# A DEFENSE OF TEMPERATE EPISTEMIC TRANSPARENCY

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FEW 2011 – USC

# Epistemic Transparency

- If *S* knows that *p*, *S* knows that she knows that *p*:

- *KK Principle:* $Kp \rightarrow KKp$

  - *Knowledge reflexivity*
  - *Positive introspection*
  - *Self-knowledge*
  - *Transparency*
  - *Luminosity*

# GOAL

- A defense of a moderate version of *KK*

# RISE AND FALL OF *KK*

- 1960s: Dogma

Then….

- Externalism – e.g.: Reliabilism
- Williamson (2000)

# STRATEGY

- (A) Why do we want transparency?

- (B) Indirect argument

# WHY DO WE CARE ABOUT TRANSPARENCY?

- Ideal agents
  - Ideally ***rational***?

# WHY DO WE CARE ABOUT TRANSPARENCY?

- Knowledge and responsibility
  - How?

# WHY DO WE CARE ABOUT TRANSPARENCY?

- Responsibility demands us to be in an appropriate reflective state.

- *What* reflective state?
  - Epistemic responsibility entails “ratifiability”.

# A MODAL FRAMEWORK

- $F = \langle W, R, P_{prior} \rangle$

- $K\varphi = \{w \in W: \forall x \in W\ (wRx \rightarrow x \in \varphi)\}$

- $R(w) = \{x \in W: wRx\}$

# WILLIAMSON: IMPROBABLE KNOWING

- $P_w(\varphi)$: the evidential probability of $\varphi$ in $w$.

- $P_w(\varphi) =$
  $P_{prior}(\varphi \mid R(w)) = P_{prior}(\varphi \cap R(w)) \,/\, P_{prior}(R(w))$

- $P_w(R(w)) = 1$

- $[P(\varphi) = r] =_{def.} \{w \in W: P_w(\varphi) = r\}$

# IMPROBABLE KNOWING

- "The ***KK*** principle is equivalent to the principle that if the evidential probability of *p* is 1, then the evidential probability that the evidential probability of *p* is 1 is itself 1" (Williamson, p. 8).

- We can build a model in which $P_w([P(R(w)) =1])$ is as low as we want.

# PROBLEMS

*Why should we say that the evidential basis is always R(w)?*

# PROBLEMS

Recall that:

- $[P(\varphi) = r] = \{w \in W\colon P_w(\varphi) = r\}$
- $[P_w(\varphi) = r]$ ?

# PROPOSAL (FIRST VERSION)

- We'll have a sequence of languages $L^0$, $L^1$, … $L^n$….with probability operators $\underline{P^0, \ldots P^n \ldots}$
- We'll have a sequence of functions $P^1{}_w$… $P^n{}_w$… on sentences $\underline{\varphi^i}$ of language $L^i$
- $P^i{}_w$: $L^{i-1} \rightarrow \mathbb{R}$

# PROPOSAL (FIRST VERSION)

- Expressions of the form $P_{prior}(\underline{\varphi})$ or $P^i_w(\underline{\varphi})$ do not belong to any language of the sequence $L^0$, $L^1$… $L^n$….

- "$\underline{\mathrm{P}^{\mathrm{i}}(\varphi)=r}$" is true in $w$ iff $P^i_w(\underline{\varphi})=r$.

# PROPOSAL (FIRST VERSION)

- How should we conditionalize?

# PROPOSAL (FIRST VERSION)

- For $P^1{}_w(\underline{\varphi})$, the relevant evidence is $R(w)$.
- For $P^2{}_w(\underline{\mathrm{P}^1(\varphi)=\mathrm{r}})$, the relevant evidence is $KR(w)$.

# CONDITIONALIZATION (FIRST VERSION)

- C* rule:

For $i \geq 1$: $P^i_w\,(\underline{\mathrm{P}^{i\text{-}1}(\ldots \mathrm{P}(\varphi)=r\ldots)}) =$

$$P_{\mathrm{prior}}(\underline{\mathrm{P}^{i\text{-}1}(\ldots \mathrm{P}(\varphi)=r\ldots)} \mid \underline{K^{i\text{-}1}\ldots KR(w)})$$

where $K^{i\text{-}1}$ is the same $\underline{K}$-operator iterated $i$-1 times

# DIFFICULTIES

- C* divorces probability 1 from knowledge.

# A MODEL FOR MODERATE TRANSPARENCY (SECOND VERSION)

- $M$ = <$W$, $R^1$,…,$R^n$…, $P_{prior}$, $v$>

- New operators $\underline{K^0}$…$\underline{K^n}$…, in addition to $\underline{P^0}$, … $\underline{P^n}$…

- We define a sequence of relations $R^1$…$R^n$ which correspond to the different $\underline{K}$s.
  - The $R$s are nested: $R^i \subseteq R^{i-1} \ldots \subseteq R^1$
  - $R^i$ is a reflexive relation over $W$, for all $i$, and transitive for $i$ > 1.

# A MODEL FOR MODERATE TRANSPARENCY

- Our conditionalization rule now incorporates operators $\underline{K}^1$,… $\underline{K}^n$… defined on the basis of relations $R^1$,… $R^n$…

- C** rule:

For $i \geq 1$: $P^i_w(\underline{P^{i-1}(\ldots P(\varphi)=r\ldots)}) =$

$P_{prior}(\underline{P^{i-1}(\ldots P(\varphi)=r} \mid \underline{K^{i-1}\ldots KR(w)})$

where "$\underline{K^{i-1}\ldots KR(w)}$" includes $i$-1 higher-order $\underline{K}$-operators

# A MODEL FOR MODERATE TRANSPARENCY

- Intended interpretation of the formalism:
  - *(*)*$\underline{K^2 p}$ does not make sense!
  - A second-order evidential probability claim is the evidential probability of a <u>probability statement</u>.
  - *Mutatis mutandis* for higher-order levels and for *conditional* evidential probabilities.

# SOME CONSEQUENCES

- Why should we demand such requirements for the *R*s?

  They are not *ad hoc*!

- Higher-order probability requires increasingly complex probabilistic claims.

- For second-order evidential probability in *w*:
  → We conditinalize over <u>*KR*(*w*)</u>
  → Thus the second-order probability of <u>*R*(*w*)</u> is 1
  → Thus the agent *knows* that <u>*KR*(*w*)</u>
  → <u>$K^2KR(w)$</u> should be true in *w*

# SOME CONSEQUENCES

- $\underline{K\varphi \rightarrow K^2K\varphi}$ ***KK² Principle***
  - (if [$K^2K$R(w)] is not empty, for any *w*)
- $\Diamond\ (\underline{K\varphi \rightarrow K^2K\varphi})$ ***KK◊ Principle***
  - (if [$K^2K$R(w)] is not empty, for some *w*)
- $\underline{K^2K\varphi \rightarrow K^3K^2K\varphi}$ ***KK⁺ Principle***

# SOME CONSEQUENCES

- A restricted version of possitive introspection holds:

  → ***Quasi-transparency principles***

- ***$KK^+$***, ***$KK^\lozenge$*** and ***$KK^2$*** result from conditionalizing over higher-order levels of evidence and from the attempt to adjust probability language and knowledge attribution in a progressively coherent way.

# SOME CONSEQUENCES

- Links between lower- and higher-order probabilities.
  - If $P^{1}_{w}(\underline{\varphi}) = r = 1$ or $0$, then $P^{2}_{w}(\underline{P^{1}(\varphi)=r}) = 1$.
  - If $R^{1}$ is an equivalence relation, $P^{2}_{w}(\underline{P^{1}(\varphi)=r})$ is either 1 or 0.
  - Suppose $P^{2}_{w}(\underline{P(\varphi)=r}) = s$. If $0 \neq r \neq 1$ and $R^{1}$ is not transitive, then $s$ need not be either 1 or 0.

# ON THE PROBABILISTIC REFLECTION PRINCIPLE (PRP)

- *PRP:*

  $P^2_w(\underline{\varphi} \mid \underline{\mathrm{P}^1(\varphi)=r}) = r$ (for $w \in W$)

- *Iterated PRP:*

  $P^i_w(\underline{\varphi} \mid \underline{\mathrm{P}^{i-1}(\varphi \mid \mathrm{P}^{i-2}(\varphi \mid \ldots)\ldots.)=r}) = r$

- Is *PRP* a theoretical truth of *M*?

# ON PROBABILISTIC REFLECTION

- **Necessary and sufficient condition for Iterated *PRP***

$R^i = R^{i-1} \in M$ is an equivalence relation

iff

for all $w \in W$ and any $\underline{\varphi} \in L^0$:

if $P^{i+1}{}_w(- \mid -)$ exists, then

$P^{i+1}{}_w(\underline{\varphi} \mid \underline{P^i(\varphi \mid P^{i-1}(\varphi | \ldots) \ldots.) = r}) = r$

# RELATION TO OTHER WORK

**Paul Egré/ Jérôme Dokic**

- Principal motivation: to deactivate Williamson's soritic argument on inexact knowledge

- Perceptual vs. reflective knowledge

- **(KK')** $K_{\pi}\varphi \rightarrow KK_{\pi}\varphi$

- Transparency failures do not generalize

# RELATION TO OTHER WORK

**Differences**

- 1. Egré/ Dokic do not offer a probabilistic framework.
- 2. They focus on reflection over perceptual knowledge, exclusively.
- 3. KK' Principle is imposed "from the outside".

→ The present model for quasi-transparency can be seen as a refinement and extension of some aspects of the system suggested by Egré - Dokic.

# CONCLUSIONS

- Once we clarify some conceptual aspects of higher-order probabilities…
- …we obtain the vindication of a number of introspective principles, or *principles of quasi-transparency*.
- Quasi-transparency principles were not just assumed to hold, but they have been obtained as a result of implementing a number of natural constraints on the structure of the system.

  → Formally speaking, they behave quite differently from presuppositions of consistency or deductive closure.

# CONCLUSIONS

- The framework vindicates the intuition that first- and second-order knowledge differ substantially:
  - Different attitudes about ignorance
  - Different attitudes toward “margin of error” principles
  - Second-order knowledge is concerned with the “ratification” of first-order attitudes.

# CONCLUSIONS

- Quasi-transparency fully vindicates the normative link between self-knowledge and responsibility.

→ $\underline{K^{+}Kp}$: “responsible knowledge” of *p*.

# CONCLUSIONS

→ Second-order knowledge, as a state of epistemic responsibility, is a desideratum we have *qua* agents.

Thank you!