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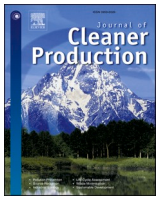

Explaining political participation intention through the lens of the civic voluntarism model and extended theory of planned behavior

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ABSTRACT

Citizens can express their views on environmental policies such as the redesign of urban streets in a number of ways, including participating in deliberative forums, signing petitions, or sharing their views on social media. However, political participation intentions arise from the interaction of various socio-demographic, psychological, and contextual factors. To better understand these dynamics, this study applies the Civic Voluntarism Model (CVM; Verba et al., 1995) and the extended Theory of Planned Behavior (eTPB; Ajzen, 1991), linking the fields of political science and psychology to provide a comprehensive explanation of political participation intentions. Using structural equation modeling on a large sample ($N = 2532$) and integrating variables from both theories, we found strong relationships between CVM and eTPB variables. While eTPB variables such as social norms, perceived behavioral control, and attitudes towards political participation directly shaped participation intentions, CVM variables provided a deeper insight into the relevant background factors. For example, involvement in local networks such as sports clubs was associated with stronger social norms for political participation. In addition, resources such as education, income, and male socialization were associated with higher internal political efficacy, which in turn influenced perceived behavioral control. Political interest had a strong effect on attitudes towards participation, internal political efficacy, and recruitment networks. Trust in local government was associated with both positive and negative emotional responses to the policy measure. However, only negative affect was directly related to political participation intentions, while positive affect had no significant effect. In sum, our study contributes both conceptually and empirically to integrating political science and psychological theories, providing a framework for empowering citizens to become politically involved in urban transition processes and beyond.

1. Introduction

According to Nielsen et al. (2021), psychology—particularly in environmental contexts—has disproportionately focused on individuals in their role as consumers over recent decades. As a result, other important roles that individuals assume—such as investors, producers, participants in organizations, community members, and citizens—have been largely overlooked (Nielsen et al., 2021). Recognizing and appreciating these different roles can help to bridge the gaps between psychological approaches and those of other disciplines, which have paid greater attention to individuals' societal positions, agency, and power (Nielsen et al., 2021). Building on this perspective, this study focuses on the individual's role as a "citizen" seeking to integrate and bridge approaches from political science and psychology. By acting in the role of citizens, individuals aim to indirectly affect the environment, mainly through shaping governmental decisions (Stern, 2000). Despite the indirect effect, the impact might be significant as public policies have the potential to simultaneously change the behaviors of large populations (Stern, 2000).

Parking space redesigns are a relevant example of public policies that have recently been implemented and empirically investigated (e.g., Goetting and Jarass, 2022; Marcheschi et al., 2022). These projects demonstrate that public parking spaces hold significant potential for purposes beyond parking, such as cycling, non-commercial public spaces, and urban greenery through unsealing and planting (e.g., Creutzig et al., 2020; Goetting and Jarass, 2022; Klaever et al., 2024a).

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However, during the implementation phase, vocal protests often arise from distinct segments of the community, where individuals can experience pronounced disruptions in their daily practices due to escalating parking shortages, possibly resulting in a preference for maintaining the status quo (Oltra et al., 2022; Van Wymeersch et al., 2019). As a result of being directly affected, individuals who were previously not engaged in politics can become politically motivated to express their support for or opposition to the redesigns (Field et al., 2018; Goetting and Jarass, 2022; Van Wymeersch et al., 2019).

Citizens can express their opinions on parking space redesign in different ways, including speaking up at public events, signing petitions, joining protests, expressing their opinions online and in newspapers, or considering political parties' stance on the redesign when voting in elections. However, it remains unclear which psychological and socio-demographic factors can increase citizens' intentions to express their opinions through actions. In political science, the Civic Voluntarism Model (CVM; Schlozman et al., 2018; Verba et al., 1995) is a widely used theory to assess such factors' relationships with participation intention. This model considers structural resources (e.g., income), motivational factors (e.g., political efficacy), and community aspects (e.g., a person's level of integration in relevant recruitment networks). While CVM explains important boundary conditions of political participation intention, the Theory of Planned Behavior (TPB; Ajzen, 1991)—an individual-focused psychological theory—specifically addresses core psychological factors that are more proximal antecedents of concrete behavioral intentions (and actual behavior; Ajzen, 2020). These proximal antecedents are attitudes towards behavior, perceived behavioral control, and social norms. Together, these three constructs typically explain a large amount of the variation in behavioral intentions. One extension of TPB includes emotions and allows linking this theory to current research and discourses on (political) engagement regarding the mobility transition (e.g., Allert and Reese, 2023). Therefore, in the present study, we aimed to investigate how eTPB and CVM can complement each other in explaining political participation intention regarding parking space redesign. Our research questions can be summarized as follows:

- How can a combined eTPB and CVM framework help to link psychology and political science?
- How do the various variables in this combined framework interact to explain political participation intention in the context of parking space redesign?

2. Conceptual framework

2.1. Political participation intention

Verba et al. (1995) define political participation in a very broad sense, encompassing all unpaid and voluntary activities intended to influence political decision-making processes. These activities can be institutionalized or non-institutionalized, individual or collective actions, and can include examples of either activist or non-activist behavior in the public sphere (Kaim, 2021; Stern, 2000). Furthermore, political participation can take place both online and offline, and in spaces that are invited, claimed, or invented (e.g., Gaventa, 2006; Baber, 2020; Kersting, 2013). In (environmental) psychology, research often focuses either on single political actions such as protesting (e.g., Haugestad et al., 2021; Wallis and Loy, 2021) or a broader operationalization of diverse political formats and actions (e.g., Fielding et al., 2008; Huijts et al., 2014). For instance, Huijts et al. (2014) examined citizens' intentions to engage politically in response to a hydrogen fuel station, including behaviors such as signing a petition, writing a letter to a newspaper or magazine, speaking up at a public meeting, voting for a party that shares one's opinion on this topic in the local elections, and participating in demonstrations or public events to show support or rejection. More recently, Allert and Reese (2023) explored how psychological factors within the Social Identity Model of Collective Action (SIMCA; Van Zomeren et al., 2008) can influence individuals' intentions to engage in political actions. Their study examined similar activities (e.g., posting online, signing petitions, participating in protests). Building on this earlier research, we conceptualize intentions to engage in political participation in a similarly broad manner, capturing a wide range of options available to citizens for raising their voices regarding urban street reallocation.

2.2. Civic voluntarism model

By exploring the question of why citizens sometimes abstain from participating in political actions, Verba et al. (1995) delineated resources, psychological engagement, and recruiting network as three distinct categories.

2.2.1. Resources

In our society, resources are distributed unequally, resulting in disparities in the opportunity to engage in political actions or participatory processes (e.g., Marien et al., 2010). These disparities not only affect individuals but also various groups characterized based on income, education, occupation, ethnicity, gender, and religion (Schlozman et al., 2018). Previous research has indicated that citizens with higher socio-economic status—characterized by higher income and education levels—are more inclined to participate in political actions (e.g., Marien et al., 2010; Rottinghaus and Escher, 2020; Verba et al., 1995). One possible explanation is that individuals develop civic skills over the life span as they pass through different educational institutions (Schlozman et al., 2018). These civic skills appear to be a fundamental prerequisite for political participation such as writing letters to representatives or speaking at public events.

Beyond income and education, political participation requires time, which is not primarily associated with socio-economic status but rather life circumstances (Schlozman et al., 2018). Therefore, working hours and caregiving responsibilities—including care work for children, the elderly, or sick relatives, as well as volunteer work—diminish the time available for political participation (Schlozman et al., 2018). In addition, subjective perceptions of time might substantially differ from objectively available time. By conceptualizing time as a resource, the exploration of time wealth or time affluence (e.g., Geiger et al., 2021; Kasser and Sheldon, 2009) becomes an intriguing avenue for understanding political participation intention. Time wealth is "a state in which people experience first and foremost a reasonable amount of discretionary time (sufficient time) that facilitates adequate time per activity […], plannability, […] sovereignty and […] synchronization" (Geiger et al., 2021, p. 2). Individuals can vary in their perception of having plenty of spare time and enough time to do things, that are important to them (e. g. Geiger et al., 2021; Kasser and Sheldon, 2009). However, the relationship between sufficient time perception and time spending in recruiting networks is unclear. On the one hand, sufficient time is essential to engage in activities that foster connections with others and community engagement (Kasser, 2002). For example, Kasser and Sheldon (2009) found that greater time affluence can partly contribute to satisfying basic psychological needs, such as relatedness and social exchange. On the other hand, individuals who perceive a lack of sufficient time may still spend time in recruiting networks, as Tröger et al. (2021) found that individuals with lower perceived time affluence still seek to practice collaborative consumption. Moreover, as described by the CVM, resources have already been discussed in relation to gender (e.g., Barkan, 2004). Based on the notion that gender differences are not fully captured by variations in care hours and income, we also include this variable under resources.

2.2.2. Psychological engagement

Having ample resources can indeed facilitate political participation. However, resources do not automatically lead to involvement. Verba

et al. (1995) underline the significance of psychological engagement, which includes political interest, political efficacy, political information, and the strength of party identification for political participation. Since political participation intention in context of parking space redesign is unlikely to require fundamental knowledge about the political system or actors (political information), nor does it depend on strength of party identification, we do not consider these variables in our empirical investigation.

According to Schlozman et al. (2018), political interest involves following day-to-day politics and caring about what happens. While this definition encompasses both national and local politics, political engagement related to parking space redesign specifically involves participation in local debates and a vested interest in occurrences at the neighborhood level. Furthermore, individuals who typically lack political interest or engagement might swiftly become politicized when faced with parking space redesign as it might directly disrupt their daily practices (e.g., Van Wymeersch et al., 2019).

Once interest is sparked, the CVM assumes that political efficacy is crucial to initiate political action. Political efficacy pertains to citizens' beliefs about their political competences (internal political efficacy) and their individual influence on politics (external political efficacy; e.g., Schlozman et al., 2018). Recent qualitative research on civic voluntarism emphasizes the importance of trust in the municipal administration to engage in participatory processes in the mobility transition (Klaever and Verlinghieri, 2024). Besides, external political efficacy typically correlates strongly with trust (e.g., Niemi et al., 1991). We incorporated trust in the municipal administration in our framework to explore the role of trust in predicting political participation intention.

2.2.3. Recruitment network

Beyond resources and political engagement, the recruiting network plays a crucial role regarding political participation intention (Schlozman et al., 2018; Verba et al., 1995). Recruiting networks can be understood as social networks with the potential to mobilize citizens and encourage them to express their opinions and engage in political activities (e.g., Schlozman et al., 2018; Verba et al., 1995). On the one hand, established groups that meet regularly can function as recruiting networks, for example citizen initiatives, sports clubs, or similar associations within the neighborhood (Mueller, 2020; Holecz et al., 2022). On the other hand, more informal, regular conversations with neighbors or acquaintances about local topics can also serve as recruiting networks by sharing information about upcoming neighborhood changes and opportunities for participation (Mueller, 2020).

2.3. Theory of planned behavior

The TPB (Ajzen, 1991) is a well-established psychological theory to study behavioral intentions towards acting in specific contexts. It is widely used, e.g., to understand failures to engage in health behaviors (e.g., McEachan et al., 2011) or the acceptance of new technologies (e.g., Venkatesh et al., 2003, Ludwig et al., 2024). The theory has also been utilized to explain intentions to engage in political participation (e.g., Abonyi and McDermott, 2024; Homyamyen and Kulachai, 2024; Pavlova and Silbereisen, 2015; Read et al., 2013).

According to the theory, three psychological processes inform citizens' intention to perform a specific behavior, namely in our case political participation: attitude towards the behavior, social norm, and perceived behavioral control. Behavioral intentions are typically accurate predictors of actual behavior (Ajzen, 1991; Fishbein and Ajzen, 2011). Attitudes describe an individual's subjective belief that taking part in this behavior will result in a particular outcome. Thus, it can be measured as individual appraisal of the behavior. Perceived behavioral control refers to an individual's subjective control belief about how easy or difficult it would be to perform a specific behavior. Perceived behavioral control is related to beliefs about enabling or constraining factors in a specific situation (Ajzen, 2020). The perceived social norm is based on normative beliefs in relation to the specific behavior and can be divided into descriptive and injunctive norms. Descriptive norms are the respondents' beliefs about how often significant others (e.g., family or friends) engage in the specific behavior. On the other hand, injunctive norms represent the respondents' beliefs about what significant others think of them when they behave in a certain way, thus reflecting a value-based appraisal (Fishbein and Ajzen, 2011). Research building on the TPB framework often focuses on these three core components to explain behavioral intentions. However, depending on the specific context, it can be worthwhile to consider further aspects. In the realm of mobility transition and political participation intention, emotional reactions seem highly relevant since the focal issues often touch on personal rituals and other habitual behaviors that can be difficult to change. Mobility behaviors—and consequently measures within mobility transition—are intertwined with numerous emotional reactions (Sheller, 2004; Gössling, 2023). Moreover, Allert and Reese (2023) found that affect regarding a street reallocation measure can explain intentions to participate in collective action. Thus, we considered affect as an important predictor of intentions to engage in political participation, in addition to the core TPB variables.

2.4. Combining civic voluntarism model and theory of planned behavior

In this study, we aspire to establish a connection between political science and (environmental) psychology for several reasons. In CVM studies, a significant portion of variance remains unexplained (e.g., Kirbiš et al., 2017; Mueller, 2020). The TPB—focusing on psychological predictors closely tied to specific behavioral intentions—is expected to explain additional variance in this context. On the other hand, psychological theories such as the TPB have faced criticism for being overly simplistic, treating psychological factors as independent (e.g., Dijk et al., 2016) and neglecting contextual factors (e.g., Steg and Vlek, 2009; Wullenkord and Hamann, 2021). In this way, the CVM can help to provide a more complete picture of the factors that jointly shape political participation in the specific case of citizens' intentions to become active in support of or against a local parking space redesign initiative. By considering both core psychological variables from the TPB and psychological and socio-demographic factors like those described in the CVM, our goal is to specify these background variables and make the links between the theoretical approaches more visible and potentially useful for designing interventions. Previous studies have mostly measured direct effects from the CVM and TPB variables on criterion variables (e.g., Baber, 2020). However, the literature also indicates that the relationship between the variables could be better described indicating direct and indirect effects. For instance, Schlozman et al. (2018) characterize resources as *causes* of political (non-)participation. Schlozman et al. (2018) illustrated how specific skills are acquired for political participation through socialization and educational processes. Individuals with higher income and education exhibit elevated political efficacy (Oser et al., 2023) and higher self-esteem (Bleidorn et al., 2023). Moreover, previous studies have consistently identified a gender gap in internal political efficacy, indicating that citizens identifying as males perceive higher levels of internal political efficacy compared to those identifying as females (e.g., Fraile & De Miguel Moyer, 2022; Preece, 2016). Furthermore, one might expect political efficacy to have a close relationship with perceived behavioral control because both constructs are rooted in or related to general self-efficacy (Ajzen, 2020; Bandura, 1997; Beierlein et al., 2014; Hamann et al., 2024). Given that internal political efficacy pertains to general political competencies, while perceived behavioral control is associated with specific competencies or the perceived difficulty of specific political actions, we hypothesize that internal political efficacy predicts perceived behavioral control.

Similarly, we assume that other variables captured by the CVM can serve as background variables in this way. For instance, we expect that social norms are stronger when citizens have a relatively large recruiting network, e.g., through their active involvement in sports clubs,

neighborhood initiatives, etc. These networks might lead to a stronger social norm to become (politically) engaged during neighborhood transitions. Furthermore, we predict that the extent to which citizens are part of a strong recruiting network is contingent on their interest in local discussions and politics. Additionally, subjective perception of time is expected to have a direct impact on the time devoted to initiatives and neighborhood conversations (e.g., the recruiting network). Subjective time perceptions in turn should be affected by actual work and care hours. Finally, trust in institutions has been related to both negative and positive affect in previous studies (e.g., Morton et al., 2021), which we expect to be directly relevant for predicting behavioral intentions to engage in political participation. We employed a structural equation model to examine these aforementioned effects. Fig. 1 presents the conceptual framework, clarifying the hypothesized connections between factors described by the CVM and the eTPB. Our hypotheses can be summarized as follows.

H1. Perceived social norm, perceived behavioral control, and attitude towards the behavior are positively related to the intention to participate.

H2a. Negative affect is positively related to political participation intention.

H2b. Positive affect is positively related to political participation intention.

H3. Spending time in recruiting networks is positively related to social norm.

H4. The perception of having sufficient time (subjective time) is related to spending time in recruiting networks.

H5. Care hours and working hours are negatively related to subjective time.

H6. Internal political efficacy is positively related to perceived behavioral control.

H7. Resources such as education and income are positively related to political efficacy.

H8. Participants who self-identify as male demonstrate stronger political efficacy compared to those who self-identify as female or non-binary.

H9a. Trust in municipal administration is negatively related to negative affect.

H9b. Trust in municipal administration is positively related to positive affect.

H10. Political interest is positively related to spending time in recruiting networks and attitude towards political participation intention.

3. Methodology

3.1. Procedure and participants

Data collection took place from November 11 to December 1, 2023 via an online survey. First, participants read a scenario about an upcoming parking space redesign in their neighborhood (see appendix A), which was developed observing different real-world experiments in Berlin. Subsequently, participants were asked to answer items operationalizing key concepts of the CVM, TPB, and socio-demographics.

3.2. Measures

Ten multi-item scales and five single-item variables were included in the analysis (see appendix B for an overview). The scales encompassed all constructs derived from the conceptual framework under investigation. In the eTPB, measurements were taken for attitude towards the behavior, perceived behavioral control, social norms, and positive and negative affect. Within the CVM, measurements were taken for trust, political efficacy, political interest, the recruiting network, and subjective time. Furthermore, CVM resources were measured, including education, income, gender, work, and care hours. Most of the scales were based on earlier related research by Baber (2020), Huijts et al. (2014), and Klaus et al. (2020) and were adapted to our context of parking space redesign. We reworded these items into simple language to be comprehensible for all educational levels. For this purpose, two pilot studies (*Ns* = 136 and 114) were conducted to evaluate and refine the items as necessary. Response options for most items ranged from 1 = *strongly disagree* to 7 = *strongly agree* (see appendix B). Work and care

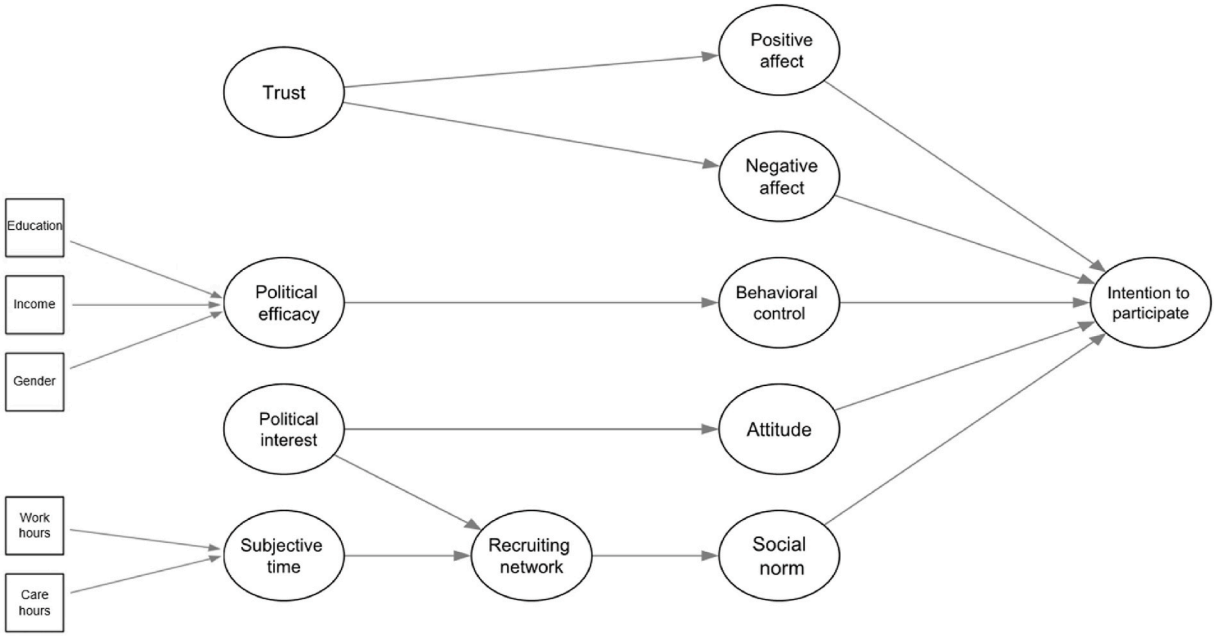

Fig. 1. Conceptual framework combining CVM and eTPB variables explaining intention for political participation.

Table 1
Descriptive statistics of surveyed citizens.

Characteristic	N = 2532
Age	53 (17)
Gender	
Male	1371 (54 %)
Female	1161 (46 %)
Number of children (under 14) in household	.31 (.71)
Missing	33
Percentage car use of total mobility	44 (31)
Missing	11
International standard classification of education (ISCED-2011)	
Primary education	20 (.8 %)
Lower secondary education	146 (5.8 %)
Upper secondary education	1206 (48 %)
Post-secondary non-tertiary education	145 (5.7 %)
Bachelor's or equivalent	530 (21 %)
Master's or equivalent level	419 (17 %)
Doctoral or equivalent level	66 (2.6 %)
Equivalized household income €/Month ɵ	2200
Preferred political party	
Christian Democratic Union (CDU)	558 (23 %)
The Greens (Bündnis 10/Die Grünen)	540 (22 %)
Social Democratic Party (SPD)	482 (20 %)
Alternative for Germany (AfD)	207 (8.4 %)
Free Democratic Party (FDP)	106 (4.3 %)
Left party (Linke)	97 (4.0 %)
Another party	130 (5.3%)
No party	330 (13 %)
Missing	82
Self-perception political orientation (left 0–10 right)	5.64 (1.87)
Missing	69

hours per week were obtained through an open-ended response format. For participants who did not provide open-ended responses, categorical variables were employed (see appendix B). Income was obtained as monthly net household income, also using an open-ended response format with a categorical backup variable (see appendix B). For the education variable, data was collected for both school and vocational training. We measured social gender on a seven-point scale following Döring (2013) and an open-response format (see appendix B).

3.3. Participants

The participants were a sample of German adults recruited from an online panel run by a market research agency (omninet panel forsa). They were paid at the standard rate for the market research panel for their time spent completing the survey. The sample characteristics are displayed in Table 1. Forty percent of the participants reported that they rather like the scenario of parking space redesign in their neighborhood, while 40 % participants reported that they dislike it, and 19 % were undecided. Forty-eight percent of the sample reported using the car (almost) every day, while 14 % cycle every day, and 9% use public transport almost every day. Fifty percent among the car drivers experience car parking pressure in their daily life. Twelve percent of the participants reported being mobility-impaired.

4. Data analysis

4.1. Preprocessing

Initially, we eliminated outliers and unrealistic values (e.g., monthly household net income >16,000 Euro) from our sample. To ensure data quality, cases with missing values exceeding 10 % of the questionnaire or those who did not provide responses to any items central to our analysis were excluded. Intra-individual variability was examined, revealing no abnormalities. Subsequently, we replaced missing values

Table 2
Composite reliability, AVE, Cronbach's alpha, and missing values for each construct.

Variable	Source	CR	AVE	Cronbach's Alpha	Missing (in %)
CVM					
Income	Saravia, 2023	-	-	-	7.2
Education	Saravia, 2023	-	-	-	.8
Work hours	Saravia, 2023	-	-	-	.4
Care hours	Self-developed	-	-	-	8.3
Subj. time	Geiger et al. (2021)	.877	.783	.869	.2
Pol. interest	Baber (2020)	.897	.684	.891	1.5
Pol. efficacy	Beierlein et al. (2014); Baber (2020)	.800	.570	.782	1.3
Trust	Klaus et al. (2020)	.949	.822	.950	2.1
Recruiting network	Self-developed, following Holecz et al. (2022); Mueller (2020)	.551	.382	-	1.6
eTPB					
Attitude	Huijts et al. (2014)	.806	.399	.845	1.5
Perceived behavioral control	Huijts et al. (2014)	.829	.383	.827	2.1
Social norm	Klaus et al. (2020)	.799	.666	.793	5.3
Neg. affect	Klaus et al. (2020)	.913	.778	.914	1.4
Pos. affect	Klaus et al. (2020)	.903	.824	.902	1.7
Political participation intention	Huijts et al. (2014)	.816	.397	.841	.5

for income, work, and care with values of the backup variables (see appendix B). Moreover, we created a new variable to indicate education, aligned with ISCED 2011 (UNESCO Institute for Statistics, 2012) by jointly considering school and vocational training. Income was transformed to equivalized household net income following Anyaegbu (2010).

For four variables— care hours, descriptive social norm, social gender, and income—missing values exceeded 5 %. We opted to use the binary gender variable provided by the panel provider instead of responses to the question on social gender. Furthermore, we decided to replace the response on care hours per week variable with estimates based on gender and children in the household and income with estimates based on gender, age, education, and work hours. For the remaining missing values, we applied full information maximum likelihood method in further analysis.

4.2. Main analysis

We conducted all analyses in R (R Core Team, 2023), mainly relying on the lavaan and semptools packages (Epskamp, 2015; Rosseel, 2012). First, to validate our assumed factor structure, we conducted a confirmatory factor analysis (CFA) encompassing all variables that we intended to use for SEM. Subsequently, we examined the correlations between the variables to explore bivariate relationships between variables included in the conceptual framework. Finally, we assessed our conceptual framework using a structural equation model.

5. Results

5.1. Confirmatory factor analysis

The CFA demonstrated an acceptable fit (CFI = .926, RMSEA = .048, SRMR = .051; Hu and Bentler, 1999). One item measuring political efficacy—more precisely, external political efficacy—exhibited a weak loading (.178) and had to be removed, therefore. All other items demonstrated factor loadings exceeding .30. Table 2 presents the average variance extracted (AVE), composite reliability (CR), and Cronbach's α for all constructs. Most AVEs exceeded .50, and nearly all CRs surpassed .60. Considering that AVE is a more conservative estimate of validity than CR (Fornell and Larcker, 1981) and an acceptable fit was observed, we concluded that the convergent validity of the included constructs was adequate. Notably, the CR for the recruiting network fell below .60 (CR = .55). Since the items measuring political participation intention, perceived behavioral control, and attitude were measured in a similar manner, we assumed correlations between their measurement errors.

5.2. Correlation analysis

Bivariate correlations are presented in appendix C. Additionally, the square root of AVE for each construct was included in the diagonal, demonstrating that it surpasses the correlations with other constructs within our framework. Intention to participate exhibited strong positive correlations with the core TPB variables, ranging from r = .45 to .59. Negative affect showed a positive correlation with political participation intention, while positive affect showed no significant correlation. Furthermore, political participation intention displayed small or moderate correlations with most variables from the CVM. Political interest demonstrated a stronger positive correlation with political efficacy (r = .65), as expected. Additionally, it strongly correlated with participation intention (r = .61). These relationships have previously been observed (e.g., Baber, 2020) and appear plausible. For instance, citizens with a stronger interest in politics might be better informed and consequently develop stronger political efficacy. Therefore, we adjusted our conceptual framework by assuming respective paths between political interest and political efficacy as well as political interest and intention to engage in political participation.

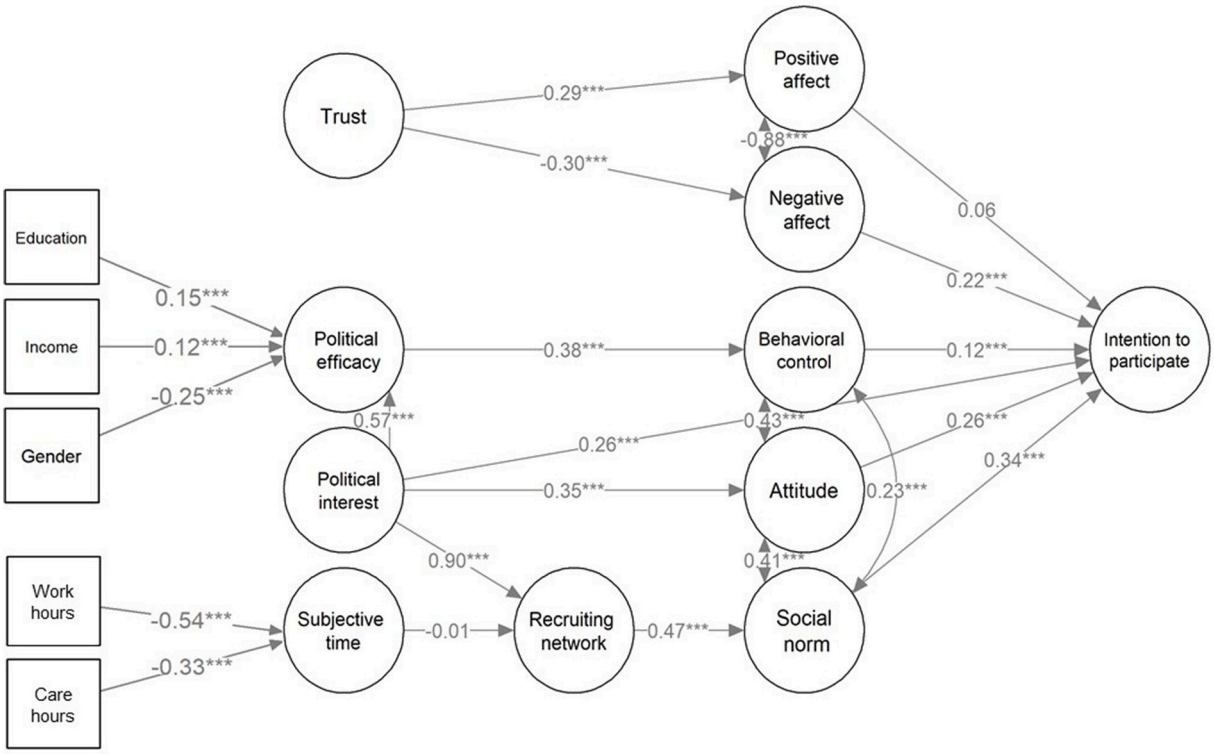

Fig. 2. Empirical validated framework for the CVM and eTPB explaining political participation intention.

5.3. Structural equation model

The SEM model was specified based on the previously stated hypotheses. The fit indices indicate a good overall model fit, with CFI = .914, RMSEA = .046, and SRMR = .062. Thus, the model was deemed acceptable based on established cut-off criteria for goodness-of-fit indices (Hu and Bentler, 1999). Most of the anticipated paths were significant, as evidenced in Fig. 2.

As anticipated in hypothesis 1, the TPB variables of attitude towards the behavior, perceived behavioral control, and social norm exhibited a positive association with political participation intention. However, hypothesis 2 was only partially supported. While negative affect showed a positive correlation with political participation intention (H2a), the relationship with positive affect remained insignificant (H2b). Hypothesis 3 was supported as a significant relationship was found between recruiting network and social norm. Contrary to hypothesis 4, the subjective perception of having sufficient time did not significantly affect participation in recruiting networks. However, as expected, subjective time was negatively predicted by objective measures of work and care hours, supporting hypothesis 5. In accordance with hypothesis 6, internal political efficacy was positively related to perceived behavioral control. As predicted by hypothesis 7, resources such as income and education were positively related to political efficacy. Additionally, participants identifying as male exhibited stronger political efficacy than those identifying as female, supporting hypothesis 8. Our analysis also supported hypothesis 9, with trust negatively associated with negative affect (H9a) and positively associated with positive affect (H9b). Moreover, hypothesis 10 was supported by two predicted observations. First, there was a positive relationship between political interest and time spent in recruiting networks. Second, political interest was linked to attitudes towards political participation intention.

6. Discussion

In our study, we have sought to link theories from both psychology (TPB) and political science (CVM). Specifically, we have aimed to explain political participation intentions in response to a parking space reallocation initiative. To test the combined conceptual framework, we employed a structural equation model and analyzed data from a large sample (N = 2532) in Germany. The results show that the CVM and eTPB together can effectively explain the intricate relationships between psychological, social, and structural factors in shaping intentions to engage in political participation. Our findings highlight that psychological factors like those captured by the TPB are embedded in social and societal structures, although the TPB does not fully capture these aspects. On the other hand, the CVM served as a framework to bring into focus the "background variables" (Ajzen, 2011, 2020), with potential impacts often not explicitly detailed in research on the TPB.

In our study, social norms were the strongest predictor of political participation intentions. Hence, both the beliefs about political participation of significant others (descriptive norm) and the perceived expectations of significant others concerning whether one should participate or not (injunctive norm) were relevant for the intention to engage in political participation. This result aligns with prior studies (e.g., Pavlova and Silbereisen, 2015). However, the connection to CVM variables reflects a novel finding. The time spent in the recruiting network appears to have a substantial association with the social norm. On one hand, a greater amount of time spent on citizen initiatives or sports clubs in the neighborhood seems to shape a positive and activating social norm regarding political participation. On the other hand, engagement in conversations within the neighborhood is also linked to social norms. This is in line with Klaever et al.'s (2024b) observations from focus groups where citizens highlight that they gather information about a parking space redesign and participation processes through discussions with neighbors and friends or at (sports) events and informal spaces in the neighborhood. In these networks, citizens might develop normative beliefs about political participation. We did not find support for a relationship between the perception of having sufficient time and time spent in recruiting networks. This could be due to the fact that the recruiting network was not sufficiently adequately measured. Moreover, the perception of having sufficient time seems to be notably constrained by care and work hours.

Efficacy beliefs play a crucial role for individual-level change (e.g., Hamann et al., 2024; Wullenkord and Hamann, 2021). In this study, we have identified a strong relationship between perceived behavioral control and political efficacy (H6). By contrast, a study on online participation in India found only a weak correlation between these two constructs (Baber, 2020). Possible explanations for these disparate results could be either the different operationalization of the perceived behavioral control variable or the distinct context. Both political efficacy and perceived behavioral control are connected to Bandura's (1997) efficacy theory, which means that they can naturally reciprocally influence each other while also sharing conceptual similarities. Furthermore, political efficacy and perceived behavioral control—as central variables in our framework—can be linked to socio-ecological transition literature. Wullenkord and Hamann (2021) located perceived behavioral self-efficacy at the micro level in the modified Multilevel Perspective model (Geels, 2012; Göpel, 2016). This draws attention to the potential for change at the individual level while emphasizing the constraints imposed by path dependencies, practices, and structures at the meso and micro level, which influence efficacy through experiences and feedback (Wullenkord and Hamann, 2021). Perceived efficacy of political participation seems to be constrained not only by path dependencies from regimes—such as in our case, the automotive regime, or municipal administrations—but also by the societal position of individuals influenced by factors such as education, income, and gender (H7/H8). Our model reveals constraints and opportunities by highlighting the influence of the education system and resource distribution—which are inscribed from meso and meta levels—on perceived political efficacy and therefore concrete individual behavior or intention. It also underscores the leverage of political efficacy and perceived behavioral control, grounded in the perspective of individuals as political agents who can actively engage rather than being solely constrained by external circumstances (Bandura, 1997; Wullenkord and Hamann, 2021).

Interestingly, the stronger the negative affect of citizens in response to parking space redesign, the more likely it is that they intend to participate (H2a). Our findings are in line with Allert and Reese (2023). Applying the SIMCA (van Zomeren et al., 2008), they identified negative affect as a central component for participation intention in collective political actions regarding urban street redesign (Allert and Reese, 2023). On the one hand, this is desirable as concerns and considerations can be directly conveyed to responsible decision-makers. On the other hand, it could potentially lead to discourage quieter citizens from participating, if mainly loud and angry individuals express their opinions (Klaever and Verlinghieri, 2024). Similar to previous findings (e.g., Morton et al., 2021), negative affect in response to a parking space redesign project was negatively predicted by trust in institutions (H9a). Thus, citizens with low trust in institutions might easily develop negative affect, making them more likely to express their frustration in different forms of political participation. Conversely, higher trust might lead to more positive affect towards the policy measure (H9b). However, positive affect did not transfer to political participation intentions in this study. This contrasts with previous findings that found an effect, at least among supporters (e.g., Allert and Reese, 2023; Huijts et al., 2014).

The final path in our public participation model leads from political interest through attitude to political participation intention. The direct effect between attitude and intention to participate aligns with prior research, particularly in the realm of online participation (e.g., Baber, 2020). However, these results differ from Pavlova and Silbereisen (2015), who did not find a significant relationship between attitude and political participation intention among a sample of youths. Homyamyen

and Kulachai (2024) demonstrate that attitude towards behavior consistently emerges as a significant predictor in most studies included in a review of the TPB's influence on political participation intention.

In our conceptual framework, we assigned political interest a central role in shaping attitudes and spending time in recruiting networks. However, political interest seems to play an even more crucial role than anticipated. Indeed, it not only has a direct effect on political participation intention but also political efficacy. This suggests that individuals who are highly interested in political topics or issues in their locality might gather more information about opportunities to become engaged in participatory processes, and consequently have a better understanding and greater self-confidence in their political competencies.

6.1. Limitations and implications for further research

While our study possesses several strengths, such as having a very large, diverse, and nearly representative sample, we also acknowledge some limitations, including a high missing rate for income, care hours, and the descriptive social norm indicator. Although our data analysis relies on a substantial and robust sample and we were able to use available information to address missing values, caution is advised when interpreting results related to these variables. Additionally, given that our data is based on a cross-sectional study, one important limitation is that we cannot rule out bidirectional relationships between constructs. For instance, Sussman and Gifford (2019) showed reciprocal causal relations between TPB variables. Therefore, a thorough examination of such relationships through longitudinal studies seems appropriate. We also note that the reliability of the recruiting network scale used in this study was insufficient. Future empirical studies on the CVM would benefit from the development and psychometric validation of a reliable scale to capture individual differences in the strength of recruiting networks for political participation.

We note that there might be more plausible links in the structural equation model than simply the ones assumed in this study. Relatedly, our conceptual framework is certainly not the only possible way to combine insights from research on both the TPB and the CVM. We encourage future research to expand on the links between these theories, especially where there might be important potential to inform policy-making. We will return to this aspect shortly.

One final limitation of our study is that we focused solely on measuring intentions for political participation rather than actual behavior. This was a deliberate choice as our primary goal was to draw robust conclusions about the general public based on a broad sample, which involved a trade-off between population and external validity. However, it is important to acknowledge the well-established intention–behavior gap, particularly in areas such as sustainable consumption, health, and technology usage (e.g., Bhattacherjee and Sanford, 2009; Rhodes et al., 2022; Sukumaran and Majhi, 2024). While this gap is less well explored in political behavior, existing studies show mixed results. For example, Eckstein et al. (2013) found in a three-wave longitudinal study that students' intentions to engage in political participation predicted changes in their actual political behavior, such as visiting political debates. Similarly, Reichert (2016) identified a link between political participation intention and behavior in conventional political behavior and voting behavior, but not for unconventional political actions. Further research is necessary to validate and expand on our model to predict actual political behavior.

6.2. Theoretical implications

In this study, we have aimed to explore how a combined framework of the eTPB and the CVM could link psychology to political science. Reflecting on our approach, we emphasize several key conclusions for interdisciplinary research. First, identifying a behavior (intention) that links the two disciplines proves valuable. By drawing on the different roles of individuals (Nielsen et al., 2021), we focused on the role of the citizen and the associated behavior of political participation, which is most likely to connect psychology and political science. Additionally, we selected a political science theory that already integrates psychological variables, facilitating the connection between the two theoretical frameworks. Another important insight comes from the discussion of background variables in the TPB. While these variables are often considered and sometimes modeled, their origins are not always clearly defined (e.g., Ajzen, 2011). By measuring these background variables, using constructs from the CVM, we were able to establish a clearer link between them. This approach fosters greater collaboration between behavioral and social scientists from different disciplines. Our study aims to initiate a conversation by attempting to merge theories from different disciplines and applying them in the context of urban sustainability transitions. We encourage researchers to integrate theories from diverse fields to better capture complex relationships and promote interdisciplinary understanding. Future research could enhance this framework by incorporating additional psychological models, such as the SIMCA (van Zomeren et al., 2008). Another promising direction would involve merging psychological variables such as perceived behavioral control with political science variables such as internal political efficacy to create a more parsimonious model. Hamann and colleagues (2024) have highlighted the overabundance of efficacy constructs and the lack of a clear approach to defining and operationalizing them, particularly in the research fields of environmental psychology. Although internal political efficacy and perceived behavioral control were precisely measured in the current study with results indicating no multicollinearity, these constructs could provide a basis for reducing the complexity of the overall model and identifying a common construct in future research. Hamann and colleagues' (2024) review could serve as a valuable starting point.

6.3. Practical implications

Our results also offer important insights for practitioners. On the one hand, our model highlights the complex interplay of various factors influencing political participation intention. For example, by illustrating the relationship between gender and perceived efficacy, it becomes clear that female citizens could benefit from targeted empowerment programs. On the other hand, our model presents several intervention points aimed at encouraging individuals to express their voices through various forms of political participation. Following our model, the first step is to increase access to financial and educational resources, thereby providing a foundation for citizens to engage in active political participation. For instance, political participation—particularly in deliberative formats such as citizen assemblies—could be incentivized based on income levels. Furthermore, redefining "skills" and "education" could be valuable by incorporating and valuing residents' lived experiences as important knowledge for transformation processes (e.g., Klaever et al., 2024b). Given the relationship between resources and perceived political efficacy, training programs should be tailored for citizens who do not identify as male or have lower education or income levels. Once citizens develop greater political efficacy, practitioners could focus on identifying and providing targeted support to overcome inhibiting control beliefs about specific political actions. The critical role of social norms in political participation intention underscores the importance of making political participation more accessible and inclusive. If

individuals are only approached for political participation through traditional recruiting networks (e.g., citizen initiatives), opportunities for changing social norms in other communities might be missed (see Klaever et al., 2024b). Instead, practitioners could reach out to bars, elderly homes, or regular neighborhood meetings, spread information through WhatsApp groups and similar channels or through well-connected individuals (e.g., Klaever et al., 2024b). Given the growing distrust in governmental and official institutions and that trust influences both negative affect and political participation intention, diversifying the actors who organize and offer political participation opportunities could be beneficial. Finally, in line with these considerations, it might be useful to rethink what constitutes political participation. Klaever et al. (2024b) found that citizens engage in forms of participation beyond traditional spaces like those that we have studied. For example, they discovered that participants considered informal discussions with neighbors who shared similar everyday experiences as important spaces for political participation during urban transition processes. Similarly, Kaim (2021) proposes "alternative spaces" as a category for political participation that cannot be easily categorized within established frameworks.

7. Conclusion

The aim of our study was to combine the CVM—a political science model—with the TPB—a psychological model—to explore political participation intention in the context of urban street redesign. We performed a SEM to explain factors behind political participation intention. We identified different paths to public participation intention that connect CVM and TPB variables. For instance, political efficacy and spending time in recruiting networks—two CVM variables—mediated the relationship between the required resources for political participation intention and eTPB variables. This highlights the potential of psychological variables for designing urban transition interventions that seek to mitigate the impact of disparity. Our contribution aligns with the recent development in (environmental) psychology to consider sociodemographic variables not only as control variables but as independent predictors (e.g., Player et al., 2023). Moreover, political interest—a CVM variable—proved crucial for political participation intention as it was not only indirectly associated with intentions to participate (e.g., through efficacy and the recruiting network) but also directly predicted intentions. While each variable has its explanatory value, further studies could qualitatively and quantitatively examine content and statistical commonalities between various psychological constructs to develop a more parsimonious model that effectively merges insights from political science and psychology. Through our findings, we aim to expand the perspectives of local stakeholders—including politicians, municipal administrators, and civic initiatives—regarding citizens' reasons for (non-)participation and highlight the complex interaction between different factors from psychology and political science. While changes in resource variables require long-term transformation processes such as achieving equal access to education, wealth redistribution, and gender equality, psychological variables such as perceived behavioral control can be addressed through empowering programs and social learning trainings within local decision processes that target urban transitions.

CRediT authorship contribution statement

Katharina Goetting: Writing – review & editing, Writing – original draft, Visualization, Software, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Sophia Becker:** Writing – original draft, Supervision, Funding acquisition.

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Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT in order to improve language style and readability. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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.

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Appendix A

Parking space redesign scenario

To answer the following questions, imagine this situation. Half of the parking spaces and parking lanes in the center of your locality are to be transformed equally into bike lanes, green areas and public squares. Afterwards, no cars are allowed to park in these spaces anymore, but they can be used for other things. The remaining parking places can be used equally by all road users (e. g. for cars, taxis, e-scooters, cargo bikes, etc.). Nothing will change for public transport and further bike lanes. You have various options to participate in the transformation.

Appendix B

Materials

Attitude towards political participation. An eight-item scale adapted from Huijts et al. (2014) assessed participants' attitudes towards political actions as a response to the parking space reallocation. Participants were asked: "How useful or useless do you find the following actions regarding parking space reallocation?" 1) taking part in an information event; (2) contributing your ideas and critics at an event; (3) contributing your ideas or critics via an online platform; (4) taking part in a citizens' assembly; (5) voting for a party that represents your opinion on the transformation; (6) taking part in a demonstration; (7) signing a petition; and (8) writing a social media post or reader's letter. Response options ranged from 1 = *very useless* to 7 = *very useful.*

Perceived behavioral control. Participants rated the perceived difficulty or ease of various actions related to political participation on a Likert scale from 1 = *very difficult* to 7 = *very easy* following the question: "Do you think it is difficult or easy to do the following actions?" Items included attending an information event, contributing ideas or criticism at an event, contributing ideas or criticism via online platforms, participating in a citizens' assembly, choosing a party representing their opinion on the transformation, participating in a demonstration, signing a petition, and writing a social media post or reader's letter. This scale was also developed following Huijts et al. (2014).

Social norm. A social norm scale was developed for the current study following Klaus et al. (2020). Participants were asked: "To what extent do you agree with the following statements: 1) people who are important to me (e.g., friends, family) would participate in the aforementioned activities related to the redesign of parking spaces; and 2) people who are important to me (e.g., friends, family) would expect me to participate in the aforementioned activities related to the redesign of parking spaces." Response options ranged from 1 = *strongly disagree* to 7 = *strongly agree*.

Affect. For assessing affect, we modified and condensed a scale utilized by Klaus et al. (2020), encompassing both negative (sad, angry, afraid) and positive affect (glad, hopeful). Respondents were asked: "How do you feel when you think about this urban street redesign?" The intensity for each item was measured on a scale ranging from 1 = *not at all* to 7 = *strong* (e.g. not at all sad to very sad). Positive and negative affect was used separately in the structural equation model.

Political interest. Political interest was measured by participants' agreement with statements related to their involvement in discussions and opinions on topics in their locality and adapted from Baber (2020). Participants were asked: "To what extent do you agree with the following statements" Items included 1) I take part in discussions about political topics in my neighborhood; 2) I like to express my opinion about topics in the neighborhood; 3) I like to take part in discussions about topics in my neighborhood; and 4) I mainly deal with various political topics in the area where I live. Response options ranged from 1 = *strongly disagree* to 7 = *strongly agree*.

Political efficacy. For measuring political efficacy, we adapted items from Beierlein et al. (2014) and Baber (2020) for internal political efficacy, assessing participants' agreement with following statements: (1) I am well-informed and know more about local political issues than people of my age; (2) I understand important political questions well; and (3) I feel capable of actively participating in political discussions. Besides, we incorporated one item on external political efficacy: "People like me have no influence on government actions." Response options ranged from 1 = *strongly disagree* to 7 = *strongly agree*.

Trust in municipal administration. A four-item scale adapted from Klaus et al. (2020) assessed participants' trust in the municipal administration. Items included: (1) I trust the municipal administration; (2) I am confident that the municipal administration at my place of residence is competent; (3) I think the municipal administration acts on my behalf; and (4) I think that the municipal administration acts in the interest of society. Response options ranged from 1 = *strongly disagree* to 7 = *strongly agree*.

Recruiting network. This scale was developed based on Holecz et al. (2022). Participants' engagement was measured by their agreement regarding the following statements (1) I spend a lot of time on local citizens' initiatives, an association, or similar groups where I live; and (2) I often inform myself through personal conversations (e.g. with acquaintances, neighbors) about issues in the area where I live. Responses were rated on a scale from 1 = *strongly disagree* to 7 = *strongly agree*.

Subjective time. For assessing subjective time, we adopted two items of the first dimension (sufficient time) of time wealth scale developed by Geiger et al. (2021). Again, participants were asked: To what extent do you agree with the following statements? (1) I have plenty of spare time; and (2) I have enough time to do the things that are important to me. The response scale ranged from 1 = *strongly disagree* to 7 = *strongly agree*.

Income. This was assessed as monthly net household income, using an open-ended response format. Participants who refused to answer the open-ended response had the option to respond on a scale with 500€ increments from 500€ or less to 10,000€ or more. This scale was adopted from Saravia (2023).

Education. Participants provided information about their school education (six categories from still in school until high-school graduation (Abitur)) and additionally indicated their vocational training (eleven categories from no vocational training to academic degree) following a scale from Saravia (2023). Participants with an academic degree could further specify their degree, choosing between seven categories from Bachelor to Doctorate. Subsequently, eight categories were formed following the ISCED 2011 classification. This scale was adopted from Saravia (2023).

Work and care hours. These were obtained through an open-ended response format, reporting the number of hours per week. For participants who did not provide open-ended responses, categorical variables were employed. Response option on the categorical variables were full-time (employed or in training/studies/voluntary military service), part-time (employed or in training/studies/voluntary military service), mini job, parental leave, managing household (without employment), no employment or (pre-)retirement. We used the work hours scale from Saravia (2023) to assess work hours as well as care hours.

Political participation intention. This was measured by an eight-item scale developed for the current study following Huijts et al. (2014). Participants were asked: "There are several ways to express your opinion on the urban street redesign. How likely would you be to take the following actions? 1) take part in an information event; (2) contribute your ideas and critics at an event; (3) contribute your ideas or critics via an online platform; (4) take part in a citizens' assembly; (5) vote for a party that represents your opinion on the transformation; (6) take part in a demonstration; (7) sign a petition; and (8) write a social media post or reader's letter. Response options ranged from 1 = *very unlikely* to 7 = *very likely*.

Mobility behavior. This was measured following a large representative mobility survey in Germany (Lanzendorf et al., 2024; Nobis and Kuhnimhof, 2018). First, daily mobility (private car, car sharing, public transport, private bike, cargo bike, bike sharing, e-scooter, by foot, others) was determined on a five-level Likert scale from "never" to "(almost) daily" to determine the proportionate car use. Subsequently, an average number of days per month was assigned to the frequency categories of the scale (almost daily = 22, 1–3 times per week = 8, 1–3 times per month = 2, less frequently than monthly, never = 0) and used to calculate the relative frequency per person for all means of transport.

Gender. This information was obtained from the panel provider, exclusively employing a binary classification (male/female). Additionally, we measured social gender on a seven-point scale from masculine to feminine, following Döring (2013). Participants were presented with an information text and had the option to specify their gender identity in an open-response format if they did not identify with the scale. Unfortunately, due to numerous missing values in this variable, we had to utilize the binary variable for our analysis.

Appendix C

Bivariate correlation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Political interest	**.827**															
2 Political efficacy	.65***	**.755**														
3 Trust	.06**	.05**	**.907**													
4 Attitude	.42***	.27***	.18***	**.631**												
5 Perceived behavioral control	.38***	.44***	.12***	.52***	**.619**											
6 Negative affect	.04	−.04*	−.32***	−.18***	−.11***	**.882**										
7 Positive affect	.00	.04*	.28***	.22***	.12***	−.88***	**.908**									
8 Intention to participate	.61***	.48***	−.03	.59***	.45***	.09***	.00	**.63**								
9 Income	.07***	.19***	.03	.04	.11***	−.05**	.04	.02	–							
10 Education	.07***	.21***	.08***	.11***	.14***	−.13***	.12***	.06**	.27***	–						
11 Work hours	−.01	.04	−.03	.10***	.17***	.05*	−.04*	.04*	.21***	.13***	–					
12 Care hours	.03	−.06**	−.01	.06**	.02	.00	.01	.02	−.07**	.04	−.05*	–				
13 Recruiting network	.69***	.48***	.07***	.31***	.28***	.06**	−.02	.47***	.03	.04*	−.01	.08***	**.618**			
14 Social norm	.40***	.30***	.11***	.49***	.34***	−.12***	.21***	.58***	.03	.06**	.02	.01	.33***	**.816**		
15 Subjective time	.00	.05*	.10***	−.10***	−.06**	−.08***	.06**	−.05**	−.00	−.11***	−.49***	−.29***	−.02	−.01	**.885**	
16 Gender	−.13***	−.30***	.01	.02	−.11***	−.02	.03	−.13***	−.14***	−.11***	−.19***	.20***	−.09***	−.08***	−.07***	–

Note. The diagonal in bold represents the square root of the average variance extracted (AVE), while the lower triangle displays the correlation coefficients.

Data availability

Data will be made available on request.

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