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[18] The Lottery

0. Outline

1. Graded vs Full belief – some options

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- So far:
  - We have countenanced the existence of degrees of belief (and degrees of desire aka 'utilities' – see L11), on the basis of both introspective evidence and reports of the form:

    'I'm pretty sure he said 'left, then right at the lights'…'

    'I'm not all that keen on those curtains'

    'I went for the VW because, although I badly wanted to save some money, I wasn't confident enough that the Fiat was going to survive the journey.'
  - We have presented, in reasonable detail, the Bayesian take on various rational constraints on these degrees of belief (probabilistic coherence, Bayesian conditionalisation).

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  - We have also *very* briefly (!) mentioned some putative rational constraints on decision making with graded belief/desire (maximising expected utility; see again L11)
  - This view is incredibly popular in *many* fields: some areas of AI, statistics, economics, philosophy of science.
- But on the other hand…
  - We *also* often speak of, and rationalise/explain behaviour in terms of unqualified,'all-or-nothing' belief/desire:

    'I don't believe he said that'

    'I want that one!'

    'I didn't bother calling round because I thought you were ill and wouldn't want any company.'

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- This qualitative doxastic profile of an individual can also be formally modelled, as (say) a function BEL_s from $\mathcal{F}$ to the set {0, 1}, such that 1 stands for belief and 0 for lack of belief (≠ belief in the negation of the proposition!).
- Note: *do not* confuse $\text{Bel}_S(P) = 1$ (being certain that P) with $\text{BEL}_S(P) = 1$ (believing that P)!!!! As we shall see shortly, they arguably mean different things!!
- A number of *synchronic* rational constraints seem to govern these qualitative belief states. If S is (ideally) rational, then:

[F1]: $\text{BEL}_s(\Omega) = 1$ (S believes every tautology)

[F2]: $\text{BEL}_S(\emptyset) = 0$ (S doesn't believe any contradiction)

[F3]: $\text{BEL}_S(P \cup Q) \geq \text{BEL}_S(P) + \text{BEL}_S(Q) - \text{BEL}_S(P \cap Q)$

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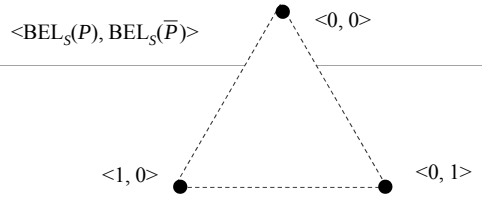
(either (i) S believes that P or Q, believes that P, believes that Q and believes that $P\&Q$, or (ii) S believes that P or Q, believes that P (Q), doesn't believe that Q (P) and doesn't believe that $P\&Q$, or (iii) S doesn't believe that P or Q, doesn't believe that P, doesn't believe that Q and doesn't believe that $P\&Q$)

- Note: formally, this gives us a DS function.



1. Graded vs Full belief – some options

- Note that the following follows (this will be important shortly):

[F4]: If S believes that P and S believes that Q, then S believes that P and Q. (if $\text{BEL}_s(P) = 1$ and $\text{BEL}_s(Q) = 1$, then $\text{BEL}_s(P \cap Q) = 1$)

- A number of *diachronic* rational constraints have also been proposed (e.g. the AGM belief revision framework - see Hansson's [2006] overview).
- This view is incredibly popular in *many* fields: philosophy of mind, traditional epistemology, some other areas of AI, etc.

- Not a tidy picture... ☹
- How, if at all, do the two types of discourse relate?

1. Graded vs Full belief – some options

- Three options:
  - Autonomy
  - Reduction of partial to full belief
  - Reduction of full to partial belief
- *Option #1*: autonomy view – there is no metaphysical connection whatsoever between degrees of confidence and full belief.
- But surely there is *some* kind of connection!
- The following seem inconsistent (not just conversationally odd):

'I am certain that it isn't the case that P but I think it is the case that P.'

'I believe that P but I am more confident in P's being false than in P's being true'

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- *Option #2*: Reduction of partial to full belief
- We have already spoken of 'probabilities' albeit in a *purely technical* sense (i.e. as an abstract set-theoretic construct).
- But there is of course, a non-technical layperson's usage.
- This first reductionist proposal makes use of this concept.
- Proposal:

  'I am certain that *P*' = 'I believe that the probability of *P* is 1'

  'I am agnostic as to whether *P* or *Q*' = 'I believe that *P* and *Q* are equiprobable.'

  Etc.
- On this view, the quantities are features of the *propositional content* of the attitude, not of the attitude *itself*.

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- Now the question of the appropriate analysis of the non-technical everyday concept of 'probability' is extremely vexed…
- Some views equate probability with either subjective degrees of belief (fairly implausible) or objective, *rational* degrees of belief (somewhat more plausible).
- As Christensen [2004: 19] points out, the reductionist proposal embodied by *option #1* obviously doesn't pan out on either of these analyses.
- Other analyses divorce probability from opinion…
- Some have held that probabilities are to be identified with *frequencies* in a finite set (e.g. the probability of F(*a*) = the frequency of *x*'s that are *F*, in some suitably chosen finite set of individuals).

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- Others have held the view that probabilities are to be identified with certain *dispositional properties* ('propensities') of certain physical setups (e.g. a physical system composed of a roulette wheel and a croupier).
- Christensen argues that plugging these analyses into the reduction proposed in *option #1* yields implausible results (see also Frankish [forthcoming: 3]).
- But we needn't even delve that deep:

  Whatever analysis of probability pans out to be true, it is surely merely *odd* (in a Moore's paradox kind of way) but *not* paradoxical to assert 'I am confident that *P* but I believe that *P* is unlikely to be true'.

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- Other issue: other propositional attitudes clearly seem to come in degrees (e.g. fearing, wanting, …) so why give belief a special treatment? (Christensen [2004:20])
- *Option #3*: Reduction of full to partial belief
- Prima-facie attractive proposal: all-or-nothing belief is simply sufficiently high degree of confidence.
- This is sometimes known as the 'Lockean Thesis' (Foley [1992]):

  Locke: *S* believes that *P* iff *S*'s degree of belief in *P* exceeds some suitably high threshold *t*. ($BEL_S(P) = 1$ iff $Bel_S(P) > t$, where *t* = suitably high)
- Question: how high is 'sufficiently high'?
- *Suggestion 1*: sufficiently high = 1.

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- Problem: the resulting account seems too strict
  - It's ok to say 'I believe he did it, but I'm not completely sure.'; it's also ok to say 'I believe that *P* and believe that *Q* but am more certain of the latter than the former.'
  - Furthermore, according to the standard view of the connection between degrees of belief and valuation of bets, it would follow that:

    For any *P* believed by some agent *S*, *S* should be indifferent between the status quo (a bet on *P* with $\mathcal{S} = 0$) and a bet on *P* paying 0 if *P* and $-\mathcal{S}$ for arbitrarily high $\mathcal{S}$.

    Pb: I believe that my car is still parked outside my house but I wouldn't enter some arrangement in which I get nothing if this turns out to be true and risk loosing my life if it doesn't.

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- *Suggestion 2*: sufficiently high = t or greater, for some $t < 1$.

Reference

- Christensen, D. [2004]: *Putting Logic in its Place*. Oxford: OUP.
- Foley, R. [1992]: 'The Epistemology of Belief and the Epistemology of Degrees of Belief', *American Philosophical Quarterly*, 29(2): 111-121.
- Frankish [forthcoming]: 'Partial Belief and Flat-Out Belief', in F. Huber and C. Schmidt-Petri (eds), *Degrees of Belief: An Anthology,* Oxford: Oxford University Press.
- Hansson, S. O. [2006]: 'Logic of Belief Revision', *The Stanford Encyclopedia of Philosophy (Summer 2006 Edition)*, Edward N. Zalta (ed.).

Next lecture: 'The Lottery (ctd.)'

- No set reading.