Comment on 'Quantifying the consensus on anthropogenic global warming in the scientific literature'

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Abstract

Cook's highly influential consensus study is an outlier in the consensus literature. It omits tests for systematic differences between raters. Many abstracts are unaccounted for. The paper does not discuss the procedures used to ensure independence between the raters, to ensure that raters did not use additional information, and to ensure that later ratings were not influenced by earlier results. Clarifying these issues would further strengthen the paper.

The consensus paper by Cook et al. (2013) generated a lot of interest. Consensus is not proof, but occasional stock takes of the state of scientific knowledge are useful for identifying fruitful new research avenues and potential paradigm shifts. Agreement, or perceived agreement, about the extent and causes of climate change has no bearing on rational choices about greenhouse gas emission reduction – those are driven by the trade-offs between the impacts of climate change and the impacts of climate policy – but it does affect the public perception of and the political debate on climate policy, as does the integrity of climate research.

Cook et al. (2013) estimate the fraction of published papers that argue, explicitly or implicitly that most of the recent global warming is human-made. They find a consensus rate of 96-98%. Other studies find different numbers. Bray and von Storch (2007) find 40% for 1996 and 53% for 2003; and Bray and von Storch (2010) find 84% for 2008. Oreskes (2004) finds 75%. Doran and Zimmerman (2009) find 82% for the whole sample, while the consensus in subsamples ranges from 47% to 97%. Anderegg, Prall, Harold, and Schneider (2010) find 66% for the whole sample, but 90% to 98% in subsamples. Stenhouse et al. (2013) find 52% for the whole sample, while subsamples range from 35% to 78%. Verheggen et al. (2014) find 66% for the whole sample, with subsample consensus ranging from 7% to 79%. Figure 1 shows these estimates; see also Table A1 in the Appendix. Cook et al. (2013) seem to be an outlier in the consensus literature: their results, for a large sample, are in line with other results for small samples but contradict other large samples.

The problem may lie in the methodology of Cook et al. (2013). Reusswig (2013) praises the paper but Legates, Soon, Briggs, and Monckton of Brenchley (2013) and Tol (2014a)

question its data and methodology (Bedford & Cook, 2013; Cook et al., 2014a; Tol, 2014b). Dean (2015) notes that the paper omits inter-rater reliability tests. Cook and Cowtan (2015) add these. These methodological exchanges omit the following five points:

- Cook et al. (2013) do not show tests for systematic differences between raters. Abstract rater IDs may or may not be confidential (Queensland, 2012, 2014), but the authors could have reported test results without revealing identities.
- The paper argues that the raters were independent. Yet, the raters were drawn from the same group. Cook et al. (2013) are unfortunately silent on the procedures that were put in place to prevent communication between raters.
- The paper states that "information such as author names and affiliations, journal and publishing date were hidden" from the abstract raters. Yet, such information can easily be looked up. Unfortunately, Cook et al. (2013) omit the steps taken to prevent raters from gathering additional information, and for disqualifying ratings based on such information.
- Cook et al. (2013) state that 12,465 abstracts were downloaded from the Web of Science, yet their supporting data show that there were 12,876 abstracts. A later query returned 13,458, only 27 of which were added after Cook ran his query (TOL). The paper is silent on these discrepancies.
- The date stamps, which may or may not have been collected (Cook, 2013; Cook et al., 2014b), reveal that the abstracts were originally rated in two disjoint periods (mid-February to mid-April; second half of May). There was a third period of data collection, in which neutral abstracts were reclassified. Unfortunately, Cook et al. (2013) do not make clear what steps were taken to ensure that those who rated abstracts in the second and third periods did not have access to the results of the first and second periods.

It would be of considerable benefit to readers if these issues would be clarified, if at all possible.

Cook et al. (2013) renewed interest in the question how to communicate (climate) science. While several studies show that people respond to cues about the scientific consensus (Guy, Kashima, Walker, & O'Neill, 2014; Myers, Maibach, Peters, & Leiserowitz, 2015; Van der Linden, 2015; van der Linden, Leiserowitz, Feinberg, & Maibach, 2014, 2015), other studies show that this effect is dominated in the long run by other factors (Bliuc et al., 2015; Campbell & Kay, 2014; Kahan, 2015).

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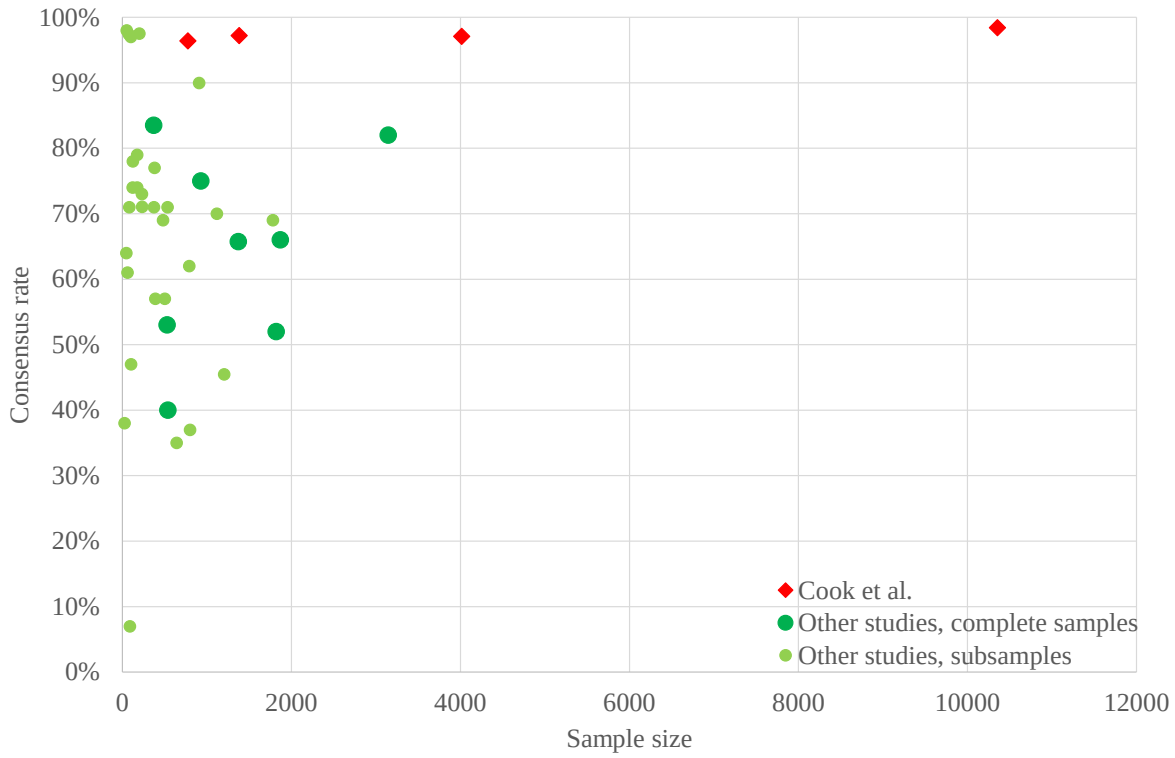

Figure 1. Estimates of the consensus on anthropogenic global warming according to Cook et al. and other studies (Bray, Oreskes, Doran, Anderegg, Stenhouse, Verheggen) as a function of the sample size.

Table A1. Details of consensus estimates: lead author, year of publication, year of research, sample size, method, estimated consensus rate, object of study.

Author	Year	Year	N	method	consensus	object
Bray	2007	1996	539	survey	40.0%	climate scientists
		2003	530	survey	53.0%	climate scientists
Oreskes	2004	2004	928	other-rated abstracts	75.0%	number of papers
Bray	2010	2008	370	survey	83.5%	climate scientists
Doran	2009	2008	3146	survey	82.0%	earth scientists
		2008	103	survey	47.0%	economic geologists
		2008	77	survey	97.4%	climate scientists
		2008	47	survey	64.0%	meteorologists
Anderegg	2010	2009	1372	public statements	65.7%	all
		2009	908	public statements	90.0%	20+ climate papers
		2009	200	public statements	97.5%	most publications
		2009	100	public statements	97.0%	most publications
		2009	50	public statements	98.0%	most publications
Cook	2013	2012	4014	other-rated abstracts	97.1%	number of papers
		2012	10356	other-rated abstracts	98.4%	number of authors
		2012	1381	self-rated papers	97.2%	number of papers
		2012	774	self-rated papers	96.4%	number of authors
Stenhouse	2013	2012	124	survey	78.0%	climate scientists, climate focus
		2012	82	survey	71.0%	climate scientists, other focus
		2012	26	survey	38.0%	climate scientists, not publishing
		2012	232	survey	71.0%	climate scientists
		2012	61	survey	61.0%	meteorologists, climate focus
		2012	501	survey	57.0%	meteorologists, other focus
		2012	641	survey	35.0%	meteorologists, not publishing
		2012	1203	survey	45.5%	meteorologists
		2012	231	survey	73.0%	climate focus
		2012	790	survey	62.0%	other focus
		2012	800	survey	37.0%	not publishing
		2012	1821	survey	52.0%	all
Verheggen	2014	2012	1868	survey	66%	all
		2012	388	survey	57%	3- climate papers
		2012	480	survey	69%	4-10 climate papers
		2012	373	survey	71%	11-30 climate papers
		2012	379	survey	77%	32-300 climate papers
		2012	174	survey	79%	IPCC AR4 WG1 authors
		2012	1118	survey	70%	IPCC WG1
		2012	534	survey	71%	IPCC WG2
		2012	120	survey	74%	IPCC WG3
		2012	175	survey	74%	focus on attribution, aerosols, clouds
		2012	88	survey	7%	unconvinced of anthropogenic climate change
		2012	1780	survey	69%	convinced of anthropogenic climate change