Review of: "Notes on the Implications of Ignoring Bayes' Rule in Search and Rescue Practice in the UK"

Marcos Roberto de Sousa[1]

1 Universidade Federal de Minas Gerais

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The text discusses the application of Bayes' theorem in search and rescue operations and compares it with the traditional approach. It highlights the importance of adjusting the probability of finding a missing person based on the information collected during the search. While it is common practice, as pointed out by the author, in the UK, to multiply the probability of finding someone in the area (POA) by the probability of detection (POD), the author suggests using Bayes' theorem to get more accurate results. The text also addresses practical challenges in implementing this method, such as the uncertainty in creating the original POAs and the difficulty in maintaining relativities between the new adjusted POAs. When illustrating the effect of Bayes' theorem in a specific search scenario, the author emphasizes that the traditional approach may overestimate the probability that the person is outside the search area, which may influence the decision to expand the search. The text highlights the importance of taking these nuances into account in decision-making during search and rescue operations.

According to Donald Gillies[1], the subjective theory identifies probability with the degree of belief of a given individual. Here it is no longer assumed that all rational human beings given the same evidence will have the same degree of belief in a hypothesis or prediction. Differences of opinion are permitted. People specialized in rescue operations in a specific region have a lot of information learned along their experience. Some information is prone to mistake, for example, confirmation bias, recent cases memories. An interesting way to reduce experts' personal bias is to ask them, when there is more than one, to provide a number and calculate their average. These experts are the best source of information in the absence of data. When data are available about the frequencies of local rescues, this information is better than expert opinion. But the statistics of rescue can be biased by a low number of cases and chance. Along time, the experience of experts is a subjective and objective mixture of previous experiences and previous studies with real data-based information.

According to Ian Hacking[2], we learn new things all the time. Unless you are truly prejudiced, new evidence should have some effect on what you believe - and on your personal probabilities. If we are going to talk about dynamic learning from experience over the course of time, we should not use the abbreviation "timeless " "Pr (H)" for the probability of H (H=hypothesis). We must put a subscript “t” to indicate the subjective probability of a person at time t. Prt (H) means your degree of belief in H at time t. Prt (H|E) (E=event)is an indicator of the conditional bets you would place in time t. You must have a certain existential commitment to the person you choose to be. When you are true to your old self, you will actually learn from experience, following Bayes' rule. This is a rather surprising development from the perspective of belief about probability. The belief perspective leads us to learn from the experience. This is Bayesian thinking.

Besides, during the search, information about the specific situation and history of the disappeared person, Bayesian thinking is like a Sherlock Holmes job: every investigation lead gives additional Bayesian probability.

So, I agree with the author that Bayesian way of thinking is better than the traditional way. You should look for people in places with more probable and more accurate probabilities. You can always be wrong when you talking about probabilities, but using a hierarchy of expert opinion and evidence (obviously, giving more weight to the best quality evidence available) with Bayesian thinking over time gives you more chance of finding someone spending less resources.

References

1. ^ *Donald Gillies. (2012). Philosophical Theories of Probability. doi:10.4324/9780203132241.*
2. ^ *Ian Hacking. (2001). An Introduction to Probability and Inductive Logic. doi:10.1017/cbo9780511801297.*