CHAPTER 11

The Triad of Uncertainty – The Interaction Between Scientists and Politicians

Raino Malnes
University of Oslo

Abstract: This chapter sheds light on interaction (*samhandling*) between scientists and politicians. What happens when the latter gives the former a role in an effort to ensure that society is not exposed to an unforeseen calamity? The chapter has two objectives – one conceptual and one pertaining to the analysis of public policy in a particular context. First, distinctions are drawn between three dimensions of uncertainty about the consequences of action. The aim is to create a clearer understanding of what is meant by assertions that policy is made under conditions of uncertainty. Secondly, the political implications of uncertainty are charted with particular reference to the choice of climate policy. The analysis targets the way the Intergovernmental Panel on Climate Change (IPCC) has handled the task of publicizing the effect that anthropogenic emissions of greenhouse gases have on the atmosphere. The conclusion is that the IPCC's communication with politicians and the public has contributed to, rather than ameliorated, the problem of uncertainty that stands in the way of resolute political action.

Keywords: *Samhandling*, interaction, decision making under uncertainty, scientific disagreement, unforeseen.

Citation: Malnes, R. (2018). The Triad of Uncertainty – The Interaction Between Scientists and Politicians. In G.-E. Torgersen (Ed.), *Interaction: 'Samhandling' Under Risk. A Step Ahead of the Unforeseen* (pp. 199–212). Oslo: Cappelen Damm Akademisk. DOI: https://doi.org/10.23865/noasp.36.ch11

Introduction

Normative questions about what we ought to do bring descriptive questions about matters of fact in their wake. This is because the consequences of our actions depend, to a greater or lesser extent, on what goes on elsewhere, outside our control. Uncertainty about such matters is apt to stand in the way of resolute action.

In this chapter, I shall first argue that the problem of uncertainty has several aspects. Indeed, it is no single problem, but a triad of what I shall call bewilderment, ignorance and scientific inconclusiveness. Secondly, I shall discuss the role of science in dealing with bewilderment and ignorance. I pay particular attention to research into the cause of climate change. The aim of the article is to shed light on the interaction between scientists and politicians. What happens when the latter gives the former a role in an effort to ensure that society is not exposed to an unforeseen calamity?

A brief introduction to the issue of climate change and the choice of climate policy is in order. Political authorities would like to know how human activity affects the earth's climate in order to decide whether anthropogenic emissions of greenhouse gases should be reduced or allowed to continue at, or above, their current level. What is achieved by adopting one or the other course of action depends crucially on what goes on in the atmosphere. On the one hand, the effect of doing nothing, or not much, to lower emissions may be grave. The greenhouse theory says that greenhouse gases have an appreciable effect on the climate of the earth. If so, continued emissions at the current level are dangerous. On the other hand, reducing emissions may be costly, too. This, at any rate, is the opinion of many economists. If they are right, there is good reason to dispense with reductions unless they will contribute to stabilizing the climate. Let us assume that they are right. Let us also assume that the consequences of climate change may turn out to be far worse, at least in certain parts of the world, than any economic hardship anyone will suffer owing to reductions of emissions. Most of the subsequent argument will be unaffected if we drop the latter assumption, but it plays a crucial role towards the end of what follows.

An important conclusion is that scientific opinion about climate change has influenced parts of political opinion in a way that belies the scientists' best intentions. Their presentation of results from research was

meant to counteract the reluctance of political agents – leaders as well as people at large – to do something about the dangers of climate change. This may well have produced the opposite effect.

Bewilderment

We – or those of us who are not well versed in atmospheric chemistry – do not know what to believe about anthropogenic emissions of greenhouse gases. We are uncertain in the psychological sense of the word. Uncertainty, thus conceived, is a state of mind – a doxastic attitude – and it amounts to the absence of wholehearted belief. With regard to the matter at hand, we cannot judge that things are definitely thus or so. I shall call it *bewilderment*.

To arrive at a more precise definition, consider an episode in Shakespeare's *Othello*. Night falls on Venice and Brabantio, a nobleman, is at home. So, he believes, is his daughter; indeed, he is certain that she is at home. He has a *full belief*. Then consider Hamlet. In the tragedy that bears his name, he has just lost his father, who was King of Denmark, and he suspects murder was committed at the behest of the Queen and the late King's brother. But he is by no means sure. After all, the body was found lying in a garden where poisonous snakes live. Hamlet has no full belief, only a *partial* one. In general, to have a partial belief in a proposition, P, is to attach greater likelihood to P than any contrary proposition – i.e. any proposition that entails the denial of P – but some likelihood to at least one contrary proposition. As Hamlet sees it, murder is the likelier of two explanations that both have some likelihood.

Partial belief can border on full belief. Suppose, for example, that I peer out of the window and see people in their shirtsleeves. This gives me reason to believe that the weather is warm. As it happens, however, the past week has been unseasonably cold and perhaps these people have taken off their jackets in protest against the weather, as it were. What I see favors the first hypothesis, but does not rule the latter out of court. I have a partial belief that is nearly full.

Partial belief can also be distant from full belief. Let's say that I wonder whether my daughter will go right home after school to take our dog out for a walk. She said she would, but it is a beautiful day, so perhaps she will

succumb to the temptation of hanging out with some friends. Only by a small margin does one proposition ("she will go right home") surpass its negation ("she won't") in terms of likelihood. My partial belief borders on refusal to accord the former a higher probability than the latter. I am, in other words, on the verge of *suspending judgment*.

In view of these distinctions, we may refine the account of bewilderment. To be bewildered about something is to have a partial belief about it or, at the limit, no belief at all. The latter amounts to suspension of judgment. Short of that, bewilderment comes in degrees. The further we are from full belief, the greater our bewilderment. In the second last paragraph, I invoked a case of mild bewilderment, whereas the last paragraph portrayed me as very bewildered.

Bewilderment is a problem from a practical point of view. It is apt to stand in the way of resolute action. One is naturally reluctant to choose an alternative that does not match up with a clear-cut consequence. Reluctance is apt to vary with the distance from full belief. The more unsure one is about what a given alternative leads to, the less keen one is to choose it, all things being equal. Reluctance fostered by uncertainty presumably reaches its highest level when judgment is suspended.

Ignorance

Suppose someone has a full belief. She may, for example, stand before a choice and feel certain about what an alternative has in store for her. There is no doubt in her mind. All the same, she can be out of her depth. Certainty, to quote Wittgenstein (1972:6e), is "a tone of voice in which one declares how things are, but one does not infer from the tone of voice that one is justified." To be certain but not knowledgeable about a certain subject at the same time is no feat (not, at any rate, if experience from my life is anything to go on).

Being knowledgeable is no state of mind, but an epistemic position. It consists in being aware of how things really are. This, too, is a kind of certainty. Similarly, being unknowledgeable is a kind of uncertainty. Call it *ignorance*. I shall offer a more refined account of it after briefly digressing on the topic of truth.

The term "truth" stands for a relation between a representation and some matter of fact. Say the representation is verbal – a written account, for example. It is true if, and only if, it depicts things as they are. In particular, the assertion that X causes Y is a true explanation of Y, provided Y really owes its occurrence to X. David Hillel-Ruben (1991:210) makes the point cumbrously: "Explanations work, when they do, only in virtue of underlying determinative or dependency structural relations in the world." Jon Elster (2017:24) puts it pithily: "A genuine explanation accounts for what happened, as it happened."

Elster (ibid.:25) adds, "Why would anyone want to come up with a purely conjectural account of an event?" This statement, however, is apt to invite misunderstanding. Nothing contrasts more starkly with guesswork than truth revealed, but mere conjecture and certified truth are extremes. Between them is the immensely important category of representations that are conjectural but credible. They constitute promising candidates for truth. Their importance derives from the fact that we do not search for truth the way we search for, say, a word to rhyme with another. One can tell whether words rhyme by comparing them to one another, but no proposition permits straightforward comparison with reality. Going after truth is a more roundabout matter.

In Colin McGinn's words, there is "no more to the injunction to seek the truth than to respect the evidence", not because "there is no distinction between evidence and truth", but because "our position as cognitive agents is confined to that of evaluators of evidence" (McGinn 2003:72). This dictum needs some fleshing out. I take it that "evidence" stands for information, in particular, perceptual information.[1] Not for nothing, McGinn speaks of the evaluation, rather than collection, of it. We do not just register bits and pieces of evidence; we scrutinize information before it can serve as a cue to the truth. Documents, for example, are assessed for authenticity. A further and more notable complication is that informational value can be boosted by means of reasoning. Here is an illustration

1 "Evidence" sometimes has a more inclusive meaning. It may stand for what I will soon talk about under the head of "epistemic considerations". McGinn's use of "evidence" seems to be in line with mine rather than the more inclusive meaning, but it does not matter if I am wrong on this score. The substance of what I am going to say will be unaffected.

of how this works. After Beethoven had lost his hearing, he carried notebooks about with him, in which people he met wrote down what they said to him. His own contributions to the conversations are mostly unrecorded, but the written record, together with background knowledge of the life and times of the composer, permit credible conjectures. We may fill out the blanks by asking what Beethoven is likely to have said that elicited the responses he got. Similarly, to turn to science for an illustration, we can figure out the chemical composition of stars by inference, from observations of the frequency and pattern of light rays. It is a question of *abductive* inference, which, schematically put, goes like this: (i) there is evidence that Y is the case; (ii) the best explanation of Y is that X is the case; hence (iii) X is the case. Evidence is one kind of pointer to truth and abductive inference is another. There are yet others, notably inductive inference. We can call them collectively *epistemic considerations*.

Now we are equipped to restate McGinn's dictum. In practice, there is no more to the injunction to seek the truth than to respect epistemic considerations, not because there is no distinction between propositions that rest on epistemic considerations and propositions that are true, but because there is no better way of getting at the truth than respecting epistemic considerations. This, in turn, equips me for refining the definition of ignorance. To be ignorant about something is to form a belief about it without paying sufficient attention to epistemic considerations. Like bewilderment, ignorance is a matter of degree, running the whole gamut from a mild lack of attention to epistemic considerations to pronounced inattentiveness. In other words, the evidence for, and the reasoning behind, a certain belief can leave a little or a lot to be desired.

Consider Brabantio again. He is certain that his daughter is at home. Enter Iago and Roderigo, who tell him that the girl has eloped with a lover. Brabantio does not believe what they say, but searches the house and then realizes that he is wrong: "It is too true an evil, gone she is." (Shakespeare *Othello* scene 1, act 1) Both before and after the search, Brabantio has a full belief. Beforehand, he is certain that his daughter is at home; afterwards, he is certain that she is not. Psychologically speaking, the two states of mind are akin to one another. Both bespeak confidence. But epistemologically speaking, they differ. The original belief is, if not

flippant, at least careless. It is replaced by one that rests on a propitious way of getting at truth – or, more accurately, a well-suited way of inquiring into someone's whereabouts. It is not that by going and looking for a person at a certain site one is certain to find out whether or not she is there, but the procedure is promising to a tee.

Then consider Hamlet for a second time. The basis for the partial belief he holds when the play begins is flimsy. What makes him suspect that his father was murdered is the hasty marriage between his uncle and his mother. (I disregard the nightly appearances of his father's ghost.) It may well have been improper of the two to wed so soon, but it hardly indicates that they are murderers. Hamlet is on thin epistemic ice; his case is a paradigm of ignorance. Later, however, he conducts an ingenious experiment. He arranges for a group of travelling actors to stage a tragedy about regicide in the presence of his uncle. The new King reacts with evident horror when the players enact the murder scene. This fortifies Hamlet's suspicions. His doxastic attitude still falls short of a full belief, but now reflects attentiveness to epistemic considerations. He is no longer ignorant.

Scientific inclusiveness

It is in the nature of scientific inquiry to help with the problem of ignorance. I take this claim to be uncontroversial. Not only will I refrain from defending it; I will give it a rhetorical lift by borrowing a couple of felicitous phrases from Jonathan Bennett. Ordinary, untutored belief about matters of complexity tends to be based on "scanty reasoning about a small set of empirical data", whereas science offers "thorough reasoning about a rich set of empirical data" (Bennett 2016:15).

In contrast, it is not in the nature of science to help with the problem of bewilderment. The transition from untutored belief to belief that takes its cue from scientific inquiry is as likely to exacerbate as alleviate that problem. When we are presented with a rich set of varied evidence and become privy to ingenious reasoning, we may not be capable of forming a full belief or retaining one we had in advance.

In view of this, I shall define one more conception of uncertainty. Suppose that no full belief emanates from scientific inquiry about some

matter of fact. Science warrants only partial belief of what takes place or no belief at all. Then there exists *scientific inconclusiveness*. Conversely, when science puts doubt to rest, scientific conclusiveness is achieved. In the previous paragraph, I suggested that both upshots of enquiry are normal, which is not to say that they are equally welcome. The purpose of science is, after all, to get at truth. Only scientific conclusiveness bespeaks success in this respect (but does not, of course, guarantee it). Scientific inconclusiveness does away with ignorance, which is fine, but leaves us in a state of bewilderment, which is not so fine, as it is apt to hinder resolute action.

Combatting and exacerbating bewilderment

In the remainder of the article, I shall turn to research on climate change in order to extract some more specific lessons about the role of science in dealing with ignorance and bewilderment. Political authorities have engaged scientific experts to help with the question of whether or not anthropogenic emissions of greenhouse gases affect the climate in ways that are dangerous. The *Intergovernmental Panel on Climate Change* (IPCC) is a network of scientists whose task is, among other things, to sort this question out. What have these scientists done for us?

To all appearances, the IPCC has helped with the problem of uncertainty-cum-ignorance. Quibbles about the quality of its successive reports notwithstanding, they firmly belong to the category of thorough reasoning about a rich set of empirical data. It appears, moreover, that the IPCC is also intent on helping with the problem of uncertainty-cum-bewilderment. Consider a statement by John Houghton, who has been chairperson of Working Group 1 – one of the three constituent working groups:

> … our work was rather like the making of a weather forecast. It is of little help for a forecaster to say that the weather will change tomorrow but that he is unwilling to say in what way. The forecaster also needs to give his best estimate of the detail of that change. (Houghton 1990:6)

To be sure, the statement is ambiguous. On the one hand, Houghton urges scientists to be precise and not to tell things approximately when exactness

is feasible. Saying simply that the weather will change is inadvisable, if not irresponsible, if one has reason to believe that incumbent change will take this or that particular shape. This is a pertinent but trite admonishment. On the other hand, Houghton also admonishes that scientists commit themselves to a full belief. He suggests that a weather forecast is useless for practical purposes unless the forecaster comes up with a definite prediction. Heeding the first admonishment will not help with the problem of bewilderment, but heeding the latter obviously puts an end to it.

As it turns out, the IPCC goes a long way towards committing itself to a full belief about the cause of climate change. In the first report, Working Group 1 offers the following summary of its findings:

> *We are certain of the following:* … emissions resulting from human activities are substantially increasing the atmospheric concentrations of greenhouse gases … These increases will enhance the greenhouse effect, resulting on average in an additional warming of the Earth's surface. (IPCC 1990: xi)

This is said in the Executive Summary, which directs itself to political decision makers and the public at large. However, the commitment to full belief is something of an intellectual exaggeration. In the "supporting material" provided by Working Group 1, we read that, "Poor quantitative understanding of low frequency climate variability (particularly on the 10–100 year time scale) leaves open the possibility that the observed warming is largely unrelated to the enhanced greenhouse effect." (IPCC 1990:254) There is, accordingly, a discrepancy between what some scientists (at least) believe about the effect of greenhouse gas emissions and what those who penned the executive summary communicate to politicians and the public. The formulation I quoted from in the "supporting material" is indicative of only partial belief in the greenhouse theory. Two hypotheses – an enhanced greenhouse effect and natural variability – appear to be good candidates for truth, contrary to what the IPCC states in the summary.

In the report of 2007, the summary of the contribution from Working Group 1 contains many formulations that signal, if not full belief, at least nearly full belief in the greenhouse theory. It is said, for example, that "[m]ost of the observed increase in global average temperature

since the mid-20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations." Moreover, it "is *very unlikely* that climate changes of at least the seven centuries prior to 1950 were due to variability generated within the climate system alone." (IPCC 2007:10 and 12) The IPCC goes as far as alleging that there is a chance of 9 in 10 that human activity is the cause of climate change. This, however, seems exaggerated in the light of what the scientific proceedings say. Qualifications and reservations are voiced. They have to do with the models that underlie the estimate I just cited. In particular, the role played by clouds and oceans in the causal chain between greenhouse gas emissions and climate change remains to be sorted out (ibid.:592–593).

It appears, then, that the IPCC tones down scientific inconclusiveness about the cause of climate change. The results it reports are inconclusive. Epistemic considerations support only partial belief and we are closer to suspension of judgment than full belief. Yet, in statements that direct themselves to political authorities and the public, a nearly full belief is voiced.

Why does the IPCC speak with two tongues? I venture the hypothesis[2] that it does not confine its attention to epistemic considerations when it passes a judgment on the greenhouse theory before us, its non-scientific audience. Considerations of a practical nature enter the picture. They have to do with what can go wrong if we – or politicians who act on our behalf – adopt a climate policy that reflects false belief about the cause of climate change. Two errors, in particular, are conceivable. One is to take costly steps to reduce greenhouse gas emissions that actually have very little or no effect on the climate. Call this the error of *redundancy*: making (significant) sacrifices to no avail. The other error is to refrain from reductions in the false belief that anthropogenic emissions are inconsequential, whereas they substantially affect the climate. Call this the error of *complacency*. On the face of it, the two errors are equally regrettable. The first consists in wasting resources that society

2 It is inspired by an argument of Michael Bratman (1999:22–24). His thoughts are on other matters and I do not know whether my inspired use of them will be to his liking.

might have put to good use, the second in wasting an opportunity to avert adversity.

We have seen that the findings of the IPCC warrant a partial belief as to the effect that climate change will have unless reductions are undertaken. This belief is close to suspension of judgment. Now, suppose scientists are not reporting the result of their research to us, but to someone who is about to place a bet. Suppose their task is to enlighten a gambler about the value of two lottery-tickets: one says that cuts will stave off climate change and the other that they won't. Suppose, moreover, that scientists know that this gambler is not fully rational, but liable to make an unwise decision. Then they may reinterpret their task as a dual one: both telling the gambler about the risk of, respectively, redundancy and complacency, and helping her to make a rational choice. What, apart from doing their best on the first score, might they do to forestall irrationality? It is natural to think that the *presentation* of their findings might be more or less suited to the purpose of priming the gambler for a rational choice. Will it help, for example, to inflate the estimate of one or the other risk? No, because the error of redundancy and the error of complacency are equally undesirable. If the gambler bets on the need for cuts when cuts are redundant, she loses her money; *ditto* if she wagers that it is safe to abstain from cuts that are actually needed. In view of this, the best scientists can do with a view to promoting rational choice on the part of the gambler, is to straightforwardly convey their findings to her.

The predicament we – all of us, but political authorities in particular – are in differs from that of the gambler. From our perspective, there is an asymmetry in the costs of error. The alternatives of either cutting or not cutting emissions are not on a par when it comes to how badly things may go. The consequence of complacency is worse than that of redundancy. However adversely cuts in emissions will affect the economy of this or that country, the consequences of climate change are far worse, at least in certain parts of the world. Failing to make necessary cuts could be disastrous. In contrast, the risk of making cuts to no avail is worrying, but not nearly as much. So, at any rate, I assumed at the outset.

In view of this, one would expect that scientists who let practical considerations into their reasoning behave otherwise than they would have

done if they had only reckoned on epistemic considerations. If, in particular, they are concerned about imperfect rationality on our part, it will be a concern about complacency. Considering the asymmetry in the costs of error, redundancy is, in comparison, a lesser worry.

In the case of the hypothetical gambler, I simply postulated that the hypothetical scientists worry about her lack of rationality. It will not do to argue this way when it comes to the way scientists in the IPCC behave towards us. There has to be some justification for assuming that they suspect we may not be up to the task of making a wise decision. The justification is not hard to find. On the one hand, the cost of cutting greenhouse gas emissions will be borne whether or not cuts do any good. On the other hand, the cost society will incur if cuts are needed but left undone lies in the future. This is a classic setting for myopia. The error of redundancy may make an impression that is out of proportion to the real cost of undertaking redundant cuts. It is apt to be the other way around with the cost of complacency. Under these circumstances, it is not surprising that the IPCC ratchets up the estimate of the risk that greenhouse gases cause climate change.

Suppressing doubt is a kind of manipulation. The IPCC would have us believe that the development will definitely go in the wrong direction unless emissions of greenhouse gases are cut significantly, whereas inquiry indicates only that disaster *may* happen. They encourage a nearly full belief, in spite of the fact that the epistemic considerations warrant a partial belief that is closer to suspension of judgment.

I do not think such manipulation of belief is necessarily wrong. Suppose people are prone to take uncertainty as an excuse for living dangerously. Suppose, moreover, that lecturing people on the folly of this attitude will not have much of an effect on their behavior. Neither assumption is far-fetched when, as in the case of climate change, it will be costly to deal effectively with the danger in question. In such a case, when people are dragging their feet, those who are aware of the danger at hand may be justified in covering up uncertainty in order to discourage indecisiveness in the face of danger.

In practice, however, there is a problem. Manipulation of belief by scientists may easily turn out to be counterproductive. It is apt to push scientific debate in a direction that makes people less, rather than more,

prepared to do something about the danger. The root of the problem is that scientists rarely agree on matters relating to risk. When someone expresses greater confidence in their predictions than evidence permits, those who disagree will not remain silent. The scientific debate that follows is likely to be loud and livid, and as the heat turns up inside the scientific community, people on the outside may come to believe that disagreement runs deeper than it actually does. Scientific communication that is aimed at covering up scientific inconclusiveness will rather contribute to making a major issue out of it.

In the case of climate change, a large part of the public debate revolves around the question of whether or not things are *certain* to end in disaster unless something drastic is done to reduce greenhouse gas emissions. This has set the stage for bickering and postponement of political decisions. Responsibility for this state of affairs lies largely with scientists who have used their position as public experts to argue that the greenhouse theory is the only viable explanation of climate change. It is not, and scientists who subscribe to other theories have raised their voices in protest. As a result, scientific inconclusiveness has come to be perceived as a major problem and a good reason not to do anything before scientists agree – which, of course, is unlikely to happen soon.

Conclusion

Discord among scientists has not gone unnoticed among those who, for some reason or other, want to dismiss the dangers of climate change. They have been able to defend their position simply by pointing out that there is still disagreement among scientists. A telling illustration is a memo that came from the Republican Party in the United States, when George W. Bush was President. It was meant to back up the President's resistance to greenhouse gas reductions, and it said:

> Should the public come to believe that the scientific issues are settled, their views about global warming will change accordingly. Therefore, you need to continue to make the lack of scientific conclusiveness a primary issue in the debate. (Quoted from Lanchester 2007:5)

Scientists who try to pass the greenhouse theory as certified truth open the door to this kind of argumentation. They play into the hands of those who are struggling against reductions of greenhouse gas emissions, allowing them to harp on about the margin of error in the greenhouse theory.

I shall close on a note of political engagement. Uncertainty is pronounced and resilient even in the best parts of science, and scientists should not cover it up. They should rather acclimatize people to the idea that most of time, even the best estimate is an unsure estimate. The fact that we do not know for sure, but only suspect, that greenhouse gas emissions are causing climate change is not a good excuse for inaction.

References

Bennett, J. (1974). *Kant's Dialectic*. Cambridge: Cambridge University Press.

Bratman, M. E. (1999). Practical reasoning and acceptance in a context. In: Bratman, M. E., *Faces of Intention. Selected Essays on Intention and Agency*. Cambridge: Cambridge University Press.

Elster, J. (2007). *Explaining Social Behavior*. Cambridge: Cambridge University Press.

Houghton, J. (1990). World climate needs concerted action. *Financial Times*, 11. November 6.

IPCC (International Panel on Climate Change). (1990). *Climate Change: the IPCC scientific assessment*. Cambridge: Cambridge University Press.

IPCC (International Panel on Climate Change). (2007). *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.

Lanchester, J. (2007). Warmer, warmer. *London Review of Books*, March 22.

McGinn, C. (2003). Isn't it the truth? *New York Review of Books*, April 10.

Ruben, D. H. (1990). *Explaining Explanation*. London: Routledge.

Wittgenstein, L. (1969). *On Certainty*. New York: Harper & Row.