

Uncertainty in Science vs. Certainty in Politics: Contrasting Axioms in Corona Texts

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Abstract

In this contribution, I argue that uncertainty has two completely different meanings and effects in science as in politics. Whereas uncertainty in science is routine procedure, an inevitable part that even drives scientific progress, uncertainty in politics seems a shameful weakness that hinders powerful effective political action. Certainty in science has to be based on clear evidence and significant figures but it is not a prerequisite for success; however, certainty in politics is seen as a criterion of quality – and a starting point for careers.

In functional linguistic terms, authorial stance is expressed in hedging, usually tentative expressions in academic texts compared to more boosters in political genres. Interestingly, hedging seems to contribute to credibility in science, but not in politics, where boosting seems preferred in some contexts, at least.

The Corona pandemic in 2020 brought the two contrasting concepts of uncertainty into the public discourse and the resulting clashes may help practitioners in both spheres to understand each others' concepts of uncertainty. In such a crisis situation, effective communication has to be learnt from both sides.

Keywords: uncertainty, certainty, credibility, hedging, Covid-19 pandemic

1. Introduction

“Uncertainty” always implies imperfect knowledge or insufficient evidence. This is part of all scholarly discourse, since the advancement of learning requires honesty as well as the formulation of scientific work in such a way that it allows falsification (according to Popper). Since Pyrrho (c. 360 – c. 270 BC) a school of philosophical scepticism has questioned the possibility of certainty in knowledge and an entire school of philosophical scepticism has followed him.

Every young scholar has to learn the difference between the object-related indeterminacy of academic categorisation, comparison, or even causation and the subject-related insufficiency of data and knowledge. Since the world is rarely categorical and often gradient, vagueness, ambiguity and fuzziness are natural. Scientific measurements always incorporate variability, and scientists report this as uncertainty in an effort to share with others the level of error that they found acceptable in their measurements (cf. Carpi & Egger 2008). This uncertainty in science does not imply doubt as it does in everyday use – this makes it fundamentally different.

In science, uncertainty is related to risk and even probability. Even in supposedly hard science like physics Heisenberg's uncertainty principle has made everyone aware of the limits of the observability of some phenomena.

The detailed presentation of supportive as well as contradictory evidence is the basis of all acknowledged scientific work, thus well calculated uncertainty is always an integral part of scholarly texts. By contrast, uncertainty seems an unacceptable weakness in the political realm, which has to be avoided by politicians at all cost. Whether it is the politicians who cannot stand uncertainty or whether it is the journalists who feel that their audience or readership cannot live with uncertainty is irrelevant. The result is a kind of blame game in which many politicians try to hide their uncertainty and many journalists take up the challenge of exposing uncertainty as a weakness in politics.

2. Accuracy and Precision in Science and Politics

In an instructive online paper, Carpi & Egger (2008) explain the scientific concept of "uncertainty" convincingly:

Scientific measurements also incorporate variability, and scientists report this as uncertainty in an effort to share with others the level of error that they found acceptable in their measurements. But uncertainty in science does not imply doubt as it does in everyday use. Scientific uncertainty is a quantitative measurement of variability in the data.

A useful linguistic pair of concepts within academic "uncertainty" is accuracy vs. precision. Carpi & Egger 2008 use the bullseye below to categorise uncertainty into two different types:

- Accuracy is a term that describes how well a measurement approximates the theoretically correct value of that measurement ... [on the left]
- The term precision, by comparison, describes the degree to which individual measurements vary around a central value. [on the right]

In science, accuracy is considered more important, since further measurements may lead to further approximation to the centre. In politics, precision seems to be more important, since it may be interpreted as consistency, irrespective of whether the central value is known or not.

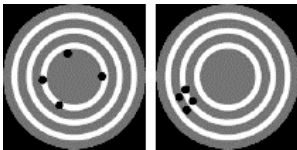


Figure: Bullseye with shooting marks to illustrate accuracy and precision (from Carpi & Egger 2008: n.p.)

A consequent comprehension difference between science and politics can be seen in the attitude towards “error”. The above figure nicely illustrates that “error” is part of scientific discovery and a necessary path towards understanding nature, for instance (Carpi & Egger’s example is from Carbon-14 dating). As uncertainty is part of nature, any scientific approach towards the description of nature includes uncertainty and tentativeness, if the researcher intends to gain professional credibility.

3. From Uncertainty to Overconfidence in Politics?

As uncertainty often appears so negative, some politicians seem inclined to over-compensate and this may lead to overconfidence.

The detrimental effects of overconfidence of (AS American) politicians on the entire democratic system have been the focus of an empirical project by Ortoleva & Snowberg (2015: 530). They conclude:

This paper introduces a model of correlational neglect leading to overconfidence, and draws implications for the political behavior. In particular, the model predicts that overconfidence and extremism are positively related, that both overconfidence and ideological extremism are independently correlated with voter turnout, that overconfidence is increasing the number of signals – that is, age and media exposure-and that, moreover, the correlation between ideology and overconfidence is increasing in the number of signals.

The most famous examples of “overconfidence” in Western politics are Donald Trump and the British Brexiteers. No wonder that this phenomenon has been discussed in the popular psychology journals, for instance, in the U.K. and political and psychological reasons have been proposed (Hodson 2017):

So why do politicians speak this way?

One answer is purely political. Voters like confident speakers and seem to admire “clear vision” and a lack of hesitation from their leaders. Political overconfidence, therefore, sways voters. And arguably the audience is a willing participant in this process. Like audience members watching a magician, citizens want to see the impossible look easy and effortless.

But there is a psychological aspect that speaks to the overconfidence in all of us. For instance, Roger Buehler’s research shows that people overwhelmingly underestimate the time required to do a vast range of tasks (for example, students writing an essay), and that this tendency is very common. They call this the “planning fallacy”.

Such fallacies are well-known and have been well researched since Tversky & Kahneman (1981). Unfortunately, participation is extremely important in democracies and this is why underestimating tasks and overestimating one’s strength may be a good recipe for success – up to a point ...

Overconfidence in academic genres is usually frowned upon, because it does not bring more credibility for the writer or more attention for the speaker – the frame of mind is simply different.

4. From Certainty to Uncertainty in Science?

In his successful book with the possibly surprising title: *From Certainty to Uncertainty: The Story of Science and Ideas in the Twentieth Century*, Peat (2002) explains clearly:

Early theorists believed that in science lay the promise of certainty. Built on a foundation of fact and constructed with objective and trustworthy tools, science produced knowledge. But science has also shown us that this knowledge will always be fundamentally incomplete and that a true understanding of the world is ultimately beyond our grasp.

This may be included in Socrates' *scio nescio* (I know that I don't know) already, which started a long tradition of philosophical scepticism. However, the awareness of the normality of "uncertainty" may be particularly important in the 21st century.

5. Focusing on Opposite Ends of the Stance Spectrum: Hedging in Science vs. Boosting in Politics

In functional linguistics, stance is seen as the expression of authorial attitude. The range of metalinguistic choices is enormous and can be used to negotiate professional "image" in texts: authors who want to present themselves as tentative, to avoid hard criticism or to seek more supportive evidence, will use *may*, *possibility* and *probably* in contrast to powerful energetic politicians, who will use *must*, *certainty* and *definitely* from the other end of the spectrum. The use of hedging in academic writing has been investigated extensively (e.g. from Hyland 1995 to Hyland & Jiang 2019). The comparison of research writing and popular academic journalist has shown that good journalists maintain more of the academic tentativeness in their texts than expected (cf. Schmied 2018). The speech of politicians seems less well researched, but a plausible hypothesis is that they use more boosters, especially in heated political debates. It depends on the voters whether this really increases their credibility as a trustworthy and dynamic politician. The reporting newspapers appear to use different strategies: the well-known tabloids use more boosting strategies in the (splash) headlines to boost their sales than traditional quality papers (e.g. Richardson 2007). Again, whether this increases a newspaper's credibility is a matter of reader expectancy and personal taste.

6. Time in Science and in Politics

During the Covid-19 pandemic, it has become obvious that the role of time is totally different in science and in politics. Obviously, politicians have no time and in times of crises their reaction time should be minimal. However, in science, the final publication of results always takes time because of the time-consuming objective review process that is standard in all acknowledged international science journals today – basically only peer-reviewed publications count in normal publication times. In Covid-19 times, many preprints were available, with the

effect that on the one hand this allowed speedy distribution of findings to a large audience (also non-experts), on the other hand this often included claims which were denied after peer review (Brierley 2021). The pressure from politics during the pandemic may have accelerated this process somewhat, but it has also shown the limits the review process and dangers of rushed publication. A critical reportage by Rohwedder (2021) even made it into the national news in Germany:

In the process, falsified, sloppily produced or scientifically dubious texts repeatedly make it through the editorial review processes and have to be withdrawn from publications - not infrequently when they have already attracted scientific or media attention.

This problem has also been pointed out frequently during Covid-19 press conferences of leading politicians and their advisory virologists (e.g. Christian Drosten and his famous podcast in Germany) – but there is no solution, it seems.

7. Conclusion

The contrast between science and politics in the attitude towards uncertainty is fundamental and is thus often misunderstood by newspaper readers and even news journalists.

Traditionally, science has no “news”, if news is defined as information on current events. As a continuous process, scientific projects have a beginning and an end (for funding), but focussing on a single event is often difficult. By contrast, politics is only events with pictures and sound bites. If these are not available, events will not “make it” into “the news”. As news are often restricted to “hard” news, any information must be evidence-based and ...

This contrast is nicely focussed on in the following timely commentary in a German quality newspaper:

In such a short period of time, there cannot yet be much evidence, the knowledge gained is only preliminary. [...]

And that's how it usually is in science. Researchers often point out the provisional nature of their findings in their publications. They discuss the results in their study and explicitly name the weaknesses. They do not make it easy for themselves. However, these shades of grey are often overlooked or lost in the flood of information in the media. Especially now in the pandemic, when everything is happening so fast, it has to be either black or white.

What is valid today may be outdated tomorrow. One must always be aware of this. And it must be pointed out again and again. The media should also do this. They must take into account that their users often do not get beyond the headline and the first few sentences. And they must pay more attention than before to presenting the limitations of studies, despite all the necessary shortening and simplification

Schweitzer, Jan (2021). Translated with www.DeepL

The rapid development of interest in science journalism during the Covid-19 pandemic in 2020 has made many academics aware that public communication of academic work is important and the “translation” of knowledge from scientific language and genres into the public sphere can only be achieved effectively if

professional specialists in journalism and in academia work together and understand each other's perspectives. All partners concerned are aware of the enormous challenges in their work when all intend to deliver good work in difficult contexts: scientists, politicians and journalists. For (practical) politicians, it is most important to understand how science works and when science can answer questions asked by politicians who would like to work evidence-based. For scientists, it is most important to understand what politicians want and to tell them openly when they cannot "deliver", especially if only simple answers are asked for. In an age of uncertainty, simple answers are often so far away from "the facts" or even "the truth" that they cannot be given a complex situation such as a world-wide pandemic – and understanding uncertainty is of crucial importance in this context.

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