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Honesty, transparency, and rigour: A study of public trust in scientists in South Africa

This paper presents an updated analysis of South Africans' trust in scientists, situated within the South African context and based on a secondary analysis of the Trust in Science and Science-Related Populism (TISP) data set. We find that South Africans have moderately high trust in scientists (ranked 23rd) and perceive scientists as having moderately benevolent intentions and moderate integrity. South Africans' trust in scientists is mainly based on trust in the scientific method. We also present evidence on how trust is shaped by factors such as gender, age, education, religion, income, and ideology. While most South Africans trust scientists, many are concerned about the unequal distribution of the benefits of science. Furthermore, there is a strong public demand for scientists to communicate their work more effectively, engage in dialogue with society, and advocate for the value of science in policymaking. Overall, our results provide a nuanced picture of trust in scientists in South Africa, with implications for future research, communication practices, and policymaking.

Significance:

The study offers nuanced and up-to-date insights into public trust in scientists in South Africa following the COVID-19 pandemic. Overall, public trust is relatively high, but there are notable concerns regarding transparency, ethical accountability, and the equitable distribution of the benefits of science. This highlights the dynamic and multifaceted nature of public trust in scientists in South Africa. South Africans want scientists to engage more with policymakers and society and to be more transparent about their work. Sustaining and building public trust in scientists will require inclusive and culturally sensitive approaches that foster mutually beneficial relationships between scientists and their publics in a diverse society. Overall, our study provides evidence to inform debates about the status of science in South African society.

Introduction

Science policymakers and scholars have expressed concern that public trust in science is under threat.^{1,2} This perceived crisis of trust has been attributed to the anti-science rhetoric of populist movements³, limited reproducibility of research findings⁴, and politically motivated resentment towards academia⁵. Diminished trust in science can undermine individuals' abilities to make informed decisions on science-related topics.⁶ Although the diagnosis of a trust crisis is not new^{7,8}, it is increasingly feared that low public trust hinders society's capacity to effectively respond to challenges such as pandemics, climate change, and misinformation⁹⁻¹¹.

However, several recent studies suggest that public trust in science remains high in many countries, with continued support for the active role of scientists in society and politics.¹²⁻¹⁵ In some countries, trust in science increased during the COVID-19 pandemic.¹⁶ The global "Trust in Science and Science-Related Populism" (TISP) Many Labs Project found that scientists enjoy moderately high trust across 68 countries.¹⁷ These studies provide a comprehensive assessment of public trust in scientists; however, there is a growing recognition of the need for nuanced, context-sensitive analyses that take into account local economic, cultural, and political contexts.

This paper presents a comprehensive and in-depth examination of public trust in scientists in South Africa. Our secondary analysis of a public data set¹⁸ – the TISP Many Labs Project^{17,19} – analyses levels and dimensions of public trust in scientists, investigates socio-demographic correlates of trust, and explores how trust is linked to perceptions of scientists' roles in society. We also present a thematic analysis of responses to two open-ended survey questions concerning the perceived benefits of science and the attributes that make scientists trustworthy. We contextualise our findings within the global trends presented by Cologna et al.¹⁷

Global, regional and national findings on public trust in scientists

Trust in science is a complex, multi-level, and multidimensional concept.²⁰⁻²³ It can refer to science as an institution, scientists as individuals, or the scientific method as a process.²⁴ We focus on trust in scientists, as it offers a tangible reference point for public audiences²⁵ and avoids the abstraction associated with the term 'science'.

According to the Wellcome Global Monitor of 2018¹⁴, 72% of people worldwide expressed trust in scientists. Globally, trust increased following the COVID-19 pandemic: in 2020, 80% of respondents worldwide reported trust in scientists, but trust levels decreased in sub-Saharan Africa between 2018 and 2020, with only 19% expressing a high level of trust in scientists.²⁶ Cologna et al.¹⁷ provide a more recent data set based on a survey of 71 922 respondents across 68 countries, showing that trust levels vary across regions and are shaped by factors such as education, religiosity, and political orientation; these findings resonate with those of earlier studies²⁷⁻²⁹. Mostly, scientists are trusted more than political leaders and journalists¹⁵, although this varies across countries¹⁷.

Trust in scientists is also shaped by perceptions of their integrity, benevolence, and independence. While scientists are often respected for their expertise³⁰, they may also be viewed with suspicion, particularly when perceived as following third-party interests³¹. R dder et al.³² found that ambivalence toward visible scientists is widespread and consistent across Global North and Global South contexts. Moreover, scientists' perceived political affiliations can erode public trust, especially in polarised environments³³, and political ideology influences public trust. For

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example, findings from the US-based Pew Research Center show that trust in scientists is increasingly shaped by partisan divides.³⁴ However, Colonna et al.¹⁷ found that this pattern is not universal.

In South Africa, historical divisions, a diverse cultural landscape, and continued economic inequalities shape the relationship between science and society. Cultural distance from science – conceptualised as less exposure to and less knowledge about science – may impede public trust in science for South Africans living in rural areas and for those with lower levels of science education.³⁵ Furthermore, historically unethical research practices and persistent inequalities have left a legacy of scepticism toward authority and expert institutions.^{36–38} Despite this, findings from the 2022 South African Public Relationship with Science Survey³⁹ indicate that trust in scientists in South Africa is generally high, with more than 70% of South Africans trusting the work of scientists and believing that they improve lives. Notably, this trust is tempered by significant reservations: 63% of respondents believed that scientists keep their work secret, and 62% were concerned that scientific research could harm people or animals. Similarly, Guenther et al.⁴⁰ found that South Africans who recognise the promise of science and support public investment in research are more likely to trust scientists. Against this backdrop, the present study explores how local conditions shape trust in scientists and how these patterns align with or diverge from global trends.

Current study and research questions

This study investigated the extent to which South Africans perceive scientists as trustworthy and explores the socio-demographic predictors of trust in scientists. We investigated whether trust in scientists is correlated with public expectations regarding scientists' roles in society and policymaking. Hence, we asked the following research questions:

- RQ1: What is the extent of trust in scientists in South Africa? (What are the dimensions of trust in scientists? What makes a scientist trustworthy?)
- RQ2: What are the socio-demographic predictors of trust in scientists?
- RQ3: How is trust in scientists related to public perceptions and expectations of science priorities, and the role of scientists in society and politics?

We present a secondary analysis of survey data collected in South Africa in February 2023 as part of the TISP Many Labs project (71 922 respondents in 68 countries). Three of the authors were part of the core team of the global TISP consortium, which conceptualised the project and facilitated data collection for South Africa. Data were collected by Bilendi & Respondi via an online survey. Participants were 18 or older and were remunerated. Ethical approval was obtained for this research.

The data set for South African respondents consisted of 1027 valid responses. We extracted the South African data from the global data set¹⁸ and analysed them in IBM SPSS. Respondents were evenly distributed across five age categories: 18–29, 30–39, 40–49, 50–59 and 60+, with an equal share of female and male respondents per category. Except for the open-ended questions, our analyses were done on a cleaned version of this data set with post-stratification weights for age, gender, and education ($n = 1000$, due to the exclusion of 27 respondents for whom no post-stratification data were available; see Mede et al.¹⁸ for more details). The point estimates (mean values, regression coefficients, etc.) reported in the results therefore incorporate post-stratification weighting, which renders them representative of the South African population with respect to gender, age, and level of education.

Nearly two-thirds of respondents reported their highest education level as 'higher education' ($n = 645$, 64.5%) compared to 35% ($n = 453$) with 'secondary education'. Most respondents ($n = 862$, 86.2%) lived in an urban area, compared to 12.8% ($n = 128$) in rural areas. Overall, the South African sample indicated a moderate level of religiosity ($\bar{x} = 3.69$, $SD = 1.32$, where 1 = not religious at all and 5 = very strongly religious), with 61.4% considering themselves religious and 22.3% selecting the midpoint of the scale. Regarding political orientation, our sample shows a moderate level of conservatism ($\bar{x} = 3.27$, $SD = 1.094$, 1 = strongly liberal, 5 = strongly conservative, 99 = I don't know), with 48% of respondents selecting the midpoint of the scale.

The following measures were applied in the study:

- **Trust in scientists:** The perceived trustworthiness of scientists was measured on a 12-item scale¹⁸ based on Besley et al.²⁰ and covered four trust dimensions: competence, integrity, benevolence, and openness. The questions used semantic differentials ranging from very inexpert (very dishonest, not concerned about people's well-being, not open to feedback, etc.) to very expert (very honest, very concerned about people's well-being, very open to feedback, etc.). Each question used a five-point scale, with higher values indicating greater perceived trustworthiness.
- **Desired and perceived goals of science.** Respondents were asked how much scientists should prioritise four goals (very low priority – very high priority) and how strongly they think that science tackles these goals (not at all – very strongly). The goals were to improve public health, solve energy problems, reduce poverty, and develop defence and military technology.
- **Perceptions of the role of scientists in society and policymaking.** Respondents indicated their agreement (strongly disagree – strongly agree) with six statements about expectations towards the role of science in politics and society, e.g. "Scientists should be more involved in the policy-making process"¹⁷.

Before answering, participants were presented with the following definition of *science* and *scientists*:

When we say 'science', we mean the understanding we have about the world from observation and testing. When we say 'scientists', we mean people who study nature, medicine, physics, economics, history, and psychology, among other things.¹⁷

Respondents were randomly assigned to answer one of two open-ended questions. One question asked respondents to share their opinion on *who benefits the most from science* (462 valid responses), and the other question asked *what makes a scientist trustworthy* (511 valid responses). Two researchers jointly qualitatively coded the complete set of responses, refining the themes via a consensual coding approach over two rounds of coding, followed by quantifying the thematic responses and extracting illustrative quotes.

Study limitations

One limitation of this study relates to the representativeness of the sample. Although quota sampling was employed, the sample was slightly skewed toward more educated, urban respondents. To mitigate sampling bias, we have used post-stratification weighting to analyse quantitative results, but not for the qualitative responses. Moreover, although English is commonly used in South Africa, the survey's administration in English and online may have led to an oversampling of more educated, digitally connected South Africans.

Results

The extent and dimensions of trust in scientists (RQ1)

In Table 1, we report the mean weighted score (on a scale from 1 to 5) for each item assessing the perceived trustworthiness of scientists, ranked from highest to lowest. For each item, we include the dimension of trustworthiness. The aggregate score of trustworthiness of scientists is the arithmetic mean of all response values of each respondent.

Overall, South Africans have a moderately high level of trust in scientists, with a mean total score of 3.75 ($n = 1000$, $SD = 0.75$, range 1 to 5). Respondents consider scientists to be intelligent ($\bar{x} = 4.42$), qualified ($\bar{x} = 4.34$), and eager to improve others' lives ($\bar{x} = 3.94$). Turning to the dimensions of trust, respondents perceive scientists as highly competent ($\bar{x} = 4.22$, $SD = 0.74$, range 1 to 5), with moderate benevolent intentions ($\bar{x} = 3.72$, $SD = 0.89$, range 1 to 5), and moderate integrity ($\bar{x} = 3.54$, $SD = 0.87$, range 1 to 5). Perceived openness among scientists scored slightly lower ($\bar{x} = 3.45$, $SD = 0.95$, range 1 to 5).

In response to the question "How much confidence do you have in scientists to act in the best interests of the public?", the mean score of 3.76 ($SD = 1.179$) signifies a moderately high perception of benevolence among scientists, and this was also strongly correlated with overall trust in science ($r = 0.755$, $p < 0.001$).

Respondents were asked "What makes a scientist trustworthy?" in an open-ended survey question. A thematic analysis of their responses reveals four key themes: (1) evidence, (2) honesty, integrity, and accountability, (3) credibility and track record, and (4) communication and engagement skills. Some responses were relevant to more than one theme. For example, one respondent wrote: "Trustworthy scientists are open and transparent about their research, including their methods, data, and results. They are willing to share their findings and engage in open discussions about their research." Our analysis (see Table 2) indicates that most respondents ($n = 219$) considered the availability of evidence, including references to factual proof and peer-reviewed results, to be the most important factor in their trust in scientists.

Respondents who indicated the importance of honesty, integrity, and accountability ($n = 65$) expect scientists to uphold strong ethical values and remain objective, avoid financial or political biases, and prioritise public benefit. They also expect scientists to avoid financial or political biases and prioritise public benefit, for example: "A scientist should be in it for the love of science and not for corruption or money." Credibility and track record, including formal qualifications, academic achievements, and professional experience, were also highlighted as significant factors contributing to a scientist's credibility ($n = 55$). These respondents stated they would trust scientists more if they held several degrees, had reputable affiliations, and a history of published research and awards. The importance of scientists' public communication and engagement skills on their public trustworthiness was also evident ($n = 45$).

A few respondents ($n = 6$) did not believe scientists are trustworthy. Their concerns included the influence of politics and money on the conduct of scientists, the uncertainty surrounding new scientific advances, fears about the risks associated with new inventions, and perceived clashes between science and religious values. One respondent said:

At the moment, with everything that's going on and coming out, I trust nothing about science.

And another:

I don't trust scientists. They promoted a fictional disease (COVID), which caused chaos for our economies and made us live in fear. They promised that their vaccines would work, but that also caused more problems.

Table 1: Weighted mean scores on the perceived trustworthiness of scientists in South Africa ($n = 1000$)

| Dimension | Question | Mean | Standard deviation |
|-------------|---|------|--------------------|
| Competence | How intelligent or unintelligent are most scientists? | 4.42 | 0.858 |
| Competence | How qualified or unqualified are most scientists when it comes to conducting high-quality research? | 4.34 | 0.831 |
| Benevolence | How eager or uneager are most scientists to improve others' lives? | 3.94 | 0.979 |
| Competence | How expert or inexperienced are most scientists? | 3.9 | 0.989 |
| Integrity | How sincere or insincere are most scientists? | 3.72 | 0.998 |
| Benevolence | How concerned or not concerned are most scientists about people's well-being? | 3.7 | 1.088 |
| Integrity | How ethical or unethical are most scientists? | 3.67 | 1.016 |
| Benevolence | How considerate or inconsiderate are most scientists of others' interests? | 3.53 | 1.101 |
| Integrity | How honest or dishonest are most scientists? | 3.53 | 1.079 |
| Openness | How willing or unwilling are most scientists to be transparent? | 3.52 | 1.124 |
| Openness | How much or little attention do scientists pay to others' views? | 3.43 | 1.152 |
| Openness | How open are most scientists to feedback? | 3.40 | 1.120 |

Table 2: South Africans' opinions on what makes a scientist trustworthy ($n = 511$)

| Theme | Count | Illustrative examples |
|--|-------|---|
| Evidence | 219 | "Having proof makes me trust science." "Scientists are trustworthy when they can prove their theories through experiments and logical explanations." "I need to see tangible proof that their experiments were tested multiple times and validated by independent sources." |
| Honesty, integrity and accountability | 65 | "Scientists are most trustworthy when they are honest and transparent." "A trustworthy scientist admits mistakes and does not manipulate data to fit an agenda." "I trust scientists who put public safety first and do not cut corners, even when pressured by corporations or governments." |
| Credibility, qualifications and track record | 55 | "I trust scientists who have a history of research, degrees from reputable institutions, and work that is validated by peers." "If they have a Nobel Prize or are affiliated with prestigious institutions, I am more likely to trust their expertise." |
| Communication and engagement skills | 45 | "I trust scientists who simplify their findings for the general public and address misinformation openly." "Trustworthy scientists should not keep secrets." "Scientists should be open about their research and willing to engage with different perspectives." |

These results reflect broader epistemic virtues that underpin scientific trustworthiness, such as honesty and transparency. A key finding of the qualitative data is that the South African public considers rigour and methodological soundness (linked to evidence and proof) as a central constituent of trust in scientists. This finding is supported by the results of a closed-ended question, in which 77.3% ($n = 773$) of respondents selected scientific research methods as the most effective way to determine whether something is true or false. We also found a positive (moderate) correlation between overall perceived trust in scientists and trust in scientific methods ($r = 0.47, p < 0.001$). These results suggest that, in South Africa, trust in scientists is primarily understood as trust in the scientific method.

The socio-demographic predictors of trust in scientists (RQ2)

The perceived trustworthiness of scientists differed slightly by gender, with men reporting higher trust in scientists than women ($t = 3.230, p = 0.001, d = 0.204$). We found a positive yet weak correlation between age and trust in scientists ($r = 0.134, p < 0.001$) with respondents between the ages of 40 and 49 reporting a higher level of trust in scientists ($\bar{x} = 3.93, SD = 0.75$) compared to respondents aged 18 to 29 years ($\bar{x} = 3.54, SD = 0.67, F = 9.761, p < 0.001, \eta^2 = 0.038$).

Respondents who lived in urban areas reported slightly higher trust in scientists than those in rural areas ($t = -3.864, p < 0.001, d = -0.344$). South Africans do not perceive strong conflicts between scientific and religious epistemologies, and trust is positively associated with religiosity ($r = 0.150, p < 0.001$). Political orientation (measured as strongly liberal to conservative, and strongly left-leaning to strongly right-leaning) was not a predictor of trust in scientists. Additionally, education level ($F = 2.662 [2, 997], p = 0.070, \eta^2 = 0.005$) and income ($r = 0.014, p = 0.659$) were weak predictors of trust in scientists in South Africa.

Trust in scientists and views about science's goals/benefits (RQ3)

Respondents were asked to rate four goals that scientists *should* prioritise, as well as their perception of how the scientific community currently addresses these goals. The results are illustrated in Figure 1.

Solving energy problems was considered the most important priority ($\bar{x} = 4.74, SD = 0.62, \text{range } 1 \text{ to } 5$), followed by health-related priorities ($\bar{x} = 4.67, SD = 0.73$) and reducing poverty ($\bar{x} = 4.35, SD = 1.02$). Defence and military-related research were considered

the least important. Looking at the perceived prioritisation of these goals, respondents considered energy-related problems to receive the most attention, while poverty received the least attention. The overall trust in scientists was moderately correlated with the perception that health ($r = 0.544, p < 0.001$), energy-related problems ($r = 0.439, p < 0.001$) and poverty ($r = 0.387, p < 0.001$) were prioritised by the scientific community.

To explore perceptions about the beneficiaries of science, we asked "Which geographic region benefits the most from the work that scientists do?" and "Which region benefits the least?". In response to the first question, Europe was the primary beneficiary (34.4%, $n = 343$), followed by Africa (28.1%, $n = 281$) and North America (20.1%, $n = 201$). However, in response to the second question, Africa was perceived to benefit the least (61.9%, $n = 617$), followed by Latin America (13.9%, $n = 138$). The seemingly inconsistent findings on Africa point to the subjective and temporal nature of this perceived benefit assessment.

To further investigate the perceived beneficiaries of science, we thematically analysed the second open-ended question: "Who benefits the most from science and why?". Six themes were identified, as listed in Table 3. In four of these themes, respondents were positive about the beneficiaries of science, while two were negative, as indicated.

Half of the respondents ($n = 230$) identified 'humanity and society' as a broad collective beneficiary of science. They described science as a shared resource that benefits all of us by improving our lives, enhancing our understanding of the world, and helping to solve global problems. Notably, several respondents emphasised that people could only benefit from science if it were accessible.

Respondents who felt that rich people, industry, and developed countries benefitted the most ($n = 107$) were more critical. These respondents highlighted how wealthy individuals, private corporations, and developed nations could leverage scientific advancements to gain greater wealth and power, adding that powerful individuals and companies controlled scientific information and could exploit it while excluding others.

Fewer respondents considered medicine and health care as the primary beneficiaries of science ($n = 33$). Respondents who saw a benefit for nature and/or the environment ($n = 29$) acknowledged the role of science in mitigating challenges such as climate change, conservation, and sustainable development. Only three respondents mentioned the benefits of science to economic growth, while five felt that no one (or only a select few) benefitted from science.

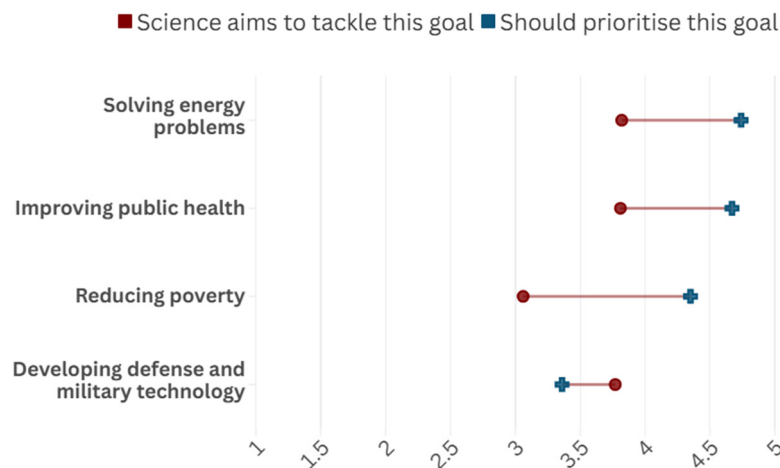


Figure 1: Mean (1–5) public rating of science goals, contrasting perceived current scientific effort ('Science aims to tackle this goal'; red circles) with normative expectations ('Should prioritise this goal'; blue crosses) across four domains. Connecting lines show within-goal differences; greater separation indicates greater divergence between perceptions and expectations.

Table 3: Perceived beneficiaries of science ($n = 462$)

| Theme | Count | Illustrative examples |
|--|-------|--|
| Humanity and society (positive) | 230 | "Science benefits society as a whole because it helps us understand the world and improve living standards." "Everybody benefits from science. After all, science is all around us and affects us all in one way or another." |
| Rich people, industry and developed countries (negative) | 107 | "The rich benefit the most from science because they can afford to use its advancements." "Science tends to benefit the wealthy more than the poor because research agendas are shaped in both explicit and invisible ways by incumbent groups without open debate on public values and wider societal benefits." |
| Medicine and health care (positive) | 33 | "With every outbreak of new diseases, such as COVID-19, the world receives information and solutions from science." "If you think of any disease that can affect and potentially render humanity extinct, science has been at the forefront of preventing that from happening many times." |
| Nature and environment (positive) | 29 | "The environment benefits the most as science helps us understand climate change and protect nature." "Animals and the earth benefit because science helps us protect natural resources." |
| Economy (positive) | 3 | "Science benefits economies by driving innovation and creating wealth." "Science has brought many benefits to society, such as technological advancements, improved quality of life, and a stronger economy." |
| No one benefits, or only a few (negative) | 5 | "I don't think anybody truly benefits from science, as scientists hide a lot of information, making it impossible for people to benefit from it." "I think that all people could benefit from science, but very few do." |

Perceived role of science in South African society and politics

A secondary objective of our third research question was to explore expectations around the role of scientists in society and politics. The results are illustrated in Figure 2 (the 'neutral' category is not illustrated) and show strong demand for scientists to interact with public audiences, with 78.8% agreeing or strongly agreeing with the statement "Scientists should communicate about science with the general public" ($\bar{x} = 4.52$, $SD = 0.85$, range 1 to 5). There is an expectation for scientists to participate in policy processes, with 58% of respondents agreeing that scientists should be more involved in policymaking ($\bar{x} = 3.74$, $SD = 1.21$, range 1 to 5), and 65% agreeing that scientists should advocate for specific policies ($\bar{x} = 3.94$, $SD = 1.143$, range 1 to 5).

We also noted some apprehension about scientists' engagement and communication with politicians, as indicated by statements such as "Scientists should work closely with politicians to integrate scientific results into policymaking" ($\bar{x} = 3.5$, $SD = 1.35$), and "Scientists should communicate their findings to politicians" ($\bar{x} = 3.4$, $SD = 1.43$). These results show a clear preference for scientific engagement with society in general over that of political actors, despite the desire for scientific advocacy.

Discussion

Dimensions of trust in science

This study provides updated, contextually grounded insights into public trust in scientists in South Africa. Compared with global results, trust in

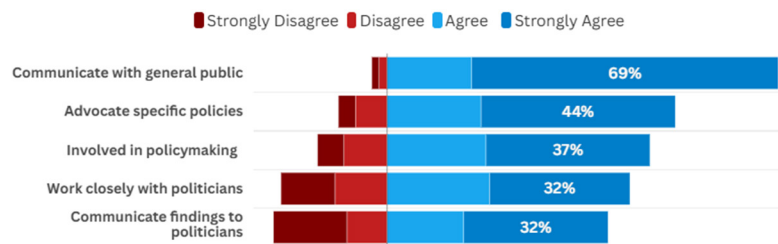


Figure 2: The South African public's agreement with scientists' role in society and policymaking on a four-point Likert Scale on five statements about scientists' public and political roles, where blue tones indicate agreement.

scientists in South Africa is marginally higher than the global average, but lower than levels reported in countries such as Egypt, Nigeria, and the United Kingdom.¹⁷ Overall, South Africa ranked 23rd out of 68 countries, with public trust in scientists almost equal to that of a neighbouring country, Botswana.⁴¹

Public perceptions of competence, benevolence, and integrity largely mirror global patterns, although slightly higher ratings for benevolence and openness may reflect specific expectations about scientists' social responsibilities in the South African context. Scientists' benevolence contributes to public trust by fostering perceptions that scientists are motivated by goodwill and ethical considerations, thereby enhancing trustworthiness and willingness to trust, particularly in the relational and moral dimensions of trust.^{20,42}

South Africans' trust in scientists is positively correlated with trust in the scientific method. Thematic analysis of the qualitative data supports this result, where participants consider empirical validation central to their assessment of a scientist's trustworthiness. This result may be indicative of a broad public understanding of science as primarily rooted in positivism. While this is not surprising in itself, it is of interest for future studies to explore what this implies for public engagement with other epistemologies, specifically in the social sciences and humanities, and how these might intersect with or diverge from dominant notions of scientific credibility.

Socio-demographic predictors of trust

Our research highlights the importance of socio-demographic factors. It identifies gender and age as predictors of trust in scientists, with men and respondents aged 40–49 reporting higher levels of trust. However, unlike findings from Europe and North America, education and income did not significantly relate to perceptions of scientists' trustworthiness. One possible explanation for this divergence lies in South Africa's socio-historical context. Deep structural inequalities, historical exclusion from scientific institutions, and the legacy of apartheid-era science have shaped public attitudes in ways that differ from high-income contexts. For example, the positive association between religiosity and trust in scientists may reflect the complementary rather than competing roles of science and religion in South Africa's social fabric. Falade and Guenther⁴⁰ show that, despite high levels of religiosity in South Africa, scientific and religious knowledge coexist mainly in parallel.

Perceived priorities and beneficiaries of science

We found public concerns about the unequal distribution of the benefits of science, with South Africans believing that industry and wealthy individuals benefit more from advances in science than disadvantaged communities. South African respondents also perceive that scientific advancements disproportionately benefit the Global North, raising concerns about inequalities in research funding and access. We found South Africans generally support science and trust scientists, but they are concerned about transparency and accessibility. This is unsurprising, given South African society's profound social and economic disparities. Public ambivalence toward science will likely remain a significant challenge for those seeking to build public trust in science, scientists, and scientific institutions in South Africa. Our findings highlight the importance of open dialogue between experts and citizens and inclusive

engagement strategies that intentionally involve marginalised and impoverished communities while foregrounding social justice objectives.

Furthermore, our research shows a misalignment between the public's *preferred* scientific priorities (energy solutions, poverty alleviation, and public health) and the *perceived* priorities, with a predilection toward developing military defence rather than poverty alleviation. Public perceptions of the goals of science are shaped by cultural worldviews and ideological contexts, which in turn influence perceptions of the purpose and implications of scientific advancements.⁴³ The energy crisis, coupled with considerable poverty and public health challenges, reflect South African society's calls for scientific developments in these areas. While basic research and long-term scientific agendas are essential, a publicly funded science system must remain attentive to societal needs and values. Persistent gaps between public expectations and perceived scientific priorities may erode perceptions of scientists' benevolence and undermine trust over time. For publicly funded science systems, attention to societal needs and values is essential. Aligning research priorities with public concerns (or at least communicating the rationale behind long-term research investments more effectively) may help build more robust and resilient forms of public trust.

Ambivalence on scientists' role in society and policymaking

Finally, while the South African public values scientists' expertise, there is a clear call for more meaningful public engagement and relevant, accessible science communication. There are clear expectations for scientists to advocate for specific policies and contribute to policymaking processes. These findings echo earlier recommendations⁴⁴ for more deliberative public engagement approaches that position the public not merely as recipients of scientific knowledge, but as active partners in shaping research agendas. Notably, although there is broad support for scientists' involvement in setting priorities and advising on public policy, there is ambivalence about their direct engagement with politicians. This aligns with concerns about trust in government, as reflected in the Edelman Trust Barometer¹⁵, which found declining confidence in political leaders and increased perceptions of government as a source of misinformation. Trust in political institutions is conditional and often conflated with trust in the individuals occupying those roles.⁴⁵ In South Africa, where increasing corruption, low service delivery and weak political efficacy and leadership have eroded public trust in national and local government and politicians, our findings illustrate the ambivalence about scientists' direct collaboration with politicians, reflecting the broader public distrust of political institutions.^{15,46-48}

Conclusion

This study examined public trust in scientists in South Africa as part of the global TISP project. Beyond methodological insights into measuring trust and credibility, our findings highlight that trust in science arises not only from perceptions of honesty, transparency, and rigour, but also through its interaction with broader belief systems that shape how individuals and communities interpret the role of science in society.

While overall trust in scientists in South Africa remains relatively high, historical legacies of exclusion and unethical practices continue to temper

trust in scientific institutions, and concerns persist about transparency, ethical accountability, and the fair distribution of science's benefits. Future scholarship building on our work will need to address normative dimensions of trust in scientists, such as an 'appropriate' or 'desired' level of trust. Trust in scientists is thus often assumed to be a universally positive trait; however, its normative dimensions deserve scrutiny⁴⁹, including whether more trust is always desirable and to what extent institutional credibility should serve as a legitimate heuristic for assessing scientists' trustworthiness.

Trust in scientists is relational and dynamic; it is shaped by social context, historical inequalities, and evolving global and local events. Therefore, building and sustaining trust will require context-specific approaches that promote inclusivity, transparency, and sustained dialogue, with a focus on inclusion of marginalised communities. Furthermore, trust in scientists in South Africa must be understood within a pluralistic epistemic landscape, where scientific rationality coexists and sometimes competes with religious, traditional, and moral worldviews. As shown during the COVID-19 pandemic, scepticism was often less about rejecting science and more about negotiating its authority alongside other systems of knowing and meaning. Fostering trust requires more than communicating facts or improving methods; it demands recognising and engaging with the moral, cultural, and historical frameworks that shape scientific authority, as well as the ethical and cultural dimensions through which people make sense of science. Although the survey data presented here offer only a snapshot, they reveal the need for longitudinal and comparative research to understand how trust changes over time and across epistemic communities and world regions.

Data availability

All the data supporting the results of this study are included in the article itself.

Declarations

We have no competing interests to declare. We have no AI or LLM use to declare. Research ethics approval was obtained from Stellenbosch University (Research Ethics Committee: Social, Behavioural and Education Research) – Project number: 26177. The original survey was funded by the University of Hamburg, with a performance-oriented allocation of funds (LOMI) awarded to S.R.

Authors' contributions

M.v.L.: Formal analysis, project administration, writing – original draft, writing – review and editing. M.J.: Conceptualisation, formal analysis, project leadership, writing – original draft, writing – review and editing. M.B.: Formal analysis, writing – review and editing. N.G.M.: Data curation, methodology, writing – review and editing. L.G.: Investigation, methodology, project administration, resource, writing – original draft, writing – review and editing. S.R.: Funding acquisition, project administration, writing – review and editing. V.C.: Conceptualisation, methodology, writing – review and editing. All authors read and approved the final manuscript.

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