

Kantian Decision Making Under Uncertainty

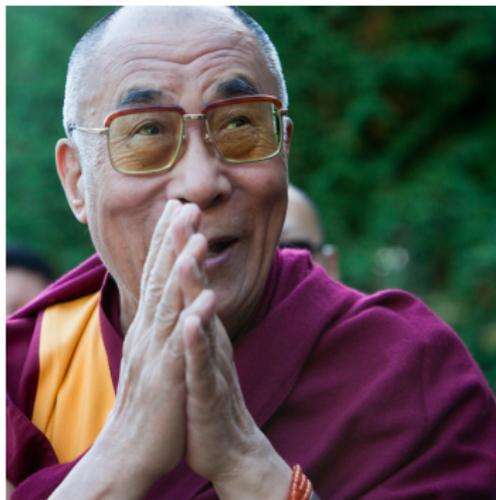
Dignity, Price, and Consistency

Adam Bjorndahl Alex John London Kevin J.S. Zollman

Normative decision theory

- ▶ Individual and collective decisions
- ▶ Pragmatic and epistemic contexts

Rationality and Ethics



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Price of dignity



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Outline

Kantian ethical theories

Formalizing Kant

Dead ends

Our proposals

Book and Money Pumps

Threshold rules

Variable threshold rules

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Kant on two domains

In the kingdom of ends everything has either a price or a dignity. What has a price can be replaced by something else as its equivalent; what on the other hand is raised above all price and therefore admits of no equivalent has a dignity

... rational beings are called persons because their nature already marks them out as an end in itself, that is, as something that may not be used merely as a means, and hence so far limits all choice (and is an object of respect)

[Dignity and price] cannot be brought into comparison or competition at all without, as it were, assaulting [dignity's] holiness

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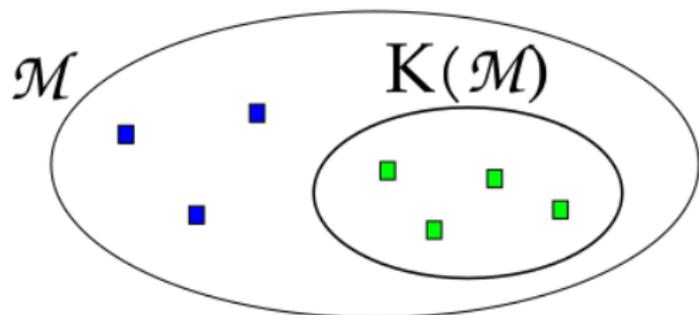
*[Dignity and price] **cannot be brought into comparison** or competition at all without, as it were, assaulting [dignity's] holiness*

Sen's mango



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Sen's decision theory



- ▶ There is a menu of acts, \mathcal{M} .
- ▶ Step 1: A function K which edits out those actions that violate Kantian injunctions
- ▶ Step 2: Maximize expected utility with respect to $K(\mathcal{M})$

Limitaitons

- ▶ Moral dilemmas, i.e. $K(\mathcal{M}) = \emptyset$
- ▶ Uncertainty about the moral norm

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- ▶ **Uncertainty about the moral norm**

Three stories

- ▶ Uncertain mango
- ▶ Graduate advice
- ▶ Uncertain proposition

Sources of uncertainty

- ▶ An agent may not know her own motivations
- ▶ An agent may not know another's motivations, but may need to act to help or hinder another's actions

Generalizing

- ▶ Action A_g^p :
 - ▶ A certain material gain with utility g
 - ▶ A probability p that dignity is violated
- ▶ Action B :
 - ▶ No material gain
 - ▶ No chance dignity is violated

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Dead end: “Middle” utility

$$\begin{aligned}u(\text{dignity}) &= x \\ u(\text{some material good}) &= y > x\end{aligned}$$

- ▶ Dignity is not “raised above all price”
- ▶ Dignity is “brought into comparison” with material goods (under any interpretation of this phrase)

Dead end: Largest utility

$$u(\text{dignity}) > \sup\{u(x) \mid x \text{ is a material good}\}$$

- ▶ Existence
- ▶ While dignity doesn't have a price, a probability of dignity does
- ▶ Again, it's hard to see how this fails to compare dignity and material goods

Dead end: Incommensurability

Dignity $\not\approx$ Material good

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- ▶ Dignity is not given special status above material goods

Making Kant's injunction precise

Weak price resistance

There is no value $v \in \mathbb{R}$ such that all the decision maker's choices are consistent with an expected utility maximizer who assigns utility v to dignity.

Dead end: Lexicography or infinite utility

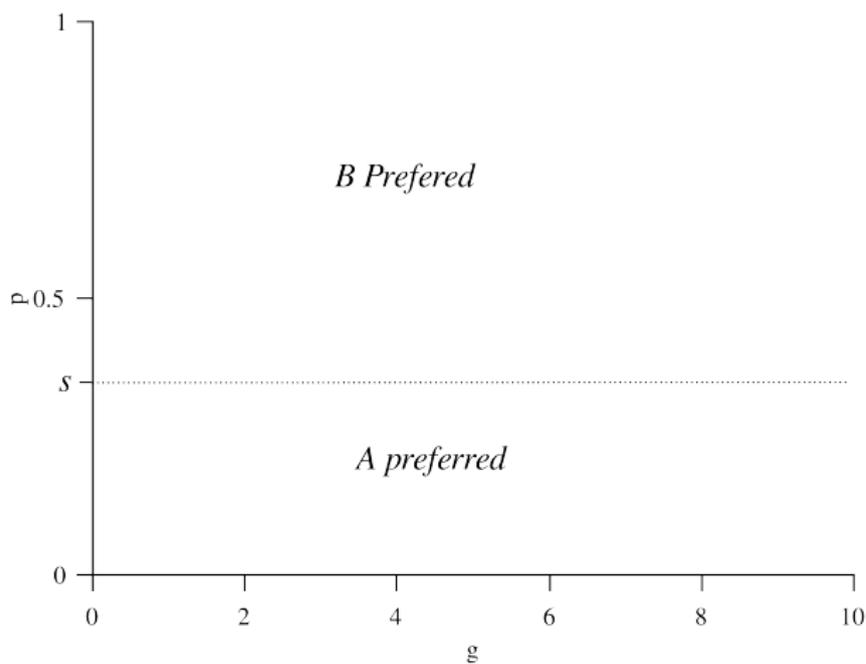
$$u(\text{dignity}) = \infty$$

- ▶ Just barely, consistent with *Weak Price Resistance*
- ▶ Renders uncertainty moot
- ▶ Is paralyzing

Our first proposal: Thresholds

- ▶ Adopt a threshold s where risks less than s are ignored
 - ▶ $A_g^p \succ B$ if and only if $p \leq s$ and $g > 0$
- ▶ This cannot be reconstructed as assigning a price to dignity

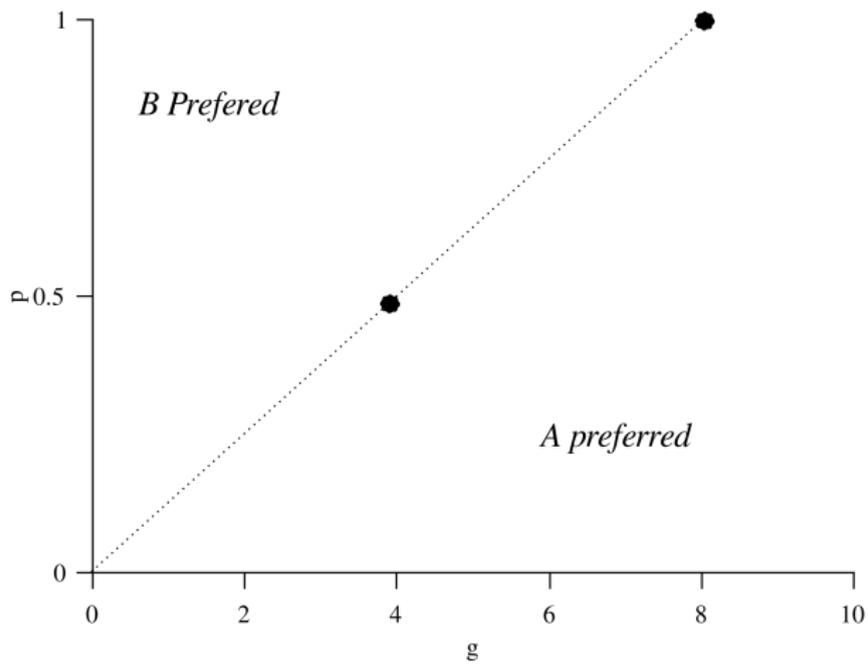
Our first proposal: Thresholds



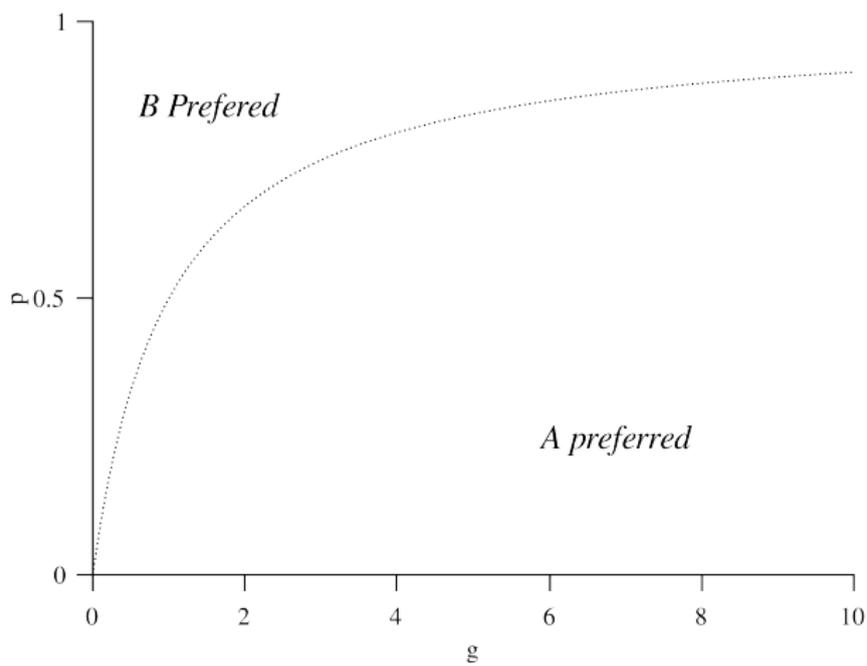
Our second proposal: Variable thresholds

- ▶ Adopt a function $\Phi : \mathbb{R} \rightarrow [0, 1]$ that defines a threshold given a material payoff g
- ▶ $\Phi(x) = x/v$ violates *Weak Price Resistance*
- ▶ But any other function does not

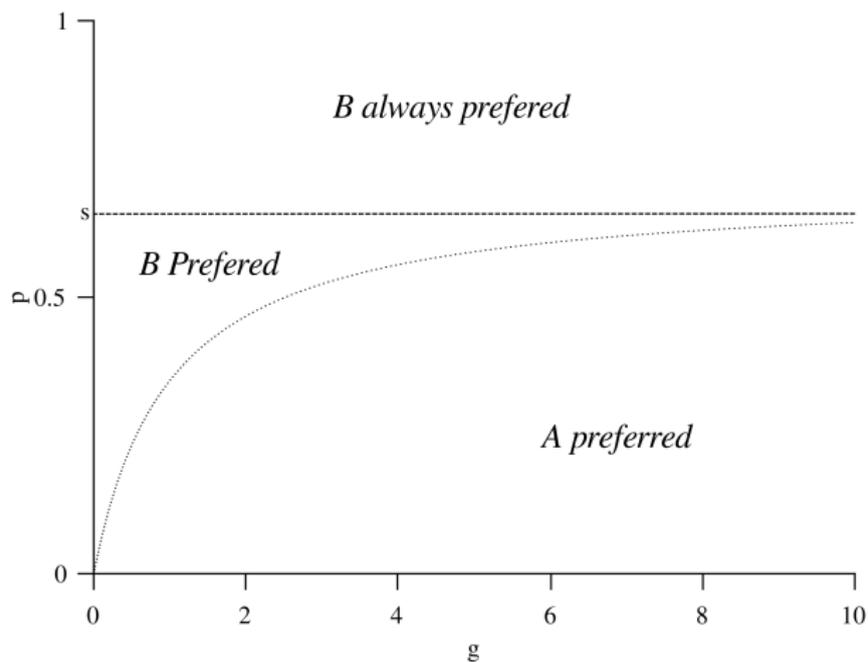
x/v



A variable thresholds



Bergstrom's proposal



But...

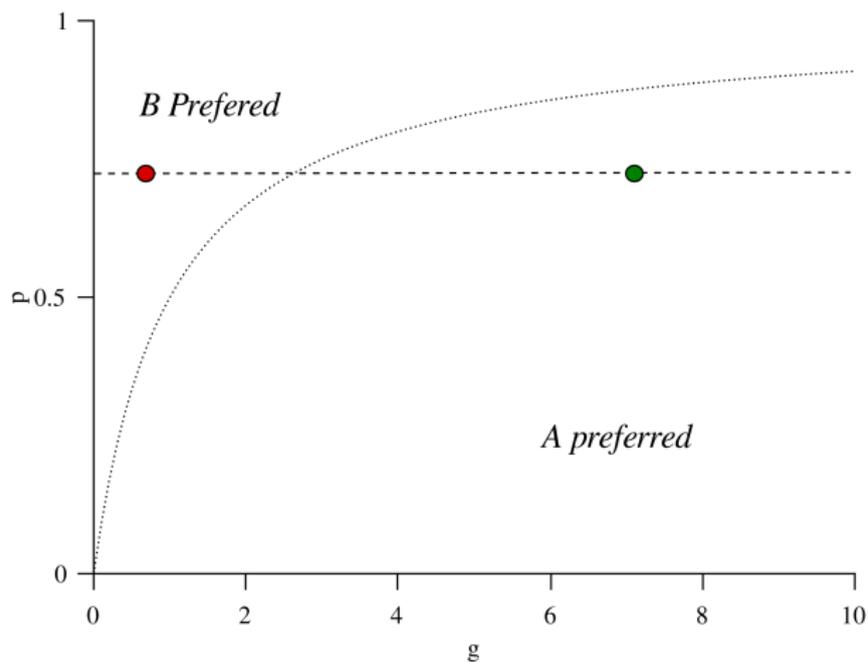
- ▶ One can approximate $\Phi(x) = x/v$ arbitrarily closely and satisfy *Weak Price Resistance*
- ▶ So, one might like a stronger principle

A stronger principle

Strong Price Resistance

If q is considered an unacceptable risk to dignity in exchange for some material payoff $g > 0$, then q is considered an unacceptable risk to dignity in exchange for any material payoff $g' > 0$.

Strong price resistance



Generalization

- ▶ This is just for comparing two special acts
- ▶ One might generalize Sen's approach, edit out any act that is above threshold and then maximize material payoff after that
- ▶ Moral dilemmas remain a problem

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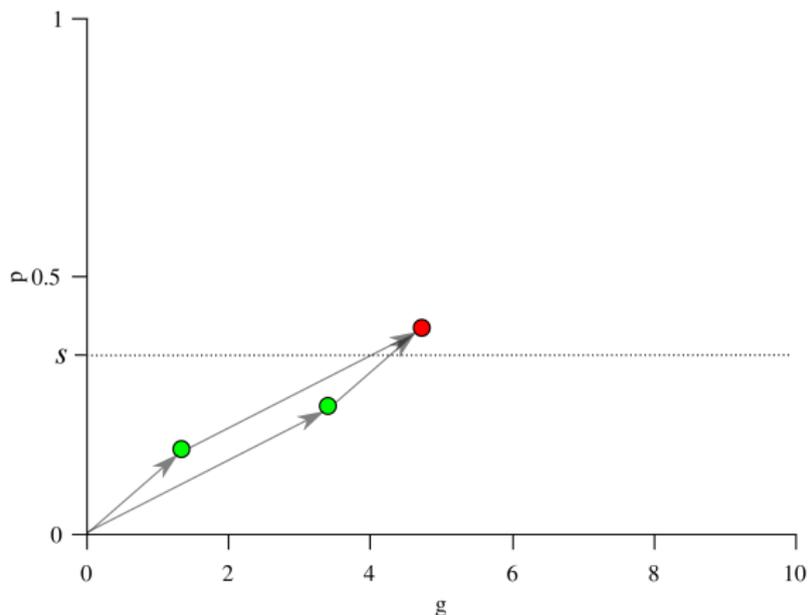
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Package principle

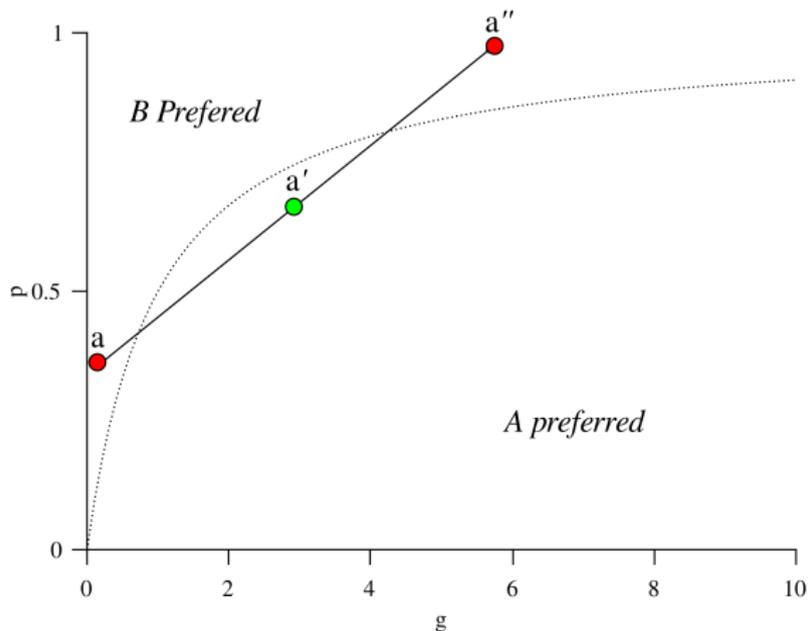


$$A_g^p \succ B \text{ and } A_{g'}^{p'} \succ B \text{ but } B \succ A_{g+g'}^{p+p'}$$

Consequences

- ▶ Under the standard description of the process, this agent is bookable
- ▶ Evaluation of gambles are history dependent

Independence axiom

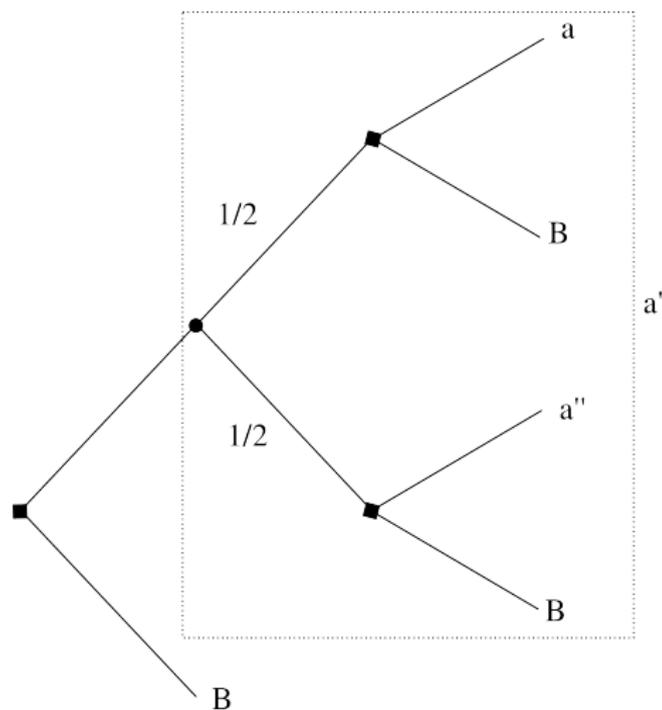


$$a' = \frac{1}{2}a + \frac{1}{2}a''$$

$$a' \succ B \succ a$$

$$a' \succ B \succ a''$$

Dynamic inconsistency



$$a' = \frac{1}{2}a + \frac{1}{2}a''$$
$$a' \succ B \succ a$$
$$a' \succ B \succ a''$$

Summary of books

- ▶ **Weak Price Resistance** \Rightarrow violating the package principle and (potentially) dynamic inconsistency
- ▶ **Strong Price Resistance** \Rightarrow violating the package principle

Conclusion



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