

Measuring Climate Change Scepticism

Using a 12 item rating scale or its 8 or 4 item short version

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Summary

- Existing measures lack a thorough approach to measuring all four dimensions of climate change scepticism.
- We compare and validate existing measurement instruments.
- Further, we develop a four-dimensional scale, building on scales of Whitmarsh (2011) and De Graaf et al. (2023).
- Finally, we propose a short scale of 8 or 4 items and a long scale of 12 items, covering all four dimensions of scepticism with good fit in CFA.

Theory

- Concept of looking at scepticism in terms of different dimensions by Rahmstorf (2004).
- He proposes 3 dimensions: Trend, Attribution and Impact.
- Response scepticism has been proposed as a fourth dimension (Capstick & Pidgeon 2014).
- The different dimensions are seen as subcategories of scepticism.

Data and Methods

- We conducted a web survey using a non-probability opt-in online panel with post-stratification weights for Germany (n=532).
- Evaluation of the dimensionality, scalability and reliability of the newly developed scale, by using confirmatory factor analysis.
- Linear regression analysis used to assess the external validity of the instrument.
- Second wave to replicate the results and test some alternative formulations.

Scale Development

- Whitmarsh's scale achieves the best statistical reliability among existing measures.
- Originally designed as a one-dimensional scale, the scale shows improved fit indices when adapted to a three-dimensional model.
- Missing items on response scepticism are added by De Graaf et al. (2023).
- Our newly proposed scale fits better than the existing measures.

Items

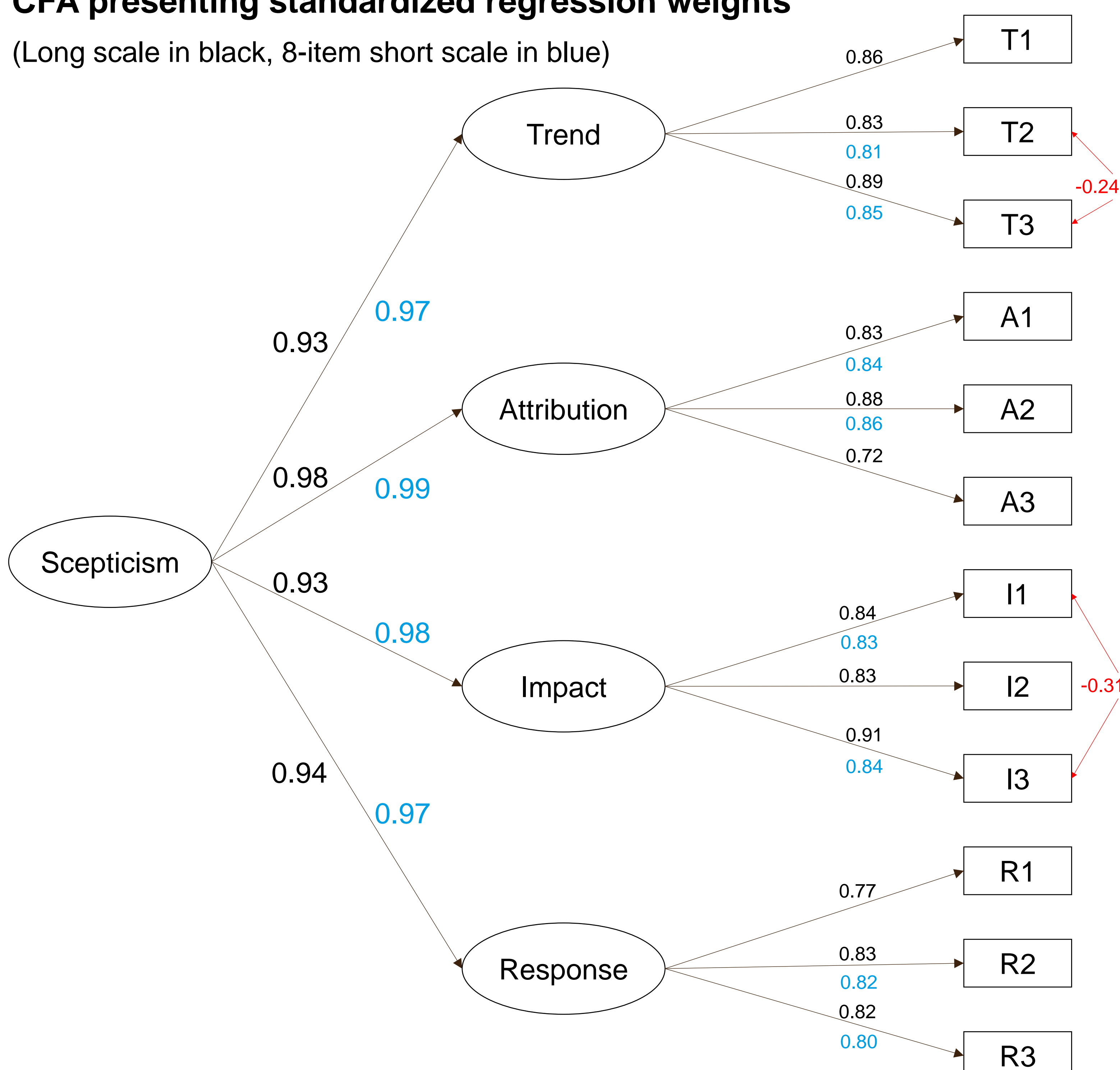
Trend	T1	There is too much conflicting evidence about climate change to know whether it is actually happening.
	T2	I am uncertain about whether climate change is really happening.
	T3	The evidence for climate change is unreliable.*
Attribution	A1	Climate change is just a natural fluctuation in earth's temperatures.*
	A2	Claims that human activities are changing the climate are exaggerated.
	A3	Many leading experts still question if human activity is contributing to climate change.
Impact	I1	It is too early to say whether climate change is really a problem.
	I2	The media is often too alarmist about issues like climate change.
	I3	Too much fuss is made about climate change.*
Response	R1	There is not much we can do that will help solve climate change.
	R2	Trying to solve climate change is a waste of time.*
	R3	Human behavior has little effect on climate change.

Note: Items on the 8-item short scale are marked in bold. Items on the 4-item short scale are marked with an asterisk.

Results

CFA presenting standardized regression weights

(Long scale in black, 8-item short scale in blue)

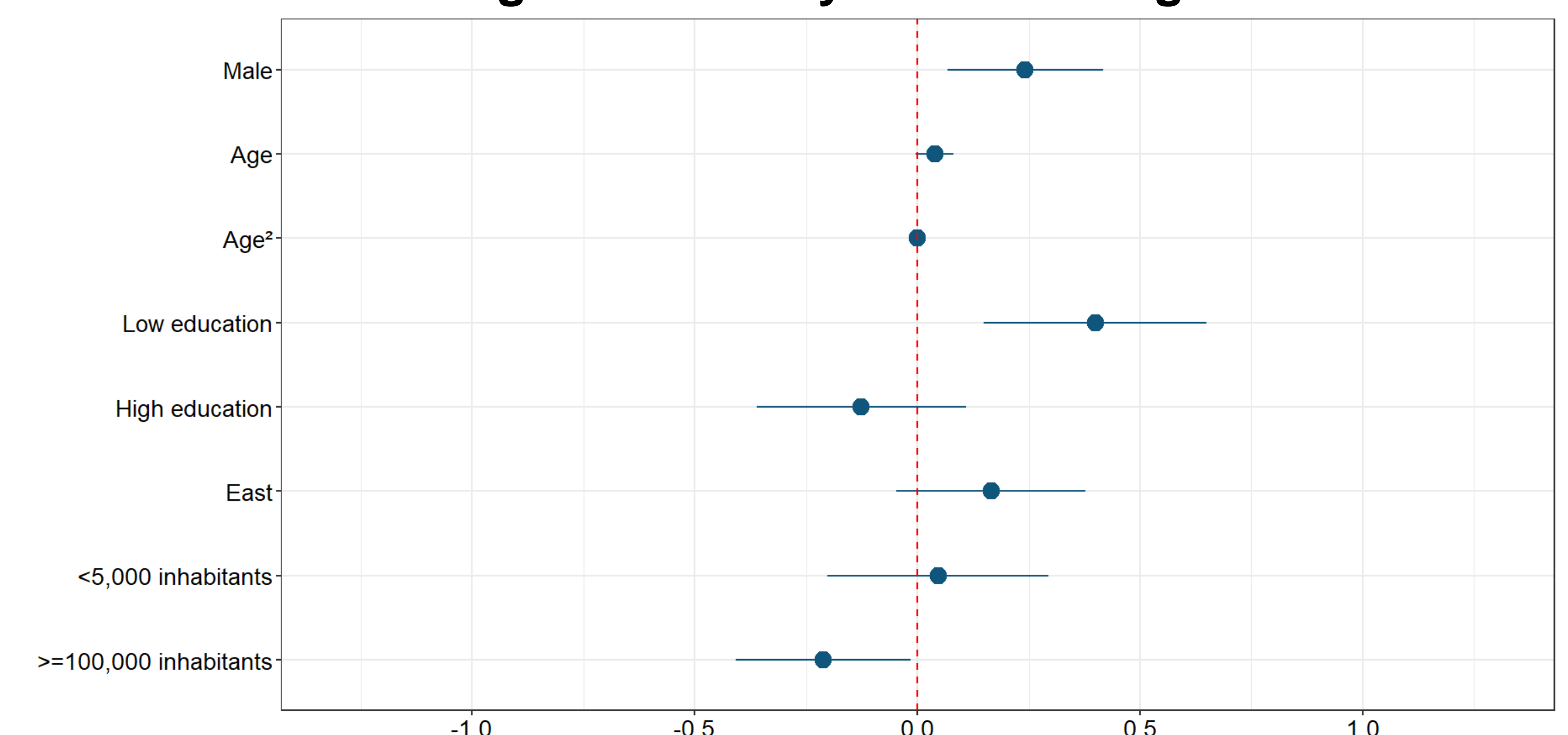


Fit Indices: CFI: 0.987/ 0.989, RMSEA: 0.052/ 0.056, SRMR: 0.023/ 0.051.

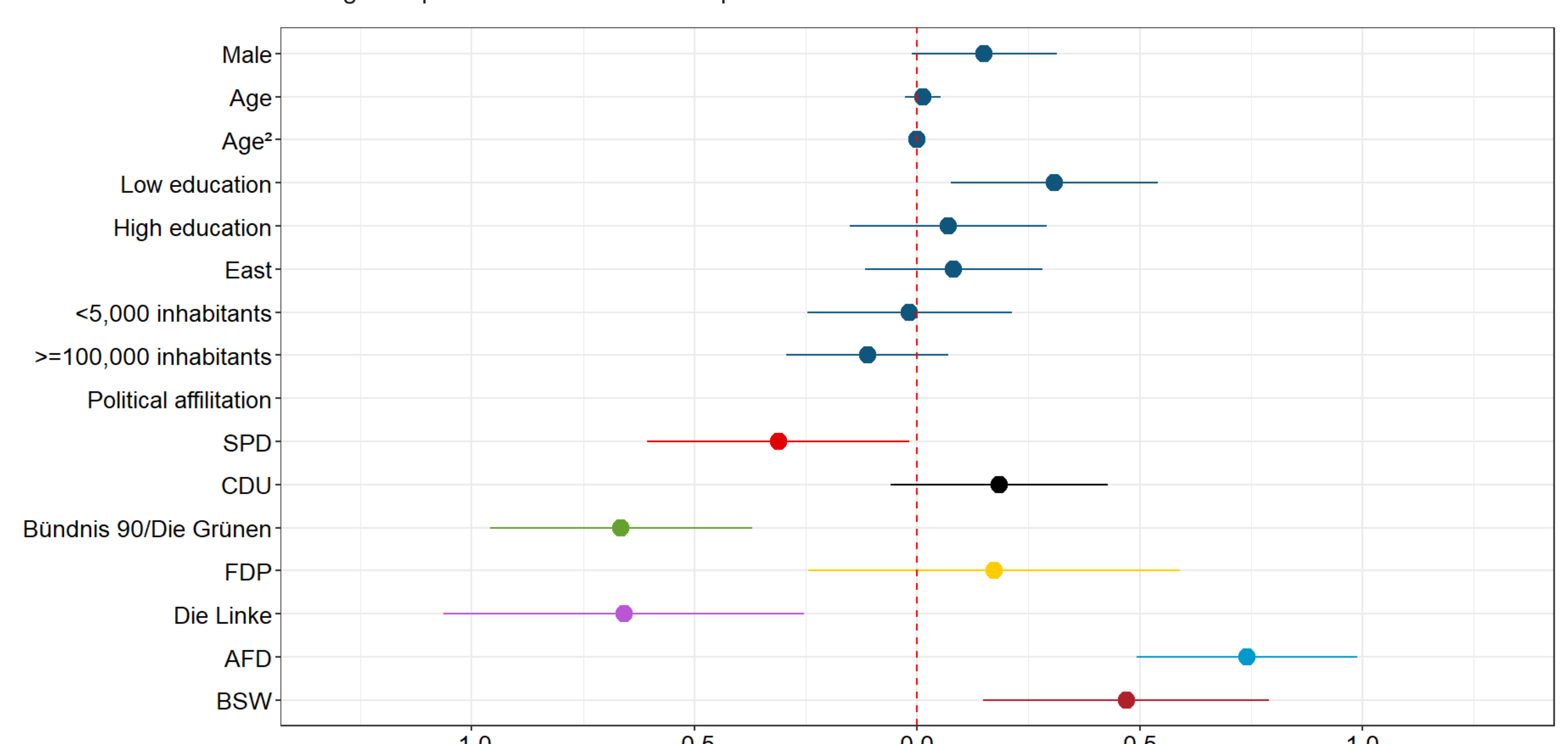
Discussion

- Results of CFA and linear regression analysis confirm the functionality and external validity of the developed scale.
- High loadings for dimensions and their corresponding items (CFA) and correlations with expected socio-demographic characteristics and right-wing populism (linear regression).
- So, the developed scale is suitable as an instrument for measuring climate change scepticism.

Linear regression analysis of the long scale of CSS



Model 1: The dots represent unstandardized coefficient estimates of the linear regression with the climate change scepticism scale score as dependent variable. The lines are the 95% confidence interval.



Model 2: The dots represent unstandardized coefficient estimates of the linear regression with the climate change scepticism scale score as dependent variable. The lines are the 95% confidence interval.

References

- Capstick, S. B., & Pidgeon, N. F. (2014). What is climate change scepticism? Examination of the concept using a mixed methods study of the UK public. *Global Environmental Change*, 24, 389–401. <https://doi.org/10.1016/j.gloenvcha.2013.08.012>
- De Graaf, J. A., Stok, F. M., Wit, J. B. de, & Bal, M. (2023). The climate change skepticism questionnaire: Validation of a measure to assess doubts regarding climate change. *Journal of Environmental Psychology*, 89, 102068. <https://doi.org/10.1016/j.jenvp.2023.102068>
- Rahmstorf, S., 2004. The Climate Sceptics. Potsdam Institute for Climate Impact Research, Potsdam. (accessed 11.11.24) In: https://www.pik-potsdam.de/~stefan/Publications/Other/rahmstorf_climate_sceptics_2004.pdf
- Whitmarsh, L. (2011). Scepticism and uncertainty about climate change: Dimensions, determinants and change over time. *Global Environmental Change*, 21(2), 690–700. <https://doi.org/10.1016/j.gloenvcha.2011.01.016>