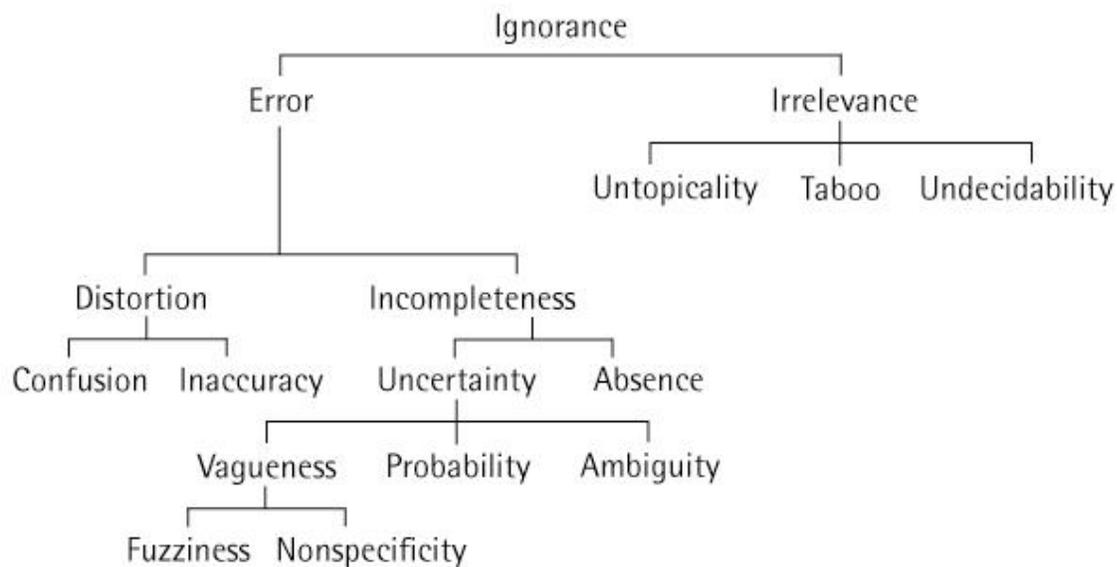# *A taxonomy of unknowns*

The figure presents a taxonomy developed by Smithson (1989, 2008), who uses the overarching term 'ignorance' as the starting point. He first distinguishes between passive and active ignorance. Passive ignorance involves areas that we are ignorant of, whereas active ignorance refers to areas we ignore. He uses the term 'error' for the unknowns encompassed by passive ignorance and 'irrelevance' for active ignorance.

Different kinds of unknowns (after Smithson, 1989):

The different elements of the taxonomy are explained next. The key issue is that the taxonomy demonstrates that there are multiple kinds of unknowns, many, if not all, of which will be inherent in any complex problem.

An Explanation of Smithson's Typology

Having differentiated passive (error) from active (irrelevance) ignorance, let us examine the types of unknowns under 'error'. Smithson distinguishes two sources of error: 'distortion' and 'incompleteness'. One type of distortion, 'confusion', involves wrongful substitution, mistaking one attribute for another. Mistaking a block of cheese for a bar of soap is an example of confusion. The other, 'inaccuracy', is distortion in degree or bias. Assuming that all swans are white is an example of inaccuracy.

In terms of 'incompleteness', Smithson first differentiates between what he calls "incompleteness in degree" or 'uncertainty', and "incompleteness in kind" or 'absence'. Let us deal with absence first. Absence is simply gaps in knowledge, which can be known or unknown gaps.

If we turn now to 'uncertainty', Smithson's taxonomy uses this term to refer to partial information. He subdivides uncertainty into three categories: vagueness, probability and ambiguity. In brief, vagueness relates to a range of possible values on a continuum; probability, simply put, refers to the laws of chance; and ambiguity refers to a finite number of distinct possibilities. In expanding on these, let us begin with vagueness.

Smithson subdivides vagueness into 'fuzziness' and 'non-specificity'. Fuzziness refers to fine-grade distinctions and blurry boundaries. For example, an object may be dark, but there is no clear boundary where darkness begins and ends. Non-specificity is another kind of vagueness. An example relates to geographical location. To say that someone lives near a school does not give any indication of whether they are a 5-minute walk away or a 5-minute drive away.

Moving on to probability, the classic example refers to numerous tosses of a fair coin and the likely outcome that half of the tosses will land heads and half tails. Much statistics involves tackling problems which combine vagueness and probability. While probability does not help us with the vague statements provided as illustrations in the previous paragraph, it can assist with other vague statements, such as 'this ticket may win money in the lottery' or 'today some drivers will be injured in an accident'. Probability then helps us calculate the chance of winning or being injured.

The final item in the 'error' side of the taxonomy is 'ambiguity', which is best demonstrated though a linguistic example. To say that food is hot does not clearly tell us if this refers to temperature or spiciness.

Let us now move to the second main arm in the taxonomy. 'Irrelevance' refers to issues which are deliberately or unconsciously overlooked. Smithson divides irrelevance into three subcategories, namely 'untopicality', 'taboo' and 'undecidability'.

For the first of these, in the consideration of any particular issue, some things will be generally agreed to be off topic. In defence policy decisions, for example, the price of children's toys would generally not be considered topical.

In terms of taboo, this refers to matters people must not know or even enquire about. This is socially enforced irrelevance. Taboo is important in the discipline of history, for example. The attempt to open up some issues – such as the Holocaust, the nuclear bombing of Japan in World War II or the demise of Australian Aborigines – to further examination can be highly controversial. In history, as in politics, denials or cover-ups can be symptomatic of taboos.

The final kind of irrelevance is undecidability, which happens when a matter cannot be designated true or false or when deciding on truth/falsity is not pertinent.

References

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Bammer G. and Smithson, M. (2008). The nature of uncertainty, In Bammer, G. and Smithson, M. (Eds.), *Uncertainty and risk: Multidisciplinary perspectives.* Earthscan: London, pp.289-303.