

Phil 184/284: Formal and Informal Epistemology

Section 3 Handout

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Terminology:

- Thick confidence:
 - o Confidence that is spread over numerous values in the unit interval
- Representer:
 - o R = The set of probability functions representing the agent's state of (thick) confidence
- Midpoint partition principle:

MIDPOINT PARTITION PRINCIPLE

When P_1, \dots, P_n are a logical partition: $\sum(\text{mid}[l_{P_i}, u_{P_i}]) = 1$.

- Midpoint conditional credence confidence rule:

MIDPOINT CONDITIONAL CONFIDENCE RULE

$$\text{mid}[l_{C/A}, u_{C/A}] = \text{mid}[l_{A\&C}, u_{A\&C}] / \text{mid}[l_A, u_A]$$

- Ratio norm:

- o $\text{cr}(C/A) = \text{cr}(A\&C) / \text{cr}(A)$.

- Ramsey norm:

- o $\text{cr}(A \rightarrow C) = \text{cr}(C/A)$.

- Nozick-Harman point:

- o Terminology:

- Rule of entailment:

- Tells you what propositions entail others

- o E.g. disjunctive syllogism:

- A = Apples are in the fridge
- M = Martians are in the White House

A or M

$\frac{\neg A}{\therefore M}$

▪ $\therefore M$.

- Rule of inference:

- Tells you what attitudes you should have on the basis of other attitudes

- o Nozick-Harman point:

- Sometimes, a rule of entailment is not a rule of inference

- More specifically, sometimes:

1. One believes p (to some degree)
2. One gets evidence for q
3. They believe q (to some degree)
4. p and q entail a conclusion C (in accordance with a rule of entailment)
5. But it is more reasonable to retract p than to infer C

Problem set 1:

- First exercise:

- o How can you mathematically define the mid-point?

- $\text{mid}[l_A, u_A] = \frac{l_A + u_A}{2}$

- Tips:
 - Think about the commutativity of addition:
 - E.g. $x + (1 - y) + z = (1 - y) + z + x = z + x + (1 - y)$
 - Think about rules for adding/separating fractions:
 - $\frac{x}{z} + \frac{y}{z} = \frac{x+y}{z}$
 - Think about whether you can prove anything about how l_A and $l_{\neg A}$ relate together if $cr(A) = l_A$ is a credence function that must respect the credence partition principle
- Suppose you have two urns:
 - Urn 1:
 - 18% Dragons
 - 50% Llamas
 - 32% Chimpanzees
 - Urn 2:
 - 80% Dragons
 - 19% Llamas
 - 1% Chimpanzees
- **Important:** You don't know the number of items in each urn
- The urns are then mixed and an item is selected
- What should your thick confidence be in the proposition that the item is a Llama?
 - [.19, .5]
- What should your thicc confidence be in the proposition that the item is a Dragon?
 - [.18, .8]
- Third exercise:
 - Calculate $q \rightarrow r$ and $\neg p \rightarrow (q \rightarrow r)$ with the below table

p	q	r	cr
T	T	T	.05
T	T	F	.05
T	F	T	.05
T	F	F	.05
F	T	T	.05
F	T	F	.5
F	F	T	.2
F	F	F	.05

- Answer:
 - $cr(q \rightarrow r) = (.05 + .05)/(.1 + .55) \approx .15$
 - $cr(\neg p \rightarrow (q \rightarrow r)) = \frac{.05}{.55} = .15 \approx .09$