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A critical reflection of skepticism towards science and democracy in Austria

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Additional authors of the original study

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Abstract

This study examines the extent to which the Austrian population is skeptical about science and democracy. Furthermore, it considers what the possible reasons for any skepticism might be and in which areas actions could be taken to improve the situation. It builds on a mixed-methods approach including a literature review of relevant social science research, a historical analysis, a secondary analysis of survey data, expert interviews, focus groups, and a stakeholder workshop. The study shows that a large share of Austrians expresses high levels of trust and support for science and democracy. However, different forms of criticism exist throughout the population, and these can be observed across all societal groups. Negative comments tend to focus on assumptions about: the practical implementation of science and democracy, links to politics, and specific technological domains. Around 10% of the population contradicts or rejects scientific knowledge on a broader scale. Our study shows that science skepticism and negative perceptions of democracy are linked, and that they are related to broader question about the role of science in society.

Keywords: Science skepticism, democracy, trust in science, science for policy, science and society, national habitus, mixed methods, Austria

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About this extended summary

This is an extended English summary of a study on science and democracy skepticism in Austria. The original study was published in 2023 in German under the title 'Ursachenstudie zu Ambivalenzen und Skepsis in Österreich in Bezug auf Wissenschaft und Demokratie', and can be accessed [online](#). This extended summary was developed by Johannes Starkbaum and Erich Griessler, who conceptualized and translated this document based on the original text by all authors. Parts of the translation were supported by the online-tool [DeepL](#) and a final language edit was made by a professional editor and native speaker. This document was developed to inform an international audience. Thus, it covers the key findings and supports them with a few additional references.

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1 Introduction

In recent years in Austria, the matter of science skepticism and a decline in satisfaction with democracy has become a focus of political and media debate. A reoccurring discussion was Austria's supposedly special position regarding skepticism towards science. Contributions from the media, science and politics repeatedly referred to items of a Eurobarometer survey, in which Austrian citizens were among the most critical on several science and technology issues (European Commission, 2021). This debate included calls for policy makers to address the relationship between science and society (Nowotny, 2021; Starkbaum et al., 2022). Yet, it is still controversial how widespread critical or skeptical attitudes towards science and democracy are and to what extent Austria is an exception in this respect.

Indications of public disinterest or critique towards science in Austria are not new (Ullram, 2013) and one might ask how the current increased attention to the topic came about. The experiences during the COVID-19-pandemic and the related questioning of the democratic legitimacy of the measures, vaccination refusal, verbal attacks on scientists, and the somewhat related spread of conspiracy theories, likely increased awareness for the matter. While the pandemic was in many ways a “magic moment for science” (Bogner, 2022: 38), it also revealed some of its limitations (Prainsack, 2022).

There are also political reasons for addressing this issue. Over the past 30 years, strengthening innovation capacity has been a consistent goal of the Austrian federal government, regardless of the political constellation (Bundesregierung der Republik Österreich, 2011 & 2020). For a small, export-oriented economy with relatively few land resources, human capital and innovative strength of its economy are of great importance (Auel et al., 2021). Overall, this continuous efforts in research and innovation policies have resulted in some remarkable developments (Janger & König, 2020): Austria now has one of the highest research and development expenditures among OECD countries (European Commission, 2023), the scientific landscape has not only been consolidated, and refocused but has also been enriched by new research institutions. In line with this focus on strengthening Austria as a location for research and innovation, the attitudes of the population towards science and technology are key for democratic legitimization.

This paper summarizes the final report of a study that was commissioned in 2022 by the Austrian Federal Ministry of Education, Science and Research (BMBWF) as part of a departmental strategy to strengthen trust in science and democracy. It focuses on the relationships between science, society and democracy and addresses the questions (a) how these relationships have developed historically in Austria, (b) which attitudes can be identified in different population groups regarding science and democracy, and (c) what roles these entanglements have, also with other areas of society. Furthermore, the study operationalizes the often poorly defined concept of skepticism and identifies areas of action for politicians, administrators, and scientists.

The empirical data is derived from a literature review of relevant social science research, historical analysis, secondary data analysis of various survey data, as well as focus groups and expert interviews. A key challenge of our research was the need to bring together different data sets and methods to understand the object of investigation itself as a specific and constructed “problem space” (Lury, 2021). Factors explaining skepticism and corresponding areas for action are derived from the results of the study and an expert workshop that took place in late 2022. It should be noted that while the study is concerned with explanations for different forms of skepticism, a clear inference in the sense of statistical probabilities cannot be achieved for such a multifaceted phenomenon (Mayo, 2018). This is also because skepticism is widely used as a somewhat abbreviated term for all possible negative attitudes, from ignorance to denial or hostility (Peters et al., 2023). In the context of the study, we therefore speak of central factors that explain criticism towards science and democracy in Austria, rather than of linear causal relationships. Furthermore, we demarcate skepticism, as a systematic and unwarranted rejection of science or democracy, from other forms of criticism.

The results of the study show that a large proportion of Austrian citizens express high levels of trust and support for science and democracy. However, different forms of criticism and reluctance are visible in the population, and these can be observed across all societal groups. Negative comments tend to focus on assumptions about: the practical implementation of science and democracy, links to politics, and specific technological domains. Yet around 10% of the population contradicts or rejects scientific knowledge on a broader scale, which corresponds with our definition of skepticism (see Chapter 2). The study shows that critique of science and democracy are linked and connected to questions about the role of science in society.

2 Operationalization of skepticism

Skepticism is a concept typically used to address negative attitudes in the population towards the institution of science (or democracy). However, there is a wide range of different positions of negative or distanced attitudes, which are often not sufficiently differentiated (Peters et al., 2023). However, skepticism can also describe a foremost positively connotated assessment of a situation that seeks (objectifiable) bases for evaluation, what Merton called *organized skepticism* (1957: 560). Similarly, it is an essential characteristic of enlightened democratic citizens to maintain a critical and distanced attitude towards political processes, decisions and plans as well as to form their own opinions and make appropriate voting decisions (Kelsen, 1955).

The phenomenon of science skepticism is often identified empirically through surveys and other empirical investigations. But such surveys do not simply depict reality, but rather generate a specific image of it, through the survey-items and questions applied to assess skepticism (Law, 2009). While skepticism is more often used to explore negative attitudes towards science, it is less often used to explore issues of democracy. A systematic review of international studies on science skepticism shows that there is no single definition of the term, even in the academic debate, and that there is a tendency to study public attitudes in controversial areas

of science and technology (Starkbaum et al., 2023). The most widespread definition of science skepticism describes it as a “systematic and unwarranted rejection of science” and explores individuals and groups who express these (Rutjens & van der Lee, 2020). Some authors of science skepticism literature consider a conspiracy theory component. Others focus the social relations, communicational aspects and identities involved, e.g., the social and cultural distance of science to parts of the citizenry (Aviva et al., 2022; Oswald & Bright, 2022).

In conclusion, while skepticism and critical questioning are central to the creation of new ideas in both science and democracy, a dismissive attitude towards these areas is problematic if it categorically (*unwarrantedly*) rejects scientific knowledge and/or democracy across multiple topical domains (*systematically*). We thus adopt the definition of skepticism above for our study, as a *systematic and unwarranted rejection of scientific findings and/or democracy*. The general terms criticism or critique are used to cover other negative expressions.

3 Science, democracy and society

The roles of science and democracy in society are contradictory and changing (see also Chapter 7). Scholars have emphasized the importance of democratic and scientific input to the political system, and how academics can also support civil society actors to impact and democratize policy (Habermas, 1968; Imhof, 2011).

Considering civil society in research has a long tradition and ranges from information transfer and educational approaches to consultation as well as to inclusion and co-creation (Epstein, 1998; Royal Society ad hoc Group, 1985; Wilsdon & Willis, 2004). There are currently several programs and activities to reach out to- and engage the Austrian public, especially schoolchildren, in science and democracy (Starkbaum et al., 2022). Generally, communication and dialogue are often linked to the ambition to strengthen trust in science and people’s science literacy (Osborne & Pimentel, 2022). While advances have been made with the democratization of science, these do not necessarily enhance public trust or result in more responsible research (Chilvers & Kearnes, 2019). Some researchers argue that the focus is too often on informing citizens, thus addressing their presumed lack of knowledge about science, and they suggest that relational approaches may be beneficial in fostering mutual exchange (Felt & Fochler, 2010) and critical thinking, as well as to teach the epistemics of science (Bertsch, 2019), which are the foundations of both science and democracy.

A general increase in the presence of science in the public domain can be observed (Seethaler & Beaufort, 2019). Digital media formats are today a central source of information on science in Austria (ÖAW, 2022). The changing media landscape matters as its fragmentation creates spaces for mis- and disinformation. Those in favor of selected (populist) media formats tend to evaluate science and/or democracy differently (Neureiter et al., 2021; Persily & Tucker, 2020; Praprotnik et al., 2019).

Negative perceptions of science by the citizenry, may be linked to idealized public images of science and research (Collins & Pinch, 1993). Yet, research follows an often

non-linear, and rather slow knowledge finding process (Felt, 2017), which also became widely visible during the pandemic (Prainsack, 2022). Moreover, science is inherently heterogeneous and sometimes contradictory (Durnová, 2015), which was mirrored in epidemiological and psycho-social responses from academia to the COVID-19 pandemic (Bogner, 2022).

Criticism of science is not necessarily the rejection of scientific methods per se but can also refer to the roles and connections of science with other areas of society, such as politics (see Chapters 4, 5 & 6). While the presence of science in the COVID-19 pandemic was widely viewed positively, on the other hand, the close and public exchange between scientists and politics also triggered criticism by parts of the population, including accusations of selective choice of expertise or influence on content (Chapters 4 & 5; ÖAW, 2022).

At the same time, research shows that the Austrian population's satisfaction with the political system and trust in democratic institutions has been declining for several years (Zandonella, 2022), but this can only be partially explained by a change in the quality of Austrian democracy. The level of education and the quality of life of the population also only partly explain this, as satisfaction and trust have deteriorated across all population groups (Grössenberger & Pausch, 2018). Changes in media consumption and recent political scandals in Austria may also play a role, but again the data are inconclusive (Perlot et al., 2022). Levels of trust and satisfaction with democratic institutions are lowest among socio-economically disadvantaged groups (Zandonella, 2022). Indeed, socio-economic resources influence people's experience of the political system and their confidence in the effectiveness of participation and democracy in general (Zandonella & Ehs, 2021). Our secondary analysis of survey data highlights, however, that criticism, towards science and democracy, can be found in all segments of the Austrian population.

4 Secondary analysis of survey data

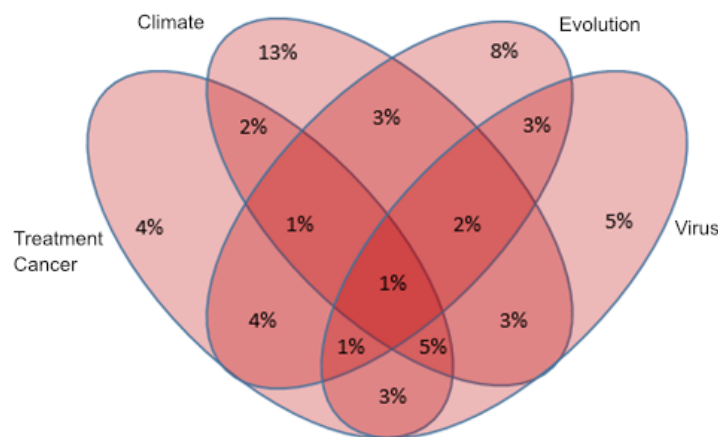
This chapter summarizes the secondary analyses of quantitative data sets on science and society in Austria, based on descriptive and multivariate analyses. We focused on the data from the Special Eurobarometer 516 (European Commission, 2021), the localization of individuals who expressed “skeptical” attitudes, and the links between science and democracy. This was supplemented by secondary analyses of four other questionnaires with data on Austria on that topic, some with several survey waves¹. The focus here is on analyses of trust in science/scientists and democracy compared to other institutions or groups of people, interest in science, and attitudes towards science and democracy.

¹ These are the data from the Austria Corona Panel Project (ACPP), March 2020-July 2021; the European Social Survey (ESS) wave 10, 2021; the Citizens' Attitudes Under COVID-19 Pandemic (CAUCP), four waves in 2020; and the Wellcome Global Monitor (WGM), from 2018 and 2020 (Brouard et al., 2020; Grand & Sailer, 2023; Kittel et al., 2020).

Analysis of Eurobarometer data

Secondary analysis of survey data shows that overall attitudes toward science in Austria are predominantly positive (Starkbaum et al., 2023). This chapter focuses findings from the analysis of Eurobarometer data (European Commission, 2021). We find that 21-30% of the population answer to individual statements (from the areas of climate change, evolution, cure for cancer and the creation of viruses) in a way that contradicts current scientific knowledge or consensus. Two of these statements also have a conspiracy theory component. These numbers are roughly in line with the EU average. The rejection of scientific consensus across three or four of these statements applies to a smaller group of 10%, as Figure 1 displays. According to our operationalization (Chapter 2), this is in line with science skepticism.

Figure 1: Agreement with counter consensus statements as a percentage of the Austrian population



Note: Own calculation based on data on Austria from EB 516 (2021, N = 1007). The percentage of respondents from Austria who expressed their disagreement with the scientific consensus regarding the four questions, with overlaps.

Counter consensual answers to these statements are generally distributed across all population groups, i.e., no clear pattern can be identified based on socio-demographic characteristics that clearly identify “science skeptics”. Overall, a lower level of education and dissatisfaction with democracy are associated with a higher likeliness to contradict scientific knowledge; for other characteristics, however, a connection is either dependent on the topic or does not exist.

In many respects, people who select answers that contradict scientific consensus do not differ significantly from the general population in how they relate to science. Depending on the field of science or technology, more or less pronounced differences exist with regard to expectations about the future impact of science and technological development. In some areas, especially in those which are less controversial in society, the group that contradicts scientific consensus tends to expect more negative effects from a technology than the entire population. The differences, however, are neither pronounced nor uniform. People who agree with at least one science-skeptic statement are also not consistently more critical of

inequal distribution of the benefits of science, however, they are more critical when it comes to personal benefits of science. It is interesting to note that, inequality in terms of benefits of science is perceived overall relatively critically in Austria.

Choosing answers that contradict scientific consensus is not clearly linked to interest or disinterest in science. Overall, interest in science in Austria is slightly lower than the EU average but has increased slightly compared to 2010. Those who are critical of science are not necessarily less interested in science, and similarly, those who express lower interest are not necessarily skeptical or critical. Interestingly, a desire for more intense engagement with science is connected with more critical attitudes toward inequality regarding the benefits of science or more critical attitudes toward scientists.

Finally, there is a correlation between attitudes toward science and satisfaction with democracy in Austria, but even this correlation is not always clear or uniform. On the one hand, selecting answers contrary to scientific consensus is associated with a higher level of dissatisfaction with democracy. However, on the other hand, this group generally has a consistently higher proportion in the “very satisfied” category, which indicates that this group tends to answer at both extremes more than the respondents in the overall sample. Those disinterested in science also have a less positive perception of democracy; however, those most satisfied with democracy are not the “very” but the “moderately” interested in science. Higher satisfaction with democracy is also associated with the attitude that decisions in the field of science and technology should be based mainly “on the advice of experts” rather than “on the opinion of the majority of people in a country”, but also with a more critical perception of inequality with regard to the benefits of science and a more critical attitude towards scientists. This suggests that critical attitudes towards science and scientists could also reflect different democratic values.

Analysis of further survey data

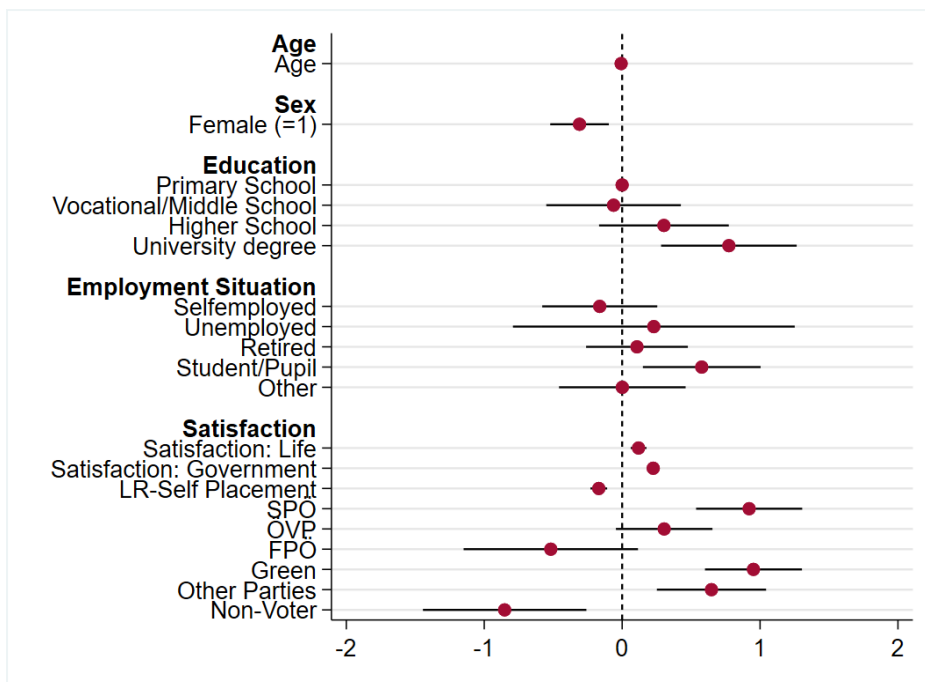
Survey data from other studies (ACPP, CAUCP, ESS, WGM) complement the picture of the Eurobarometer: In all surveys, general trust in scientists and science is higher in Austria than in many other institutions and professional groups. Despite the comparatively high level of trust in scientists and science, however, a share of around 20-30% of respondents in the other surveys, depending on the specific questions, are critical or at least reserved about (the work of) scientists. Some respondents (the proportions vary between surveys) agree with conspiracy-theory statements about the origin of the COVID-19 virus, distrust the motives of scientists, suspect that scientists (and politicians) are withholding information from the public or that politics is being manipulated.

These surveys also show that significant shares of the public agree that science is entangled with politics and wants that “common sense” plays a more important role in decision-making than science. At the same time, scientists in the private sector are judged more critically than scientists working at public universities. Nevertheless, according to the ESS, the rejection of a statement on deliberate deception of the public by scientists in Austria is third highest in Europe after Sweden and Germany.

The analyses of the surveys also confirm other key findings of the Eurobarometer study. This includes the relatively low level of interest in science in Austria. In 2018, almost half of all Austrian respondents in the WGM stated that they were not interested in learning more about science. However, this also shows that a lack of interest in science does not necessarily equate with a lack of trust in science, although interest has some positive effect on trust scores. However, in the WGM 2018 survey, the vast majority (around 85%) of those disinterested in science stated that they also trust science very much or at least somewhat.

In all surveys, differences in trust in scientists or science cannot be simply attributed to any specific population group; rather, mistrust exists in all classes and groups of society. Older people, men, and people with the highest level of education tend to trust science a bit more, but the results are not uniform for all surveys and are not always significant. In addition to greater satisfaction with their own lives, political factors such as political orientation along the left/right spectrum and, above all, party preferences play a role. Based on ESS-data, Figure 2 shows how differences in trust-scores of socio-demographic groups do not exceed one scale point and may thus be interpreted as low.

Figure 2: ESS: Regression on Trust in Scientists - Socio-economic predictors



Note: Own calculations using data from ESS 10 (2021, AV: trstsci, n=1782, weight=dweight)

Trust in science/scientists and the degree of satisfaction with democracy are more closely connected, with similar patterns for trust in science/scientists and satisfaction with democracy regarding socio-demographic characteristics and political-ideological attitudes in three surveys. Our analyses also show that basic political attitudes, affinity for populism, and understanding of democracy are similarly related to trust in science/scientists and satisfaction with democracy. Those who consider

politicians trustworthy, consider democracy to be the best form of government, and respondents who would like to see a team of leaders at the top are more likely to trust science/scientists and are more likely to be satisfied with democracy. In contrast, people who perceive political parties as the country's main problem, prefer direct referendums to representative democracy and would like to see a strong leader at the top who makes political decisions alone and is not limited by parliament and elections, are less satisfied with democracy and trust science/scientists less. Similarly, higher normative expectations of democracy, a perceived better functioning of democracy in Austria, and the perception of being able to influence politics in Austria tend to be positively related to both satisfaction with democracy and trust in science/scientists.

Overall, these survey results show that skeptical or critical attitudes towards science do not necessarily go hand in hand with distrust of or a disinterest in science in general. Rather, some respondents seem to differentiate between science, its principles and methods on the one hand, and the institutional and personal dimension of science on the other. These findings are not limited to Austria but are in line with international studies (see Achterberg et al., 2017; Wintterlin et al., 2022). More than twenty years ago, for example, an influential report on science and society stated: *“While people appear to have an appetite for popular science, the paradox is that this is accompanied by increasing skepticism about the pronouncements of scientists on science-related policy issues of all types”* (House of Lords, 2000: paragraph 2.2). This could explain why, despite a high level of general trust in science, specific critical statements about scientists, their motives and competences are relatively well received in four of the five surveys analyzed (with the exception of the ESS).

5 Expert interviews: Divided perception of science skepticism

For this project, twelve semi-structured interviews were conducted with experts who were knowledgeable on the topics of “science” and “society”. Selected interviewees covered a broad spectrum of professions and perspectives and came from the natural and social sciences, humanities, psychology, journalism and public administration. The survey consisted of a series of semi-structured interviews in which the individuals were asked several open questions. These were intended to clarify (a) what the different experts understand by science and science skepticism as well as society; (b) how they evaluate and assess them; (c) on which evidence or experiences this assessment is based, (d) what they see as the causes of science skepticism in Austria, (e) what the ideal relationship between science and society would be and (f) what measures would be necessary to establish this. The interviews were recorded, transcribed verbatim and analyzed using grounded theory (Strauss & Corbin, 1998).

What is science?

Some interviewees described science as a search for “truth” (I2)², “certainty” (I6), “knowledge” (I10) and as a “process” (I11, I12). Science creates something new “on the basis of facts” (I4). Science also has an application aspect and should “be innovative” (I8). Some interviewees emphasize that science is a social activity that developed historically (I6, I3), which differentiated and emancipated itself from other forms of knowledge generation. Science, as one interviewee pointed out, is an institution (I9).

Science was explained by having certain characteristics: It is a (a) reflected, also self-questioning (b) activity that (c) can refer to different questions; science thus recognizes (an increasing number of) disciplines. Science is (d) method-driven and (e) builds on existing bodies of knowledge; science must (f) be comprehensible, i.e., transparent and (g) communicated to the public.

Scientific knowledge was ascribed a certain quality that differs from common “human perception of phenomena” (I9); often scientific assertions are statements about regularities. Science is a “democratic process” in the sense of “open communication”, but, as one interviewee stressed, not in the sense of “voting” or “majority determination” of what is considered true (I2). Science does not produce truth, but “models”, “interpretations” of truth and “provisional findings”. The criterion for the validity of scientific findings is “connectivity” to the scientific discourse. This, in turn presupposes “intersubjectivity”, i.e., the verifiability of results and scientific “discourse” on the respective interpretation. Regularly, interpretations that were initially marginalized prevail and become “state of the art” of science. (I3) Due to the provisional nature of knowledge and the unavoidable interpretation of reality, communication and discourse are central in science (I2). Arguments are central to science, and they differ from opinions. As I3 explained, arguments must be verifiable, intersubjective, and connectable. Opinions can be determined by emotions or be influenced by ones’ peer group.

Some experts divided science into “basic”, and “applied science”, and “expertise” (I3). In basic science, in that perspective, there is “a certain freedom” and the question of the usefulness of the question being pursued does not have to be asked and is not asked. In the applied sciences, the idea is that results can be used for a very specific technical task that may not even exist yet (I3). This must again be distinguished from the direct application of scientific findings. In application, a “problem” is defined, and a scientific-technical solution is found to resolve it. The problem and solution are defined by “experts”, who can be scientists themselves or people from outside the field. Scientific-technical solutions are “commoditized”, i.e., their application is “costly” and “cost-intensive”. The commoditized nature of scientific and technical applications is a point at which science and society meet. The role of scientist and expert is fluid in practice and is often mixed up, especially in public discourse. The role of the expert leads back to the early absolutist state and is strongly associated with the “improvement” of society and with the development and exercise of political rule.

² The letter I with number indicates the number of the interviewee.

Due to the close link between experts, economy, and political rule, some interviewees view the role of experts as critical. Some claimed, the ideal image of science as an activity that is free, self-directed, and autonomous, because it is publicly funded (I4) is limited by political appointments to committees and the dependence of research on third-party funding (I2).

What is science skepticism and how widespread is it in Austria?

The interviewees differed considerably in their definition of science skepticism. One group defined it as the rejection of science, the scientific method, and the legitimacy of science. Another group emphasized that skepticism is crucial in science and distinguished between skepticism as a positive attitude and denial of science, which is rejected. A third group discussed science skepticism as being skeptical about the political and economic use of science.

Interviewees were also divided in their assessment of the occurrence of science skepticism in Austria. Some interviewees did not perceive any specific science skepticism in Austria (I5, I7). I12 did not see any science skepticism, but rather a “crisis in the understanding of science”, I3 saw “confusion” in public discourse. In contrast, I9 and I10 advocated the claim of strong science skepticism in Austria, which I10 linked to a higher valuation of art, nature, and sport. Furthermore, this was associated with a general disdain for science in Austria, a poor understanding of, trust in, and mistrust of scientific applications, particularly in the area of genetics. Also, I11 experienced science skepticism in Austria.

Several interviewees described some specific features of Austrian science skepticism. I1 perceived science skepticism not as entirely negative, but rather in the tradition of Austrian technology controversies such as nuclear energy and genetic engineering. I4 links science skepticism to a general resistance and critical attitude of Austrians towards innovation. I8 associates Austrian science skepticism, especially in the context of climate change, with fear, comfort in the sense of a desire for things to remain the same or a fear of change, and excessive demands on people in their everyday life.

Where does science skepticism come from?

Interviewees mentioned numerous causes for disinterest in and potential skepticism against science. They addressed several current, past, and in some cases recurring social conflicts surrounding science and technology in Austria such as nuclear energy, genetically modified organisms, and how to deal with the climate crisis or the COVID-19 pandemic. Although these instances appear at first glance to be predominantly technological conflicts, the interviewees addressed a wide range of topics that do not only concern different assessments of technological risks of certain technologies. They highlighted, for example, the right to freedom of expression, general freedom, autonomy, and a self-determined lifestyle, different concepts of society, the economy, justice, the “right” relationship between research, society and nature, and different concepts of desired or rejected social and ecological futures. These conflicts are also about the role that science plays or should play in society.

Possible causes of science skepticism in Austria mentioned in interviews included: (a) Distance between research and society, which arises because of the separation between science and the everyday of the population. (b) Difficulties in understanding and grasping research. (c) Increased complexity of society and the resulting increased demands on the individual. (d) Lack of understanding of science and society as a whole; general skepticism towards elites, including scientists. (e) A school system that does not convey how science works, its findings, and its importance for society's prosperity. (f) The influence of business and politics on science, which is in some cases viewed critically. (g) A connection between trust in institutions and science. (h) A connection between psychological explanations that see emotion and reflex – just like science skepticism – as dominant patterns in times of crisis. (h) Several historical explanations.³

What is the ideal relationship between science and society?

Some interviewees emphasized that science should be the basis of social discourse because it enables the discussion of facts and not opinions (I4). I9 calls for more trust in science. Science should contribute to improving living conditions (I10).

The interviewees often wished for a more intensive dialogue between science and society for mutual benefit (I6). Science should leave its “ivory tower” (I4) and explain what science is (I4). Cooperation between science and society is essential for solving major social problems (I2) and the population must be involved in research (I8). Science, administration, politics, and civil society should enter into a structured, and results-oriented discussion and exchange arguments in the sense of “good governance” (I11). An undistorted public debate on science and technology is needed (I1). However, new ground needs to be broken for these discussions, as science is used to not intervening in the systems it observes (I2), but examples for dialogue, such as citizens' councils, in which scientists and laypeople work well together, were named as well. For the discourse in society, I7 would like to see an “unexcited” relationship between science and society, in which reflection prevails and dissenting opinions are not immediately silenced, but rather questioned and their arguments are being examined (I7). Science should be an independent critical authority, recognized and publicly funded by politics, which thinks ahead and accompanies social developments in the long term (I2). The relationship between science and politics in policy advice was described as complex. Politics should listen to science but include all necessary disciplines and then decide from a single perspective where “our society should develop” (I6).

³ These include: A tradition of skepticisms towards progress, and a lack of capital for technological infrastructures dating back to as early as the 19th century. Little tradition of patronage in science, the division of a common economic area with the end of the Habsburg monarchy, the primacy of university teaching over research, the population's lack of understanding of what science is, the sometimes deliberately difficult comprehensibility of scientific language, the disdain for and suppression of education after the Counter-Reformation, the expulsion and murder of scientists after 1934 and 1938, and the prevention of the return of emigrants after 1945.

What can be done to counter science skepticism?

Ideas how to counter science skepticism aim at different institutions and levels. Recommendations for the school system include raising the social status of the teaching profession and in education emphasizing the connection between social prosperity and all sciences (I10); strengthening pupils' ability to recognize misinformation, conveying an understanding of science as an activity, and how scientific results are achieved (I12). Accompanying measures should strengthen teacher training in this area (I12).

Scientists should become visible to the public and explain how they developed their research and their findings. Researchers should make themselves transparent in their research (I7) and they should proactively engage with the public and explain their role in the research, which could help enhance feelings of trust by the public (I6). Researchers should seek contact with the public and abandon an aura of “gods”, thereby reducing any existing mistrust (I6). Scientists should convey the enthusiasm they feel for their subject and inspire others (I3, I4). Scientists should also communicate the limits of their statements (I12, I7).

Some suggestions call for more citizen participation and existing methods to bring science and society together to solve problems and reduce science skepticism (I8, I6, I2). Suggestions for participative and innovative advertising campaigns and the strengthening of science were made as well.

6 Focus Groups

Between April and May 2023, five focus groups (Kitzinger & Barbour, 1999) were conducted involving a total of 39 people in different Austrian regions, including Vienna, Upper Austria, and Styria. Through these, we explored typical narratives, how opinions are formed and how people relate to each other (Reed & Payton, 1997).

Each group consisted of six to ten people and discussions lasted about one hour and a half. The overall sample includes people of all ages and educational backgrounds and was fairly balanced in terms of gender. Participants were recruited via notices, active letters from associations and existing contacts. At the beginning of each group, discussants were given a questionnaire containing selected questions, derived from the surveys analyzed in Chapter 4, to assess their normative perceptions of science and democracy. Overall, the focus group sample is comparably somewhat less critical of science and democracy than the Austrian population, although critical voices are also represented. The moderation of the discussion followed a semi-structured guideline. All focus groups were audio recorded, subsequently transcribed verbatim and inductively coded (Strauss & Corbin, 1998) using the software Atlas.ti.

Perspectives on science

Overall, the groups showed a positive basic attitude towards science (and democracy, as discussed later), which is often grounded in an idealized image at a general level, as a statement of one participant illustrates: “Science, that's where the brightest minds are” [FG3]. Several discussants also took a more differentiated view of science and research, emphasizing non-linear knowledge production. Generally, however, there was limited knowledge about the processes of how science works and creates knowledge. As discussed earlier, this can be a problem if discrepancies or non-linear processes become publicly visible (see chapter 3).

To explain and define science, people distinguish it from other, less structured forms of knowledge production, assumed to be based on personal opinions, as one participant emphasized: “Science is a fact-based examination of topics. Science is certainly not an opinion” [FG2]. Discussants also regularly referred to issues they saw as opposed to science, such as esoteric and pseudoscientific approaches, and linked these also to the topic of science skepticism.

However, throughout the discussions, narratives emerged that blur the boundaries outlined just now. In these sections of the focus groups, people emphasized that science is important but not always mandatory for everyday life [FG1]. In line, some participants argued that common sense is not necessarily at odds with science. In one group, participants argued that it may make sense to “rely on scientific results and studies as well as common sense” and that common sense is “often based on science”, and that “relying on science is common sense” [FG2]. While such statements are not necessarily a criticism of science, they may be qualified as such in survey questions asking for the role of common sense or the importance of science in people's lives, which are included in the recent Eurobarometer on science and technology (European Commission 2021). This indicates the difficulties of measuring skepticism.

Critical statements about science were present in all focus groups. They usually did not refer to science as such but distinguished between fields of research or ways of doing and organizing research. The topic of funding science was a recurring theme in this context. Several participants expressed their preference of publicly funded research as they suspected that private or business interests influence research and its results negatively, as one person pointed out: “Science and research depend very much on who is financed by whom” [FG2]

Another reference point for criticism related to the relationship between science and politics, revealing also a widespread generalized, often negative image of politics. This has frequently been discussed in the context of the COVID-19 pandemic. In this line of argument, discussants raised concerns about limited political support or negative influence on science. Typical complaints suspected selective funding of science by politics if it “serves political purposes” or if it is “in accordance with the line of government” [FG3]. Science was seen as rather passive and dependent, in this line of argument, as another participant of this group pointed out: “we can't even imagine how much influence politics has on science” [FG3].

There was also criticism related to the entanglements of science, media and politics. One line of argument claimed one-sided reporting by some traditional media, especially in relation to COVID-19 and connected with assumptions about political influence. There has also been repeated discussion in the focus groups about the selective consolidation of information in social networks, how these foster extreme opinions and blur the boundaries of expertise and opinion. Throughout this line of argument, science was again framed as the ideal counterpart to non-scientific forms of knowledge.

We observed consensus in the focus groups that science should communicate and make its results visible, also to broader audiences. Yet, to communicate complex content in a simple and understandable way was acknowledged as a challenge, as one discussant emphasized: “science sometimes finds it difficult to present certain topics to the public in such a way that they are also partially understandable for everyone”. At the same time, public visibility by scientists was also perceived critically. One discussant referred to a television debate, where scientists raised different points of view, as an incident that has shaken his confidence in science: “there were specialists [...] and they basically contradicted each other one hundred per cent” [FG5]. Discursive formats, just as the focus groups themselves, were repeatedly mentioned as suitable instruments for debates on science and democracy.

Perspectives on democracy

Similar to science, we saw a widespread positive basic attitude towards democracy, which was framed as a meaningful and legitimate way of governance. One participant explained: “it is based on the will of the population, and this must be respected” [FG2]. Furthermore, democracy and science were both discussed in the context of civil empowerment and linked to educational aspects.

Criticism of democracy concerned mainly its actual implementation in Austria. Related statements included dissatisfaction with specific parts or practices of democracy, such as limited voting rights for parts of the population or the underrepresented role of minorities. Criticism of democracy referred repeatedly to politics; cases of corruption by Austrian politicians were also mentioned several times. Some participants argued that political decisions were too much driven by the logic of the political system, rather than the interests of citizens or long-term goals. This was seen as a hindrance to address grand challenges such as the climate crisis. Repeatedly, the desire for political processes in the spirit of “honesty and working together” [FG3] has been expressed.

Overall, science and democracy were not perceived as autonomous areas of society, but in their interaction with politics, the media and economy. Furthermore, we witnessed idealized images of science and democracy. Criticism typically addressed aspects seen in conflict with these idealized pictures. This speaks, to avoid disillusion, in favor of communicating the actual practices and at times contradictoriness of science (see also Chapter 3). However, this does not release science and politics from the responsibility to implement necessary changes and reforms in science and democracy.

7 Historical perspective

This section explores historical explanations for current attitudes in the Austrian population toward science⁴ and democracy, namely: Why are certain parts of the public disinterested in, and even skeptical about science? Which factors in Austria's history provoked or reinforced such attitudes? To address these questions, this analysis draws on Fernand Braudel's „longue durée“ (Raphael, 2013) reflecting on around 500 years of Austrian history.⁵ This broad perspective reveals that concepts such as “science”, “democracy”, and “society” change their meaning over time. It also enables us to grasp long-term continuities and changes in mentalities, behavior, patterns of interpretation, and a possibly existing Austria-specific “national habitus” (Elias, 1990), which remain hidden when dealing with the nearer past and present.

Science, society, and democracy: Continually changing concepts, structures, and functions

Over centuries, the concepts and institutions of “science”, “society”, “rule”, and “democracy” changed dramatically meaning, form, and function. In the 17th century, science was a marginal social practice to acquire knowledge that was developed by a tiny, privileged group from the upper echelons of European societies (Rommetveit et al., 2013; Weingart, 2015). In the 19th century, science differentiated autonomously into disciplines and expanded since the mid-20th century. Today, science has arrived at the core of modern societies and deeply affects their course via technological innovation and education. After World War II, science and society entered an implicit, mutual societal contract that postulates that science, in return for public funding, contributes to society's economic growth and wealth (Guston, 2020).

Austria changed in the 19th century slowly, not without struggles and steps backward, from an absolute into a constitutional monarchy. In the 20th century it developed - despite disastrous setbacks of civil war in 1934, the subsequent Christian-social dictatorship (1933-1938)⁶ and National Socialism (1938-1945) - into a democratic republic. As these few key points of history indicate, democracy is

⁴ Unlike “science” in English, the term “Wissenschaft” in German covers natural, and social sciences and the humanities. This semantic difference also contributes to the fuzziness of international comparison about trust in science between English and German speaking countries. In the following we talk about science in the all-encompassing understanding in the German language.

⁵ This section is based on analysis of long-term overviews of Austrian history (Bellabarba et al. 2020; Boyer 2022; Evans 1979; Judson 2017; Winkelbauer 2020) as well as on selected literature dedicated to its cultural (Hanisch 2005; Kann 1962; Kuzmics & Axtmann 2000), intellectual (Fleck 1996; König 2012; Mazohl & Aichner 2017; Pfefferle 2014, Stadler 1987 and 1988; Taschwer 2002) and social aspects (Goldmann 2023; Griessler & Hager 2022, Nowotny 1980; Pelinka 2006).

⁶ The historical and political assessment of the period between 1933/34 and 1938 is still controversial today. This can be seen in the conflict over what to call this period of Austrian history. According to political stance, there are various terms to choose from such as “corporative state”, “Austrofascism”, “Dollfuß/Schuschnigg regime” or “chancellor dictatorship”. There are still strong differences of opinion between Social Democrats and Conservatives on the question of whether this dictatorship was a form of fascism or not. See most recently, for example, the contribution by Simon (2021) or Goldmann (2023).

relatively recent in Austria. In the 16th and 17th century, during the reformation and counter reformation, the Habsburg rulers opposed and repressed the estates' struggles for broader political participation. Thus, the government in Austria developed differently than, e.g., in France and the UK, the democratic traditions of which rest on successful revolutions. Absolutist rule and feudalism remained largely unchallenged until the mid-19th century. The period of enlightened absolutism between 1740 and 1792, during which sovereigns in Austria decreed several important reforms from above was followed by another phase of conservative restauration that opposed major changes during and in the aftermath of the French Revolution and Napoleonic wars. In 1848, a bourgeoisie revolution was again suppressed by the Habsburg military. The subsequent neo-absolutist restoration ended in 1867 with a constitution. However, this was not achieved because of the strength of the middle classes, but due to the government's desperate situation because of several lost wars against rivaling rising European nation states.

In the following years, universal suffrage for men was slowly won; universal suffrage for women was only achieved in 1918. World War I put an end to the Habsburg Monarchy which was succeeded by the First Austrian Republic. Cooperation between the two large parties in this new and much smaller state lasted only until 1920 and ended in a permanent confrontation between the two major political blocks, the Conservatives and the Social Democrats. In 1933 and 1934, this confrontation reached its peak with Christian-social dictatorship and civil war. Many Austrians supported before and after 1938 National Socialism that excluded, marginalized, silenced, robbed, and finally forced into emigration and murdered Jewish people, other minorities and political opponents. After World War II, the Second Republic was based for many years on amnesia and amnesty of this infamous past (Goldmann 2023: 209 ff.). Until the mid- 1980s, the political system of the Second Republic was a typical "concordance democracy" (Steiner, 1972: 424, quoted after: Pelinka 2006: 231) in which the two dominating political camps – again Conservatives and Social Democrats - shared power. The population was integrated into this system via an extensive patronage system that was able to create and uphold stable voters' loyalty to one of the political camps. Since 1986, this arrangement corroded slowly and changed into a more competitive form of democracy in which voting behavior is volatile and citizens take more often an active stance in politics, e.g., civil movements (Griessler & Hager, 2016).

Science and national habitus

The sociologist Norbert Elias developed the concept of "national habitus" to explain specific characteristics of mentalities in different European nation-states from a long-term historical perspective (Elias, 1990). He assumed that the country specific distribution of power between large social groups such as rulers, nobility, bourgeoisie, and peasants impact on the "psychological structures"⁷ of the individual and on how they experience, exercise, practice and tolerate power (Kuzmics &

⁷ Translations from quotations in German by Erich Griessler.

Axtmann, 2000: 1). The position and influence of organs of state control in a society, such as police, state bureaucracy, and military, is an expression of such internal distributions of social power. Their influence and position differ in historical and international perspective. Likewise, “the structures (...) (of legitimate) authority” and “the feelings associated with the exercise and toleration of power” differ between countries (Kuzmics & Axtmann, 2000: 4). It is plausible to assume that such a national habitus also has an impact on attitudes towards science and democracy.

What does this mean for the public perception of science in Austria? The previous section illustrates the long history of political domination in Austria, in which the population rarely had any democratic rights. Various forms of absolutism, the Christian-social dictatorship and National Socialism did not perceive citizens as legitimate political actors and provided little space for active political participation. During long phases of its history, particularly during National Socialism, civil liberties were brutally suppressed in Austria. In addition, until 1848, political subordination was supplemented by the so-called manorial system, which put peasants, i.e., most of the population, in direct, personal, subservient dependence to landowning nobility (Evans, 1979; Kuzmics & Axtmann, 2000; Winkelbauer, 2020). Yet, there is also another line of tradition in Austrian history that is oriented towards emancipation. It includes ideas of enlightenment, the bourgeoisie revolution of 1848, the struggle for universal and equal suffrage, democracy, resistance against the Nazi terror, the foundation and re-erection of the Republic, and civil movements, to name a few.

The aforementioned power constellations created a special national habitus and political culture⁸ in Austria. In Austrian history, individuals frequently found themselves in contexts that impeded and even repressed participation or open critique of authorities. This generated experiences of subordination and helplessness on collective and individual levels. Thus, individuals and society developed particular strategies of adaptation such as acquiescence, keeping still, and hedging critique with humor and irony. The Austrian national habitus is strongly feudal, patrimonial, and courtly, with the civil servant as a formative figure (Kuzmics & Axtmann, 2000). Austrian political culture includes hierarchy, ceremony, love for theater, language full of rhetoric, feudal remnants, belief in the state, but also rustic insubordination, a sense for compromise, and conflict avoidance (Hanisch, 2005).

In this power constellation, science as an autonomous strive for self-enlightenment for a long-time, had little space. It could be dangerous for individuals; and the ruling powers frequently suppressed, controlled, and, at best, tolerated science. During the long phases of its history, Austrian society required uniformity and obedience and

⁸ The term “political culture” (Hanisch, 2005: 23ff.) approaches similar questions as the concept of national habitus but refers to politics (and depending on the research question, to democracy). Political culture comprises “a set of orientations, attitudes and attitudes towards political processes and structures, but also behavioral patterns in the sense of political mentality research, which are learned through historical traditions and supported by political symbols” (ibid.: 23, translated). As with the concept of national habitus, political culture is associated with “deep structures of values” and the “long duration” of an apparently “immovable history”. They include “mostly non-reflected, even unconscious attitudes, basic mental processes and everyday references” (ibid.: 3, translated).

was ready to enforce these attitudes in individuals and groups. Often, deviancy was little accepted and dangerous. In such a constellation, the abilities necessary for democratic discourse are also poorly developed.

Science, education, and politics

Likewise, education was not particularly welcome in many historical periods of Austria. For a long time, it was meant to yield adaptation to state and society and to train students to be useful subjects for the monarch and the state. During counter reformation and absolutism, education was considered dangerous for the sovereigns because it could deter subjects from true Catholic faith and encourage them to question ruling powers. This changed partly during enlightened absolutism when education was considered predominately useful for the state. However, also during that time, education was not meant to question the state order but to train useful and productive subjects. Education was also less desired in the first half of the 19th century during periods of restoration and neo-absolutism (Candolle, 1911: 236).

In a long-term perspective, the relationship between politics and science in Austria is on the one hand characterized by frequent and long phases of suppression, stagnation, or neglect of science by politics. On the other hand, there are several but short phases in which politics promoted science. Only during the second half of the 19th century did science gain momentum in the Habsburg monarchy (Mazohl & Aichner, 2017).

Defeat in the First World War, the collapse of the Habsburg empire, and the associated decrease of the “scientific space” (Surmann, 2018), the Christian-social dictatorship and National Socialism were catastrophic for the development of science in Austria (Boyer, 2022: 817; Stadler 1987; 1988). Exclusion, emigration, and murder play a strong, infamous, and a far-reaching role in Austrian science as well. Antisemitic resentments existed early in Austrian science. Discrimination at universities against Jewish people, which were only accepted as university teachers in 1867, played a significant role in the 19th century and even stronger after the 1870s. During the First Republic, the Christian-social dictatorship and National Socialism continued this development with ever increasing brutality. After 1945, for reasons of competition and latent or open anti-Semitism, there were hardly any efforts to repatriate persons who were driven into exile. The years from 1933 to 1945 had long-lasting effects on Austrian science. In an approach of “autochthone provincialization” (Fleck, 1996), universities opted for strong personnel continuities of political and scientific actors of the Christian-social dictatorship and National Socialism to prevent the return of persecuted and exiled persons, and to practice so-called “in-house appointments” (Fleck, 1996; König, 2012; Pfefferle & Pfefferle, 2014).⁹ It was not until the 1960s that there was an increased reorientation and promotion of science in line

⁹ The term “in-house appointment” refers to a practice of internal recruitment in which academic positions are preferably filled by staff from the university itself, often current or former students of the current powerful professors.

with the new social contract. A positive connection between science and democracy was also only established from this time onwards.

Science and art

Instead of research, the Catholic Habsburg rulers focused on the promotion of art, culture, painting, music and spectacle. Simultaneously, with exceptions, there was a certain disdain for rationality and science (Hanisch, 2005; Kann, 1962). This inhibited the development of science in Austria. Also in this case, lines of tradition run through counter-reformation, baroque, the dual monarchy, the ideology of Austria's mission as a "better German state" and as a civilizing cultural nation, right up to today's identification with a beautiful landscape, a land of tourism and culture. Thus, science in Austria also has a tradition of being considered secondary to arts and culture.

Science and "the" public

Science communication plays an important role for the public image of science. For a long time, no concerted efforts of science communication existed in Austria, with the exception of successful attempts around 1900 and during the First Republic, predominantly in Vienna. Activities at the University of Vienna before the World War I and at adult education centers ("Volkshochschulen") during the First Republic are important exceptions (Stifter, 2005; Taschwer, 2002). In this context, private patronage of science is almost absent in today's Austria. This is in stark contrast with the second half of the 19th century when the Jewish bourgeoisie was particularly active in promoting and communicating science. This ended when Jewish Austrians were driven into exile and/or murdered after 1938. After the World War II, approaches to science communication that had been destroyed during the Christian-social dictatorship and National Socialism were only slowly and hesitantly revived. Efforts to communicate science - such as open-, or citizen science - are recent and, even today, are not necessarily a core part of the self-image of all scientists.

Technological criticism

Austria has a strong tradition of technological criticism, including the reform movements around 1900. This, however, must not be equated with science skepticism as systematic and unwarranted rejection of science. Since the mid-1970s, several technological projects have sparked criticism in public debates in Austria. A line of tradition runs, to name a few examples, from the controversy about the nuclear power in 1978 (Nowotny, 1980), to critique of hydroelectric power plants because of nature protection in 1983, a popular petition against genetically modified organism in agriculture in 1997. Criticism of technology is not necessarily science skepticism; it includes criticism of science as it is practiced and linked to economic and political power and also comes from science itself.

8 Summary and explanatory factors

Key findings

This study shows that most Austrians are positive about science. Surveys indicate repeatedly higher trust in science and scientists than in most other institutions and groups. Austrians' trust in science is slightly below the EU average (ESS 2021). Focus group participants also describe science as positive, at times even idealizing it. There is no clear indication that negative attitudes towards science have increased recently. Comparing the Eurobarometer 2010 and 2021, interest in science grew in Austria. While Austrians are particularly dismissive or distant towards science in several questions in EU-comparison and expect relatively more often negative effects from some technologies, they are as positive as the EU-27 average when it comes to others (European Commission, 2021). Data does not clearly confirm that Austria is among the most science-skeptical countries in the EU.

Nevertheless, a part of the Austrian population is disinterested in, critical of, or skeptical about science. Our study operationalized skepticism as systematic and unwarranted rejection of science or democracy. In the secondary analysis of Eurobarometer data, we localize a group of 10% of the Austrian population that rejects scientific knowledge across various topical domains, which equals our definition of skepticism. Other forms of criticism, such as critique of scientists' motives or competence, are more widespread and can be observed in 20-30% of respondents, depending on the data set (ACCP, WGM). Surveys show that a lack of interest in science does not necessarily mean a lack of trust in science (European Commission 2021, WGM). Expert interviews highlight that there are quite different perceptions on prevalences and origins of science skepticism in the citizenry. In the focus groups, criticism of science (and democracy) relates primarily to the influence of politics or business, as well as the pursuit of vested interests. These groups also reveal that criticism is ambiguous and difficult to measure.

Agreement with statements that express skepticism towards, and low trust in science and democratic institutions, exists in all of society. Despite variation along socio-demographic characteristics, there is no distinct group with particular low trust in, or skepticism of science. Younger age, lower educational level, dissatisfaction with democracy, and preference towards the political right are associated with negative attitudes towards science (ACCP, CAUCP, European Commission 2021, ESS).

Trust in democracy and the political system has steadily decreased in recent years (ACPP, ESS, CAUCP) but from long-term perspective, the decline is less dramatic. In the ESS 2021, Austria is slightly above European average in terms of satisfaction with democracy. However, studies show that socio-economic resources influence people's experience of the political system and their satisfaction with democracy (Zandonella & Ehs, 2021). Overall, focus group participants were positive about democracy but criticized strongly aspects of political practices. Science and democracy are not perceived in isolation and individually, but as in interaction with politics, the media and economy.

Explanatory factors and conclusions

- 1. Attitudes towards science and democracy are multifaceted; a nuanced perspective is needed.** In the Austrian public debate on science skepticism, the population is portrayed - often rather offhandedly - as particularly skeptical of science. Repeatedly, a decline of trust in science has been claimed. This study shows that the Austrian population is in many regards not a special case in a European comparison of science-, and democracy skepticism. Groups expressing nuanced criticism of, or little interest in, science and democracy, must be distinguished from those who systematically and unwarrantedly reject science and/or democracy. This also requires methodological diversity when researching attitudes towards science and democracy. In addition, the debate should not only focus on alleged deficits of the population, but should also reflect the legitimate question how science, politics, economy and the media interrelate.
- 2. Many people in Austria do not experience science and democracy as part of everyday life. Ideas about how science and democracy work are often rather abstract.** There is a (social) gap between science and policy (e.g., scientific or political culture, ways of communication), and the identities and culture of some social groups (Aviva et al., 2022). Additionally, education, the media, but also science communicate predominantly facts and idealized images, rather than processes and epistemologies of science (Bertsch, 2019). Besides, socio-economically disadvantaged groups show more distance to the political system and democracy (Zandonella, 2022). Thus, science and democracy could be linked more strongly to everyday culture to become equally accessible for all social groups in all regions.
- 3. Criticism of science and democracy exists in all parts of Austrian society.** While survey data shows that some parts of the population tend to be more critical of science and democracy, often these differences are statistically not significant or uniform across different surveys. People with less education, who are dissatisfied with their lives, who vote on the right of the political spectrum, and express less satisfaction with democracy tend to be more critical of science. Criticism of democracy differs across socio-economic groups but still cuts across all social groups as well. Furthermore, critique on science and democracy is mentioned in focus group discussions also by those who expressed general trust in those areas, and is thus not restricted to a “skeptical” segment of society.
- 4. Criticism of science and democracy are connected; often, they are a critique of existing political conditions.** Trust in science and democratic institutions, as well as satisfaction with democracy are connected. In surveys they distribute in similar socio-demographic patterns and along similar political-ideological attitudes. Trust in science and satisfaction with democracy are related in a similar way with respondents’ political attitudes, affinity for populism and democratic understanding. Focus groups show that science and democracy are not seen as independent, but as intertwined areas of society. Thus, science critique is often concerned with the relationship between politics, media, and business, as well as with their influence on the development of research, democracy and, more broadly, society.

- 5. Science communication rarely conveys that research is debate, sometimes contradiction, and not without interests.** Scientists are increasingly expected to engage with the public. However, often, because of lack of credit, science communication does not promote the careers of researchers. In addition, the necessary support structures in Austria, such as educational programs or science journalism, are limited (Starkbaum et al., 2022). Science is diverse in terms of content, discipline, and method. In some cases, this diversity of disciplines and research areas leads to different and sometimes conflicting perspectives, judgments, and emphases within and between disciplines and/or research cultures. Criticism can be fostered if such differences are associated with a lack of transparency and suspected influences from business or politics (Bechtold et al., 2023). Even among experts, different and sometimes conflicting views on the independence of science exist, as the interviews showed. Science itself is called upon to critically reflect on its role in society and its dependencies (Collins & Pinch, 1993).
- 6. The current structural changes in (digital) media and the public sphere challenge the role of science in society.** In recent decades, science became more visible in the public. At the same time, the media landscape and the public sphere generally have become increasingly differentiated and digitally fragmented (Bruns, 2023). Media use has changed as well, particularly among younger people. This is important for science. Digital formats and social networks are a central source of information about science (ÖAW, 2022). Consumption of populist media can be associated with lower trust in science and agreement with potential conspiracy theory statements (Neureither et al., 2021; Trappel, 2022). As the public sphere has become more differentiated, the space for false or misleading information has also grown.
- 7. In Austria, science and democracy experienced repeatedly neglect and suppression.** During several periods of Austrian history, politics provided little support for science and democracy or even suppressed them. This does not mean that the relationship between the state, science and democratic ambitions was entirely negative. There were also beneficial phases for science and democracy in Austria. However, even today, politics sometimes opposes democratic principles or fails to consider scientific knowledge. Sometimes, political action even contradicts consensual scientific findings.
- 8. In Austrian history, a national habitus developed that also contains elements not conducive to science and democracy.** Democracy is relatively recent in Austria in comparison to other Western European countries; its development is characterized by political ruptures, setbacks, and catastrophes. Austria's "national habitus" (Kuzmics & Axtmann, 2000) developed from historical experiences of oppression, forced adaptation, and conflict. This was neither conducive to the public perception of science nor to democratic deliberation. There is also strong tradition of critique of science and controversial technology in Austria. None of these lines of tradition are deterministic, but they must be considered when interpreting today's narratives and attitudes toward science and democracy.

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