

Reasonable or radical? First-order, second-order, and meta-stereotypes of different climate activists among the German public and climate activists

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ABSTRACT

Climate activists engaging in public protest can play a vital role in accelerating the socio-ecological transformation. How activists are viewed likely influences the success of their actions. Across two German samples, we investigated how (a) the public viewed climate activists (first-order stereotypes), (b) how the public thought the public viewed climate activists (second-order stereotypes), and (c) how climate activists thought the public viewed them (meta-stereotypes). Unconventional climate activists (street-glueers) were viewed much more negatively than conventional climate activists (street-marchers) by a representative sample of the German public ($N = 1,002$). The public overestimated minority stereotypes, and underestimated majority stereotypes—indicating pluralistic ignorance. Regarding street-marchers, the public's second-order stereotypes were overly negative, meaning the public thought that more members of the public viewed street-marchers negatively than was actually the case. By contrast, the public's second-order stereotypes of street-glueers were overly positive. More negative first- and second-order stereotypes among the public were associated with lower activist support; more positive first- and second-order stereotypes were positively associated with more activist support. In a convenience sample of German climate activists ($N = 267$), street-marchers thought they were viewed more negatively by the public than they actually were, whereas street-glueers thought they were viewed more positively—the first finding being in line and the second at odds with intergroup negativity bias. Both activist groups also underestimated majority stereotypes and overestimated minority stereotypes about themselves (pluralistic ignorance). The results support both theoretical accounts of pluralistic ignorance and intergroup negativity bias—although they support pluralistic ignorance more substantively—suggesting the biases are not mutually exclusive. These insights are important because the biased social reality experienced by the public and climate activists can have profound influences on judgments and decision-making around climate change.

To prevent climate collapse, urgent and profound socio-ecological transformation is required. Climate activists can contribute to accelerating such transformation (Brehm & Gruhl, 2024; Fritz et al., 2023; Kenward & Brick, 2024; Simpson et al., 2022; Sisco et al., 2021) by engaging in strenuous (time, money, energy) and risky (financial, social,

legal, physical; Kirsop-Taylor et al., 2023) activities, such as conventional (e.g., lawful marches) or unconventional protests (e.g., sit-ins or street blocks as common methods of civil disobedience¹).

Views of such actions and of the people engaging in them (i.e., stereotypes) influence activists' success (e.g., Bashir et al., 2013; Orazani

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¹ Civil disobedience refers to peaceful, deliberate, and often collectively and publicly enacted noncompliance with laws to win attention or support for addressing a societal issue.

et al., 2021; Stenhouse & Heinrich, 2019). Most current research is concerned with the public's *first-order stereotypes* about climate activists, while we know much less about the public's *second-order stereotypes*, and climate activists' *meta-stereotypes*. First-order stereotypes are the views a *perceiver* has of a *person*. In the present study, first-order stereotypes refer to what the German public thinks about climate activists. Second-order stereotypes are those that a *perceiver* believes others have of a *person* (Perner & Wimmer, 1985). In this study, second-order stereotypes refer to what the German public thinks the German public thinks about climate activists. Meta-stereotypes are the stereotypes a *perceiver* believes *others* have of them. In our study, meta-stereotypes refer to what climate activists think the German public thinks about them (see Fig. 1 for an illustration). Additionally, theoretical predictions of how second-order and meta-stereotypes may differ from first-order stereotypes are not easily reconciled.

Consequently, here we document first-order and second-order stereotypes of climate activists among the general public, and meta-stereotypes in an activist sample. We compare second-order and meta-stereotypes to first-order stereotypes to test for the presence of pluralistic ignorance and intergroup negativity bias. Lastly, we investigate how first- and second-order climate activist stereotypes among the public relate to activist support. Together, our findings aim to advance theoretical understanding because predictions from theoretical accounts describing stereotype misperceptions diverge. On a practical level, these insights are important for promoting socio-ecological transformation (Bolderdijk & Jans, 2021; Bouman & Steg, 2022; Kurz et al., 2020; Noelle-Neumann, 1993), and they are relevant for the literature on social cohesion and harmony (Ahler, 2014; Graham & Svolik, 2020; Judge et al., 2023; McCoy et al., 2018) and on democratic decision-making (Graham & Svolik, 2020; McCoy et al., 2018).

1. Different types of stereotypes about climate activists

The *Stereotype Content Model* (SCM; Fiske et al., 2002) and the *Behaviour from Intergroup Affect and Stereotypes (BIAS) map* (Cuddy et al., 2007) describe how people form stereotypes based on perceived group characteristics or traits. Specifically, the perceiver uses the most salient social group the person they are stereotyping belongs to (e.g., Fridays for Future, climate deniers, farmers) and considers what this group is believed to be like (Yzerbyt, 2016). These stereotypes subsequently influence how perceivers feel about and behave towards the person have stereotyped (Cuddy et al., 2007; Fiske et al., 2006).

The SCM and BIAS map are well supported empirically, also in climate and environmental contexts. Cuddy et al. (2009) showed that stereotypes reliably fall into the two dimensions of warmth and competence across countries differing in cultural tightness, and for a wide range of societal groups, differing in occupation, gender, ethnicity, religion, and more (Cuddy et al., 2009; Eckes, 2002; Fiske & Cuddy, 2006). Crucially, Cuddy and colleagues (2007) demonstrated that different warmth-competence combinations elicit specific behaviours, friendly or hostile, towards the targets of first-order stereotypes (even when the stereotyped are animals; Sevillano & Fiske, 2019), such as facilitating and helping, or neglecting and harming. Building on the SCM, Li and colleagues (2023) demonstrated that people behaving pro-environmentally were perceived as warmer and more competent and subsequently as more employable than those not behaving pro-environmentally.

Three types of stereotypes have been defined (Fig. 1), all of which influence attitudes and behaviours towards the stereotyped (e.g., Finkelstein et al., 2013; Lees & Cikara, 2020; Moore-Berg et al., 2020). First-order stereotypes are the views a *perceiver* has of a *person*. Second-order stereotypes are those that a *perceiver* believes others have of a *person* (Perner & Wimmer, 1985). Meta-stereotypes are the stereotypes a *perceiver* believes *others* have of them.

1.1. First-order stereotypes about climate activists

People hold a range of positive (e.g., nature-loving, pro-social; Klas et al., 2018; Li et al., 2023; Minson & Monin, 2012) and negative (e.g., annoying, egoistic, Earle & Hodson, 2017; Minson & Monin, 2012; van de Grint et al., 2021; Richetin & Perugini, 2022; Steentjes et al., 2017) first-order stereotypes about people who behave pro-environmentally, such as, vegans/vegetarians, organic consumers, and conservationists. Some of those positive and negative stereotypes also apply to climate activists—defined here as those engaging in public protest—while others seem more unique to activists (e.g., preachy, aggressive, stubborn; Bashir et al., 2013; Klas et al., 2018). Generally, those engaging in more everyday types of pro-environmental behaviour tend to be viewed more positively than climate activists (Klas et al., 2018; Li et al., 2023), and among climate activists, those engaging in conventional protest (e.g., lawful marches) are viewed more positively than those engaging in more unconventional protest (e.g., sit-ins or street blocks; Dablander et al., 2024; Klas et al., 2018; Swim & Geiger, 2018; Simpson et al., 2022). Importantly, first-order stereotypes of climate activists can be ambiguous in that people can hold negative and positive activist stereotypes at the same time (e.g., whiny but courageous; Swim & Geiger, 2018).

Consequences of first-order stereotypes abound. If climate activists are viewed negatively, people are less likely to be influenced by them (e.g., take suggestions, copy behaviour) and more likely to socially reject them (Bashir et al., 2013; Bolderdijk et al., 2018; Feinberg et al., 2020; Markowski & Roxburgh, 2019; Sparkman & Attari, 2020; Stenhouse & Heinrich, 2019). On a societal level, negative stereotypes inhibit intergroup contact (Yzerbyt & Demoulin, 2010), increase conflict, and decrease social cohesion and harmony (Lemmer & Wagner, 2015; Shelton et al., 2014; cf. Hässler et al., 2020); meaning they can slow down socio-ecological transformation. Positive stereotypes of activists, on the other hand, are associated with increased support for the activists (Bauernschmidt et al., 2023). Nevertheless, there is also some evidence suggesting that activists might ultimately be successful at influencing others *despite* or *because of* the persistence of negative stereotypes. In Switzerland, the UK, and Germany, climate protests have been longitudinally associated with increased climate change concern and climate action (Brehm & Gruhl, 2024; Fritz et al., 2023; Kenward & Brick, 2024), despite negative public perception and stereotyping of the climate activists (Bergmann, 2019; Dablander et al., 2024; Farinha & Rosa, 2022; von Zabern & Tulloch, 2020).

1.2. Second-order and meta-stereotypes about climate activists

Second-order and meta-stereotypes both describe what individuals think others think. They can be biased when compared with first-order stereotypes (Mize, 2024), that is, they can be systematically different from first-order stereotypes. These systematic differences between first-order, second-order, and meta-stereotypes can be described by at least two possible, not necessarily independent, theoretical accounts: pluralistic ignorance and intergroup negativity bias. While pluralistic ignorance seems more readily applicable to second-order stereotypes and intergroup negativity bias to meta-stereotypes, the following review of the literature will show, that, especially when looking at meta-stereotypes, it is unclear whether pluralistic ignorance and intergroup negativity bias can both be present or whether they are mutually exclusive phenomena. Readers should note that both biases have mainly been researched in the context of non-stereotype climate beliefs (e.g., scientific focused climate beliefs, like is climate change occurring and are humans partly or fully responsible) and that research on biased second-order and meta-stereotypes is in much earlier stages (Mize, 2024). Thus, in the following brief review of the literature on the two biases, we also include research on non-stereotype climate related beliefs. We start with reviewing literature on pluralistic ignorance before turning to intergroup negativity bias as a second theoretical perspective.

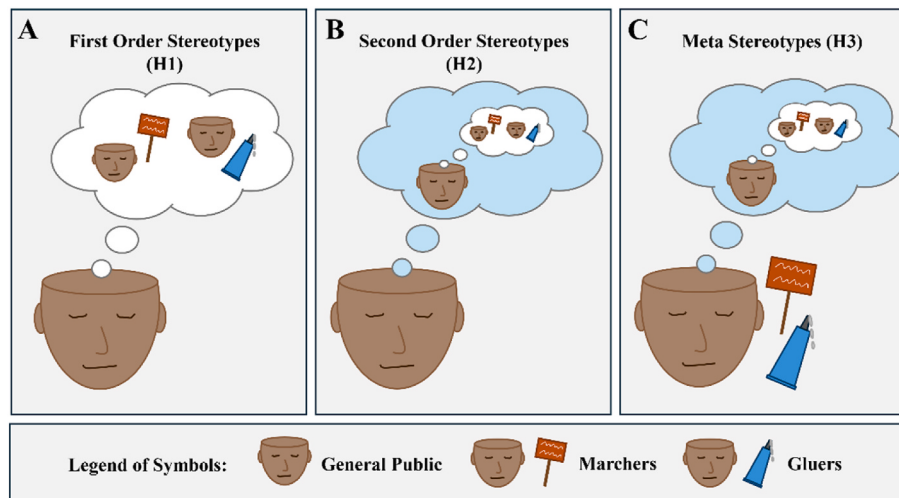


Fig. 1. Types of stereotypes tested in the present study.

Note. This visual illustrates the different stereotypes investigated: first-order (group of hypotheses H1), second-order (group of hypotheses H2), and meta-stereotypes (group of hypotheses H3).

(A) How members of the public view climate activists (street-marchers and street-glurers).

(B) How members of the public believe other members of the public view street-marchers and street-glurers.

(C) How street-marchers and street-glurers believe members of the public view street-marchers and street-glurers.

Broadly defined, pluralistic ignorance describes a situation where a group of people collectively think that others' beliefs differ from their own beliefs, when this is not the case (Sargent & Newman, 2021). More narrowly defined, pluralistic ignorance describes the collective tendency of people to underestimate the prevalence of majority beliefs and overestimate the prevalence of minority beliefs (Korte, 1972; Miller & McFarland, 1991; O'Gorman, 1986). In the following, we will work with this narrower definition of pluralistic ignorance (for an overview of debates and nuances around the concept of pluralistic ignorance, see Miller, 2023; Sargent & Newman, 2021). While this specific form of pluralistic ignorance has—to our knowledge—not yet been demonstrated for second-order stereotypes, it is well-supported for non-stereotype climate related beliefs. Geographically diverse studies show that people underestimate how many others believe that human-caused climate change is real (Ballew et al., 2019; Ballew et al., 2020; Geiger et al., 2023; Leviston et al., 2012; Mildenerberger & Tingley, 2019) and concerning (Geiger & Swim, 2016; Leviston et al., 2024; Sparkman et al., 2022), are willing to contribute financially to fighting climate change (Andre et al., 2024), and support climate policies (Sparkman et al., 2022). Pluralistic ignorance can lead to conformity to misperceived norms, which can inhibit factors important for socio-ecological transformation, including self-efficacy (Leviston et al., 2024), pro-environmental behaviour (Ballew et al., 2020; Leviston et al., 2024), support for climate action and policy (Andre et al., 2024; Leviston et al., 2012; Mildenerberger & Tingley, 2019; Sparkman et al., 2022), and willingness to discuss climate change with others (Ballew et al., 2019; Geiger et al., 2023; Geiger & Swim, 2016). To reiterate, this literature investigates beliefs about the climate beliefs held by others (e.g., if climate change is real) and not beliefs about those who hold these beliefs (e.g., what are people like who think climate change is real). Conceivable negative consequences of inaccurate second-order stereotypes warrant investigating them further. For example, if the prevalence of negative stereotypes was overestimated, this overly negative norm towards activists could result in more hostility towards activists and reduced activist support.

Intergroup negativity bias, like pluralistic ignorance, describes how people systematically err when trying to gauge what others think. Specifically, it describes the expectation of people that outgroup members—that is, others from a social group that the individual does not feel part of or identifies with—see them more negatively than do members of

their ingroup (Krueger, 1996; Sigelman & Tuch, 1997; Spencer et al., 2016; Vorauer et al., 1998; Waytz et al., 2014). Studies have shown that people frequently overestimate the extent to which the outgroup stereotypes them negatively; in other words, they have overly negative meta-stereotypes (Kteily & Bruneau, 2017; Lees & Cikara, 2020, 2021; Mernyk et al., 2022; Moore-Berg et al., 2020; Ruggeri et al., 2021; Vorauer et al., 1998; Vorauer et al., 2000; Yzerbyt, 2016; but see also Finkelstein et al., 2013; Lees et al., 2022; Saroglou et al., 2011 for evidence of overly positive meta-stereotypes). Note that while pluralistic ignorance primarily focusses on belief prevalence (frequency, percentages), intergroup research primarily focusses on belief (or stereotype) valence (positive, negative). Thus, from the studies just mentioned, it often remains unclear whether a certain belief that an outgroup holds about an ingroup (i.e., valence) is a majority or a minority belief (i.e., prevalence). Consequently, at this point we do not know whether pluralistic ignorance and intergroup negativity co-exist or are mutually exclusive. Last but not least, intergroup negativity bias is most consistent in situations in which in- and outgroup a) are salient (Druckman et al., 2022; Vorauer et al., 2000), b) are particularly different from each other (Druckman et al., 2022), c) are aware of mutual stereotyping (Vorauer et al., 2020), d) compete for resources (Lees & Cikara, 2020), or e) lend a strong group identity (Frey & Tropp, 2006; Westfall et al., 2015).

To date, it has not been investigated whether there is intergroup negativity bias in climate activist stereotypes. For example, Wehbe and colleagues (2023) do investigate the content of vegans' meta-stereotypes, but not whether the meta-stereotypes align with the respective first-order stereotypes. Vegans did expect to be viewed negatively by omnivores and meat-reducers, but it remains unclear whether they expected to be viewed more negatively than was really the case (Wehbe et al., 2023). Such negative meta-stereotypes—accurate or not—have detrimental consequences, which has so far been demonstrated mostly for vegans. Believing that others will dislike them makes vegans anxious in social situations (Williams et al., 2023), decreases their wellbeing, leads them to hide their veganism, communicate apologetically (Bolderdijk & Cornelissen, 2022; Greenebaum, 2012; Markowski & Roxburgh, 2019), or return to a vegetarian or omnivorous diet (Salmivaara et al., 2022). For climate activists, misperceived meta-stereotypes might have particularly severe consequences, as activists have the declared goal to influence others (Fisher, 2019; Fisher & Nasrin, 2020), whereas among vegans, a significant proportion do not

have that declared goal (Larsson et al., 2003). If activists think they are perceived more positively than is true, they might continue using ineffective communication or protest strategies. If they think they are perceived more negatively than they really are, they might alter communication or protest strategies that are actually working, become discouraged, suffer emotionally, or self-silence (Pennington et al., 2018; Prosser et al., 2024).

It remains unclear whether bias in second-order and meta-stereotypes is well-described by pluralistic ignorance or intergroup negativity or potentially both. The different foci on prevalence and valence make the findings on the two biases hard to reconcile: Pluralistic ignorance studies have not explicitly studied valence, and intergroup negativity studies have not explicitly studied prevalence. Additionally, studies on meta-stereotypes in climate-relevant contexts (veganism; Wehbe et al., 2023) have not investigated the accuracy of meta-stereotypes.

2. The present study

We identified multiple research gaps from the reviewed literature. First, stereotype research on climate activists has largely focussed on first-order stereotypes, while second-order and meta-stereotypes of climate activists are under-researched, despite their wide-reaching implications. While misperception research has examined stereotypes (e.g., Finkelstein et al., 2013) and non-stereotype climate change-related beliefs (Sparkman et al., 2022) separately, we bring these research traditions together. Lastly, it is unclear whether pluralistic ignorance and intergroup negativity bias are co-existing or mutually exclusive perception biases—an important theoretical research gap.

We address these research gaps in the present study, surveying the German general public² and climate activists about climate activist stereotypes. Based on their relevance for theory (e.g., Simpson et al., 2022) and practice (e.g., Buzogány & Scherhauser, 2022; Pfannkuche, 2023), we investigate stereotypes of activists participating in lawful street-marches as exemplars of conventional climate activists (henceforth: street-marchers), and activists blocking roads by glueing their hands to the road surface as exemplars of unconventional climate activists (henceforth: street-glueers). We have four aims: First, we aim to replicate previous findings that the general public's first-order stereotypes of unconventional activists are more negative than those of conventional activists (H1a-d). Second, we test whether there is pluralistic ignorance when comparing the public's first- and second-order activist stereotypes (H2a-b). Specifically, we expect the public to underestimate the prevalence of majority stereotypes and overestimate the prevalence of minority stereotypes. Third, we test whether there is pluralistic ignorance and/or intergroup negativity bias when comparing activists' meta-stereotypes to the general public's first-order activist stereotypes (H3a-c). Given that most members of the public are non-climate activists, we expect to find intergroup negativity bias. Specifically, we expect that climate activists will overestimate the prevalence of negative stereotypes and underestimate the prevalence of positive stereotypes the public has of them. However, we explore whether there is also pluralistic ignorance, that is, whether climate activists underestimate majority stereotypes and overestimate minority stereotypes about themselves. Finally, we test how the general public's first- and second-order stereotypes correlate with their support for activists (H4a-d, H5a-d). We list all hypotheses in Table 1 and illustrate the different stereotypes under investigation (first-order, second-order, meta) in Fig. 1.

² For our reasoning behind comparing the general public and climate activists (as opposed to non-activists and climate activists), see Supplementary Section 1.

Table 1
Overview of hypotheses.

Number	Stereotype	Hypothesis
First-order stereotypes: What the public thinks about street-marchers compared to street-glueers		
H1	First-order	The public will find street-marchers (a) more 'reasonable', less 'radical' (b), less 'annoying' (c), and less 'brave' (d) than street-glueers.
Second-order stereotypes: What the public thinks the public thinks about street-marchers and street-glueers		
H2	Second-order (PI)	(a) The public will overestimate minority stereotypes ^b and underestimate majority stereotypes about street-marchers. (b) Same for street-glueers.
Meta-stereotypes: What street-marchers and street-glueers think the public thinks about street-marchers and street-glueers		
H3	Meta (INB)	(a) Street-marchers underestimate the prevalence of positive stereotypes ('reasonable', 'brave') of themselves, and overestimate the prevalence of negative stereotypes ('radical', 'annoying'). (b) Same for street-glueers. (c) Street-marchers overestimate the prevalence of negative stereotypes ('radical', 'annoying') to a smaller extent than street-glueers.
Stereotype consequences: How first- and second-order stereotypes relate to activist support		
H4	First-order	(a) Negative stereotypes ('radical', 'annoying') are negatively and (b) positive stereotypes ('reasonable', 'brave') positively associated with intended street-marcher support. (c) + (d) Same for street-glueers.
H5	Second-order	Overestimating (a) negative stereotypes ('radical', 'annoying') is negatively, and (b) overestimating positive stereotypes ('reasonable', 'brave') positively associated with intended street-marcher support. (c) + (d) Same for street-glueers.

Note. PI = pluralistic ignorance, INB = intergroup negativity bias.
^a This prediction for brave constitutes an exception to our general prediction that unconventional activists are stereotyped more negatively than conventional ones. We believed street-glueers would be perceived as braver than street-marchers, as glueing is the riskier behaviour (legally, physically, financially; Robinson & Page, 2021). This hypothesis was pre-registered.
^b As preregistered, we did not have prior hypotheses about which stereotypes will come out as majority or minority stereotypes. Instead, before testing any hypotheses, we will check whether a stereotype is a majority or minority stereotype and then work with the above predictions.

3. Methods

We ran two correlational survey studies in a German general public sample and a climate activist sample, using street-marchers as exemplars of conventional activists and street-glueers as exemplars of unconventional activists. The study design, hypotheses, and analysis plan were pre-registered³ and materials, data, and code are available on the Open Science Framework (OSF; <https://osf.io/nufdw/>). This research received ethical approval from the IRB at the University of Vienna (No. 01026).

3.1. Pilot

We ran a pilot study to determine which stereotypes to include and confirm that stereotypes of environmentalists and non-protesting climate activists documented in the literature apply to protesting climate activists and the German context. Sixty participants, recruited on Prolific (inclusion criteria: 18 years or older, not a climate activist,

³ The pre-registration was uploaded after the start of data collection. The panel provider issued a certificate confirming that we received the data on the 9th of November 2023, after pre-registration upload (see OSF, <https://osf.io/nufdw/>).

German) reported their spontaneous associations with street-marchers and street-glueurs in open-ended questions. For details on the pilot procedure and results, see [Supplementary Section 2](#). We confirmed that the stereotypes of non-protesting climate activists documented previously also apply to the context of this study and included four relevant stereotypes in the main study. These stereotypes varied in terms of valence (positive vs. negative) and attitude components (affective vs. cognitive) ([Belanche et al., 2017](#); [Breckler, 1984](#)): ‘reasonable’ (positive, cognitive), ‘radical’ (negative, cognitive), ‘annoying’ (negative, affective), and ‘brave’ (positive, affective).

3.2. Participants and recruitment

3.2.1. Public sample

We collected $N = 1,002$ complete responses online through the research panel Forsa.Omninet (<https://omninet.forsa.de/>), between September and October 2023. Participants were eligible if they were 14 years or older, residing in Germany, and proficient in German. Participants received bonus points for completing the survey, which they could either cash in or donate. The sample was weighted via raking (also known as iterative proportional fitting; [Heeringa et al., 2017](#)) to be representative of the general public in Germany based on German census data (<https://www.zensus2022.de/>) regarding (1) the German federal states, (2) residency in (former) Eastern or Western Germany, and within the Eastern and Western German⁴ subsamples on the characteristics (2a) age, (2b) gender, and (2c) formal education.⁵ Participants were $M = 49.28$ years old ($SD = 19.13$; range = 14 to 88) and politically slightly left of the centre ($M = 4.63$, $SD = 1.82$).⁶ Overall, 0.4% of participants identified as diverse, and 51.0% as female. Their modal highest completed formal education was secondary education (44.7%), followed by lower education (34.0%; see [Table 2](#) for definition of categories). On average, respondents reported identifying to some degree with climate activists in Germany ($M = 3.54$, $SD = 1.09$). Lastly, 20.9% of respondents perceived themselves as part of the group of street-marchers, while no one reported feeling part of the group of street-glueurs. For a detailed overview of sociodemographic information, please refer to [Table 2](#).

3.2.2. Activist sample

We collected data from $N = 267$ climate activists online from November 2023 to January 2024 via convenience sampling, contacting activists through tweets, emails, and at activist meetings. Inclusion criteria were to be at least 18 years old, proficient in German, residing in Germany, and identifying as part of the group of people who engage in marching or glueing for more climate protection. While 663 people clicked the survey link, 396 were not included in the final sample. Of those, 144 did not meet our inclusion criteria ($n = 18$ did not give consent, $n = 9$ did not reside in Germany, $n = 7$ were underage, $n = 110$ were neither street-marchers nor street-glueurs), and 252 people stopped participation at some point in the survey. To incentivise participation, we informed participants that they could vote for their preferred climate activist organisation to receive a 200€ donation at the end of the survey.

⁴ This is a common procedure when working with German research participants, due to persistent and substantial differences between former Eastern and Western Germany ([Pew Research Center, 2019](#)).

⁵ Age categories West (East): 14–27 y.o., 18–24 y.o., 25–34 y.o. 35–44 y.o., 45–59 y.o., 60+ y.o. (14–24 y.o., 25–34 y.o. 35–44 y.o., 45–59 y.o., 60+ y.o.); gender categories: female, male (same); education categories: pupil, secondary school (including without diploma/completion), intermediate secondary education (equivalent to high school diploma or GCSE), higher education entrance qualification/university (equivalent to A-levels or completion of university degree) (same except for absence of pupil category).

⁶ $M = 4.63$ is significantly different from the scale mid-point (5), $t = -6.32$, $p < .001$, $d = -0.21$, 95% CI [-0.27, -0.14].

Table 2

Sociodemographic and group membership information on different included samples street-marcher and street-glueur subsample.

	Public	Activists ^a	Street-marchers	Street-glueurs
	M (SD) or %	M (SD) or %	M (SD) or %	M (SD) or %
				
<i>N</i>	1,002	267	166	101
Self-identified as part of following group				
Street-marchers ('Yes')	20.9%	98.9%	100%	97%
Missing	5.4%	–	–	–
Street-glueurs ('Yes')	0%	37.8%	0%	100%
Missing	1.8%	–	–	–
Self-identified climate activists				
Yes	7.4%	79.4%	68.7%	97.0%
No	87.9%	20.6%	31.3%	3.0%
Missing	4.6%	–	–	–
Identification with climate activists (1 = not at all, 5 = very)	3.56 (1.10)	4.14 (0.68)	4.02 (0.66)	4.34 (0.67)
Missing	1.1%	–	–	–
Age continuous	49.28 (19.13)	35.35 (13.92)	35.23 (13.31)	35.54 (14.95)
Age Groups				
14–29 years	21.8%	43.8%	41.6%	47.5%
30–49 years	26.5%	37.5%	42.2%	29.7%
50–64 years	25.5%	13.9%	11.4%	17.8%
65+ years	26.2%	4.5%	4.8%	4.0%
Missing	–	0.4%	–	1.0%
Gender				
Male	48.6%	53.6%	61.4%	40.6%
Female	51.0%	34.8%	28.9%	44.6%
Diverse	0.4%	6.7%	6.0%	7.9%
Missing	–	4.9%	3.6%	6.9%
Education ^b				
Lower education	34.0%	4.1%	3.6%	5.0%
Secondary education	44.7%	37.5%	40.4%	32.7%
Higher education	19.7%	58.1%	55.4%	62.4%
Missing	1.6%	0.4%	0.6%	–
Political Orientation (0 = left, 10 = right)	4.63 (1.82)	1.30 (1.24)	1.36 (1.31)	1.20 (1.12)
Missing	6.2%	15.4%	14.5%	16.8%
Income				
Under 500€	1.6%	4.5%	3.6%	5.9%
€500€ to €999	2.7%	18.0%	12.7%	26.7%
€1,000€ to €1,499	6.5%	10.1%	10.2%	9.9%
€1,500 to €1,999	9.7%	9.4%	9.6%	8.9%
€2,000 to €2,999	20.5%	13.5%	15.1%	10.9%
€3,000 to €3,999	17.6%	12.4%	10.8%	14.9%
€4,000 to €4,999	12.7%	11.6%	14.5%	6.9%
€5,000 to €5,999	7.5%	3.0%	3.6%	2.0%
€6,000 and over	8.7%	7.1%	9.0%	4.0%
Missing	12.6%	10.4%	10.8%	9.9%
Migration background ^c				
Yes	6.8%	9.7%	7.8%	12.9%
No	93.2%	89.9%	92.2%	86.1%
Missing	–	0.4%	–	1.0%

Note.

^a Street-marchers and street-glueurs.

^b The category ‘Lower Education’ comprises Compulsory Education, Apprenticeship, School for Intermediate Vocational Education; Secondary Education comprises College for Higher Vocational Education, Academic Secondary School, Master Craftsperson School, Post-Secondary VET Course; Higher education comprises University of Applied Sciences, University.

^c ‘Yes’ means either the participant themselves or one or both of their parents migrated to Germany after 1950.

We ended up donating 200€ to Letzte Generation (<https://letztegeneration.org/>), which received the most votes (41.0%), followed by Fridays for Future (13.7%; see [Supplementary Table S3](#) for details).

Participants in the activist sample were $M = 35.35$ years old ($SD = 13.92$; range = 18 to 74) and politically left leaning ($M = 1.30$, $SD = 1.24$).⁷ Regarding gender, 6.7% of participants identified as diverse, and 34.8% as female. Their modal highest level of education was higher education (58.1%), followed by secondary education (37.5%). Identification with climate activists in Germany was at $M = 4.14$, $SD = 0.68$, and 98.9% perceived themselves as part of the group of the street-marchers ($n = 166$), and 1.12% of the group of street-glueers ($n = 3$). Many participants (37.8%) felt that they were part of both street-marchers and street-glueers.

3.3. Power analysis

Sample size of the public sample was predetermined at $N = 1,000$, due to resource considerations and to allow for representativeness. For the activist sample, we ran two a priori power analyses in R, for H3a-b—activists overestimate the negativity of stereotypes the public have of them—and H3c—street-glueers overestimate the negativity of stereotypes the public have of them to a greater extent than street-marchers. Both power analyses were based on two-sided paired sample Wilcoxon tests for robust testing with non-normal data, a statistical significance of $\alpha = .05$, and a power of 90%.⁸ We derived our assumptions concerning the underlying distributions and likely effect sizes from previous research and polls ([More in Common, 2023](#); [Deutsche Presse-Agentur, 2023](#); [Geiger et al., 2023](#); [Grothmann et al., 2023](#); [Hirndorf, 2023](#); [More in, Saldivia Gonzatti et al., 2023](#); [Sparkman et al., 2022](#); [ZDF, 2023](#)). For H3a-b, the calculations returned a sample size⁹ of $n = 51$ and $n = 81$ participants to detect the smallest meaningful misperception of $\geq 10\%$ ([Carey et al., 2022](#)). For H3c, we would need $n = 190$ participants per activist group (street-marchers, street-glueers) to detect a large effect (Cohen's $d = 0.40$). As climate activists are a hard-to-reach population, we aimed to collect data from at least $n = 100$ participants per group, which we deemed feasible, with the ambition to come as close to the required sample size as possible by the end of January 2024. For more details on the power analyses, please refer to the preregistration (<https://osf.io/nufdw/>).

3.4. Materials

The survey was administered in German. Some measures were forward translated from English to German by the first and fifth author. Participants in the public sample and the activist sample responded to the same questions, with the exception of the *support of climate activists* question, which was dropped in the activist sample. Throughout the survey, we prompted participants to “Think about persons who ...”, and then “... participate in a registered protest for more climate protection.” (street-marchers), “... participate in a roadblock for more climate protection and glue themselves to the street.” (street-glueers), followed by different questions concerning the respective type of climate activist. We additionally asked about two types of *social media activists*, namely those posting in favour of more climate protection as well as those posting against more climate protection, but this is not reported here for space reasons.

⁷ $M = 1.30$ is significantly different from the scale mid-point (5), $t = -44.75$, $p < .001$, $d = -2.98$, 95% CI [-3.28, -2.67].

⁸ Power is considered acceptable at $1 - \beta \geq 80\%$. When resources allow, $1 - \beta = 90\%$ is preferred for single-study articles, which do not replicate their findings ([Lakens, 2022](#)).

⁹ We ran the power analysis for each stereotype and activist group, and these were the smallest and largest sample sizes in the range of sample sizes that resulted.

3.4.1. Pluralistic ignorance

We measured pluralistic ignorance with the commonly used proportional questioning method (for use cases, see [Leviston et al., 2012](#); [Mildenberger & Tingley, 2019](#)), where participants indicate what they think and what others think on two distinct response scales in the same survey ([Sargent & Newman, 2021](#)). Specifically, participants indicate what they think on a Likert-type scale with discrete response categories (e.g., strongly disagree to strongly agree), and then estimate the proportion of people who fall into specific categories of the response scale, for example, the proportion of people who would agree. To compare responses from the distinct formats, data is then transformed, as described below in the section on data analysis.

3.4.2. First-order stereotypes

Following the proportional questioning method, participants' *first-order stereotypes* of climate activists were measured with a Likert-type scale with discrete response options. Specifically, we asked participants for their agreement with the statements “Persons who do this [type of activism] are [reasonable, radical, annoying, brave].” on a scale from 1 *strongly disagree*, 3 *partly disagree/agree*, 5 *strongly agree*, for each activism type.

3.4.3. Second-order stereotypes

We measured *second-order stereotypes* of activists by asking “What do you think: What percentage of people in Germany would agree with the following statements? Move the slider below to a percentage that corresponds to your assessment. 0% = No one would agree with the statement, up to 100% = Everyone would agree with the statement.” The statements that followed were, for example, “Persons who [type of activism] are [reasonable, radical, annoying, brave].”

3.4.4. Activist support

In the public sample, we measured *support for climate activists* asking: “Please indicate if you would support or hinder¹⁰ these people in/from achieving their goals.” on a scale from 1 *hinder*, 3 *neither/nor*, 5 *support*, adapted from stereotype research ([Cuddy et al., 2007](#)).

3.4.5. Activism: Identification and past behaviour

We assessed participants' *climate activism identification/group membership* by asking “Do you see yourself as a climate activist?”, and “Do you see yourself as part of the groups of people who engage in the following activities?”, listing all activism types from above, both questions with the response options yes, no. Additionally, we asked “Overall, to what extent do you identify with climate activists in Germany?” with response options *completely, very much, somewhat, little, not at all*.

We assessed participants' *own climate activism* by asking “How often have you engaged in the following activities yourself in the last 12 months?” for all four activism types with the response options *not at all, one to two times, three to five times, more than five times*.

3.4.6. Socio-demographic characteristics

Participants responded to a range of sociodemographic variables, such as age, gender, education, and political orientation. For a full list and exact wording of measures, refer to the preregistration (<https://osf.io/nufdw/>).

¹⁰ We note that ‘oppose’ serves as a natural counterpole in a support scale. We nonetheless used ‘hinder’, as this was more in keeping with the original scale by [Cuddy and colleagues \(2007, p. 635\)](#). Furthermore, while in English, it is possible to ‘oppose someone in achieving their goals’, the German equivalent [‘Jemanden in seiner/ihrer Zielerreichung ablehnen.’] is grammatically incorrect.

3.5. Procedure

The surveys were administered via *forsa.Omninet* (public sample) and *Qualtrics* (activist sample; <https://qualtrics.com>). Participants gave their informed consent, after which they responded to our measures in the following order. First, participants indicated their support for the different activists. We asked this question first (as opposed to after measuring the stereotypes) to avoid participants' recently activated stereotypes biasing their support responses. Subsequently, participants received a prompt to think about a certain type of activist and then responded to all four first-order stereotypes about this activist. This was repeated for all activist types. Next, participants received the question about second-order stereotypes and then, as for first-order stereotypes, responded to all 4 second-order stereotypes for one activist, before moving on to the next activist type. The order of the activist types was randomized upon their first occurrence (i.e., between participants). This order was then kept constant for the remaining survey (i.e., within participants), to reduce mental load. By contrast, we randomized the order of the stereotypes (e.g., reasonable, radical, ...) upon each occurrence, within the same participant. We did not randomize first- and second-order stereotype question blocks as this is required for the proportional questioning method. Last, participants answered questions of identification and group membership, as well as sociodemographic questions. After completion and debriefing, the public sample received their incentives, and the activist sample voted on which activist group should receive the donation.

3.6. Data analysis plan

As we investigated potentially competing predictions, all statistical testing was two-sided to allow for effects in any direction. To correct for multiple testing, we used Bonferroni-corrected alpha levels per group of hypotheses, dividing the conventional threshold $\alpha = .05$ by the number of tests performed for the respective hypotheses (see Table notes in Results for α -levels). Analyses (descriptive and inferential) with the public sample were weighted by the survey weights—except for the appended Wilcoxon tests for robustness checks, which by design cannot integrate fractional weights. Analyses with the activist sample (descriptive and inferential) were unweighted, as distributions of characteristics among German climate activists are unknown. We prepared the data for analyses in R (R Core Team, 2021), using R Studio version 1.3.959 (RStudio Team, 2020), and conducted the analyses using IBM SPSS Statistics (Version 29.0.1.0). Deviations from the preregistration are summarised in [Supplementary Table S4](#).

3.6.1. How did we categorise group membership?

We identified street-marchers and street-glueurs from our activist sample via their self-reported group membership (see Materials). Many participants indicated that they were part of both groups ($n = 166$ street-marchers, $n = 3$ street-glueurs, $n = 98$ both; see [Table 2](#)). As we did not specify membership rules for this case of dual membership, we distinguished by the difficulty of the behaviour participants engaged in: Those who engage in more difficult behaviours (e.g., more risky, costly) have been shown to have a stronger environmental attitude or identity than those engaging in easier behaviours (Kaiser, 2021; Kaiser & Wilson, 2000). Here, glueing is the more difficult (riskier), and marching the easier (less risky), behaviour (Robinson & Page, 2021). Hence, we divided participants into *those who glue and march*, referred to as 'street-glueurs', and *those who only march*, referred to as 'street-marchers'.

3.6.2. Outline of main analyses

For H1a-d—differences in first-order stereotypes of street-marchers and street-glueurs—we calculated two-sided paired-sample *t*-tests comparing the public's first-order stereotypes of street-marchers to the public's first-order stereotypes of street-glueurs.

For testing H2a-b and H3a-b, we first had to transform the data from

the discrete response format (first-order questions) to compare it to participants' proportional guesses (second-order questions). To that end, we generated an 'observed value' of the public's stereotype (first-order) endorsement, which included all participants who 'rather' or 'strongly' agreed that a specific stereotype applies to the respective climate activist group. Accordingly, we added up the weighted percentages of respondents who 'rather' or 'strongly' agreed to the respective question. To give an example, a score of 70% for radical and street-marchers indicates that 70% of respondents in the public sample selected 'rather agree' or 'strongly agree', when asked to what extent they themselves (first-order question) agree that street-marchers are radical. This procedure then enabled us to compare two percentage values in the analyses. Such collapsing of discrete response categories into broader, readily interpretable categories is common in pluralistic ignorance research using proportional questioning (for examples, see Chia & Lee, 2008, p. 61; Mildemberger & Tingley, 2019, p. 1288), as it reduces complexity when asking about others' beliefs. For example, if we did not collapse the response categories 'rather' and 'strongly' agree, we would have to ask participants to guess the proportions of both people who rather agree and/or people who strongly agree that a stereotype applies. Such nuance would arguably make it very hard for participants to produce estimates. For H2a-b—differences between the public's first- and second-order stereotypes—we then calculated one-sample *t*-tests comparing what the public thinks other people from the public think about street-marchers (street-glueurs respectively) to the 'observed value'. For H3a-b—differences between the public's first-order stereotypes and the activists' meta-stereotypes—we calculated one-sample *t*-tests comparing what street-marchers (street-glueurs respectively) think the public thinks of them to the 'observed value'.

For H4a-d and H5a-d, we ran eight multiple linear regressions, four (one per stereotype) for each type of activist. For each of the resulting eight regression analyses, we controlled for sociodemographics by entering them in the first block, followed by one of the four first-order stereotypes in the next block (e.g., reasonable, street-marchers), and followed by the corresponding second-order stereotype in the third block (reasonable, street-marchers). These variables were then regressed on intentions to support the respective activist, in this example, street-marcher support.

4. Results

4.1. First-order stereotypes (Hypotheses 1a-d)

Correlations between all core variables are in [Supplementary Table S5](#). Providing support for hypotheses H1a to H1c, public participants perceived street-marchers as significantly more 'reasonable', $t = -45.70, p < .001, d = -1.46$, less 'radical', $t = 36.68, p < .001, d = 1.17$, and less 'annoying', $t = 36.89, p < .001, d = 1.17$, than they did street-glueurs, with large effect sizes. Contrary to hypothesis H1d, participants found street-marchers 'braver', $t = -12.04, p < .001, d = -0.39$, than street-glueurs, with a small effect size, see [Table 3](#). The results of the *t*-tests and the Wilcoxon tests for robustness checks aligned in terms of the direction and significance of effects (see [Supplementary Table S6.1](#) for details). We also tested whether the mean values presented in [Table 3](#) differed significantly from the scale mid-point, to ascertain whether there was a statistically meaningful endorsement of the respective stereotype in either direction. All mean values differed significantly from the scale mid-point, indicating that participants' directional endorsement of the stereotypes was statistically meaningful (see [Supplementary Table S7](#) for details).

4.2. Second-order stereotypes (hypotheses 2a-b)

To investigate second-order stereotypes and the next set of hypotheses, we first report prevalences of first-order stereotypes, specifically, if they constituted majority or minority stereotypes (see [Fig. 2](#) for

Table 3

Public Sample: Results of t-tests on First-Order Stereotypes.

Stereotype	Evidence ^a	Street-marchers OBS <i>M</i> (<i>SD</i>)	Street-glueurs OBS <i>M</i> (<i>SD</i>)	<i>t</i> (<i>df</i>)	<i>p</i> ^b	Cohen's <i>d</i> 95% CIs
reasonable	✓	3.57 (1.22)	1.65 (0.99)	−45.70 (982)	<.001	−1.46*** [−1.55, −1.37]
radical	✓	2.52 (1.19)	4.23 (1.16)	36.68 (979)	<.001	1.17*** [1.09, 1.25]
annoying	✓	2.57 (1.32)	4.23 (1.22)	36.89 (987)	<.001	1.17*** [1.09, 1.26]
brave	✗	3.15 (1.24)	2.55 (1.52)	−12.04 (972)	<.001	−0.39* [−0.45, −0.32]

Note. OBS = observed.

*Small effect size, ** medium effect size, *** large effect size (Cohen, 1969).

^a ✓ = supports hypothesis, ✗ = does not support hypothesis.

^b Bonferroni-corrected $\alpha = .0125$.

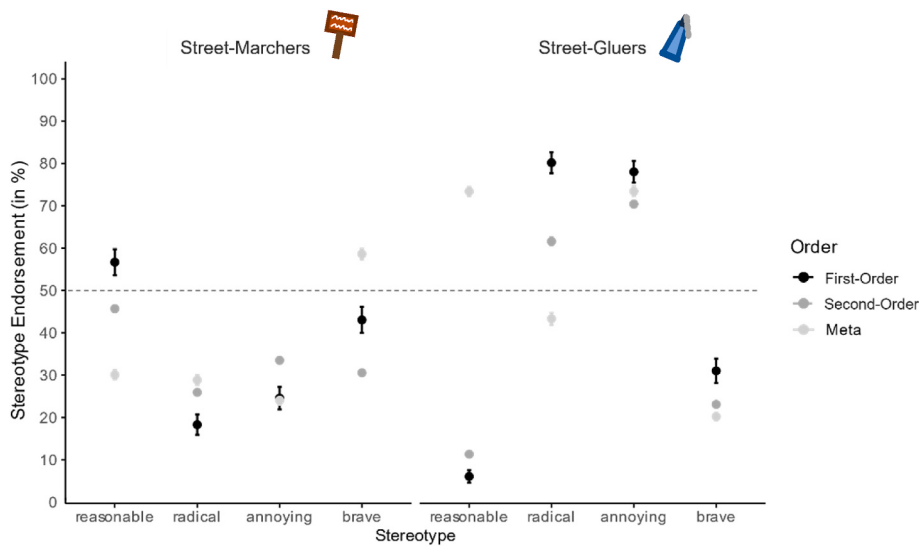


Fig. 2. First-order, second-order and meta-stereotypes among general public and climate activists.

Note. Order = Stereotype order (first, second, meta); FO = first-order stereotypes, SO = second-order stereotypes, Meta = meta-stereotypes, the dashed line represents the 50%-threshold between minority and majority stereotypes.

The colours represent first-order, second-order and meta-stereotypes.

First-order: Datapoints represent the combined weighted proportion of respondents (public sample) who indicated to 'rather agree' or 'strongly agree' to hold a certain stereotype of the respective climate activists, that is, endorse the stereotype.

Second-order: Datapoints represent respondent's (public sample) estimates of how many others (public sample) 'rather agree' or 'strongly agree' to hold a certain stereotype of the respective climate activists, that is, endorse the stereotype.

Meta: Datapoints represent respondent's (activist sample) estimates of how many others (public sample) 'rather agree' or 'strongly agree' to hold a certain stereotype of the respective climate activists, that is, endorse the stereotype.

Error bars represent standard errors of the mean, and for first-order stereotypes the margins of error. Some error bars are not visible, as they are very small in size.

prevalences of all stereotypes). A majority of the general public thought that street-marchers were 'reasonable' (56.6%, 95% CIs [53.5%, 59.7%]), while a minority thought they were 'radical' (18.3%, 95% CIs [15.9%, 20.7%]), 'annoying', (24.5%, 95% CIs [21.8%, 27.2%]) and 'brave' (43.0%, 95% CIs [39.9%, 46.1%]). On the other hand, a majority of Germans thought that street-glueurs were 'radical' (80.2%, 95% CIs [77.7%, 82.7%]) and 'annoying' (78.0%, 95% CIs [75.4%, 80.6%]), while a minority perceived them as 'reasonable' (6.0%, 95% CIs [4.5%, 7.5%]) and 'brave' (31.0%, 95% CIs [28.1%, 33.9%]).

For all stereotypes, except for 'brave', we found pluralistic ignorance (see Table 4 for an overview). For street-marchers, the public overestimated the prevalence of the minority stereotypes 'radical' in the public by 8.4% (95% CI [7.0%, 9.9%], $t = -12.12$, $p < .001$, $d = -0.39$, 95% CI [−0.45, −0.32]), and 'annoying' by 10.0% (95% CI [8.5%, 11.6%], $t = 11.43$, $p < .001$, $d = 0.37$ 95% CI [0.30, 0.43]), and underestimated the prevalence of the majority stereotype 'reasonable' by 9.8% (95% CI [−11.36%, −8.20%], $t = 12.59$, $p < .001$, $d = 0.40$, 95% CI [0.34, 0.47]). For street-glueurs, the public overestimated the

prevalence of the minority stereotype 'reasonable' by 5.6% ([4.8%, 6.5%], $t = 13.50$, $p < .001$, $d = 0.43$ 95% CIs [0.37, 0.50]), and underestimated the prevalence of the majority stereotypes 'radical' by 17.3% ([−19.1%, −15.4%], $t = -18.36$, $p < .001$, $d = -0.59$, 95% CI [−0.65, −0.52]), and 'annoying' by 6.2% (95% CI [−7.8%, −4.6%], $t = -7.70$, $p < .001$, $d = -0.25$, 95% CI [−0.31, −0.18]). For both street-marchers and street-glueurs, 'brave' was a minority stereotype but was underestimated by 11.7% (95% CI [−13.1%, −10.3%], $t = -16.46$, $p < .001$, $d = -0.53$, 95% CI [−0.59, −0.46]) for street-marchers, and by 7.3% (95% CI, [−8.7%, −5.8%], $t = -9.93$, $p < .001$, $d = -0.32$ 95% CI [−0.38, −0.25]), for street-glueurs. These misperceptions were not driven by a minority of particularly 'bad guessers'. Instead, the proportion of respondents who misperceived a stereotype by at least 9.9% in either direction was between 55.9% and 73.0%—except for 'reasonable' ratings of street-glueurs, where the proportion was only 25.1%. Again, the results of the *t*-tests and the Wilcoxon tests for robustness checks aligned in terms of the direction and significance of effects (see Supplementary Table S6.2).

Table 4Public Sample: Results of *t*-tests on First-Order and Second-Order Stereotypes among the Public (Cohen, 1969).

Stereotype	Evidence ^a PI	First-order	Second-order	<i>Diff</i> %	<i>t</i> (df)	<i>p</i> ^b	Cohen's <i>d</i> 95% CIs
		OBS % 	EST <i>M</i> (<i>SD</i>) % 				
Street-marchers 							
reasonable	✓	56.6	46.8 (25.2)	-9.8	-12.12 (977)	< .001	-0.39* [-0.45, -0.32]
radical	✓	18.3	26.7 (23.0)	8.4	11.43 (971)	< .001	0.37* [0.30, 0.43]
annoying	✓	24.5	34.5 (24.8)	10.0	12.59 (971)	< .001	0.40* [0.34, 0.47]
brave	✗	43.0	31.3 (22.2)	-11.7	-16.46 (976)	< .001	-0.53** [-0.59, -0.46]
Street-glueurs 							
reasonable	✓	6.0	11.6 (13.1)	5.6	13.50 (974)	< .001	0.43* [0.37, 0.50]
radical	✓	80.2	62.9 (29.5)	-17.3	-18.36 (980)	< .001	-0.59** [-0.65, -0.52]
annoying	✓	78.0	71.8 (25.2)	-6.2	-7.70 (981)	< .001	-0.25* [-0.31, -0.18]
brave	✗	31.0	23.7 (22.9)	-7.3	-9.93 (975)	< .001	-0.32* [-0.38, -0.25]

Note. PI = pluralistic ignorance, OBS = observed value, EST = estimated value, significant results in bold

* small effect size, ** medium effect size, *** large effect size (Cohen, 1969)

^a ✓ = supporting hypothesis, ✗ = not supporting hypothesis^b Bonferroni-corrected $\alpha = .00625$ **Table 5**Public and Activist Sample: Results of *t*-test on Climate Activists' Meta-Stereotypes and the Public's First-Order Stereotypes (Cohen, 1969).

Stereotype	Evidence ^a		Public OBS %	Meta EST <i>M</i> (<i>SD</i>) %	<i>Diff</i> %	<i>t</i> (df)	<i>p</i> ^b	Cohen's <i>d</i> 95% CIs
	PI	INB						
Street-marchers 								
reasonable	✓	✓	56.6	30.6 (17.9)	-26.0	-18.70 (165)	< .001	-1.45*** [-1.67, -1.23]
radical	✓	✓	18.3	28.6 (18.4)	10.3	7.19 (165)	< .001	0.56** [0.39, 0.72]
annoying	✗	✗	24.5	24.4 (15.4)	0.1	-0.09 (165)	.928	-0.01 [-0.16, 0.15]
brave	✓	✗	43.0	56.1 (20.6)	13.1	8.18 (165)	< .001	0.64** [0.47, 0.80]
Street-glueurs 								
reasonable	✓	✗	6.0	75.5 (16.3)	69.5	42.76 (100)	< .001	4.25*** [3.63, 4.87]
radical	✓	✗	80.2	42.8 (22.5)	-37.4	-16.70 (100)	< .001	-1.66*** [-1.96, -1.36]
annoying	✓	✗	78.0	74.0 (18.6)	4.0	-2.17 (100)	.032	-0.22 [-0.41, -0.02]
brave	✗	✓	31.0	22.9 (16.8)	-8.1	-4.85 (100)	< .001	0.48* [-0.69, -0.28]

Note. PI = pluralistic ignorance, INB = intergroup negativity bias, OBS = observed value, EST = estimated value, significant results in bold

* small effect size, ** medium effect size, *** large effect size (Cohen, 1969)

^a ✓ = supporting hypothesis, ✗ = not supporting hypothesis^b Bonferroni-corrected $\alpha = .00625$

4.3. Climate activists' meta-stereotypes (Hypotheses 3a-b)

The meta-stereotypes of both conventional (street-marchers) and unconventional (street-glueurs) activists were highly inaccurate. Specifically, we found some overall support for both pluralistic ignorance and intergroup negativity bias, with instances where both biases appeared to be present (see Table 5 for details). Street-marchers, on average, underestimated the prevalence of the positive majority stereotype 'reasonable' in the general public by 26.0% (95% CI [-28.8%, -23.3%], $t = -18.70$, $p < .001$, $d = -1.45$, 95% CI [-1.67, -1.23]), and overestimated the negative minority stereotype 'radical' by 10.3% (95% CI [7.5%, 13.1%], $t = 7.19$, $p < .001$, $d = 0.56$, 95% CI [0.39, 0.72]), providing support for both pluralistic ignorance and intergroup negativity. By contrast, supporting pluralistic ignorance, not intergroup negativity bias, street-marchers overestimated the prevalence of the positive minority stereotype 'brave' by 13.1% (95% CI [9.9%, 16.2%], $t = 8.2$, $p < .001$, $d = 0.64$, 95% CI [0.47, 0.80]). Although street-glueurs' meta-stereotypes also provided some evidence for pluralistic ignorance,

there was almost no evidence of intergroup negativity. Street-glueurs overestimated the prevalence of the positive minority stereotype 'reasonable' by 69.5% (95% CI [66.3%, 72.8%], $t = 42.76$, $p < .001$, $d = 4.25$, 95% CI [3.63, 4.87]), and underestimated the prevalence of the negative majority stereotype 'radical' by 37.4% (95% CI [-41.9%, -33.0], $t = -16.70$, $p < .001$, $d = -1.66$, 95% CI [-1.96, -1.36]). By contrast, street-glueurs underestimated the prevalence of the positive minority stereotype 'brave' by 8.1% (95% CI [-11.43%, -4.8%], $t = -4.85$, $p < .001$, $d = -0.48$, 95% CI [-0.69, -0.28]). Both street-marchers and street-glueurs estimated the prevalence of the negative stereotype 'annoying', which is a minority stereotype for street-marchers and a majority stereotype for street-glueurs, rather accurately, with misestimations of 0.1% (95% CI [-2.5%, 2.3%], $t = -0.09$, $p = .928$, $d = -0.01$, 95% CI [-0.16, 0.15]) and 4.0% (95% CI [-7.7%, -0.4%], $t = -2.17$, $p = .032$, $d = 0.22$, 95% CI [-0.41, -0.02]). While street-glueurs' misestimation of 'annoying' was significant and evidenced pluralistic ignorance, the misestimation was very small. Overall, differences between how activists think the public sees them (i.e., their

meta-stereotypes') and how the public actually sees them (i.e., public's first-order stereotypes) seemed to offer more support for a pluralistic ignorance (6 out of 8 stereotypes), rather than an intergroup negativity bias (3 out of 8 stereotypes), account (see Table 5 for details).

Again, it was a majority of respondents whose meta-stereotypes diverged from the observed first-order stereotypes by at least 9.9 % in either direction (between 54.7 % and 98.5 %), indicating that the results were not driven by a minority of particularly 'bad guessers'. The results of the *t*-tests and the Wilcoxon tests for robustness checks aligned in terms of the direction and significance of effects (see Supplementary Table S6.3).

4.4. Stereotypes and activist support (Hypotheses 4a-d and 5a-d)

Overall, all regression models explained medium to large amounts of variance in activist support, with adjusted R^2 values ranging from 0.29 (model 'radical' - > street-gluer support) to 0.44 (model 'reasonable' - > street-marcher support). Controlling for sociodemographics (age, gender, education, political orientation), we found that first-order stereotypes were strongly and significantly associated with activist support for street-marchers ('reasonable': $\beta = 0.35$, $t = 11.90$, $p < .001$, 'radical': $\beta = -0.26$, $t = -8.44$, $p < .001$, 'annoying': $\beta = -0.36$, $t = -12.56$, $p < .001$, 'brave': $\beta = 0.21$, $t = 6.83$, $p < .001$), as well as for street-glueurs ('reasonable': $\beta = 0.34$, $t = 12.37$, $p < .001$, 'radical': $\beta = -0.25$, $t = -8.67$, $p < .001$, 'annoying': $\beta = -0.38$, $t = -13.36$, $p < .001$, 'brave': $\beta = 0.37$, $t = 11.84$, $p < .001$).

While second-order stereotypes were also for the most part significantly associated with activist support, the association was somewhat weaker than for first-order stereotypes, for both street-marchers ('reasonable': $\beta = 0.22$, $t = 7.81$, $p < .001$, 'radical': $\beta = -0.09$, $t = -2.94$, $p = .003$, 'annoying': $\beta = -0.17$, $t = -5.95$, $p < .001$, 'brave': $\beta = 0.15$, $t = 5.02$, $p = .001$), and street-glueurs ('reasonable': $\beta = 0.20$, $t = 7.42$, $p < .001$, 'radical': $\beta = -0.06$, $t = -2.10$, $p = .036$, 'annoying': $\beta = -0.10$, $t = -3.39$, $p < .001$, 'brave': $\beta = 0.02$, $t = 0.65$, $p = .516$). Overall, negative first-order stereotypes were negatively, and positive first-order stereotypes positively associated with support, and added substantially and significantly to the variance explained by the regression models with changes in adjusted R^2 values (between Model 1 and Model 2, see Supplementary Tables S8.1 to S8.4) ranging from 0.06 (model 'brave' - > street-marcher support) to 0.18 (model 'reasonable' - > street-marcher support). Likewise, second-order stereotypes, for the most part, added significantly to the variance explained, although to a much smaller extent (changes in adjusted R^2 values ranging from 0.00 to 0.04 across models). For details of the regression analyses, see Tables 6–9 and Supplementary Tables S8.1 to S8.4.

Of note, the order in which first-order and second-order stereotypes were entered into the regressions did not substantively influence results (see Supplementary Tables S9.1 to S9.4). For example, regardless of the order of input, first-order stereotypes had a larger association with activist support and added more to the variance explained by the regression models, than did second-order stereotypes. Similarly, significance patterns did not change. As we arguably lose explanatory power by entering first-order stereotypes as a binary variable (as opposed to the full 5-point Likert scale), we also ran regressions with the untransformed 5-point Likert scale first-order stereotypes. Again, signs and significance of effects did not change, while betas of first-order stereotypes as well as explained variance were larger in these regressions with the continuous first-order stereotype variable (see Supplementary Tables S10.1 to S10.4).

5. Discussion

We investigated first-order, second-order, and meta-stereotypes of climate activists (specifically street-marchers and street-glueurs) and their implications for supporting activists, inspired by literature on pluralistic ignorance and intergroup biases. To do so, we ran two pre-

registered, correlational surveys among the public and climate activists in Germany. The results add to our understanding of social responses to climate activism and wider consequences for society.

First, we compared stereotypes the public holds of conventional (street-marchers) versus unconventional (street-glueurs) climate activists. We show that unconventional activists were viewed more negatively than were conventional ones, corroborating previous research (Dasch et al., 2023; Feinberg et al., 2020; Simpson et al., 2022). The literature suggests that this difference could be due to unconventional climate activists posing a greater threat to perceivers than conventional activists (Herrmann et al., 2008; Parks & Stone, 2010). More specifically, our respondents found conventional climate activists more 'reasonable', less 'radical', less 'annoying', and 'braver' than they did unconventional climate activists, with large effect sizes. Among these stereotypes, the negative ones likely weigh more heavily and are more consequential for relations between activists and the non-activist members of the public in general, as negative stereotypes tend to be more persistent than positive ones and tend to self-reinforce because they inhibit interactions between the stereotypers and the stereotyped (Denrell, 2005).

Second, we found pluralistic ignorance when comparing the general public's first-order stereotypes of climate activists to their second-order stereotypes of climate activists. For conventional activists, the public overestimated the prevalence of the minority stereotypes 'radical' (by 8.4%) and 'annoying' (by 10.0%) and underestimated the prevalence of the majority stereotype 'reasonable' (by 9.8%). For unconventional activists, the public overestimated the prevalence of the minority stereotype 'reasonable' (by 5.6%) and underestimated the prevalence of the majority stereotypes 'radical' (by 17.3%) and 'annoying' (by 6.2%). In both cases, 'brave' was a minority stereotype, but was underestimated, by 11.7% and 7.3% for conventional and unconventional activists respectively. We suspect that this could be rooted in diverse possible interpretations of 'brave'. People may stereotype anyone as brave who publicly voices their opinion on climate action, be it in favour or against it, and whether the stereotyper agrees with them or not. Brave stereotypes may merely signal that the stereotyped is taking a risk voicing a minority opinion. Thus, it is possible that people stereotype activists generally as brave, regardless of the type of activity performed. Studies investigating free associations with activists in general, that is, not linked to any specific activist activity, do not find 'brave' or 'courageous' as associations, but closely linked characteristics, such as 'strong', 'determined', 'confident' (Bashir et al., 2013, p. 617). Further, the evidence indicates the presence of *relative* pluralistic ignorance, meaning that people's second-order stereotypes are inaccurate, but not to the extent that they perceive a majority stereotype as a minority stereotype and vice versa (see Korte, 1972). These findings are in line with previous pluralistic ignorance research (Andre et al., 2024; Ballew et al., 2019; Ballew et al., 2020; Geiger et al., 2023; Geiger & Swim, 2016; Leviston et al., 2012; Leviston et al., 2024; Mildenerberger & Tingley, 2019; Sparkman et al., 2022), and are among the first to demonstrate pluralistic ignorance in climate activist stereotypes. While the causes of pluralistic ignorance are not yet sufficiently understood (Sargent & Newman, 2021), media exposure might explain some of it (Sargent & Newman, 2021) and in this case may also explain why the public's second-order stereotypes were inaccurate but not that far off. The German public has likely been exposed to more negative than positive media content about climate activists, even including opinion polls giving precise information on what the German public thinks of these activists (just two of many examples: Deutsche Presse-Agentur, 2023; Hirndorf, 2023), which might explain their relatively accurate estimates. Having detected pluralistic ignorance, we can also interpret the valence of the public's second-order stereotypes. Regarding street-marchers, the public's second-order stereotypes were overly negative, meaning the public thought that more members of the public viewed street-marchers negatively than was actually the case. By contrast, the public's second-order stereotypes of street-glueurs were

Table 6

Hierarchical regression of activist support on 'reasonable' controlling for sociodemographics (public sample).

	Street-marchers 				Street-glueers 			
	b	95% CI b	β	p	b	95% CI b	β	p
Model 3 ^a								
Age	0.00	(-0.00, 0.00)	0.00	.881	-0.00	(-0.01, 0.00)	-0.04	.108
Education (<i>ref</i> = <i>lower</i>)								
Secondary	0.08	(-0.04, 0.20)	0.04	.199	0.11	(-0.03, 0.24)	0.05	.119
Higher	0.23	(0.08, 0.39)	0.09	.003	0.24	(0.07, 0.41)	0.09	.006
Gender (<i>ref</i> = <i>male</i>)								
Female	0.06	(-0.05, 0.16)	0.03	.286	0.09	(-0.02, 0.21)	0.04	.120
Diverse ^b	0.36	(-0.44, 1.15)	0.02	.378	0.35	(-0.54, 1.24)	0.02	.442
Pol. Or.	-0.17	(-0.18, -0.12)	-0.30	< .001	-0.22	(-0.25, -0.19)	-0.36	< .001
FO Reasonable OBS	0.76	(0.64, 0.89)	0.35	< .001	1.55	(1.30, 1.80)	0.34	< .001
SO Reasonable EST	0.01	(0.01, 0.01)	0.22	< .001	0.02	(0.01, 0.02)	0.20	< .001
Constant	3.39				2.70			
Adjusted R ²	0.44				0.38			
Delta R ²	0.04				0.04			
N	898				902			

Note. Pol. Or. = Political Orientation (0 *right* to 10 *left*), FO = first-order (0 = *strongly disagree*, *rather disagree*, and *partly agree/disagree*, 1 = *rather agree*, *strongly agree*), SO = second-order (0–100 %), OBS = observed, EST = estimated.

^a Models 1 and 2 can be found in [Supplementary Table S8.1](#).

^b Only n = 4 participants described their gender as 'diverse', do not interpret on its own, only serves as a control variable.

Table 7

Hierarchical regression of activist support on 'radical' controlling for sociodemographics (public sample).

	Street-marchers 				Street-glueers 			
	b	95% CI b	β	p	b	95% CI b	β	p
Model 3 ^a								
Age	-0.00	(-0.01, 0.00)	-0.04	.180	-0.01	(-0.01, -0.00)	-0.08	.006
Education (<i>ref</i> = <i>lower</i>)								
Secondary	0.09	(-0.05, 0.22)	0.04	.219	0.17	(0.02, 0.32)	0.08	.022
Higher	0.30	(0.13, 0.47)	0.11	< .001	0.43	(0.25, 0.61)	0.15	< .001
Gender (<i>ref</i> = <i>male</i>)								
Female	0.09	(-0.03, 0.21)	0.04	.126	-0.01	(-0.13, 0.12)	-0.00	.941
Diverse ^b	0.64	(-0.24, 1.52)	0.04	.153	1.10	(0.14, 2.01)	0.06	.025
Pol. Or.	-0.22	(-0.25, -0.18)	-0.37	< .001	-0.24	(-0.27, -0.20)	-0.39	< .001
FO Radical OBS	-0.70	(-0.86, -0.54)	-0.26	< .001	-0.73	(-0.89, -0.56)	-0.25	< .001
SO Radical EST	-0.00	(-0.01, 0.00)	-0.09	.003	-0.00	(-0.01, 0.00)	-0.06	.036
Constant	4.80				3.91			
Adjusted R ²	0.31				0.29			
Delta R ²	0.01				0.00			
N	882				900			

Note. Pol. Or. = Political Orientation (0 *right* to 10 *left*), FO = first-order (0 = *strongly disagree*, *rather disagree*, and *partly agree/disagree*, 1 = *rather agree*, *strongly agree*), SO = second-order (0–100 %), OBS = observed, EST = estimated.

^a Models 1 and 2 can be found in [Supplementary Table S8.2](#).

^b Only n = 4 participants described their gender as 'diverse', do not interpret on its own, only serves as a control variable.

overly positive.

We also show that stereotypes are consequential for attitudes towards the stereotyped, in line with previous research (Cuddy et al., 2007; Bashir et al., 2013): Controlling for sociodemographic variables, first-order stereotypes and, to a lesser extent, also second-order stereotypes of climate activists were associated with the public's intentions to hinder or support said activists in their goal achievement. While, generally, positive stereotypes were positively associated with activist support, and negative stereotypes negatively, how reasonable and annoying activists were perceived weighed particularly heavily in determining activist support. This is interesting, as reasonable is a more cognitive assessment, for example of the legitimacy and sensibility of the applied strategies and suggested goals, whereas annoying is a more affective evaluation. We also do not know what information the stereotypes about activists were based on. Generally said, the relationship

between socio-demographics, first-order stereotypes, and second-order stereotypes is likely more intricate than can be captured with regression models in a cross-sectional design. For example, a question for future research would be if one of the variables precedes others, or whether relationships between variables may be bidirectional. Do people first become aware of second-order stereotypes, that is, stereotypes others hold of someone, and then form their own (first-order) stereotypes, or vice versa? There is indirect evidence for both directions of influence, namely that second-order stereotypes trigger first-order stereotypes (Thøgersen, 2006), and that first-order stereotypes determine second-order stereotypes, that is when we already have a certain opinion, we are more likely to surround ourselves with others with the same opinion (Williams et al., 2015). While we do employ a certain question order in our study (first-order stereotypes followed by second-order stereotypes, for technical reasons), we cannot gain insight

Table 8

Hierarchical regression of activist support on ‘annoying’ controlling for sociodemographics (public sample).

	Street-marchers 				Street-glueurs 			
	b	95% CI b	β	p	b	95% CI b	β	p
Model 3 ^a								
Age	−0.00	(−0.00, 0.00)	−0.05	.085	−0.01	(−0.01, −0.00)	−0.11	< .001
Education (<i>ref</i> = <i>lower</i>)								
Secondary	0.07	(−0.06, 0.20)	0.03	.282	0.15	(0.01, 0.28)	0.07	.033
Higher	0.32	(0.16, 0.47)	0.12	< .001	0.31	(0.14, 0.48)	0.11	< .001
Gender (<i>ref</i> = <i>male</i>)								
Female	0.05	(−0.06, 0.16)	0.02	.383	0.04	(−0.08, 0.16)	0.02	.531
Diverse ^b	0.76	(−0.05, 1.58)	0.05	.067	0.72	(−0.17, 1.61)	0.04	.110
Pol. Or.	−0.18	(−0.21, −0.15)	−0.31	< .001	−0.19	(−0.22, −0.15)	−0.30	< .001
FO Annoying OBS	−0.90	(−1.04, −0.76)	−0.36	< .001	−1.04	(−1.19, −0.89)	−0.38	< .001
SO Annoying EST	−0.01	(−0.01, −0.01)	−0.17	< .001	−0.00	(−0.01, 0.00)	−0.10	< .001
Constant	4.89				4.13			
Adjusted R ²	0.41				0.37			
Delta R ²	0.00				0.01			
N	886				904			

Note. Pol. Or. = Political Orientation (0 *right* to 10 *left*), FO = first-order (0 = *strongly disagree, rather disagree, and partly agree/disagree*, 1 = *rather agree, strongly agree*), SO = second-order (0–100 %), OBS = observed, EST = estimated.

^a Models 1 and 2 can be found in [Supplementary Table S8.3](#).

^b Only n = 4 participants described their gender as ‘diverse’, do not interpret on its own, only serves as a control variable.

Table 9

Hierarchical regression of activist support on ‘brave’ controlling for sociodemographics (public sample).

	Street-marchers 				Street-glueurs 			
	b	95% CI b	β	p	b	95% CI b	β	p
Model 3 ^a								
Age	−0.00	(−0.00, 0.00)	−0.02	.550	0.00	(−0.00, 0.00)	0.00	.987
Education (<i>ref</i> = <i>lower</i>)								
Secondary	0.15	(0.02, 0.29)	0.07	.029	0.08	(−0.06, 0.23)	0.04	.252
Higher	0.37	(0.20, 0.54)	0.14	< .001	0.18	(0.01, 0.36)	0.07	.041
Gender (<i>ref</i> = <i>male</i>)								
Female	0.06	(−0.06, 0.18)	0.03	.319	0.06	(−0.07, 0.18)	0.03	.362
Diverse ^b	0.45	(−0.43, 1.33)	0.03	.314	1.04	(0.13, 1.95)	0.06	.026
Pol. Or.	−0.22	(−0.25, −0.19)	−0.38	< .001	−0.20	(−0.23, −0.16)	−0.32	< .001
FO Brave OBS	0.45	(0.32, 0.58)	0.21	< .001	0.90	(0.75, 1.05)	0.37	< .001
SO Brave EST	0.01	(0.00, 0.01)	0.15	< .001	0.00	(−0.00, 0.00)	0.02	.516
Constant	4.06				2.48			
Adjusted R ²	0.31				0.34			
Delta R ²	0.02				0.00			
N	894				892			

Note. Pol. Or. = Political Orientation (0 *right* to 10 *left*), FO = first-order (0 = *strongly disagree, rather disagree, and partly agree/disagree*, 1 = *rather agree, strongly agree*), SO = second-order (0–100 %), OBS = observed, EST = estimated.

^a Models 1 and 2 can be found in [Supplementary Tables S8.4](#).

^b Only n = 4 participants described their gender as ‘diverse’, do not interpret on its own, only serves as a control variable.

into these more intricate relationships due to the cross-sectional design of our study.

Third, comparing activists’ meta-stereotypes with the general public’s first-order stereotypes shows that climate activists’ meta-stereotypes are highly inaccurate—with the exception that both types of activists gauged very accurately how many people from the public find them annoying. Here, the results support neither pluralistic ignorance nor intergroup predictions exclusively. Instead, we find a mixed picture, and the nature of misperceptions in meta-stereotypes seems to depend on activist type: While conventional activists’ meta-stereotypes were overly negative (more negative than is true of public opinion), unconventional activists’ meta-stereotypes were overly positive. Thus, we find a similar mixed picture as previous literature on meta-stereotypes, which showed that they can be both overly negative (Kteily & Bruneau, 2017; Lees & Cikara, 2020, 2021; Mernyk et al.,

2022; Moore-Berg et al., 2020; Ruggeri et al., 2021; Vorauer et al., 1998, 2000; Yzerbyt, 2016) and overly positive (Finkelstein et al., 2013; Lees et al., 2022; Saroglou et al., 2011; Lees et al., 2022), depending on context. Those studies suggest that a negativity (rather than a positivity) bias in meta-stereotypes is more likely in competitive, political contexts, which might have also caused the mixed picture in this study.

The competition context in this study can be described as negotiations about how we should mitigate and adapt to climate change. While there are overwhelming majorities in favour of more climate action in most countries of the world (Andre et al., 2024), consensus regarding which policies should address it is lower (Drews et al., 2024; Gerdes et al., 2023; Grothmann et al., 2023; Mehdizadeh et al., 2024). In a similar vein, policies suggested by the types of activists included in this study, for example, a speed reduction on motorways, as requested by Letzte Generation in Germany (a real-world equivalent of

unconventional activists/street-glueers) are very unpopular among the public (e.g., Gerdes et al., 2023; Mehdizadeh et al., 2024). However, regarding conventional and unconventional climate activists, it is hard to say which group would be more 'in competition' with the general public. Unconventional protests may pose more of a threat (i.e., competition) to the status quo—which people naturally favour (Andersson et al., 2023)—as they often propose more ambitious goals than do conventional activists (Simpson et al., 2022). Additionally, they attract more attention to their cause (Brehm & Gruhl, 2024), which might make them more likely to reach their ambitious goals. Consequently, in this case, the street-glueers' gain may feel more like the public's loss than is the case for conventional activists, such as street-marchers like Fridays for Future. On the other hand, one could argue that conventional protests pose a larger threat to the status quo, as they may be more likely to be heard by politicians due to their moderate, more acceptable positions, and thus in turn more likely to achieve their goals.

The observed misperceptions might also be the results of motivated reasoning—a type of self-serving reasoning that helps humans uphold motivation, a positive self-image, and a favourable social standing (Dunning, 2015; Kunda, 1990). Accordingly, unconventional activists' overly positive meta-stereotypes may help maintain the motivation required to endure the risks related to their activism, which are significantly higher than the risks of conventional activists. Doing what they do, unconventional activists like street-glueers risk being sued, fined, incarcerated, physically harmed, and socially excluded. Likewise, when conventional activists show overly negative meta-stereotypes, they may exhibit a basic human tendency to focus on negative information to minimize risks (Unkelbach et al., 2020). Scanning their environment for negative opinions on them may help them anticipate social risks, such as being rejected or excluded (see Markowski & Roxburgh, 2019), which ultimately protects their well-being and social standing (Raihani & Power, 2021). Street-marchers engaging in more conventional activism are also likely more conformist than unconventional activists, like street-glueers and thus more interested in avoiding rejection and exclusion (Bicchieri, 2017), which might further explain the differences in the meta-stereotype inaccuracies between both groups (Bursztyjn & Jensen, 2017).

Based on the results, one could argue that activists should favour conventional forms of protests to gain more public support and approval. However, some research indicates that more unconventional activist groups within movements—while not much supported themselves—play an important role in the conventional groups' success. Specifically, unconventional activists can make conventional activists look more acceptable in comparison and thus increase identification with and support for the conventional activists—a phenomenon referred to as the positive radical flank effect (Dasch et al., 2023; Simpson et al., 2022). Further, research on minority influence suggests that (often unpopular) minorities can nonetheless promote societal change (Bolderdijk & Jans, 2021), for example, by establishing trend norms (Sparkman & Walton, 2017) and pushing society towards tipping points (Centola et al., 2018; Judge et al., 2024).

5.1. Limitations and future avenues

While this research improves our understanding of stereotypes and support regarding climate activists in Germany, we recognize there are limitations that present fruitful directions for future research. Arguably, the adjectives we selected may have additional nuances of meaning. For example, the public may think of street-glueers as unreasonable because they put themselves in danger with their roadblocks, while activists may think they are the reasonable ones because inaction on climate change is dangerous. Thus, our results should always be interpreted paying attention to the specific stereotypes under investigation, without detaching conclusions from them. At the same time, the ambiguities observed open interesting avenues for future research, which could look

more into ambiguous stereotypes than previously (Geiger & Swim, 2016). Some of the stereotypes we investigated overlap with previous activist stereotype research (e.g., 'radical', 'annoying'), while other, more positive, stereotypes had been looked at less frequently (i.e., 'reasonable', 'brave'), meaning we strike a balance between building on the literature and creating novel insights. Importantly, we verified in a pilot study that the stereotypes were relevant to the specific context of our investigation. Similarly relating to issues of question wording, we measured activist support with a hinder-support scale. Future studies, in languages where this might be easier to operationalise, could investigate how different wordings of such scales, for example, the use of an oppose-support scale, influence the results.

Another limitation may be the potential short shelf life of the results, due to the time-sensitivity of pluralistic ignorance research (Sargent & Newman, 2021) and the dynamics of climate activism and public concern (de Moor et al., 2021; Milfont et al., 2021). Having emerged in 2021, Letzte Generation (the real-world equivalent of street-glueers) announced in 2023 that they will stop glueing and move into different tactics (Kurmayer, 2024; van der Ploeg, 2020), including entering EU elections (Neubert, 2024). Similarly, activist stereotypes can change quickly, as could be seen in the public reception of Greta Thunberg's stance on the Israeli occupation and attacks in Gaza (Scally, 2023; UN, 2024). However, this criticism only applies to the direction and strength of stereotypes (i.e., the descriptive data). The differences found between conventional and unconventional activists, and between first- and second-order and meta-stereotypes, followed regularities and theoretical patterns, and are thus more timeless. Regardless, we need to conduct phenomenon-driven, alongside theory-testing research to generate relevant discoveries in behavioural science (Eronen & Bringsmann, 2021; Nielsen et al., 2024).

We acknowledge that while pluralistic ignorance can encompass a wider range of social misperceptions (Sargent & Newman, 2021), we worked with the narrower definition used and documented much in the environmental field (e.g., Andre et al., 2024; Geiger et al., 2023; Sparkman et al., 2022), by focussing on overestimation of minority stereotypes and underestimation of majority stereotypes. Future research into activists might want to expand this definition of pluralistic ignorance and examine which types of pluralistic ignorance misperceptions occur most frequently and under which conditions. While we documented stereotypes of climate activists and some of their consequences, future research could also look at the consequences of meta-stereotypes on climate activists, for example their wellbeing and motivation. Furthermore, how activists perceive the general public and non-activists specifically is also a consequential perspective for relations between those groups and thus for activist success, and has been neglected so far (for a rare exception, see Kutlaca et al., 2020). Importantly, alongside climate activists' meta-stereotypes, future studies might also investigate the public's meta-stereotypes (i.e., what the public thinks climate activists think about the public). There is indirect evidence that the public's meta-stereotypes are possibly also inaccurate; for example, people tend to feel morally threatened by vegans and fear that vegans want to convert them, while many vegans in fact do not judge non-vegans and do not have the declared goal to convert non-vegans either (Larsson et al., 2003). Given that we compared activists to the general public, the latter also including some activists, for reasons referred to above (Supplementary Materials Section 1), future research could also work with different grouping, for example, comparing activists only to non-activists.

More research is also needed to understand the differences in meta-stereotypes between conventional and unconventional activists, for example, by looking into processes behind how meta-stereotypes develop. Similarly, it would be interesting for future studies to investigate how climate activists from different activist groups stereotype each other, particularly as dynamics between activist groups have been shown to influence the perception of the climate movement as a whole. Given research that has shown that unconventional climate activists

may generate support for the climate movement more indirectly (e.g., Simpson et al., 2022), future research may want to measure longer-term outcomes, as support for unconventional climate activists may develop over time despite negative stereotyping. We also acknowledge that outcomes that are more publicly visible may be more strongly influenced by pluralistic ignorance than privately expressed activist support. For example, overly negative second-order activist stereotypes might stop people from publicly expressing their activist support, due to fears of social sanctioning.

Additionally, future studies should document sources of activist stereotypes, as well as whether they can be influenced by interventions (e.g., Lemmer & Wagner, 2015; Shelton et al., 2014; cf. Hässler et al., 2020), to lessen associated negative consequences. Qualitative or diary study methodology might help shed more light on what specifically inhibits cooperation between groups relevant to climate change mitigation (e.g., farmers and street-glueers), and how stereotyping unfolds in daily life (see Hargreaves & Middlemiss, 2020).

Lastly, we chose the types of climate activists to investigate based on their relevance, more specifically, we chose activists that receive much public or media attention, are commonly thought of when thinking of climate activism, and whose effectiveness has received empirical support (Brehm & Gruhl, 2024; Fisher, 2019; Fisher & Nasrin, 2020; Fritz et al., 2023; Kenward & Brick, 2024; Simpson et al., 2022; Sisco et al., 2021; for an overview of pathways and drivers, see Otto et al., 2019). In deciding this, we would have benefitted from comprehensive taxonomies of different climate activists and what sets them apart, which are currently rare (cf. Kirsop-Taylor et al., 2023). Besides, there are other forms of climate activism which satisfy the criteria listed above but were simply beyond the scope of this work (e.g., see Janson, 2022; Setzer & Higham, 2022; UNEP, 2023). We urge future research to come up with taxonomies of climate activism, and particularly to pay more attention to counter-movements or antagonists (particularly powerful ones) to the climate movement. Definitions of and research on counter-movements are currently scarce (Levain et al., 2022; Nielsen et al., 2024), but counter-movements (if they can and should be construed as such) can get a lot of media attention and be influential in climate policymaking (e.g., the farmer's protests in Germany, France, the Netherlands; von der Burchard, 2024). Lastly, acceptability and thus also stereotypes of climate activists heavily depend on activists' communications, strategies, and targets (Badullovich et al., 2024), which can be manifold (Kirsop-Taylor et al., 2023). We showed this for just two different strategies of protesting for climate action. Future research could systematically vary the many more relevant characteristics and look at stereotypes and their misperceptions in comparison (for initial efforts in this direction, see Ferrali et al., 2023; Stenhouse & Heinrich, 2019).

5.2. Conclusion

With the present study, we demonstrate that stereotypes about climate activists (1) are more negative for unconventional than conventional activists, (2) matter for activist support, and (3) are often misperceived, both by the public and climate activists themselves. We observed pluralistic ignorance when comparing first-order with second-order and meta-stereotypes. Second-order stereotypes of conventional activists were overly negative, whereas those of unconventional activists were overly positive. Of particular novelty was the finding that this pattern was reflected in the meta-stereotypes held by activists themselves, with conventional activists mistakenly thinking they were perceived more negatively than they really were and unconventional activists thinking they were perceived more positively than they really were. These results for meta-stereotypes provide mixed support for intergroup negativity bias. Our work is among the first to investigate stereotypes, their systematic misperceptions, and the consequences of both, for different types of climate activists. Our findings are relevant for practitioners working on climate activism and societal transformation,

as well as for researchers interested in advancing theory on perception biases and intergroup processes and stereotyping.

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CRediT authorship contribution statement

Jana K. Köhler: Writing – review & editing, Writing – original draft, Visualization, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Sandra J. Geiger:** Writing – review & editing, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Angelika Gellrich:** Writing – review & editing, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization. **Marlene Münsch:** Writing – review & editing, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization. **Mathew P. White:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Sabine Pahl:** Writing – review & editing, Supervision, Methodology, Conceptualization.

Declaration of competing interest

None.

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Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jenvp.2025.102594>.

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