

## Science-related populism: Conceptualization, empirical investigation, and implications for science communication (Dissertation Summary)

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### Abstract

Populist criticism has become a significant challenge for science and science communication. Such criticism maintains that allegedly corrupt academic elites and their expertise are inferior to allegedly virtuous “ordinary people” and their common sense. It suggests that the people, rather than elites, should have authority over how “true knowledge” is produced and communicated. This dissertation provides a conceptual and empirical analysis of populist science criticism against the backdrop of science communication scholarship and practice. It develops a theoretical framework for populist demands toward science, conceptualizing them as *science-related populism*. It also introduces a novel measure to investigate science-related populism in surveys – the *SciPop Scale* – and provides empirical evidence on populist science criticism in Switzerland and beyond. Moreover, the dissertation discusses implications of science-related populism for public discourse about science as well as science communication practice and proposes ways to respond to it.

### Keywords

science communication, populism, public opinion, theory, scale development, survey

## 1 Introduction and research questions

Populist movements have gained influence in many countries (Berman, 2021). They typically criticize political elites – but also *academic* elites: For example, populist key figures like Donald Trump suggested that the “natural instinct” and “common sense” of “ordinary people” are superior to allegedly useless scientific knowledge (Morin, 2018). In a similar vein, British politician Michael Gove claimed that “the people [...] have had enough of experts” (Mance, 2016). Claims like these contain key characteristics of political populism, such as anti-elitist ideas and positive conceptions of the common people (Mudde, 2017). However, they are more than a mere concomitant of political populism: They do not (only) criticize a political power elite, but a societal knowledge elite. More-

over, they do not (only) refer to the political will of the people, but to alternative truth claims. They can thus be understood as a distinct form of populism: as *science-related populism*.

Science-related populism may not only appear in the *communication* of public figures. Surveys indicate that single facets of science-related populism can also manifest as an *attitude* among the population (e.g., Motta, 2018). This raised concerns among scholars, journalists, and political decision-makers: They suggested that populist resentment against science can have negative consequences for societies' resilience against crises like the COVID-19 pandemic; for individual well-being, due to populist vaccine hesitancy; and for the natural environment, due to populist climate change denial (e.g., Kennedy, 2019; Krämer & Klingler, 2020). But despite these problematic implications, science-



related populism had not been systematically studied. My cumulative dissertation (Mede, 2022) approaches this caveat in five peer- or editor-reviewed articles and a synopsis. They pursue the following research questions:

RQ1: How can we conceptualize science-related populism?

RQ2: How can we measure people's support for science-related populism, i.e., science-related populist attitudes?

RQ3: How prevalent are science-related populist attitudes and similar phenomena during and beyond crises like the COVID-19 pandemic, and what are correlates?

RQ4: What are implications of science-related populism for science communication?

Article I addresses RQ1: It introduces a conceptual model of science-related populism (Mede & Schäfer, 2020b). The article maintains that science-related populism can manifest as a set of attitudes among its supporters. However, there had not been a social-scientific instrument to measure these attitudes. Article II fills this gap, as it develops, tests, and validates the SciPop Scale, an eight-item scale to measure science-related populist attitudes in survey studies (Mede, Schäfer, & Fuchsli, 2021). Article III applies this scale in a panel study in Switzerland, demonstrating a significant decline in science-related populist attitudes during the COVID-19 pandemic (Mede & Schäfer, 2022). Science-related populism involves elements of other types of populism (e.g., support for populist parties) and science criticism (e.g., distrust). Article IV explores these elements, examining the relationship between public perceptions of the "replication crisis," distrust toward science, and populist voting (Mede, Schäfer, Ziegler, & Weißkopf, 2021).

Science-related populism has important implications for science communication, as it suggests certain norms for how science should be discussed in society. However, scholarship of normative demands in science communication has typically only considered democratically defensible perspectives and largely ignored populist worldviews as normative reference points – a caveat Arti-

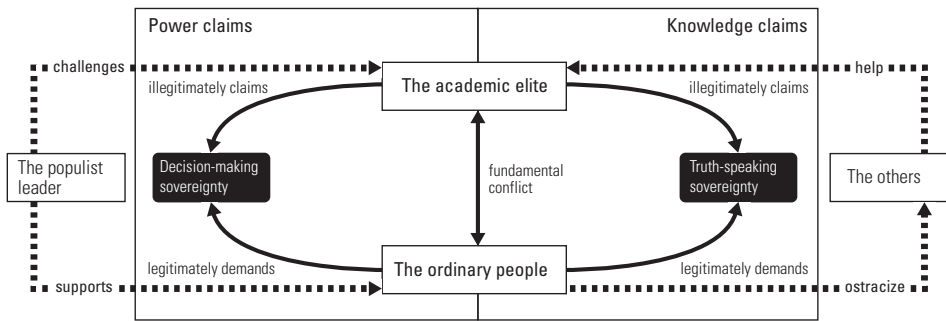
cle V aims to compensate (Mede & Schäfer, 2020a). The synopsis offers a comprehensive discussion of Articles I-V: I extend their conceptual arguments, scrutinize their methods and results, analyze implications for science communication, and explain how my dissertation contributes to (science) communication scholarship and may inform responses to science-related populism.

## 2 Theoretical framework: Introducing a conceptual model of science-related populism (RQ1)

My dissertation develops a novel conceptual framework for populist demands toward science. It conceptualizes these demands as "science-related populism," integrating three strands of scholarship: first, scholarship of political populism, which theorized perceptions of a fundamental conflict of societal elites versus "ordinary people" (Mudde, 2017). Second, scholarship of the "participatory turn," which has identified an increasing demand for public participation in different realms of society, including science, and thus resonates with populist ideals of civic participation (Bherer, Dufour, & Montambeault, 2016). Third, scholarship of alternative epistemologies, which has analyzed how experiential, commonsensical, and emotional truth claims challenge dominant truth claims in society (Saurette & Gunster, 2011).

Based on key arguments and findings from these literatures, Article I proposes a theoretical model of science-related populism. It conceptualizes science-related populism as a set of ideas that suggest an irresolvable antagonism between allegedly virtuous *ordinary people* and allegedly immoral *academic elites*. Science-related populism maintains that this antagonism is because academic elites withhold two kinds of sovereignty from ordinary people: First, science-related *decision-making sovereignty*, i.e., the power to decide on research goals and methods, for example. Second, *truth-speaking sovereignty*, i.e., the power to determine what is deemed "true knowledge." Science-related populism contends that academic elites raise illegitimate claims for both these sovereignties, as they allegedly use unreliable methods, are

Figure 1: Extended model of science-related populism



Source: Mede (2022, p. 19) based on Mede and Schäfer (2020b).

ideologically biased, and ignore the needs of common people. Legitimate decision-making and truth-speaking sovereigns are rather the ordinary people, because their common will and common sense are seen as the only valid principles for determining what is regarded as “true.”

The synopsis extends the conceptual analysis of science-related populism substantially: First, I respond to critiques suggesting that the concept may be indistinct from similar concepts and too versatile to be a useful analytical framework (Krämer, 2021). I maintain that science-related populism has indeed parallels to other anti-establishment sentiments – but it involves a clearly defined set of theoretical assumptions and has important differences to them, which makes it a precise and distinctive social-scientific concept (Gerring, 1999). In contrast to political populism, for example, it does not primarily target political elites and political power claims, but challenges the legitimacy of decision-making and truth-speaking claims of scientists beyond policy-making processes. Science-related populism is also different from distrust toward science, because it does not only criticize scientific approaches to the production of knowledge, but also promotes alternatives to them, i.e., popular sovereignty over the definition of “true knowledge.” Empirical studies recently provided evidence for these differences: They showed that individual support for science-related populism is different from support for political populism (Eberl, Huber, Mede, & Greussing, 2023) and has only weak

correlations with (dis)trust in science (Mede, Schäfer, Metag, & Klinger, 2022).

Second, I identify four factors that can explain why science-related populism has been less visible, successful, and pervasive for certain scientific issues – and more so for others, such as climate change and COVID-19. These factors include the public salience of an issue (Dennison, 2020), the influence of charismatic science-related populist leaders (Kriesi, 2014), attachment of science-related populism to conservatism, libertarianism, and other “host ideologies” that may aid its public appeal (Mudde, 2017), and the availability of science-related populist claims in traditional or online media.

Third, I discuss how individual perceptions of an epistemological people-elite conflict – which is central to science-related populism – may escalate to the societal level, exacerbating “societal cleavages” (Lipset & Rokkan, 1967), polarization against counterpositions like technocracy, and ostracization of alleged “helpers” of academic elites, such as journalists of mainstream media or pro-science movements like Fridays For Future (e.g., Bergmann & Ossewaarde, 2020).

I integrate these considerations in an extended model of science-related populism, which involves the four core building blocks “academic elite,” “ordinary people,” “decision-making sovereignty,” and “truth-speaking sovereignty,” as well as two additional components: the *science-related populist leader*, who may trigger and nurture populist demands toward science among the public, and *the others*, who are blamed by science-re-

lated populists for allegedly upholding the illegitimate epistemic authority of academic elites (see Figure 1).

Article I calls for empirical research on science-related populism, distinguishing between *supply*-side populism (e.g., public communication) and *demand*-side populism (e.g., individual attitudes). Article II responds to this call by introducing an empirical measure for the demand-side of science-related populism, i.e., for *science-related populist attitudes*.

### 3 Method: Measuring science-related populist attitudes in surveys (RQ2)

Extant research has examined attitudes which are similar but also different to science-related populist attitudes, such as conspiracy beliefs or anti-intellectualism. Yet there had been no instrument to measure these attitudes in surveys. Article II develops and validates such an instrument: the *SciPop Scale* (Mede, Schäfer, & Fuchsli, 2021).

In a first step, we devised 17 survey items based on prior research and a pretest with a student sample. They addressed four dimensions that correspond with the four core components of science-related populism (see Figure 1). These dimensions are:

- 1) Positive conceptions of ordinary people, which suggest that “ordinary people” are virtuous and trust common sense (indicated by agreement with items like “What unites the ordinary people is that they trust their common sense in everyday life.”).
- 2) Negative conceptions of academic elites, which suggest that scientists are immoral and produce useless knowledge (indicated by agreement with items like “Scientists are only after their own advantage.”).
- 3) Demands for decision-making sovereignty, which claim that “ordinary people” should decide on science’s goals and methods (indicated by agreement with items like “People like me should be involved in decisions about the topics scientists research.”).
- 4) Demands for truth-speaking sovereignty, which claim that “ordinary people,” rather than academic elites, should determine

what is considered “true knowledge” (indicated by agreement with items like “We should rely more on common sense and less on scientific studies.”).

We then conducted two survey studies: In study 1, we submitted German versions of all 17 items to a representative online survey that was carried out in March 2019 in Switzerland. A series of exploratory factor analyses suggested eight items to form a stable and plausible four-factor solution: the *SciPop Scale*. In study 2, we tested the performance of the *SciPop Scale* in three languages (German, French, Italian) using data from a telephone survey conducted in June/July 2019 with a nationally representative sample of the Swiss population. Results of a confirmatory factor analysis supported the eight-item / four-factor structure we found in study 1. Multi-group confirmatory factor analysis suggested that the *SciPop Scale* performed well in all three languages. However, Item Response Theory models indicated that the measurement precision of single items differs across languages and may be slightly compromised by socially desirable response behavior of the survey participants. Further analyses indicated high external validity of the *SciPop Scale*, showing significant correlations of the scale and constructs that are presumably (inversely) related to science-related populism, such as trust in science.

The synopsis further engages with the strengths and potential weaknesses of the *SciPop Scale*: First, I point out eight major advantages, e.g., cross-lingual invariance, convergent validity, high measurement precision across different intensities, and a strong concept-measurement link (Lundberg, Johnson, & Stewart, 2021). Second, I identify eight limitations of the *SciPop Scale* and propose solutions to them. These limitations include language-specific connotations, semantic ambiguities, unknown discriminant validity, and minor social desirability bias, for example. They should be assessed with cross-national measurement invariance analyses and could be compensated with culturally and linguistically sensitive translation procedures, for example (Beaton, Bombardier, Guillemin, & Ferraz, 2000). Third, I discuss five challenges of empirical studies using the *Sci-*

Pop Scale, such as non-response, context-dependency, and covariate selection.

#### **4 Main findings: Populist criticism of science in Switzerland and Germany (RQ3)**

Article III applies the SciPop Scale in a panel survey in Switzerland to test the temporal stability of science-related populist attitudes (Mede & Schäfer, 2022). It investigates if the COVID-19 pandemic has decreased public support for science-related populism. On the one hand, this is plausible: After the pandemic unfolded, publics in many countries showed higher support for foundational societal institutions including science (Sibley et al., 2020), which can be described as a science-related “rally ‘round the flag’ effect” (Baker & Oneal, 2001, p. 661). On the other hand, media headlines suggested that populist resentment against science had surged during the pandemic (Brooks, 2020). Article III tested this using individual-level panel data from two population surveys that included the SciPop Scale and were conducted in Switzerland before (2019) and during (2020) the pandemic.

Results showed that respondents had significantly less support for science-related populism after the pandemic hit Switzerland. This indicates that science-related rally effects may alleviate public resentment against science. We also found that the decline of science-related populist attitudes was more pronounced for people who had been particularly prone to science-related populism before the pandemic, which suggests that the pandemic contributed to a convergence of pro- and anti-science milieus rather than polarized or fragmented the population.

Article III provides important evidence on a shift toward pro-science views during the COVID-19 pandemic. From a normative perspective, this shift may be worthwhile, because effective approaches to cope with crises like the pandemic (e.g., vaccination) and its accompaniments (e.g., circulation of disinformation) require low levels of (populist) anti-science resentments among the public. Nevertheless, even small levels of such resentments can be detrimental to the status

of scientific expertise in society, because they may extend to other realms: For example, they can be associated with support for populist parties, which often fuel resentment against science (Krämer & Klingler, 2020).

Article IV examines the link between populist party support and distrust toward science more closely. It focuses on Germans’ perception of the “replication crisis,” i.e., the inability of many studies to yield equal results in follow-up studies applying the same or similar methods. Using a secondary analysis of the German “Science Barometer” survey 2018, we found that the “replication crisis” may evoke or reinforce negative attitudes toward science among supporters of the German populist right-wing party AfD. They tended to see the “replication crisis” as a reason to distrust science even if they had not heard about it before the survey. This suggests that the “replication crisis” accommodates populists’ existing reservations against science by providing them with a useful narrative of an untrustworthy science.

#### **5 Implications of science-related populism for science communication (RQ4)**

All five articles and the synopsis emphasize that science-related populism has important implications for how individuals and societies communicate about science: For example, it can manifest in the rhetoric of politicians, circulate in news or social media, and lead people to perceive media coverage about science as less trustworthy (see also Blassnig, 2021). Article V interrogates the relationship of science communication and science-related populism (Mede & Schäfer, 2020a). It analyzes the normative claims of three established science communication models – the Public Understanding of Science model (PUS), the Public Engagement with Science and Technology model (PEST), and the Science Communication as Political Communication model (SCPC) – and compares them with the normative claims of science-related populism. The three models differ in what they consider “good” science communication – and they conflict substantially with the claims of science-related populism, which

suggest that “good” science communication should articulate common sense arguments and criticisms of academic elites, rather than accurate scientific facts and positive portrayals of science, for example. We conclude that a variety of normative reference points is not problematic per se, as they can inspire insightful analyses from different angles. But reference points that challenge established science communication approaches – such as science-related populism – can be seen as problematic, as they undermine the capacity of science communicators to provide society with the “best scientific input available” (Scheufele, 2014, p. 13590).

The synopsis scrutinizes implications of science-related populism for science communication further. It explains how science-related populism may (re)configure individual communication and societal discourse about science, for example, by manifesting in social media discussions about science, shaping science-related communication behavior, or fueling a “public disconnection” from science – i. e., a “constellation in which segments of the public feel alienated from scientific institutions due to a lack of connectedness to societal discourse around science-related topics” (Mede, Schäfer, & Metag, 2023, p. 16).

Moreover, I discuss appropriate responses of scholars and communication practitioners to science-related populism. This discussion first approaches the question if they have an obligation to prevent science-related populism. Some pundits would dispute this, assuming that prevention efforts may backfire or will be “a waste of resources on those who will never change their minds” (Gil, 2020, p. 126). Others, however, argue that scientists and science communicators do have a responsibility to prevent science-related populism, as they have subscribed to the scientific epistemology, which obligates them to defend the norms of science against contrarian norms (Grodzicka & Harambam, 2021). This raises questions of how prevention can be achieved and which prevention measures are ethically defensible.

I focus on these questions in the concluding chapters of my dissertation: Potential responses to science-related populism include, for example, increasing public understanding of how science is done (to prevent

populist perceptions that scientists fake results “behind closed doors”), fostering dialogue and engagement with science-related populists via their opinion leaders (to alleviate populist perceptions that scientists are a distant elite), and reflecting whether scientists may give publics legitimate reasons to be criticized (to anticipate populist backlash for politicized science debates). These responses should involve ethical considerations: For example, top-down interventions to increase public understanding of science could be conceived as “socially engineering” public opinion (Freiling, Krause, & Scheufele, 2023, p. 229). After all, not only complete endorsement but also complete rejection of science-related populism may be undesirable, as certain aspects of populism can serve as healthy correctives within democracy (Rovira Kaltwasser, 2012).

## 6 Conclusion

Scholars and pundits worried that the legitimacy of scientific expertise is at stake in many countries worldwide: Some claimed that “truth” is increasingly being determined by emotions, personal opinions, common sense, folk wisdom, and individual experiences. This may have triggered a “reconfiguration of scientific authority” (Oliveira, Evangelista, Alves, & Quinan, 2021, p. 165). Populist demands toward science are an essential component within such a reconfiguration. Yet, scholarship had not analyzed these demands. My dissertation compensates this gap: It provides a theoretical model that conceptualizes them as science-related populism, introduces a reliable instrument to measure it, presents empirical findings, and offers a detailed discussion about implications for science communication. Accordingly, it has introduced a useful and instructive framework for conceptual and empirical scholarship within and beyond communication research, may hopefully stimulate further research, inform appropriate responses to science-related populism – and help to “better understand the social and media environments” of a “post-truth, post-trust, post-expert world” (Cormick, 2019, p. 161).

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## Conflict of interest

The author declares no conflict of interest.

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