Calculus for Christ:

Explaining My Use of Bayes' Theorem

Bayes' Theorem
General Formula

- General Bayes' Theorem:

- **Pr (H | E&B) =** $\dfrac{\Pr(\boldsymbol{E|H}) * \Pr(\boldsymbol{H|B})}{Pr(\boldsymbol{E|H}) * Pr(\boldsymbol{H|B}) + \Pr(\boldsymbol{E|{\sim}H}) * \Pr(\boldsymbol{{\sim}H|B})}$

Bayes' Theorem
Secular Example

$$P(\text{Cancer}|\text{Symptoms}) = \frac{P(\text{Symptoms}|\text{Cancer})P(\text{Cancer})}{P(\text{Symptoms})}$$

$$= \frac{P(\text{Symptoms}|\text{Cancer})P(\text{Cancer})}{P(\text{Symptoms}|\text{Cancer})P(\text{Cancer}) + P(\text{Symptoms}|\text{Non-Cancer})P(\text{Non-Cancer})}$$

$$= \frac{1 \times 0.00001}{1 \times 0.00001 + (10/99999) \times 0.99999} = \frac{1}{11} \approx 9.1\%$$

Bayes' Theorem
Resurrection Hypothesis

- **General Bayes' Theorem for Resurrection hypothesis:**

- <u>Terms:</u>

- R = The Resurrection hypothesis is true (God raised Jesus from the Dead or Jesus rose from the dead- whatever you want to prove).

- B = Background knowledge or evidence

- E = Evidence relevant to the truth/falsity of the hypothesis (note- this refers to the sum of all relevant evidences).

- ~R = Not "R" or the Resurrection hypothesis is not true (i.e., false).

$$Pr(R|E\&B) = \frac{[Pr(E|R) * Pr(R|B)]}{[Pr(E|R) * Pr(R|B)] + [Pr(E|\sim R) * Pr(\sim R|B)]}$$

Fallacious Atheist Version

- Some Atheists (like Robert Greg Cavin in 1993) are biased against the truth of the Resurrection hypothesis and so they try to cheat using Bayes Theorem;

- **Terms:**

- **R =** The Resurrection hypothesis is true (God raised Jesus from the Dead or Jesus rose from the dead- whatever you want to prove).

- **B =** Background knowledge or evidence

- **E =** Evidence relevant to the truth/falsity of the hypothesis (**sum of all evidences**).

- **Ai =** Sum of all Not "R" hypotheses (sum of all alternative Resurrection hypotheses).
  [*** But this is a cheat as multiple mutually exclusive non-Rez hypotheses is not a single hypothesis representing ~R.]

- $$Pr(R|E\&B) = \frac{[Pr(E|R) * Pr(R|B)]}{[Pr(E|R) * Pr(R|B)] + [Pr(E|Ai) * Pr(Ai|B)]}$$

Bayes Theorem
Odds Form

- **Odds Form (Compares Two Specific Hypotheses for Ratio);**

$$\underbrace{\frac{Pr(H_1 \mid E)}{Pr(H_2 \mid E)}}_{\substack{\text{ratio of posterior} \\ \text{probabilities}}} = \underbrace{\frac{Pr(E \mid H_1)}{Pr(E \mid H_2)}}_{\substack{\text{likelihood} \\ \text{ratio}}} \times \underbrace{\frac{Pr(H_1)}{Pr(H_2)}}_{\substack{\text{ratio of prior} \\ \text{probabilities}}}.$$

Jefferey Conditionalization Formula (Assessing the Prior Probabilities)

- **Prior Probability of the Rez hypothesis being true:**

- G =God (Real Maximally Great Being + detected Religion-Authenticating context) exists.

- ~G = God does not exist (and/or no religion authenticating context detected).

$$Pr(R|B) = [Pr(R|B\&G)* Pr(G|B)] + [Pr(R|B\&\sim G) * Pr(\sim G|B)]$$

- The latter part of equation (in green) without God is arguably virtually zero as people not likely to rise from the dead given Godless naturalism anyways and so one can ignore it to help out the Atheists and skeptics argue against a miracle.

- Inscrutable probabilities here with divine psychology. Inscrutable for me in Bayesian terms means 50% plugged in as we must be Agnostic and suspend judgement either way whether God willed or not in this instance to do Religion-Authenticating miracle.

- UPDATE: I said this works for any hypothesis but formula is for miracle/God event hypotheses.

End of General Bayes Knowledge

- Any Clarification Questions on How it Works in General?

My Bayes-ish Approach
Key Differences Explained

- **Proper Bayes' Theorem for Resurrection hypothesis:**

$$Pr(R|E\&B) = \frac{[Pr(E|R) * Pr(R|B)]}{[Pr(E|R) * Pr(R|B)] + [Pr(E|\sim R) * Pr(\sim R|B)]}$$

- **Bayes-ish Theorem for Resurrection hypothesis:**

$$Pr(R|E\&B) = \frac{[Pr(R|E) * Pr(R|B)]}{[Pr(R|E) * Pr(R|B)] + [Pr(\sim R|E) * Pr(\sim R|B)]}$$

- I don't employ conditional probabilities, but instead just direct subjective probabilities. The ~R side is the same as [1-related numerator component].

- *** **NOTE that just as I do with the Proper version, the Bayes-ish approach also fators in the sum of all relevant evidences as well.** ***

Bayes' vs. Bayes-ish Comparative Illustration

- Let us suppose the **prior probability of the Resurrection hypothesis ("R") is 50%** in both cases and that the same evidences are relevant (the empty tomb, appearance to Paul, appearance to the "12" & appearance to the "500").

- **Proper Bayes' for Resurrection hypothesis:**

- The conditional probabilities of each evidence given the assumed truth of "R" is 100% or 1/1- of course we would have these four evidences if the Rez hypothesis were true.

- The conditional probabilities for each evidence given the Rez hypothesis is assumed to be false are; i) 100%, ii) 7/10 = 70%, iii) 5% and iv) 90%

$$Pr(R|E\&B) = \frac{[Pr(E|R) * Pr(R|B)]}{[Pr(E|R) * Pr(R|B)] + [Pr(E|\sim R) * Pr(\sim R|B)]}$$

$$Pr(R|E\&B) = \frac{[(100\% * 100\% * 100\% * 100\%) * (50\%)]}{[100\% * 100\% * 100\% * 100\%) * (50\%)] + [(100\% * 70\% * 5\% * 90\%) * (50\%)]}$$

$$Pr(R|E\&B) = \frac{[(100\% * 50\%)]}{[100\% * 50\%] + [(3.15\%) * (50\%)]} = \frac{50\%}{50\% + 1.58\%} = \frac{50\%}{51.58\%} = \underline{\textbf{Approx. 97\%}}$$

Bayes' vs. Bayes-ish Comparative Illustration

- **<u>Bayes-ish for Resurrection hypothesis:</u>**

- The prior probability is again 50% for R and ~R and the direct Pr(R) for each evidence is; i) 55%, ii) 70%, iii) 80%, iv) 30% (Note that anything 50% or less is ignored from the calculation as inability to prove does not entail R is false necessarily). The Pr(~R) for the evidences are; i) 100%-55%= 45%, ii) 30%, iii) 20% and, iv) N/A (not applicable).

- $$Pr(R|E\&B) = \frac{[Pr(R|E) * Pr(R|B)]}{[Pr(R|E) * Pr(R|B)] + [Pr(\sim R|E) * Pr(\sim R|B)]}$$

- $$Pr(R|E\&B) = \frac{[(55\% * 70\% * 80\%) * (50\%)]}{[(55\% * 70\% * 80\%) * (50\%)] + [(45\% * 30\% * 20\% *) * (50\%)]}$$

- $$Pr(R|E\&B) = \frac{[(30.8\%) * (50\%)]}{[(30.8\%) * (50\%)] + [(2.7\%) * (50\%)]}$$

- $$Pr(R|E\&B) = \frac{[15.4\%]}{[(15.4\%)] + [(1.4\%)]} = \frac{15.4\%}{16.8\%} = \underline{\textbf{Approx. 92\%}}$$

End of General Comparison

➡ Any questions on the general differences?

Applying the Bayes-ish Approach

- Essentially, I only ever use Bayes Theorem when I need it to calculate the overall cumulative probability of a given hypothesis given multiple evidential factors either in favour or against it.

  - For example, I use Bayes-ish for the hypothesis that God exists (Premise #1 in my 11 Premise argument) or the hypothesis that Christianity has religion-authenticating events/miracles (Premise #11 of my 11 premise argument), I do not use Bayes-ish at all for the truth of the Rez hypothesis as only the appearance to the "12" I think provably establishes the hypothesis (so no need for a cumulative probability given only one relevant evidential factor is provable)

- My use of the formula includes both the positive evidences in favour of the truth of the hypothesis and the negative evidences against it to arrive at the overall probability that the hypothesis is true.

Example of the Bayes-ish Method

- The hypothesis is "God exists" ("G"). Let's assume that the prior probability is 50% (equally probable God exists or doesn't exist) for illustration purposes.

- **Positive Evidences:** i) Cosmological Argument (65% or .65), ii) Ontological Argument (90% or .9), iii) Moral Argument (75% or .75).

- **Negative Evidences:** i) Problem of Evil (70%), ii) Hiddenness of God (95%). Converting to positive evidences for "G" = i) 100%-70% =**30% or .3** and ii) 100%-95% = **5% or .05.** These probabilities are less than 50% but are plugged in because they disprove the truth of the "G" hypothesis and are thus relevant.

- $$\Pr(G|E\&B) = \frac{[\Pr(G|E) * \Pr(G|B)]}{[\Pr(G|E) * \Pr(G|B)] + [\Pr(\sim G|E) * \Pr(\sim G|B)]}$$

- $$\Pr(G|E\&B) = \frac{[(.65)(.9)(.75)(.3)(.05) * (50\%)]}{[(.65(.9)(.75)(.3)(.05) * (50\%)] + [(.35)(.1)(.25)(.7)(.95) * (50\%)]}$$

- $$\Pr(G|E\&B) = \frac{[(0.7\% \text{ or } .007) * (50\%)]}{[(.007) * (50\%)] + [(0.6\% \text{ or } .006) * (50\%)]}$$

- $$\Pr(G|E\&B) = \frac{[(0.7\% \text{ or } .007) * (50\%)]}{[(.007) * (50\%)] + [(0.6\% \text{ or } .006) * (50\%)]} = \frac{[(.0035)]}{[(.0035] + [(0.003)]} = \frac{.0035}{.0065} = \underline{\textbf{53.85\%}}$$

Prior Probability Relevance (Illustration)

- Same Numbers as Above;

- $Pr(G|E\&B) = \dfrac{[(.007) * (50\%)]}{[(.007) * (50\%)] + [(.006) * (50\%)]} = \dfrac{[(.0035)]}{[(.0035] + [(0.003)]} = \dfrac{.0035}{.0065} = \mathbf{\underline{53.85\%}}$

- BUT, let's assume a lower/higher Prior Prob factor;

- Lower Prior Prob (30%):

- $\dfrac{[(.007) * (30\%)]}{[(.007) * (30\%)] + [(.006) * (70\%)]} = \dfrac{[(.0021)]}{[(.0021] + [(0.0042)]} = \dfrac{.0021}{.0063} = \mathbf{\underline{33.33\%}}$

- Higher Prior Prob (60%):

- $\dfrac{[(.007) * (60\%)]}{[(.007) * (60\%)] + [(.006) * (40\%)]} = \dfrac{[(.0042)]}{[(.0042] + [(0.0024)]} = \dfrac{.0042}{.0066} = \mathbf{\underline{63.63\%}}$

End of Opening Statement

David J. Objections

- **1. "Blank Slate" is False:**

- **Principle of Indifference** is a rule for assigning epistemic probabilities, it states that in the "absence of any relevant evidence, agents should distribute their credence (or 'degrees of belief') equally among all the possible outcomes under consideration".

- The lottery example proves my point as the only reason we don't suspend judgement and think it very improbable that I will win is because we have relevant evidence from the odds against any specific individual winning the lottery if done randomly and fairly (so thus, not a blank slate here in this example).

- Point of blank slate is not meant literally, but as a practical mindset that aids proper debate and discussion between those who disagree, if you have background assumptions and presuppositions that I do not share, then those need to be stated and then proved first else nothing you say will persuade me.

- **2. 0% is Proper Prior Probability (Not 50%/50%):**

- This is not true in Bayes Theorem as 50% is the neutral probability that doesn't affect the calculation one way or the other, a 0% is not neutral but instead entails there is a 0% probability that the hypothesis is true; this is a positive claim that requires one to meet their burden of proof.

- David misunderstands what the hypothesis is; we are not asking what is the probability that I have evidence or proof that God exists or Jesus rose from the dead (which would be 0% if someone had nothing), but instead we are assessing the probability of 2 separate hypotheses- for example, that God does/does not exist proper. On this front, in Bayes- 0%-49% = It is false that God exists; 50% = agnostic we must suspend judgement either way on both hypotheses and 51%-100% = God probably exists.

David J. Objections

- **3. 51% Not Enough:**

- **Principles of Rational & Proportional Belief-** There are three main cognitive attitudes you can take toward a proposition: belief, disbelief, and suspension of judgment. If you conclude that a proposition is probably true (>50%) then you believe the proposition; if you conclude that it is probably false (<50%), then you disbelieve the proposition; and if you can't decide (50/50%), then you suspend judgment about the proposition.

- Believing a proposition is not necessarily the same as acting on the basis of that belief. I disagree as how is it rational to act on the basis of a lower probability out of irrational fear or emotions about potential risks- follow the evidence I say.

- David uses the highly controversial **Pragmatic Encroachment Theory** in epistemology to argue that the "evidential sufficiency threshold" for belief in God or Christianity or any religious proposition must be much higher than 51%.

- But, there are many problems with this theory in the literature & is completely arbitrary- William Lane Craig says the sufficiency threshold for belief in God or Jesus is much lower than 50%- who is right, who sets the standard and on what objective basis ought everyone agree to that threshold?

David J. Objections

- **4. Forced Belief:**

- No I'm not, do your own calculations, you don't need to believe on the basis of my work.

- I only argue that my numbers are within the "reasonableness range", not that you ought to agree with me. **(Theistic Uniqueness Thesis vs. Permissivism debate in Epistemology**).

- Remember Premise #9 in my 11 Premise argument where God will prevent any undue confusion for any and all "Reasonable Real Seekers" before the Point of No Return and so in one way or another you get overall >50%, but you may disagree with me (within the reasonableness range) on a given evidence or argument or all of them and you may have other arguments I don't use; but in the end we all get to overall 50%+ on Christianity or whatever religion God wants us to follow.

Skeptical Objections

- **5. Subjective Probabilities vs. Frequentist Probabilities are Useless:**

- No this is demonstrably false as everyone admits subjective probabilities are valid and are sued in academia all the time such as in **decision theory**.

- In fact every one of you Atheists use it the same way I do to think Christianity is false or that God doesn't exist, but you are less transparent about it.

- Benefit of my method- GIGO 1 applies to both of us, but only I avoid the GIGO 2 cumulative assessment problem.

Theological Objection

- **6. Paul Is Against Using Probabilities:**

- No he doesn't- he supports their use implicitly by speaking of faith/trust on the basis of the evidence (also belief help with my unbelief)- implies degrees of credence or belief = probability.

- God invented or grounds math and Bayes and so he likes our using every thought and tool to find Him. Your objection is like saying God doesn't have like jokes- yes he does, He gave us humour. Same with math and probability theory- he wants us to take every thought (even math ones) captive for the sake of His Kingdom.

- Doubting Thomas doesn't negate empirical evidence as Jesus gave it to him, just says that all else equal, it is better have PBB by H.S. and not need empirical evidence given that line of evidence entails a better spiritual healthiness.

Notes & Links

- MAKING EQUATIONS LOOK GOOD FIX UP THE FORUMLAS PROPERLY TO LOOK GOOD ABOVE = https://www.youtube.com/watch?v=2DwIJImXcbw

- LYDIA MCGREW'S WORK:

- realseekerministries.files.wordpress.com/2020/04/tim-and-lydia-mcgrew-resurrection-chapter-in-balckwell-book.pdf

- OR BLOG = BOTTOM ATTAHMENT = https://realseekerministries.wordpress.com/2021/02/27/gospel-of-john-the-maximal-facts-approach-with-dr-lydia-mcgrew-david-j-marvin-wallace/