H13	Perceived competence of the state	+ (partially indirect via credibility)	(Grelle and Hofmann, 2024)
H14	Policy credibility	+	(Rogge and Dütschke, 2018)
H15	Environmental identity	+	(Player et al., 2023)
H16	Climate change denial	–	(Bergquist et al., 2022)
H17	Support for national politics	–	
H18	Support for social politics	+	
H19	Support for conservative politics	–	(Bolte et al., 2024; Ejelöv and Nilsson, 2020; Whitmarsh and Corner, 2017)
H20	Support for liberal politics	?	
H21	Support for environmental politics	+	
H22	Perceived car dependence	–	n.a.
H23	Car identity	–	n.a.
H24	Sustainable travel norms	+	n.a.
H25	House ownership preferences	?	n.a.
H26	Environmental concern	+	n.a.
H27	Empowerment	–	n.a.
H28	Driving aversion	+	n.a.
H29	Social norm framing	+ (for the combined package)	(Klein et al., 2022; Mundaca et al., 2022)

Note. + indicates positively directed hypotheses. – indicates negatively directed hypotheses. ? indicates exploratory hypotheses.

3.2. *Procedure*

We conducted an online survey between November 2023 and January 2024. First, participants were randomly assigned to one of four groups. Participants in the first group (“incentive group”, $N = 570$) were presented with four mobility-related policy instruments aimed at incentivizing a shift away from cars with internal combustion engines to low-carbon transport options. Participants in the second group (“restrictive group”, $N = 572$) were presented with four mobility-related policy instruments aimed at disincentivizing the purchase and use of cars with internal combustion engines. Participants in the third group (“combined group”, $N = 562$) were presented with all eight mobility policy instruments listed above. Participants in the fourth group (“framing group”, $N = 571$) were also presented with all eight policy instruments and received the social norm framing message. This message read as follows:

“The following section of the questionnaire deals with a bundle of policy measures for mobility. Citizens from different regions and with different social backgrounds – people like you! – were selected at random. They were invited to compile measures for climate-friendly mobility. The following measures have emerged. Please read the description of the bundle of measures carefully first.”[4]

In both the combined and the framing group, participants were shown a list of the aforementioned eight policy instruments, with either four incentive or four restrictive measures first in the list. We balanced the number of participants who saw the restrictive or the incentive measures first in each group.

Subsequently, participants in all four groups were told to consider the presented instruments as one bundle of policies (policy package) and asked questions about their acceptance of this policy package and the various properties of the policy package. These properties included perceived comprehensiveness, perceived effectiveness, perceived efficiency, perceived fairness, perceived coherence, and perceived consistency. They then answered questions on the overall credibility of German mobility politics, the state’s perceived competence to reduce transport-related GHG emissions, and their trust in the state. There were further questions about

[4] All study materials including analysis code can be accessed on OSF: https://osf.io/h5e2f/overview?view_only=2b3110d0c4f142b8aa0fd58174e57e83

Table 4
Summary statistics for socio-demographic characteristics.

	Share of total sample ($N = 2,275$)	Share of BW sample (N = 1,629)	Share in BW population	Share of MV Sample (N = 646)	Share in MV population
State					
Baden-Württemberg (BW)	71.6 % ($N = 1,629$)	100 % ($N = 1,629$)		n.a.	
Mecklenburg-Western Pomerania (MV)	28.4 % ($N = 646$)	n.a.		100 % ($N = 646$)	
Administrative region (BW: NUTS2, MV: NUTS3)					
Freiburg	14.5 % ($N = 331$)	20.3 %	20.5 %	n.a.	n.a.
Karlsruhe	17.9 % ($N = 408$)	25.0 %	25.3 %	n.a.	n.a.
Stuttgart	26.7 % ($N = 607$)	37.3 %	31.7 %	n.a.	n.a.
Tübingen	12.4 % ($N = 283$)	17.4 %	23.1 %	n.a.	n.a.
City of Rostock	4.7 % ($N = 107$)	n.a.	n.a.	16.6 %	12.9 %
City of Schwerin	2.2 % ($N = 50$)	n.a.	n.a.	7.7 %	5.9 %
District of Mecklenburgische Seenplatte	4.7 % ($N = 106$)	n.a.	n.a.	16.4 %	16.0 %
District of Rostock	3.5 % ($N = 79$)	n.a.	n.a.	12.2 %	13.5 %
District of Vorpommern-Rügen	4.2 % ($N = 95$)	n.a.	n.a.	14.7 %	14.0 %
District of Nordwestmecklenburg	2.2 % ($N = 50$)	n.a.	n.a.	7.7 %	9.8 %
District of Vorpommern-Greifswald	4.4 % ($N = 99$)	n.a.	n.a.	15.3 %	14.6 %
District of Ludwigslust-Parchim	2.6 % ($N = 60$)	n.a.	n.a.	9.3 %	13.2 %
Gender					
Male	47.7 % ($N = 1,085$)	49.8 % ($N = 812$)	50.3 %	42.3 % ($N = 273$)	50.7 %
Female	52.3 % ($N = 1,190$)	50.2 % ($N = 817$)	49.7 %	57.7 % ($N = 373$)	49.3 %
Age	$M = 48.7$, $SD = 15.6$, $MD = 49$, $Min = 17$, $Max = 89$	$M = 48.5$, $SD = 15.7$, $MD = 49$, $Min = 17$, $Max = 89$		$M = 49.2$, $SD = 15.4$, $MD = 50$, $Min = 18$, $Max = 87$	
Monthly net household income					
<€1,300	12.4 % ($N = 281$)	11.0 % ($N = 180$)	15.5 %	15.6 % ($N = 101$)	19.4 %
€1,300 – €2,600	27.0 % ($N = 615$)	24.1 % ($N = 392$)	18.9 %	34.5 % ($N = 223$)	36.0 %
€2,600 – €3,600	23.7 % ($N = 539$)	24.1 % ($N = 393$)	17.6 %	22.6 % ($N = 146$)	18.1 %
€3,600 – €5,000	23.1 % ($N = 525$)	24.7 % ($N = 402$)	18.3 %	19.0 % ($N = 123$)	14.6 %
> €5,000	13.8 % ($N = 315$)	16.1 % ($N = 262$)	30.0 %	8.2 % ($N = 53$)	12.0 %
Car ownership	86.1 % ($N = 1,958$)	87.2 % ($N = 1,421$)		83.1 % ($N = 537$)	
Degree of urbanization[b]					
Urban	32.7 % ($N = 733$)	32.1 % ($N = 518$)		34.1 % ($N = 215$)	
Semi-urban	41.3 % ($N = 926$)	49.8 % ($N = 802$)		19.7 % ($N = 124$)	
Rural	26.0 % ($N = 584$)	18.1 % ($N = 292$)		46.3 % ($N = 292$)	

[b] For a definition, see section 3.4.6.

participants' political and ideological views, including climate change denial, environmental identity, and political orientation and their socio-demographic characteristics. Finally, participants responded to the AE items.

The questionnaire contained additional questions that are not relevant to the present study, but form part of a larger overarching research project (Tröger et al., 2024). The complete questionnaire can be downloaded from OSF. It took approximately 20 min to complete the questionnaire (median).

3.3. Participants

A total of 2,275 participants from the German states of Baden-Württemberg and Mecklenburg-Western Pomerania completed the questionnaire online. The participants were recruited and financially compensated for their participation with the help of a market research company. Our sample was representative of the populations of Baden-Württemberg and Mecklenburg-Western Pomerania regarding gender, age, income and administrative regions within the states. This means that the shares of men and women, of people in different age and income groups, as well as from the different administrative regions within the two states were not statistically different from the shares in the states' populations (determined by Chi^2 tests, see OSF). Table 4 gives an overview of the socio-demographic characteristics of the total sample, the state subsamples as well as the population shares of quota-relevant characteristics. The distribution of the socio-demographic characteristics in the four subgroups (i.e., incentive, restrictive, combined, and framing group) was similar to the distribution in the total sample (see OSF). We recruited in these two German states because the data were collected as part of a larger panel study on mobility behavior and habits for which the differences in structural and mobility-related issues between these states were important. For example, 96 percent of people living in Baden-Württemberg have reasonable access to public transport,[5] while the same is true for only 79 percent of those living in Mecklenburg-Western Pomerania. However, 28 percent of the streets in Mecklenburg-Western Pomerania are equipped with bike lanes while only 13 percent of the streets in Baden-Württemberg are (Baden-Württemberg State Ministry, 2022). In Baden-Württemberg, the transport sector emitted a

[5] This is defined as living within 600 (bus) or 1,200 (train) meters from a public transport stop with at least 20 departures per day, Baden-Württemberg State Ministry (2022).

total of 19.8 million tons CO_{2e} in 2024, which accounts for 32.4 percent of the state's total GHG emissions (Baden-Württemberg State Statistical Office, 2025). In Mecklenburg-Western Pomerania, the transport sector's emissions amounted to 3.2 million tons CO_{2e} or 18 % of the state's total GHG emissions in 2020 (more recent data not availabile; Dr.-Ing. Grüttner EUS GmbH, 2025).

3.4. Measures

Except for the items measuring policy package acceptance, all items were answered on five-point Likert-type scales ranging from 1 (completely disagree) to 5 (completely agree). The items measuring policy package acceptance were answered on 5-point scales ranging from 1 (completely against) to 5 (completely in favor). The middle point of all scales was 3 (partly/partly). With many items, participants additionally had the option to indicate that they were not able to evaluate them or did not have an opinion about them. This possible sixth value was coded as a missing value before the analyses. We refer to Table 5 for descriptive statistics and Appendix A for the full item list.

3.4.1. Policy package acceptance

Participants indicated whether they were against or in favor of each of the individual policies presented in the respective policy packages. To construct the dependent variables, the ratings of the four incentivizing policies were averaged to build a composite variable for the acceptance of the incentive package. Similarly, the ratings of the four restrictive policies were averaged to build a composite variable for the restrictive package. For the combined and the framing group, the ratings of all eight policies were averaged to build a composite variable that was used for both groups. Internal consistency was (very) good for all composite variables (.70 ≤ Cronbach's α ≤ .86).

3.4.2. Policy package properties

We adapted the Policy Mix framework by Rogge and Reichardt (2016) and used items following Rogge and Schleich (2018) as well as some of our own formulations to operationalize the properties of the policy packages. These properties included perceived effectiveness, efficiency, fairness, coherence, consistency, and comprehensiveness. The variables were measured with two to eight items each and then averaged to build composite variables. Internal consistency was good to excellent for all composite variables (.71 ≤ Cronbach's α ≤ .94).

3.4.3. Policy credibility, perceived competence, and trust in the state

Policy credibility, perceived competence of the state and trust in the state were each operationalized by four items. One of the four items measuring perceived competence was reversely coded and omitted from the composite variable because it drastically reduced internal consistency. Internal consistency was excellent for all three composite variables (.88 ≤ Cronbach's α ≤ .90).

3.4.4. Political and ideological views

We asked participants to what extent they endorsed national, social, conservative, liberal, and environmental politics with one item each. In addition, we measured participants' environmental identity using three items. Lastly, we measured the extent to which

Table 5
Descriptive statistics of independent variables.

Variable (possible range)	*M* (*SD*)	# of items	Cronbach's α
Perceived effectiveness (1–5)	2.78 (1.08)	2	.80
Perceived efficiency (1–5)	2.77 (1.03)	2	.71
Perceived fairness (1–5)	2.75 (0.94)	4	.82
Perceived coherence (1–5)	2.42 (0.94)	8	.94
Perceived consistency (1–5)	2.71 (1.01)	3	.85
Perceived comprehensiveness (1–5)	3.23 (1.02)	1	n/a
Credibility (1–5)	2.63 (1.02)	4	.90
Perceived competence of the state (1–5)	2.25 (0.98)	3	.89
Trust in the state (1–5)	2.48 (0.94)	4	.88
Environmental identity (1–5)	3.54 (0.79)	3	.88
Endorsement of national politics (1–5)	3.40 (0.98)	1	n/a
Endorsement of social politics (1–5)	3.62 (0.92)	1	n/a
Endorsement of conservative politics (1–5)	2.90 (0.96)	1	n/a
Endorsement of liberal politics (1–5)	3.18 (0.86)	1	n/a
Endorsement of environmental politics (1–5)	3.45 (1.01)	1	n/a
Climate change denial (1–5)	2.30 (1.14)	2	.85
Car dependence (1–5)	3.27 (1.03)	7	.85
Car identity (1–5)	2.31 (0.99)	6	.84
Sustainable travel norms (1–5)	3.07 (0.90)	5	.83
Environmental concern (1–5)	3.09 (0.99)	3	.84
Driving aversion (1–5)	2.43 (1.09)	3	.83
Empowerment (1–5)	3.35 (0.93)	4	.82
House ownership preferences (1–5)	3.48 (1.00)	3	.66

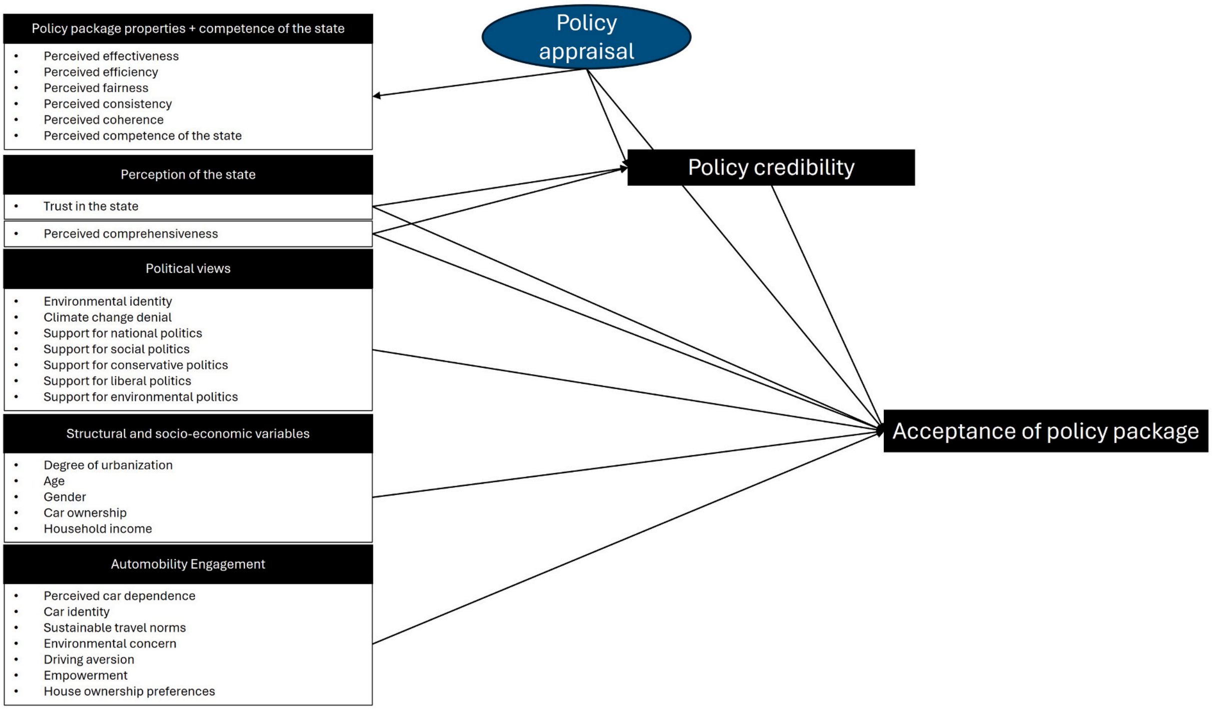

Fig. 2. Adjusted research framework.

participants denied the existence of human-induced climate change using two items. Internal consistency was excellent for both environmental identity (Cronbach's α = .88) and climate change denial (Cronbach's α = .85).

3.4.5. *Automobility engagement (AE)*

AE was measured using 31 items comprising seven facets. Perceived car dependence was measured with seven, car identity with six, sustainable travel norms with five, and empowerment with four items. Environmental concern, driving aversion, and house ownership preferences were measured with three items each. Internal consistency was good for most composite variables, with Cronbach's α > .80. House ownership preferences was the exception with Cronbach's α = .66. Since this value was still satisfactory, we proceeded with all items included to replicate the original scale.

3.4.6. *Structural and socio-economic variables*

We derived the degree of urbanization by matching participants' zip codes (indicated during the survey) with data from Eurostat (2023). Areas with more than 1,500 inhabitants per km^2 were coded as urban areas, those with 300 to 1,500 inhabitants per km^2 were coded as semi-urban areas and those with less than 300 inhabitants per km^2 were coded as rural areas (Eurostat, 2023). Furthermore, we included people's age (continuous variable), gender, car ownership (dummy variables), and the monthly net household income (categorical variable) as socio-economic variables. Descriptive statistics for these variables are shown in Table 4.

3.4.7. *Manipulation checks*

According to Carlsmith et al. (1976; as cited in Ejelöv and Luke, 2020, p. 2), manipulation checks are "a separate measure designed to find out whether the experimental treatment succeeded in producing the internal state that constituted the conceptual variable" (p. 141). Thus, to check whether the social norm message in the framing group worked and whether a sense of social identification with the group of people who designed the policy packages had developed, we asked participants three questions. The following phrasing was used: Question 1, "My own perspectives were taken into account when selecting the measures". Question 2, "I can identify with the selection of measures". Question 3, "I have the feeling that a majority of the population is in favor of these selected measures". If the framing was effective, i.e., the ingroup identification increased, we would anticipate that the framing group would score higher than the combined group on these manipulation check items.

3.5. *Preparatory analysis*

We performed Confirmatory Factor Analysis (CFA) using the full-information maximum likelihood (FIML) estimator to test the factor structure of the policy package properties as well as the variables regarding overall perception of mobility politics and the state. This was done because the items we used had only been used a few times before (Rogge and Dütschke, 2018; Rogge and Schleich, 2018)

Table 6
ANOVA and post-hoc *t*-test results of manipulation check items.

	Restrictive group	Incentive group	Combined group	Framing group	ANOVA results
My own perspectives were taken into account when selecting the measures.	2.53 (1.12)[a]	2.97 (1.09)[b]	2.77 (1.13)[c]	2.84 (1.08)[b, c]	$F(3,2271) = 15.95, p < .001$
I can identify with the selection of measures.	2.60 (1.16)[a]	3.12 (1.05)[b]	2.79 (1.12)[c]	2.88 (1.11)[c]	$F(3,2271) = 21.56, p < .001$
I have the feeling that a majority of the population is in favor of these selected measures.	2.39 (1.03)[a]	3.12 (0.96)[b]	2.65 (1.05)[c]	2.69 (1.04)[c]	$F(3,2271) = 50.67, p < .001$

Note. Mean values (standard deviations) are given in the table cells. Different superscript letters indicate significant group mean differences at $p < .05$, obtained by post-hoc t-tests with Bonferroni correction. If the group mean values share the same superscript letter, they do not differ significantly.

Table 7
ANOVA and post-hoc *t*-test results for policy package acceptance.

	Restrictive group	Incentive group	Combined group	Framing group	ANOVA results
Policy package acceptance	2.55 (1.15)[a]	3.52 (0.94)[b]	2.95 (0.93)[c]	3.00 (0.95)[c]	$F(1, 1987) = 16.68, p < .001$

Note. Mean values (standard deviations) are given in the table cells. Different superscript letters indicate significant group mean differences at $p <$ .001, obtained by post-hoc t-tests with Bonferroni correction. If the group mean values share the same superscript letter, they do not differ significantly.

or were some of our own formulations that had not been used in previous studies. Therefore, we sought to confirm the intended factor structure with our data. We considered the χ^2 statistic, the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA) and its corresponding confidence interval as well as the Standardized Root Mean Square Residual (SRMR) along with common cut-off values according to Hu and Bentler (1999) to evaluate model fit. The measurement model was defined so that each item belonging to a factor was allowed to load on that factor alone. All standardized factor loadings were above .50. The model fit was very good according to the cutoff values recommended by Hu and Bentler (1999)[6], with $\chi^2(377) = 1618.23$, $p < .001$; CFI = .97; RMSEA[90 % CI] = .038[.036, .040], SRMR = .025. Hence, we can be confident in our proposed factor structure.

3.6. Main analyses

First, we calculated the difference in acceptance between the four groups using ANOVA and post-hoc t-tests with Bonferroni correction. Second, we performed a correlation analysis to explore the general structure of the data. Third, we set up identical single-indicator latent variable (SILVA) models for the incentive, restrictive, combined, and framing group. This was done to correct for measurement error of the composite variables which is not accounted for in traditional path analysis (see, e.g., Cole and Preacher, 2014; Savalei, 2019). We thus included latent variables with one single indicator each, namely the variables presented in Table 5. The error variance of the indicators was then fixed to $(1 - Cronbach's\ \alpha(Indicator)) \times Variance(Indicator)$. We used the group-specific Cronbach's α and variance estimates. In case of single-item measures (e.g., political orientations, comprehensiveness) where no reliability estimate was available, we assumed Cronbach's $\alpha = .80$ as suggested by Savalei (2019). The socio-demographic variables were included as manifest variables. The resulting models displayed issues with collinearity between the variables perceived effectiveness, efficiency, fairness, consistency, coherence, and competence of the state. To address this issue, we introduced a second-order latent factor called "policy appraisal", with the variables that exhibited collinearity serving as indicators. This second-order latent factor was used to predict credibility and acceptance. The final model is displayed in Fig. 2. All analyses were performed using the R version 4.5.0 (R Core Team, 2023) and the *lavaan* package (Rosseel, 2012).

4. Results

4.1. Manipulation checks

We conducted ANOVAs and post-hoc t-tests with Bonferroni correction for each of the three manipulation check items. The results showed that the framing group did not score higher than the combined group on any of the three manipulation check questions (see Table 6). Therefore, we concluded that the social norm manipulation was not successful.

4.2. Difference in acceptance

We ran an ANOVA to test for differences in policy package acceptance between the four groups and found a significant main effect. Post-hoc t-tests with Bonferroni correction revealed significant differences between the restrictive and all other groups as well as between the incentive and all other groups. Only the difference between the combined and the framing group was not significant. Detailed results are displayed in Table 7 and Fig. 3.

4.3. Correlations

Perceived policy package properties (except for perceived comprehensiveness) were positively correlated with acceptance in all four groups. The same was true for environmental identity and endorsement of social and environmental politics, sustainable travel norms, environmental concern, and driving aversion. Furthermore, policy package acceptance was negatively correlated with climate change denial, endorsement of conservative politics, car ownership, and perceived car dependence in all four groups. Inconsistent results exist regarding other factors that were correlated with acceptance only in some of the groups. The significant correlations are displayed in Appendix B. The full correlation results are presented on OSF.

[6] They recommend RMSEA < 0.05; SRMR < 0.06 and CFI > 0.95, Hu and Bentler (1999, 24, 26).

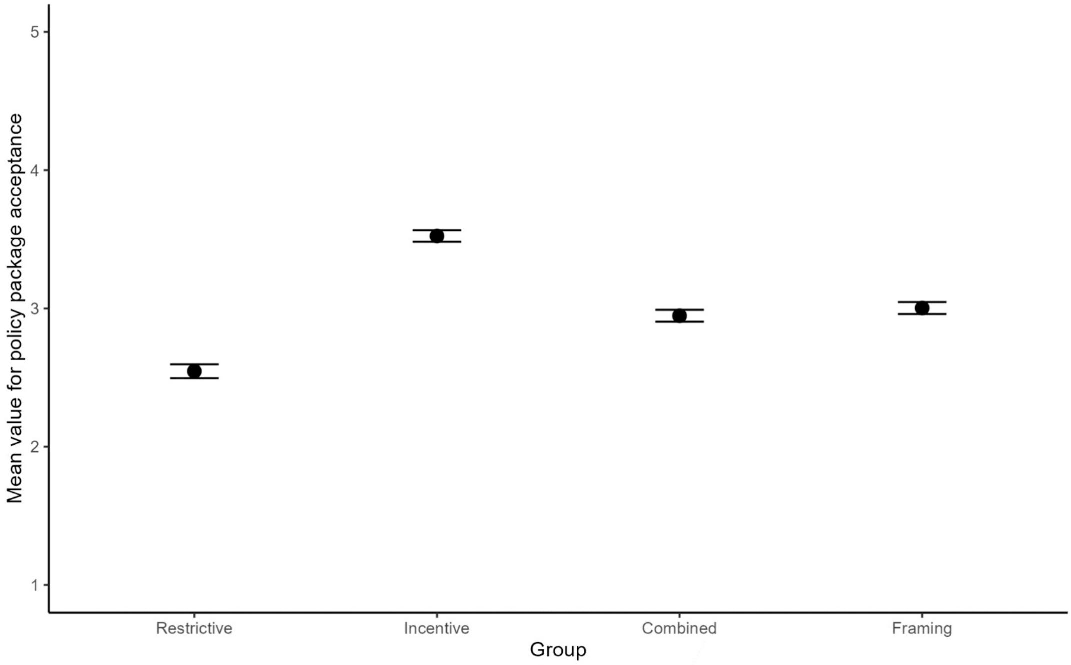

Fig. 3. Policy package acceptance across groups. Error bars are standard errors.

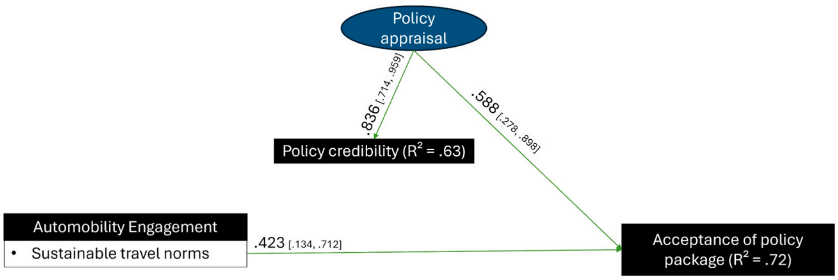

Fig. 4. SILVA results in the incentive group.

4.4. SILVA results

The SILVA results are displayed in Fig. 4 (incentive group), Fig. 5 (restrictive group), Fig. 6 (combined group), and Fig. 7 (framing group). Only significant relationships are shown. Values indicated on the arrows are standardized regression coefficients, including 95 % confidence intervals in brackets. Green arrows show positive associations, red arrows show negative associations. Table 8 shows the values for selected model fit indicators for all four SILVA models. Table 9 gives an overview of both the supported and rejected hypotheses. The complete results from all SILVA models can be found on OSF.

5. Discussion

In this study, we investigated the social acceptance factors of different mobility policy packages. To this end, we randomly assigned the participants to one of four groups and let them answer questions regarding one of the three policy packages or the combined policy package including the framing message. The data were analyzed using correlations, ANOVAs and single-indicator latent variable analysis (SILVA). Table 9 gives an overview of the hypotheses and their approval or rejection.

5.1. Summary of results

In answering parts of RQ1, we found very consistent results regarding the relationships between policy package properties and their acceptance in the correlation analyses. In all four groups and in line with our hypotheses, acceptance was positively correlated with

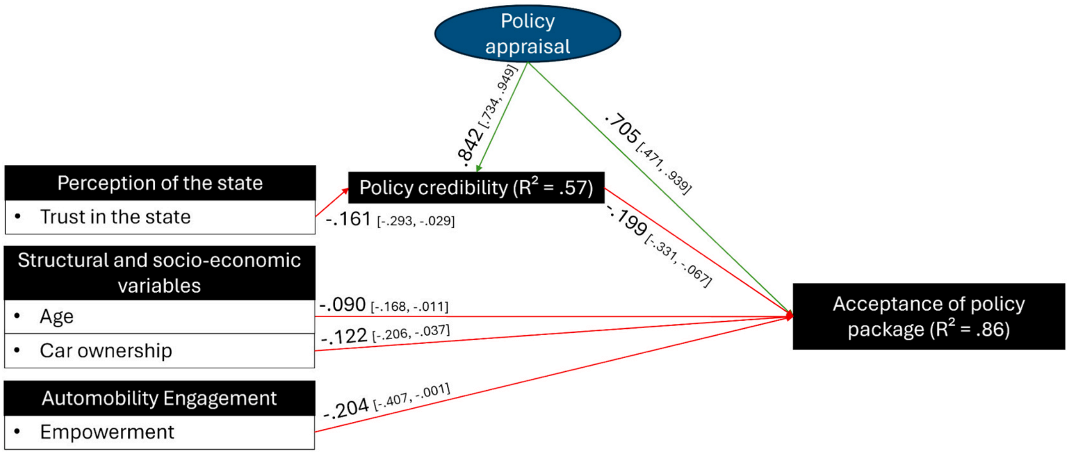

Fig. 5. SILVA results in the restrictive group.

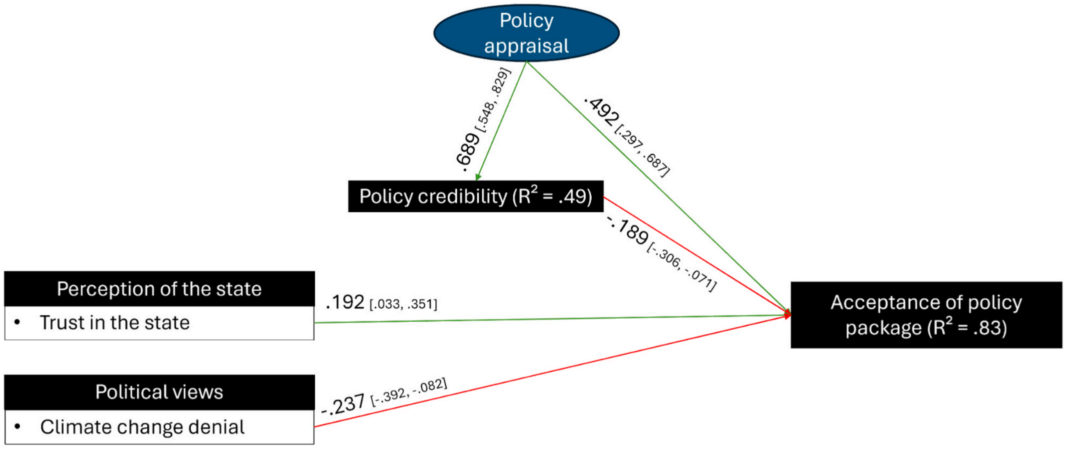

Fig. 6. SILVA results in the combined group.

perceived fairness, effectiveness, consistency, coherence and efficiency. The correlation with perceived comprehensiveness was not significant in any of the groups. The results from the SILVA models were slightly more varied. Some effects were not found in any of the groups and others only in some of the groups (see Table 9 for details). However, it seems to be very important that policy packages be appraised positively (i.e., fair, effective, consistent, coherent, efficient) and that the state be perceived as competent at reducing transport-related GHG emissions in order to increase the acceptance of the policy packages, as shown by the positive associations between the second-order latent factor policy appraisal and policy package acceptance. Following recent research by Bergquist (2024a), it is plausible that fairness might play the largest role within this second-order factor, but we were unable to separate individual-variable effects in this factor due to collinearity issues. Policy appraisal was also an important positive predictor of policy credibility, indicating that policy packages that are appraised more positively are perceived as being more credible, i.e., more stringently working towards the goal of reducing transport-related GHG emissions. The indirect effect of policy appraisal through credibility was only significant in the restrictive and the combined group. This suggests that policy credibility may only play a mediating role for policy package properties in particular policy environments, namely if restrictive measures are part of a policy package. However, the association between policy credibility and policy package acceptance was negative, indicating that the more credible the political environment is perceived, the less accepted is the policy package. The role of credibility should be investigated further in future research.

Trust in the state was a positive predictor for policy package acceptance in the correlational analysis and in the SILVA model in the combined group. This is in line with previous research (e.g., Cologna and Siegrist, 2020). Interestingly, however, trust in the state was negatively associated with policy credibility in the framing group.

A similar phenomenon could be observed with climate change denial. Its association with policy package was negative in the combined group, as expected based on previous research (e.g., Bergquist et al., 2022). However, in the framing group, this association was found to be positive. It is possible that there was some kind of interaction with the framing message or with other predictors in the

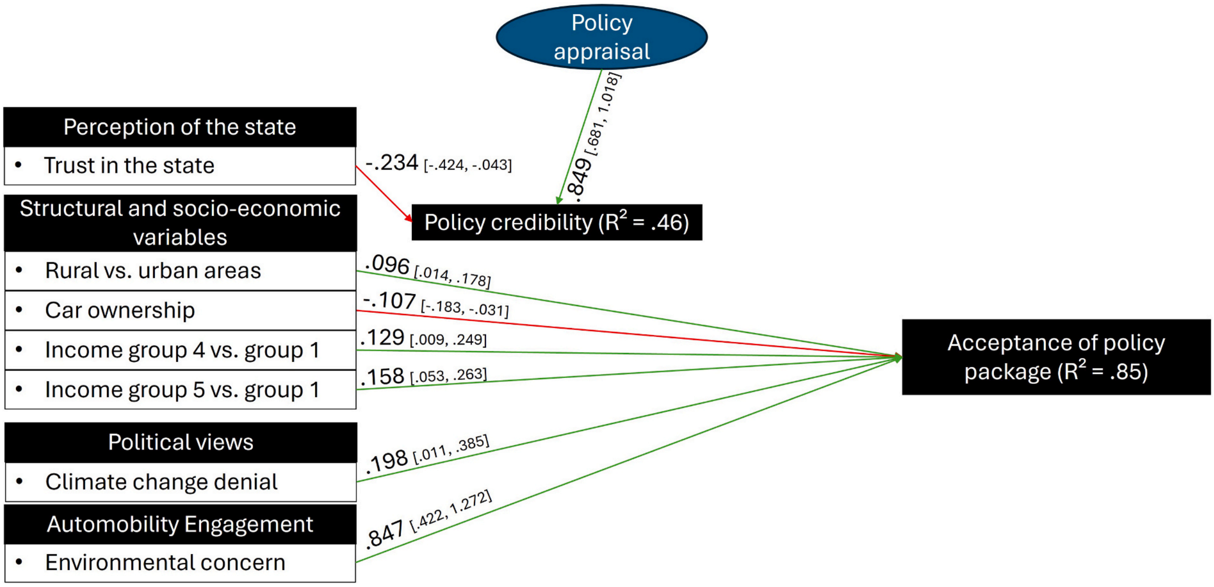

Fig. 7. SILVA results in the framing group.

model. Since both curious changes of sign were observed in the framing group, future research should carefully investigate the processes behind such framing messages and the effects they may have on cognitive processes when evaluating policy packages.

Older people showed lower policy package acceptance in the restrictive group, which aligns with previous research (Lanzendorf et al., 2023; Sælen and Aasen, 2023) and our hypothesis. In addition, higher income was associated with higher policy package acceptance, but only in the framing group. Since this group evaluated a policy package including restrictive measures, it is plausible that people with lower incomes had concerns about being able to cope with the costs that these restrictive measures might impose (see also Player et al., 2023). This might be exacerbated by higher car dependence in low-income groups (Curl et al., 2018), which gives these groups fewer options to avoid increased costs. Beyond this, as expected, car ownership was associated with lower acceptance in the framing and the restrictive group (Lanzendorf et al., 2023).

Higher perception of sustainable travel norms, environmental concern and empowerment showed the expected associations with increased acceptance of policy packages, but only in some groups. This means that people who perceive stronger norms of sustainable mobility and who are more concerned about the negative environmental consequences of car use accept the presented policy packages more, while people with a positive attitude towards driving were less likely to accept the packages. This indicates that policies are more likely to be accepted if they align with people's values (Isaacson et al., 2024).

The incentive package showed the lowest number of significant predictors for its acceptance, while exhibiting approximately the same amount of explained variance compared with the other three policy packages. We interpret this in a way that citizens find it easier to accept incentivizing policy measures. Restrictive measures or packages consisting of both incentives and restrictive measures are more complex and difficult to understand, which might need more cognitive effort and deliberation for the individuals to build an opinion. In line with the Elaboration Likelihood Model (ELM; Petty and Cacioppo, 1986), it is plausible that citizens use *the central route* to process the information about these more complex policy packages. Based on this theory, people would use more cognitive resources to build an opinion, which could then translate into more predictors of acceptance as we found in this study. The policy package consisting only of incentives might have been easier to understand and thus citizens could have taken the peripheral route of information processing, which requires fewer cognitive resources (i.e., fewer predictors) to build an opinion (i.e., acceptance). Following the central vs. the peripheral route of ELM would also mean that the opinion at the end of the central route is more stable than the one at the end of the peripheral route. Future studies could thus test this assumption, for instance by designing longitudinal studies to investigate how the acceptance of different policy packages evolves over time.

Answering RQ2 and contrary to our hypothesis (H29), the social norm framing did not significantly increase the acceptance of the combined package. Policy package acceptance was lowest for the restrictive package, followed by the combined and the framing package, with no significant difference between these two. Acceptance was highest for the incentive package. The difference between

Table 8
Selected model fit indicators for SILVA models.

	Incentive group	Restrictive group	Combined group	Framing group
RMSEA [90 % CI]	.081 [.075, .087]	.070 [.064, .076]	.069 [.063, .075]	.078 [.072, .084]
CFI	.832	.882	.874	.862
SRMR	.069	.059	.066	.073

the restrictive, combined and incentive packages is in line with previous literature (e.g., Thaller et al., 2024). Based on the unsuccessful manipulation check, we conclude that the framing was too weak to create an injunctive social norm and, as a result, no sense of belonging or legitimacy in the participants. While we would have expected an effect of the framing on policy package acceptance (e.g., Schorn, 2024), other studies also found null effects of framing messages (e.g., Bolte et al., 2024). Furthermore, clarifying the conditions under which such a framing can work was beyond the scope of this study, but is an important avenue for future research, as well as investigating the curious changes of sign we observed in the framing group in this study. In addition, future research designing and testing additional interventions to increase policy package acceptance can and should logically follow our study, building on the results we presented here.

5.2. Contributions

In this paper, we studied packages of mobility policy instruments rather than single instruments. In similar studies investigating acceptance factors for policy measures, the focus is often on one or a few single policy measures (Hoyle and Rhodes, 2025; Nilsson et al., 2016; Oltra et al., 2021; Player et al., 2023). Studies investigating policy packages to date focus mostly on the composition of policy packages, i.e., which policy instruments should be combined to ensure the highest possible level of acceptance (e.g., Thaller et al., 2024; Wicki et al., 2019; Wicki et al., 2020). We combined these two strands of research by investigating social instead of travel-related or socio-demographic acceptance factors of policy packages, which had only been done in three previous studies so far (Baumgartner et al., 2025; Hössinger et al., 2023; Schade and Schlag, 2003). In addition, we augmented the existing research by adding AE facets to the set of predictors. AE refers to the way people interact with automobility within the automobility system, and we explored its associations with the acceptance of policy packages aiming at reducing individual automobility. We also investigated whether the social acceptance factors differed between packages consisting exclusively of incentive or restrictive measures or a combination of both. In addition, we investigated whether a social norm framing could increase the acceptance of a policy package, thus building a bridge to the framing literature which only a few studies have done (e.g., Thorman et al., 2020).

5.3. Limitations

This study is subject to several limitations. First, the selection of instruments included in the policy packages limits the result of this study. While many instruments were taken from important policy documents as outlined above, the selection only mirrors three possible configurations of policy packages. The selection of the instruments and composition of the policy package was arbitrary to some extent and could have had an effect on the results presented in this study, a limitation that is inherent to the design of this study.

Table 9
Overview of both the supported and rejected hypotheses.

Hypothesis	Independent variable	Hypothesized direction of association with policy package acceptance	Hypothesis supported?	
			Correlation	SILVA
H1	Age	–	Yes[1,3,4]	Yes[2]
H2	Car ownership	–	Yes[1,2,3,4]	Yes[2,4]
H3	Income	+	Yes[4]	Yes[4]
H4	Gender	?	No	No
H5	Living in rural vs. Urban areas	–	Yes[1,3]	No
H6	Perceived fairness	+ (partially indirect via credibility)	Yes[1,2,3,4]	Not testable
H7	Perceived effectiveness	+ (partially indirect via credibility)	Yes[1,2,3,4]	Not testable
H8	Perceived consistency	+ (partially indirect via credibility)	Yes[1,2,3,4]	Not testable
H9	Perceived coherence	+ (partially indirect via credibility)	Yes[1,2,3,4]	Not testable
H10	Perceived comprehensiveness	– (partially indirect via credibility)	No	No
H11	Perceived efficiency	+ (partially indirect via credibility)	Yes[1,2,3,4]	Not testable
H12	Trust in the state	+ (partially indirect via credibility)	Yes[1,2,3,4]	Yes[3]
H13	Perceived competence of the state	+ (partially indirect via credibility)	Yes[1,2,3,4]	Not testable
H14	Policy credibility	+	No	No
H15	Environmental identity	+	Yes[1,2,3,4]	No
H16	Climate change denial	–	Yes[1,2,3,4]	Yes[3]
H17	Support for national politics	–	Yes[2,4]	No
H18	Support for social politics	+	Yes[1,2,3,4]	No
H19	Support for conservative politics	–	Yes[1,2,3,4]	No
H20	Support for liberal politics	?	Yes[1,2,3]	No
H21	Support for environmental politics	+	Yes[1,2,3,4]	No
H22	Perceived car dependence	–	Yes[1,2,3,4]	No
H23	Car identity	–	No	No
H24	Sustainable travel norms	+	Yes[1,2,3,4]	Yes[1]
H25	House ownership preferences	?	No	No
H26	Environmental concern	+	Yes[1,2,3,4]	Yes[1,4]
H27	Empowerment	–	Yes[2,3,4]	Yes[2]
H28	Driving aversion	+	Yes[1,2,3,4]	No
H29	Social norm framing	+ (for the combined package)		No

Note. [1] Supported in the incentive group. [2] Supported in the restrictive group. [3] Supported in the combined group. [4] Supported in the framing group.

Future studies should test the robustness of the results presented here with different instruments and package compositions. In addition, some of the instruments did not exist at the time of the study, so answering questions about them was, to a certain degree, a hypothetical exercise for participants. As an inherent part of our methodological approach, we constructed our dependent variables by taking the mean support of the individual policy instruments that made up the respective policy packages. We were thus unable to include the support levels of individual policy instruments as predictors for policy package acceptance and consequently unable to discern which instrument had the strongest impact on package acceptance. This is a question that future research should address by using different methodological approaches (e.g., choice experiments, scenario approach).

Second, in this study we focused on the social acceptance factors of policy packages. Therefore, travel characteristics or other more objective factors that could play a role in policy package acceptance were beyond the scope of this study. While these factors have been addressed in previous studies (e.g., Moeinaddini and Habibian, 2023, 2024), future studies should work towards combining these categories of acceptance factors.

Data collection stretched over a period of about two months. During this period the German government abolished the purchase premium for battery-electric vehicles. This change in the political funding landscape can have had an impact on participants' answers to our survey, particularly regarding policy credibility. However, results from a current longitudinal research project indicate that policy perceptions have not changed much over the last two years (Tröger et al., 2024).

In addition, our results are based on the policy support that people indicated in a questionnaire setting, rather than on the actual support they have shown or would show, for example by signing petitions or through their voting behavior. Research has shown that intentions do not necessarily translate well into actual behavior (intention-behavior gap, e.g., Webb and Sheeran, 2006). Acceptance as we present it here can thus be seen as an approximation of revealed policy acceptance with the intention-behavior gap as a caveat to keep in mind.

The social norm framing did not work as we intended, i.e., we found no difference in acceptance between the combined and the framing groups. Resource limitations did not allow us to conduct a randomized controlled experimental setting that tested the influence of such framing in every single policy package. Nevertheless, the patterns of associations between the independent and the dependent variables differed between the combined and the framing group. This implies that something was different between these two groups, but our study design, data and analyses were insufficient to capture it. Future research could delve deeper into the processes here by more carefully designing and pilot testing the framing message (for recommendations on pilot testing and manipulation checks, see Ejelöv and Luke, 2020). Bergquist (2024b) recently proposed a framework suggesting that the properties of the sender, the message itself and the receiver need to be considered for a persuasive social norm message. Future studies should focus on how to effectively promote and manage the sense of belonging to a group that selects the policy package, e.g., in a more controlled laboratory setting. Such future studies could be informed by research indicating that social identity processes related to belonging to a group are important for policy support (Allert and Reese, 2023). From our perspective, exploring innovative approaches to communicating injunctive and dynamic norms as well as majority support, represents a crucial avenue for future research because changing discourses and narratives has been identified as a key to societal transformation (Tröger and Reese, 2021). Additionally, investigating whether communication about citizen dialogues or other forms of citizen engagement can enhance acceptance among individuals who did not directly participate in policy creation is an important question to address. This is particularly important for fostering approval of essential mobility policies needed to decarbonize the transport sector, since "there is no common understanding of the problems and solutions to foster a mobility transition, [which] complicates the prevailing implementation gap of the mobility transition" (Drexler et al., 2022, p. 1).

Lastly, our decision to introduce a second-order latent factor to address collinearity entails certain drawbacks regarding the interpretation of the underlying constructs. By combining the respective constructs into a higher-order factor "policy appraisal", the individual effects of these constructs could no longer be tested separately. Although this step was necessary to improve model stability, it limited our ability to examine several of our initial hypotheses. While the effect of policy appraisal can be meaningfully interpreted, it should be noted that this construct was not part of our original theoretical framework and was therefore analyzed in an exploratory manner.

6. Policy implications and conclusions

In this study, we demonstrated that policy packages consisting exclusively of incentive measures are the most accepted. This is not surprising, but it is also very unlikely that a mobility transition will succeed based only on incentives. Therefore, increasing the acceptance of restrictive measures is important. Consequently, we also showed that a policy package combining incentive and restrictive measures is accepted more readily than a package consisting exclusively of restrictive measures. When policymakers seek to introduce a restrictive measure to effectively reduce transport-related GHG emissions, it is therefore useful to communicate the ecosystem of policy instruments to which the new policies are to be added, i.e., existing incentive or subsidy structures or even newly introduced measures that help to bolster the adverse financial effects of restrictive measures. When communicating policy packages, it may be beneficial to identify distinct target groups and to tailor messages specifically towards the needs and concerns of each group. Based on our results, these groups may include one that is highly environmentally concerned and perceives high sustainable travel norms, and another group that is older and more dependent on their car or enjoys driving. Depending on the group characteristics, it will be important to highlight different benefits of a proposed policy package to further increase acceptance. It can also be useful to develop and introduce a tool that forecasts or simulates the societal effects and interactions with existing instruments. Using such a tool, people in politics and administration can better assess how a new restrictive measure will impact different social groups when it is developed and implemented. Based on these assessments, additional (group-specific) measures can be developed that might be needed to alleviate the adverse effects. These simulations and further developments may then be the basis for the communication measures outlined above. In this way, the perceived fairness of the whole policy package may be increased. A tool that covers many of the ideas that we have outlined here was presented by Taeihagh and colleagues (2014). They presented a virtual environment which "enhances the ability of the policy makers to systematically consider a large number of policy measures, configure and analyze different policy packages in a shorter period and at a greater depth and provides real-time feedback and a variety of visualization options to help them grasp the implications of their choices" (Taeihagh et al., 2014, pp. 65–66).

We acknowledge that not all the predictors of policy package acceptance we identified in this study will lie within the influence of policymakers. However, our results highlight the critical importance of ensuring that proposed policy packages are appraised positively, which among others means that they should be both consistent with existing instruments and coherent within themselves. This approach may enhance both the acceptance of the proposed policy package and the perceived credibility of the overall political landscape. Including researchers in policymaking through, for example, a researcher-stakeholder co-creation process (e.g., Soria-Lara and Banister, 2017) or other strategies (Erismann et al., 2021) has been identified as a success factor in policymaking. Researchers could play a role in different steps of the policy process and help with capacity building for different (policy) stakeholders (see Haddad et al., 2022, for a review). In summary, we have identified a few processes that can improve the acceptance of restrictive measures, which is good news for policy making in the field of mobility.

CRediT authorship contribution statement

Marvin Helferich: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Josephine Tröger:** Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Conceptualization.

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.

Acknowledgments

This publication was written within the framework of KAMO: Karlsruhe Mobility High Performance Center (https://www.kamo.one), the association of Karlsruhe's institutions for research, education and transfer in the field of innovative mobility and logistics solutions. We thank Oscar Bauer, Justine Heute, Nele Hübner, Maria Exael Carrillo Pinto, Amelie Krebs, Ronja Lauer, Daniel Hanß and Elisabeth Dütschke for their support in creating the policy packages and drafting the questionnaire. We are also thankful to Elisabeth Dütschke for her feedback on earlier versions of this manuscript, to Gillian Bowman-Köhler and Louise Antill-Blum for proofreading the manuscript, and to Alicia Gernand for her support with statistical challenges.

Appendix A. Item list

Construct	Items	Source
Perceived effectiveness	The policy measures presented contribute significantly to the reduction of transport-related greenhouse gas emissions in Germany. The policy measures presented will lead me to change my mobility behavior and thus contribute to reducing transport-related greenhouse gas emissions.	Own formulation
Perceived efficiency	With this bundle of measures, the costs and benefits for private households are proportionate. With this bundle of measures, the costs and benefits for the state are proportionate.	Own formulation
Perceived fairness	Everyone benefits equally from the policy measures presented. The policy measures presented are particularly burdensome for people whose mobility behavior contributes more to climate change. The policy measures presented place an individually affordable burden on people. The policy measures presented were developed in a fair negotiation process between social stakeholders.	Own formulation
Perceived coherence	There is a continuous exchange of information between policymakers and players in the mobility sector. Policymakers are well informed about developments in the mobility sector. Emerging problems in the mobility sector are spotted early by policymakers. Policymakers always strive to remove obstacles in the mobility sector. The search for solutions to problems takes place in a constructive exchange between policymakers and players in the mobility sector. The policy measures presented for the mobility sector are drafted in a transparent process.	(Rogge and Schleich, 2018, adapted)

(*continued on next page*)

(*continued*)

Construct	Items	Source
	The responsibilities for the mobility sector are clearly defined for the relevant Federal ministries. National and Federal state governments are pulling in the same direction.	
Perceived consistency	The goal of reducing transport-related greenhouse gas emissions in Germany is a good match with other energy and climate policy targets of the German government. The policy measures presented reinforce each other in their positive effect on reducing transport-related greenhouse gas emissions in Germany. The goal of reducing transport-related greenhouse gas emissions in Germany can be achieved with the help of the policy measures presented.	(Rogge and Schleich, 2018, adapted)
Perceived comprehensiveness	Important flanking policies are missing that push the reduction of transport-related greenhouse gas emissions in Germany.	(Rogge and Schleich, 2018, adapted)
Credibility	Concerning the reduction of transport-related greenhouse gas emissions in Germany, there ... …is a clear political vision. …is a firm political will. …are unambiguous political signals. …is strong support from the German government.	(Rogge and Schleich, 2018, adapted)
Perceived competence of the state	The state has extensive experience in reducing transport-related greenhouse gas emissions in Germany. The state is adept at reducing transport-related greenhouse gas emissions in Germany. The state has a high level of expertise in reducing transport-related greenhouse gas emissions in Germany.	(Newell and Goldsmith, 2001, adapted)
Trust in the state	I trust the state. The state provides truthful information. The state is honest. I don't believe what the state tells me.	(Newell and Goldsmith, 2001, adapted)
Endorsement of different politics	I am in favor of politics that are geared towards national interests. I am in favor of socially oriented politics. I am in favor of conservative-oriented politics. I am in favor of liberal-oriented politics. I am in favor of environmentally oriented politics.	(Ziegler, 2017, adapted)
Environmental identity	Acting environmentally friendly is an important part of my identity. I am the type of person who acts environmentally friendly. I see myself as an environmentally friendly person.	(van der Werff et al., 2013)
Climate change denial	Human-induced climate change does not exist. Global warming is natural and is not dependent on human influence.	Own formulation
Perceived car dependence	Owning a car is important to me. I need a car to fulfil my everyday obligations. It is easy to plan my day without a car. It is difficult for me to access my friends and family without a car. In my area, every household needs a car. I need a car for my job. Sometimes I feel too dependent on my car.	(Helferich et al., 2024; Kelber, 2021)
Car identity	Owning a car shows that I am successful. I want my car to represent my personality. You can learn a lot about someone by looking at their car. Buying a car is an important milestone in life. A car is just a way to get around and nothing more. I often feel emotionally connected to cars.	(Helferich et al., 2024; Kelber, 2021)
Sustainable travel norms	It is important that I live in a neighborhood where I can walk to shops and other destinations. It is important for me to live in a place where I can easily access transit. I know a lot of people that use public transit (bus, subway, etc.) Many of my friends are trying to reduce their car use. Many of my friends commonly walk or cycle to get around.	(Helferich et al., 2024; Kelber, 2021)

(*continued on next page*)

(*continued*)

Construct	Items	Source
Environmental concern	Air pollution from cars is a serious problem.	(Helferich et al., 2024; Kelber, 2021)
	Car use is causing climate change.	
	Cars, streets and parking take away too much public space.	
Driving aversion	If possible, I'd prefer not to own a car.	(Helferich et al., 2024; Kelber, 2021)
	Driving is stressful.	
	The idea of driving makes me tired.	
Empowerment	I feel in control when I am driving.	(Helferich et al., 2024; Kelber, 2021)
	Driving makes me feel free.	
	Being inside a car feels like a safe, protected space.	
	Widespread car use is needed to support jobs and the economy.	
House ownership preferences	My ideal situation is to live in a private, detached home (not apartment or townhome).	(Helferich et al., 2024; Kelber, 2021)
	It is important for me to own my home.	
	I prefer to live away from urban centers.	

Appendix B. Significant correlations with policy package acceptance in the four subgroups

Variable	Incentive group	Restrictive group	Combined group	Framing group
Perceived effectiveness	$r = .56, p < .001$	$r = .66, p < .001$	$r = .60, p < .001$	$r = .65, p < .001$
Perceived efficiency	$r = .58, p < .001$	$r = .67, p < .001$	$r = .58, p < .001$	$r = .64, p < .001$
Perceived fairness	$r = .52, p < .001$	$r = .68, p < .001$	$r = .56, p < .001$	$r = .64p < .001$
Perceived consistency	$r = .53, p < .001$	$r = .61, p < .001$	$r = .64, p < .001$	$r = .65, p < .001$
Perceived coherence	$r = .40, p < .001$	$r = .53, p < .001$	$r = .53, p < .001$	$r = .51, p < .001$
Trust in the state	$r = .41, p < .001$	$r = .48, p < .001$	$r = .53, p < .001$	$r = .60, p < .001$
Perceived competence of the state	$r = .38, p < .001$	$r = .44, p < .001$	$r = .47, p < .001$	$r = .48, p < .001$
Perceived comprehensiveness	$r = .14, p < .001$	$r = .14, p < .01$	n.s.	$r = .14, p < .01$
Environmental identity	$r = .27, p < .001$	$r = .25, p < .001$	$r = .32, p < .001$	$r = .29, p < .001$
Endorsement of social politics	$r = .32, p < .001$	$r = .22, p < .001$	$r = .24, p < .001$	$r = .30, p < .001$
Endorsement of liberal politics	$r = .11, p < .05$	$r = .14, p < .01$	$r = .14, p < .01$	n.s.
Endorsement of environmental politics	$r = .46, p < .001$	$r = .48, p < .001$	$r = .56, p < .001$	$r = .52, p < .001$
Endorsement of conservative politics	$r = -.09, p < .05$	$r = -.15, p < .001$	$r = -.13, p < .05$	$r = -.21, p < .001$
Endorsement of national politics	$r = -.21, p < .001$	n.s.	n.s.	$r = -.19, p < .001$
Income group 5 vs. income group 1	n.s.	n.s.	n.s.	$r = .16, p < .001$
Income group 3 vs. income group 1	n.s.	n.s.	n.s.	$r = -.10, p < .05$
Sustainable travel norms	$r = .45, p < .001$	$r = .42, p < .001$	$r = .48, p < .001$	$r = .55, p < .001$
Environmental concern	$r = .56, p < .001$	$r = .66, p < .001$	$r = .66, p < .001$	$r = .75, p < .001$
Driving aversion	$r = .30, p < .001$	$r = .45, p < .001$	$r = .48, p < .001$	$r = .47, p < .001$
Empowerment	n.s.	$r = -.29, p < .001$	$r = -.30, p < .001$	$r = -.34, p < .001$
Climate change denial	$r = -.28, p < .001$	$r = -.39, p < .001$	$r = -.43, p < .001$	$r = -.40, p < .001$
Living in rural vs. urban areas	$r = -.09, p < .05$	n.s.	$r = -.10, p < .05$	n.s.
Age	$r = -.16, p < .001$	n.s.	$r = -.13, p < .05$	$r = -.16, p < .05$
Car ownership	$r = -.12, p < .01$	$r = -.12, p < .01$	$r = -.21, p < .001$	$r = -.26, p < .001$
Perceived car dependence	$r = -.17, p < .001$	$r = -.31, p < .001$	$r = -.34, p < .001$	$r = -.40, p < .001$

Data availability

Data can be made available upon reasonable request.

References

ADAC., 2025. *Parken an E-Ladesäulen mit und ohne Ladevorgang: Das gilt.* https://www.adac.de/rund-ums-fahrzeug/elektromobilitaet/laden/parken-e-ladesaeulen/.

Allert, V., Reese, G., 2023. Social identity based motivation to engage in collective action supporting the redistribution of street space. Transport. Res. F: Traffic Psychol. Behav. 94, 9–24. https://doi.org/10.1016/j.trf.2023.01.009.

Alsheimer, S., Schnell, T., Chlebna, C., Rohe, S., 2025. Competing terms for complementary concepts? Acceptance and legitimacy. Renew. Sustain. Energy Rev. 207, 114960. https://doi.org/10.1016/j.rser.2024.114960.

Arnz, M., Göke, L., Thema, J., Wiese, F., Wulff, N., Kendziorski, M., Hainsch, K., Blechinger, P., von Hirschhausen, C., 2024. Avoid, Shift or Improve passenger transport? Impacts on the energy system. Energ. Strat. Rev. 52, 101302. https://doi.org/10.1016/j.esr.2024.101302.

Arnz, M., Krumm, A., 2023. Sufficiency in passenger transport and its potential for lowering energy demand. Environ. Res. Lett. 18 (9), 94008. https://doi.org/10.1088/1748-9326/acea98.

Axsen, J., Plötz, P., Wolinetz, M., 2020. Crafting strong, integrated policy mixes for deep CO2 mitigation in road transport. Nat. Clim. Chang. 10 (9), 809–818. https://doi.org/10.1038/s41558-020-0877-y.

Baden-Württemberg State Ministry, 2022. *Baden-Württemberg und die anderen Länder*. https://www.baden-wuerttemberg.de/?id=2093&compare=MV&faktid=137.

Baden-Württemberg State Statistical Office, 2025. *Klimabilanz 2024: Treibhausgasemissionen um 3,6 % gesunken: Energiewirtschaft Haupttreiber des Rückgangs*. https://www.statistik-bw.de/presse/pressemitteilungen/pressemitteilung/klimabilanz-2024-treibhausgasemissionen-um-36-gesunken/.

Baumgartner, A., Klinner, N., Lanzendorf, M., 2025. Right to the city or right to park a car? Acceptability of parking management for a social-ecological transformation of urban neighbourhoods. Transport. Res. Part A: Policy Practice 199, 104528. https://doi.org/10.1016/j.tra.2025.104528.

Bergquist, M., 2024a. Limiting support for environmental policies: Unfairness is a more critical barrier than cost and ineffectiveness. Ambio. Advance Online Publication. https://doi.org/10.1007/s13280-024-02074-9.

Bergquist, M., 2024b. A Sender-Message-Receiver (SMeR) framework for communicating persuasive social norms – the case of climate change mitigation behavioral change. Current Opinion Psychol., 101941 https://doi.org/10.1016/j.copsyc.2024.101941.

Bergquist, M., Nilsson, A., Harring, N., Jagers, S.C., 2022. Meta-analyses of fifteen determinants of public opinion about climate change taxes and laws. Nat. Climate Change 12 (3), 235–240. https://doi.org/10.1038/s41558-022-01297-6.

Bolte, S., Klackl, J., Hansen, J., Jonas, E., Uhl-Hädicke, I., 2024. The role of political orientation and value framing in carbon pricing acceptance: evidence from a representative sample. J. Environ. Psychol. 96, 102330. https://doi.org/10.1016/j.jenvp.2024.102330.

City of Karlsruhe, 2021. *Only two weeks to go until the start of the combined solution: final spurt for the new Kriegsstraße*. https://www.karlsruhe.de/stadt-rathaus/aktuelles/meldungen/nur-noch-zwei-wochen-bis-zum-start-der-kombiloesung-endspurt-fuer-neue-kriegsstrasse.

City of Karlsruhe, 2022. "Permanent green" traffic lights: initial findings available: Pilot project by the city and Karlsruhe University of Applied Sciences at two facilities. https://www.karlsruhe.de/stadt-rathaus/aktuelles/meldungen/dauergruen-ampel-erste-erkenntnisse-liegen-vor.

Carlsmith, J.M., Ellsworth, P., Aronson, E., 1976. Methods of research in social psychology, 1st ed. Addison-Wesley, Reading, MA.

Cole, D.A., Preacher, K.J., 2014. Manifest variable path analysis: potentially serious and misleading consequences due to uncorrected measurement error. Psychol. Methods 19 (2), 300–315. https://doi.org/10.1037/a0033805.

Cologna, V., Siegrist, M., 2020. The role of trust for climate change mitigation and adaptation behaviour: a meta-analysis. J. Environ. Psychol. 69, 101428. https://doi.org/10.1016/j.envp.2020.101428.

Constantino, S.M., Sparkman, G., Kraft-Todd, G.T., Bicchieri, C., Centola, D., Shell-Duncan, B., Vogt, S., Weber, E.U., 2022. Scaling up change: a critical review and practical guide to harnessing social norms for climate action. Psychol. Sci. Public Interest : A J. Am. Psychol. Soc. 23 (2), 50–97. https://doi.org/10.1177/15291006221105279.

Creutzig, F., Javaid, A., Koch, N., Knopf, B., Mattioli, G., Edenhofer, O., 2020. Adjust urban and rural road pricing for fair mobility. Nat. Climate Change 10 (7), 591–594. https://doi.org/10.1038/s41558-020-0793-1.

Curl, A., Clark, J., Kearns, A., 2018. Household car adoption and financial distress in deprived urban communities: a case of forced car ownership? Transp. Policy 65, 61–71. https://doi.org/10.1016/j.tranpol.2017.01.002.

Dr.-Ing. Grüttner EUS GmbH, 2025. *Entwicklung der* Treibhausgasemissionen *in Mecklenburg-Vorpommern von 1990 bis 2020*. https://www.regierung-mv.de/Landesregierung/wm/Service/Publikationen/?id=28846&processor=veroeff.

Drexler, C.E., Verse, B., Hauslbauer, A., Lopez, J., Haider, S., 2022. Framing the mobility transition: Public communication of industry, science, media, and politics in Germany. Energy Sustain. Soc. 12 (1), 50. https://doi.org/10.1186/s13705-022-00374-0.

Ejelöv, E., Luke, T.J., 2020. "Rarely safe to assume": evaluating the use and interpretation of manipulation checks in experimental social psychology. J. Experiment. Soc. Psychol. 87, 103937. https://doi.org/10.1016/j.jesp.2019.103937.

Ejelöv, E., Nilsson, A., 2020. Individual factors influencing acceptability for environmental policies: a review and research agenda. Sustainability 12 (6), 2404. https://doi.org/10.3390/su12062404.

Eriksson, L., Garvill, J., Nordlund, A.M., 2008. Acceptability of single and combined transport policy measures: the importance of environmental and policy specific beliefs. Transp. Res. A Policy Pract. 42 (8), 1117–1128. https://doi.org/10.1016/j.tra.2008.03.006.

Erismann, S., Pesantes, M.A., Beran, D., Leuenberger, A., Farnham, A., Gonzalez, B., de White, M., Labhardt, N.D., Tediosi, F., Akweongo, P., Kuwawenaruwa, A., Zinsstag, J., Brugger, F., Somerville, C., Wyss, K., Prytherch, H., 2021. How to bring research evidence into policy? Synthesizing strategies of five research projects in low-and middle-income countries. Health Res. Policy Syst. 19 (1), 29. https://doi.org/10.1186/s12961-020-00646-1.

European Parliament, Council of the European Union, 2023. *Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU*. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32023R1804.

Eurostat, 2023. *Degree of urbanisation*. https://ec.europa.eu/eurostat/web/degree-of-urbanisation/information-data.

Federal Administrative Court, 2023. *Bewohnerparkgebührensatzung der Stadt Freiburg im Breisgau unwirksam* [Press release]. https://www.bverwg.de/pm/2023/47.

Federal Environment Agency, 2023. *Fahrleistungen, Verkehrsleistungen und Modal Split in Deutschland*. https://www.umweltbundesamt.de/daten/verkehr/fahrleistungen-verkehrsaufwand-modal-split#fahrleistung-im-personen-und-guterverkehr.

Federal Environment Agency, 2024a. *Klimaschutz im Verkehr*. https://www.umweltbundesamt.de/themen/verkehr/klimaschutz-im-verkehr#rolle.

Federal Environment Agency, 2024b. *Treibhausgas-Projektionen 2024: Ergebnisse kompakt*. https://www.umweltbundesamt.de/sites/default/files/medien/11850/publikationen/thg-projektionen_2024_ergebnisse_kompakt.pdf.

Federal Government, 2024. *Mehr Spielraum für Länder und Kommunen*. https://www.bundesregierung.de/breg-de/aktuelles/stvg-reform-2197452.

Federal Ministry for Digital and Transport, 2023. *Charging Infrastructure Masterplan II*. https://nationale-leitstelle.de/wp-content/uploads/2023/01/Masterplan-Ladeinfrastruktur-II-der-Bundesregierung_Englisch_DIN_A4_barrierefrei.pdf.

Federal Ministry for Economic Affairs and Energy, 2023. *Umweltbonus endet mit Ablauf des 17. Dezember 2023* [Press release]. https://www.bundeswirtschaftsministerium.de/Redaktion/DE/Pressemitteilungen/2023/12/20231216-umweltbonus-endet-mit-ablauf-des-17-dezember-2023.html.

Federal Ministry of Finance, 2025. *Kfz-Steuer-Rechner*. https://www.bundesfinanzministerium.de/Web/DE/Service/Apps_Rechner/KfzRechner/KfzRechner.html.

Federal Ministry of Transport, 2025. *Digitaler, mobiler und einfacher mit dem Deutschlandticket: Einfach, digital, deutschlandweit im Nahverkehr unterwegs*. https://www.bmv.de/DE/Themen/Mobilitaet/OEPNV/Deutschlandticket/deutschlandticket.html.

Fesenfeld, L.P., 2022. The effects of policy design complexity on public support for climate policy. Behaviou. Public Policy 1–26. https://doi.org/10.1017/bpp.2022.3.

Gauer, V.H., Axsen, J., Dütschke, E., Long, Z., 2022. Exploring "automobility engagement": a predictor of shared, automated, and electric mobility interest? Transp. Res. Part D: Transp. Environ. 109, 1–17. https://doi.org/10.1016/j.trd.2022.103353.

Givoni, M., 2014. Addressing transport policy challenges through Policy-packaging. Transp. Res. A Policy Pract. 60, 1–8. https://doi.org/10.1016/j.tra.2013.10.012.

Givoni, M., Macmillen, J., Banister, D., Feitelson, E., 2013. From policy measures to policy packages. Transp. Rev. 33 (1), 1–20. https://doi.org/10.1080/01441647.2012.744779.

Gossen, M., Tröger, J., Veneny, M., Eichhorn, H., Bergener, J., 2023. Do people make sufficiency-oriented mobile phone choices based on dynamic norms? the perception and effectiveness of sufficiency-promoting messages in online media. Front. Sustainability 4, 1145243. https://doi.org/10.3389/frsus.2023.1145243.

Granulo, A., Fuchs, C., Böhm, R., 2025. Psychological reactance to system-level policies before and after their implementation. Proceed. Nat. Acad. Sci. U. S. A. 122 (18), e2409907122. https://doi.org/10.1073/pnas.2409907122.

Grelle, S., Hofmann, W., 2024. Why and when do people accept public policy interventions? – an integrative public policy acceptance framework. Perspect. Psychol. Sci. 19 (1), 258–279. https://doi.org/10.1177/17456916231180580.

Davies, P (Ed.), 1980. American Heritage Dictionary of the English Language. Dell Publishing, New York.

de Groot, J.I., Schuitema, G., 2012. How to make the unpopular popular? Policy characteristics, social norms and the acceptability of environmental policies. Environ. Sci. Policy 19–20, 100–107. https://doi.org/10.1016/j.envsci.2012.03.004.

Haddad, C.R., Nakić, V., Bergek, A., Hellsmark, H., 2022. Transformative innovation policy: a systematic review. Environ. Innov. Soc. Trans. 43, 14–40. https://doi.org/10.1016/j.eist.2022.03.002.

Haferkamp, A., Fetchenhauer, D., Belschak, F., Enste, D., 2009. Efficiency versus fairness: the evaluation of labor market policies by economists and laypeople. J. Econ. Psychol. 30 (4), 527–539. https://doi.org/10.1016/j.joep.2009.03.010.

Helferich, M., Tröger, J., Dütschke, E., 2024. The role of Automobility Engagement for car use and car use reduction intentions in Germany. Transport. Res. F: Traffic Psychol. Behav. 106, 199–214. https://doi.org/10.1016/j.trf.2024.08.002.

Hössinger, R., Peer, S., Juschten, M., 2023. Give citizens a task: an innovative tool to compose policy bundles that reach the climate goal. Transp. Res. A Policy Pract. 173, 103694. https://doi.org/10.1016/j.tra.2023.103694.

Howarth, C., Bryant, P., Corner, A., Fankhauser, S., Gouldson, A., Whitmarsh, L., Willis, R., 2020. Building a social mandate for climate action: lessons from COVID-19. Environ. Resource Econ. 76 (4), 1107–1115. https://doi.org/10.1007/s10640-020-00446-9.

Hoyle, A., Rhodes, E., 2025. Explaining public support for net-zero climate policy instruments: perceptions of distributive fairness under competing frames. Energy Policy 203, 114644. https://doi.org/10.1016/j.enpol.2025.114644.

Hu, L., Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Struct. Equ. Model. Multidiscip. J. 6 (1), 1–55. https://doi.org/10.1080/10705519909540118.

Huber, R.A., Wicki, M., 2021. What explains citizen support for transport policy? the roles of policy design, trust in government and proximity among swiss citizens. Energy Res. Soc. Sci. 75, 101973. https://doi.org/10.1016/j.erss.2021.101973.

Huber, R.A., Wicki, M.L., Bernauer, T., 2020. Public support for environmental policy depends on beliefs concerning effectiveness, intrusiveness, and fairness. Environ. Politics 29 (4), 649–673. https://doi.org/10.1080/09644016.2019.1629171.

Isaacson, S., Jagers, S.C., Helferich, M., Bergquist, M., 2024. The role of perceived fairness in public opinion on sustainable transportation policy: a meta-analytic structural equation model. Int. J. Climate Change: Impacts Respon. 17 (1), 1–24. https://doi.org/10.18848/1835-7156/CGP/v17i01/1-24.

Javaid, A., Creutzig, F., Bamberg, S., 2020. Determinants of low-carbon transport mode adoption: systematic review of reviews. Environ. Res. Lett. 15 (10), 103002. https://doi.org/10.1088/1748-9326/aba032.

Justen, A., Schippl, J., Lenz, B., Fleischer, T., 2014. Assessment of policies and detection of unintended effects: Guiding principles for the consideration of methods and tools in policy-packaging. Transp. Res. A Policy Pract. 60, 19–30. https://doi.org/10.1016/j.tra.2013.10.015.

Kaiser, F.G., Gerdes, R., König, F., 2023. Supporting and expressing support for environmental policies. J. Environ. Psychol. 87, 101997. https://doi.org/10.1016/j.jenvp.2023.101997.

Kelber, A., 2021. *On the way to a sustainable mobility system: An empirical evaluation of the automobility engagement scale.* Unpublished Bachelor's Thesis at the Faculty of Psychology, University of Mannheim.

Kirschner, F., Lanzendorf, M., 2020. Support for innovative on-street parking policies: empirical evidence from an urban neighborhood. J. Transp. Geogr. 85, 102726. https://doi.org/10.1016/j.jtrangeo.2020.102726.

Klebl, C., Jetten, J., 2023. Perceived national wealth increases support for structural climate policies. J. Environ. Psychol., 102055 https://doi.org/10.1016/j.jenvp.2023.102055.

Klein, S.A., Horsten, L.K., Hilbig, B.E., 2022. The effect of environmental versus social framing on pro-environmental behavior. J. Environ. Psychol. 84, 101897. https://doi.org/10.1016/j.jenvp.2022.101897.

Lanzendorf, M., Baumgartner, A., Klinner, N., 2023. Do citizens support the transformation of urban transport? evidence for the acceptability of parking management, car lane conversion and road closures from a German case study. *Transportation.* Advance online publication. https://doi.org/10.1007/s11116-023-10398-w.

Miller, G.A., 1956. The magical number seven, plus or minus two: some limits on our capacity for processing information. Psychol. Rev. 63 (2), 81–97. https://doi.org/10.1037/h0043158.

Moeinaddini, A., Habibian, M., 2023. Transportation demand management policy efficiency: an attempt to address the effectiveness and acceptability of policy packages. Transp. Policy 141, 317–330. https://doi.org/10.1016/j.tranpol.2023.07.027.

Moeinaddini, A., Habibian, M., 2024. Acceptability of transportation demand management policy packages considering interactions and socio-economic heterogeneity. Res. Transp. Econ. 103, 101374. https://doi.org/10.1016/j.retrec.2023.101374.

Mulder, L.B., Kurz, T., Prosser, A.M., Fonseca, M.A., 2024. The presence of laws and mandates is associated with increased social norm enforcement. J. Econ. Psychol. 101, 102703. https://doi.org/10.1016/j.joep.2024.102703.

Mundaca, L., Román-Collado, R., Cansino, J.M., 2022. Assessing the impacts of social norms on low-carbon mobility options. Energy Policy 162, 112814. https://doi.org/10.1016/j.enpol.2022.112814.

Nagel, S.S., 1986. Efficiency, effectiveness, and equity in public policy evaluation. Rev. Policy Res. 6 (1), 99–120. https://doi.org/10.1111/j.1541-1338.1986.tb00651.x.

Nemet, G.F., Jakob, M., Steckel, J.C., Edenhofer, O., 2017. Addressing policy credibility problems for low-carbon investment. Glob. Environ. Chang. 42, 47–57. https://doi.org/10.1016/j.gloenvcha.2016.12.004.

Newell, S.J., Goldsmith, R.E., 2001. The development of a scale to measure perceived corporate credibility. J. Bus. Res. 52 (3), 235–247. https://doi.org/10.1016/S0148-2963(99)00104-6.

Nilsson, A., Schuitema, G., Jakobsson Bergstad, C., Martinsson, J., Thorson, M., 2016. The road to acceptance: attitude change before and after the implementation of a congestion tax. J. Environ. Psychol. 46, 1–9. https://doi.org/10.1016/j.jenvp.2016.01.011.

Oltra, C., Sala, R., López-Asensio, S., Germán, S., Boso, À., 2021. Individual-Level determinants of the public acceptance of policy measures to improve urban air quality: the case of the barcelona low emission zone. Sustainability 13 (3), 1168. https://doi.org/10.3390/su13031168.

Petty, R.E., Cacioppo, J.T., 1986. The Elaboration Likelihood Model of Persusaion. In: Berkowitz, L. (Ed.), Advances in Experimental Social Psychology, 19. Academic Press, pp. 123–205.

Player, L., Prosser, A.M., Thorman, D., Tirion, A.S., Whitmarsh, L., Kurz, T., Shah, P., 2023. Quantifying the importance of socio-demographic, travel-related, and psychological predictors of public acceptability of low emission zones. J. Environ. Psychol. 88, 101974. https://doi.org/10.1016/j.jenvp.2023.101974.

Poortinga, W., 2025. The role of policy appraisals and second-order beliefs in public support for climate policies in the UK. Clim. Pol. 1–15. https://doi.org/10.1080/14693062.2025.2539977.

R Core Team, 2023. *R: A language and environment for statistical computing* [Computer software]. R foundation for statistical computing. https://www.r-project.org.

Rinscheid, A., Koos, S., 2023. War and pandemic do not jeopardize Germans' willingness to support climate measures. Commun. Earth Environ. 4 (1), 101. https://doi.org/10.1038/s43247-023-00755-z.

Rogge, K.S., Dütschke, E., 2018. What makes them believe in the low-carbon energy transition? Exploring corporate perceptions of the credibility of climate policy mixes. Environ. Sci. Policy 87, 74–84. https://doi.org/10.1016/j.envsci.2018.05.009.

Rogge, K.S., Johnstone, P., 2017. Exploring the role of phase-out policies for low-carbon energy transitions: the case of the German Energiewende. Energy Res. Soc. Sci. 33, 128–137. https://doi.org/10.1016/j.erss.2017.10.004.

Rogge, K.S., Reichardt, K., 2016. Policy mixes for sustainability transitions: an extended concept and framework for analysis. Res. Policy 45 (8), 1620–1635. https://doi.org/10.1016/j.respol.2016.04.004.

Rogge, K.S., Schleich, J., 2018. Do policy mix characteristics matter for low-carbon innovation? a survey-based exploration of renewable power generation technologies in Germany. Res. Policy 47 (9), 1639–1654. https://doi.org/10.1016/j.respol.2018.05.011.

Rosseel, Y., 2012. lavaan : an R package for structural equation modeling. J. Stat. Softw. 48 (2). https://doi.org/10.18637/jss.v048.i02.

Ruhrort, L., Allert, V., 2021. Conceptualizing the role of individual agency in mobility transitions: avenues for the integration of sociological and psychological perspectives. Front. Psychol. 12, 623652. https://doi.org/10.3389/fpsyg.2021.623652.

Sælen, H.G., Aasen, M., 2023. Exploring public opposition and support across different climate policies: poles apart? Ecol. Econ. 209, 107838. https://doi.org/10.1016/j.ecolecon.2023.107838.

Savalei, V., 2019. A comparison of several approaches for controlling measurement error in small samples. Psychol. Methods 24 (3), 352–370. https://doi.org/10.1037/met0000181.

Schade, J., Schlag, B., 2003. Acceptability of urban transport pricing strategies. Transport. Res. F: Traffic Psychol. Behav. 6 (1), 45–61. https://doi.org/10.1016/S1369-8478(02)00046-3.

Schorn, A., 2024. Why should I when no one else does? a review of social norm appeals to promote sustainable minority behavior. Front. Psychol. 15, 1415529. https://doi.org/10.3389/fpsyg.2024.1415529.

Schuitema, G., Steg, L., Forward, S., 2010. Explaining differences in acceptability before and acceptance after the implementation of a congestion charge in Stockholm. Transp. Res. A Policy Pract. 44 (2), 99–109. https://doi.org/10.1016/j.tra.2009.11.005.

Soria-Lara, J.A., Banister, D., 2017. Dynamic participation processes for policy packaging in transport backcasting studies. Transp. Policy 58, 19–30. https://doi.org/10.1016/j.tranpol.2017.04.006.

Steg, L., 2003. Factors Influencing the Acceptability and Effectiveness of Transport Pricing. In: Schade, J., Schlag, B. (Eds.), *Acceptability of Transport Pricing Strategies*. Emerald Group Publishing Limited, pp. 187–202. https://doi.org/10.1108/9781786359506-012.

Taeihagh, A., Bañares-Alcántara, R., Givoni, M., 2014. A virtual environment for the formulation of policy packages. Transp. Res. A Policy Pract. 60, 53–68. https://doi.org/10.1016/j.tra.2013.10.017.

Thaller, A., Fleiß, E., Brohmer, H., Köstenbaumer, D., Posch, A., Athenstaedt, U., 2023. When perceived fairness and acceptance go hand in hand–Drivers of regulatory and economic policies for low-carbon mobility. PLOS Clim. 2 (5), e0000157. https://doi.org/10.1371/journal.pclm.0000157.

Thaller, A., Posch, A., Dugan, A., Steininger, K., 2021. How to design policy packages for sustainable transport: Balancing disruptiveness and implementability. Transp. Res. Part D: Transp. Environ. 91, 102714. https://doi.org/10.1016/j.trd.2021.102714.

Thaller, A., Wicki, M., Fleiß, E., Maier, R., Posch, A., 2024. Pushing low-carbon mobility: a survey experiment on the public acceptance of disruptive policy packages. Clim. Pol. 1–14. https://doi.org/10.1080/14693062.2024.2302322.

Thorman, D., Whitmarsh, L., Demski, C., 2020. Policy acceptance of low-consumption governance approaches: the effect of social norms and hypocrisy. Sustainability 12 (3), 1247. https://doi.org/10.3390/su12031247.

Thorpe, N., Hills, P., Jaensirisak, S., 2000. Public attitudes to TDM measures: a comparative study. Transp. Policy 7, 243–257. https://doi.org/10.1016/S0967-070X(00)00007-X.

Tröger, J., Helferich, M., Dütschke, E., 2024. *Results of the MobilKULT project*. https://www.isi.fraunhofer.de/en/competence-center/energietechnologien-energiesysteme/projekte/mobilkult/ergebnisse.html.

Tröger, J., Reese, G., 2021. Talkin' bout a revolution: an expert interview study exploring barriers and keys to engender change towards societal sufficiency orientation. Sustain. Sci. 16 (3), 827–840. https://doi.org/10.1007/s11625-020-00871-1.

van der Werff, E., Steg, L., Keizer, K., 2013. The value of environmental self-identity: the relationship between biospheric values, environmental self-identity and environmental preferences, intentions and behaviour. J. Environ. Psychol. 34, 55–63. https://doi.org/10.1016/j.jenvp.2012.12.006.

van Wee, B., Annema, J.A., van Barneveld, S., 2023. Controversial policies: growing support after implementation. a discussion paper. Transport Policy 139, 79–86. https://doi.org/10.1016/j.tranpol.2023.05.010.

Vieira, J., Moura, F., Manuel Viegas, J., 2007. Transport policy and environmental impacts: the importance of multi-instrumentality in policy integration. Transp. Policy 14 (5), 421–432. https://doi.org/10.1016/j.tranpol.2007.04.007.

Webb, T.L., Sheeran, P., 2006. Does changing behavioral intentions engender behavior change? a meta-analysis of the experimental evidence. Psychol. Bull. 132 (2), 249–268. https://doi.org/10.1037/0033-2909.132.2.249.

Whitmarsh, L., Corner, A., 2017. Tools for a new climate conversation: a mixed-methods study of language for public engagement across the political spectrum. Glob. Environ. Chang. 42, 122–135. https://doi.org/10.1016/j.gloenvcha.2016.12.008.

Whitmarsh, L., Poortinga, W., Capstick, S., 2021. Behaviour change to address climate change. Curr. Opin. Psychol. 42, 76–81. https://doi.org/10.1016/j.copsyc.2021.04.002.

Wicki, M., Fesenfeld, L., Bernauer, T., 2019. In search of politically feasible policy-packages for sustainable passenger transport: insights from choice experiments in China, Germany, and the USA. Environ. Res. Lett. 14 (8), 84048. https://doi.org/10.1088/1748-9326/ab30a2.

Wicki, M., Huber, R.A., Bernauer, T., 2020. Can policy-packaging increase public support for costly policies? Insights from a choice experiment on policies against vehicle emissions. J. Publ. Policy 40 (4), 599–625. https://doi.org/10.1017/S0143814X19000205.

Ziegler, A., 2017. Political orientation, environmental values, and climate change beliefs and attitudes: an empirical cross country analysis. Energy Econ. 63, 144–153. https://doi.org/10.1016/j.eneco.2017.01.022.