

Deliberate Violations of Dominance by Economists in Normative choice

due to

Secondary Satisfaction – Attractions to Chance (Utility of Gambling)

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Via SKAT

**Stages of Knowledge Ahead Theory
of decisions under risk, uncertainty**

SKAT

Stages of Knowledge Ahead Theory

I developed SKAT to solve a famous complementarity paradox in economics of von Neumann and Morgenstern 1944, 1947 who wanted to model risk effects like thrills. Applications:

- 1 insurance, protection, security book out with Graz researchers, Springer, The Knowledge Ahead Approach to Risk
- 2 Exchange rate variations in a team under Reinhard Selten Germany's Nobel Laureate in Economics, in Bonn University's experimental economics laboratory
- 3 Owl risk taking with Aachen University co-researchers
- 4 Today mental health –the brain's need for stimulation, thrills, avoiding damage from boredom

Your Decision

Name optional

Date

Sex

Belle is president of a mountaineering club. Five of her members plan a trip for next weekend. Their choice is between Mt Pleasant and Mt Danger. In pleasure from the scenery and in physical exercise, the two mountains are equal. Where they differ is that very occasionally, about once in every fifty years, there is an avalanche on Mt Danger. Climbing Mt Danger involves therefore a tiny risk of serious injury or even death, whereas climbing Mt Pleasant is riskless.

Particularly since next weekend's party includes two teenage boys who have been in trouble with the police for stealing cars to joy ride, Belle advises its leader Dan to choose Mt Danger. "It is always important to challenge yourself by choosing exciting difficult tasks," she says to Dan. "Your self-esteem is aided by succeeding in such challenges. And it is tremendously important to switch the imagination of those two teenage boys away from finding their excitement in stealing cars to joy ride. Engross their imaginations instead in the challenging world of climbing mountains in situations that involve just a tiny whiff of danger."

- 1 Do you agree with Belle, if so explain
- 2 If you did not agree with Belle's advice, how would the situation need to alter for you to recommend that the party go up Mt Danger?

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Primary and Secondary Satisfactions Terminology

Marshall

primary: utility of money

secondary: utility of gambling

Von Neumann and Morgenstern

primary: utility

**secondary: positive or negative utility
from the mere act of taking a chance**

Harsanyi

primary: utility

secondary: process utility

Primary and Secondary Satisfactions Terminology

**Primary: independent of degree of risk /
uncertainty**

**Secondary: based on degree of risk /
uncertainty**

**Consider now risk uncertainty from point of
choice, ie concerning the outcomes, if
choose to climb Mt Danger: 2 possible
outcomes - death or returning alive**

Anticipated Satisfaction from Act to Climb Mt Danger

Primary

before outcome is known: scenery, exercise

after outcome is known dead – nothing **Or**

alive – those satisfactions that are independent of
previous possibility of death

Secondary

before outcome is known: excitement about which
outcome will occur

After outcome is known dead – nothing **Or**

alive – thankfulness, extra self esteem having survived

First Order Stochastic Dominance Principle

Only a single period

–as no way to add up multiple periods without appealing to person's time etc preferences

Outcomes must be specified independently of the degree of uncertainty or risk and so must be after risk is past

- as must be able to throw any cumulative probability distribution over the set of outcomes to determine which is stochastically dominant

Ignored by Dominance Principle and Expected Utility Theory

**Pre-outcome period altogether ignored
Primary and Secondary satisfactions**

**Post-outcome period ignored for
Secondary Satisfactions**

**Simplistic framing – no pre-outcome period and
no secondary satisfactions**

Verdict of Economists and Other Decision Scientists

**Secondary satisfactions should be
considered in reaching a decision**

**For 50% violated dominance as Belle
advised**

**For rest violated dominance if
circumstances changed enough – eg
some wanted more danger or else
the thrills were too little**

Circumstances to Violate Dominance in Agency Normative Choice Role

- 1 democratic – if group preferred Mt danger**
- 2 more skill needed to avoid an avalanche (from those ignorant of mountaineering in snow)**
- 3 less skill needed to avoid an avalanche (those from Austria who all have friends lost in avalanches needing more skill)**
- 4 right amount of risk for thrills – some reckoned 1/50 years too little, others too much**

Conclusions

- 1 Expected utility theory and game theory fail normatively since they are too narrow in imposing the narrow dominance principle**
- 2 The belief in the rationality of the dominance principle stems from a failure to understand the inherently 2 period nature of risk experiences and satisfactions from focussing on simplistically framed problems that omit secondary satisfactions**

Conclusions

- 3 Use SKAT to be rationally broad in understanding health situations and the QALY**
- 4 Separate the pre-outcome experiences of risk and uncertainty from the post-outcome when that outcome will have become known and so experiences will be different**

Conclusions

5 In examining mental health problems, be alert to brain deterioration from not enough risks of the appropriate sort for people to develop and maintain good decision making – the Whiffs of Danger / Risk Starvation applications of SKAT

Focus of Research / Therapy for Depressions

and tinges of this focus for dementias and alcoholism

Safer Environment

No notion of a good set of risks.

Any risk is bad — cocoon —

In cocoon existence, pour in

Drugs to overcome

Bad Genes with chemical balancing



cocoon to get rid of
actual risk: by safer environment
perceived risk: by drugs
attention to risk: by relaxation

Result of Escalating Research / Spending on Drugs and Genes

Age for age cohort for incidences
of depressions, dementias

In rich countries higher than in poor countries



Also alcoholism remains a big problem in
rich countries

le very limited success where most health
spending is done – is there a missing link in
understanding brain morbidities

What is a Risk?

**Animal recognises,
not typically consciously,
that it does not know the
future, anticipates a change
in its knowledge ahead**

What is a Brain for?

To process risks into, with luck, beneficial action in six stages

Stage 1 Detect signals of a surprise

Stage 2 Interpret signals – what might the surprise be – nice neutral, nasty?

Stage 3 Discover choices

Stage 4 Choose

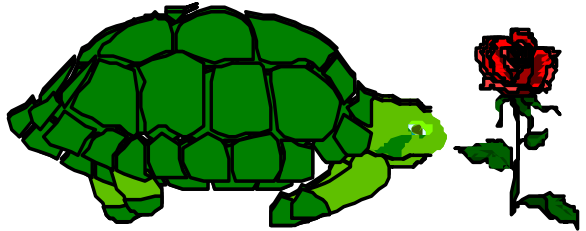
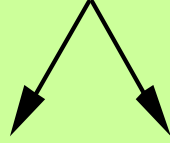
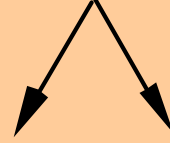
Stage 5 Result – nice, neutral, nasty?

Stage 6 Evaluate 1-5 for next action

Risk is the Brain Anticipating a Change in its Knowledge Ahead

— A Surprise in the Future

Five successive Stages - 5 Surprises
5 Changes in the Tortoise's Knowledge Ahead



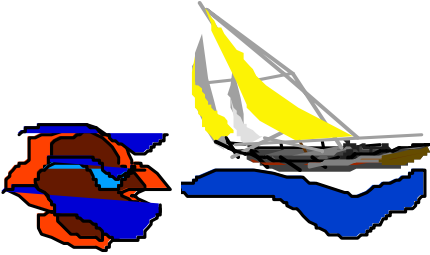
| 1st "Now" 11.50am Surprise | 2nd "Now" 11.52am Risk | 3rd "Now" 11.53am Choosing | 4th "Now" noon Choice | 5th "Now" 1pm Surprise |
|---|--|--|--|---|
|  <p>new thing - could reach it by 1pm.</p> | <p>Conflicting Discoveries</p>  <p>food not</p> | <p>Conflicting Acts</p>  <p>go stay to it put</p> | <p>Decide to Discover</p> <p>start walk to thing</p> | <p>Nasty</p> <p>ouch - thorns, not food</p> |

October 23, 2008

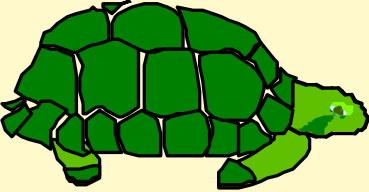
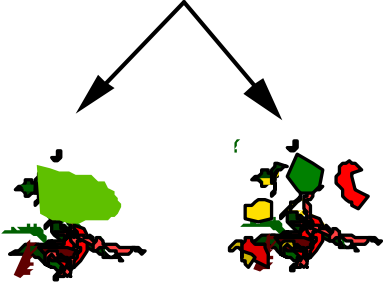
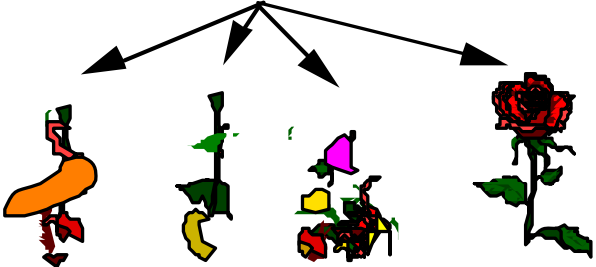
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A Person Risk Processes to See Distinct Objects, Increasing Chances, Reducing Dangers

| | | |
|---|--|---|
|  |  |  |
| <p>see stork distinct from bulrushes (increase food chance)</p> | <p>see lion distinct from earth (reduce danger that ravaged)</p> | <p>see rock distinct from water (reduce danger that crash)</p> |

Risk Processing in Registering and Organising Light into Information — Seen Objects

| <p>Anything Ahead to eat or get stung by?</p> | <p>Slow Unintelligent Visual Processing manages only two uninformative conflicting organisations</p> | <p>Faster, More Intelligent Eye Brain manages four conflicting organisations, reaches an informative one</p> |
|--|---|--|
|  <p>What mess of light signals did I get? Do they contain information?</p> |  <p>nothing nothing</p> |  <p>nothing nothing nothing new thing</p> |

Reversals of Brain Damage from Enriched Environments

of play items changed every few days
ie from whiffs of danger from physical,
psychological, social chances, challenges



In transgenic mouse models+ laboratory mice enjoyed:

- 1 spectacular delays in the onset and progress of Huntington's brain-like degeneracy Hockley et al (2002)
- 2 Ameliorated learning and memory deficits of Alzheimer's Janowsky et al (2005)

Lead poisoning causes crime, Needleman et al (2000) and
biggest cause of reduced crime in the US, Nevin (2008)

For rats environmental enrichment has reversed lead
poisoning stress the resulted in learning and long term
potential impairment, Cao et al (2007)

Reversals of Brain Damage from Enriched Environments

of play items changed every few days
ie from whiffs of danger from physical,
psychological, social chances, challenges

For rats environmental enrichment has reversed damage from:

- **chronic pre-natal stress that caused addictive and depressive tendencies, cognitive deficits and impaired hippocampal synaptic plasticity, Yang et al 2006**
- **being stereotaxically injected with enough ebotenic acid to cause substantial atrophy of dendritic arborization (that is correlated with Downs syndrome, Alzheimer's disease, senile dementia and schizoprhenia) and significantly reduced spinal density (that is correlated with learning difficulties), Bindu et al (2007).**

SKAT, the Last Four Stages of Knowledge Ahead Theory

3 Pre Discovery of Choice Set tricky negotiations

Ends in knowing alternatives

4 Pre Evaluation and Choice

ends in knowing which chose

5 Pre-Outcome: before learn result of risk taken

eg **planning costs of flexibility, anxiety, thrills**

ends when know result, ie the outcome

6 Post-Outcome: Know Result – Certainty

but legacies from before eg risk premia, blame if bad result, maybe fired, praise if better, maybe promoted
use 1-6 to evaluate actions

Whiffs of Danger to grow, maintain brains

Sets of risks (chances, challenges) that
promote good risk processing
learn / retain decisionmaking ability – realism, self-discipline
appropriate hope under adversity
appropriate fear under success

- 1 Each Tiny, not too tiny
- 2 Great Variety - physical, mental,
psychological, social, ethical, spiritual
- 3 High Frequency, not too high frequency

Risk Starvation – Lack of Whiffs

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Perception and Filtering of Signals

Individual differences in filtering of perceived signals to avoid information overload results in

individual differences in when a set of risks are too tiny or too big or of too high or too low a frequency for the brain to risk process through to decision and thus to constitute whiffs of danger – to cause risk starvation

Whiffs of Danger / Risk Starvation Theory

Whiffs develop, maintain, restore brains
Risk starvation destroys brains

Related theories and therapies

- **Coping and resilience theories, but these do not see that whiffs are exercise needed by brains**
- **cognitive etc therapies, but these are too limited in varieties of risks**
- **holistic and eustress therapies can span the varieties – the whiffs of danger / risk starvation theory explains why they can work**

Risk Starvation

in Dementias, Depressions

Dementias higher where lack of whiffs of being compelled to contribute even if unemployed or too old, and low in vision, transforming goals_(uneducated)

Depressions higher where people lack whiffs as boring lives – poor, females locked in nuclear family's home and increasingly, the young coddled, mainly computer games and TV - not adult-free social, physical whiffs away from adults as in pre-mother escort everywhere era

Legal Remedies?

- **Compulsory community contributions from unemployed and elderly - eg teaching foreigners own language**
- **Parenthood has requirements to demonstrate an enriched environment - children alone in parks is good, children mainly in house with computers and TV games is criminal neglect**
- **Drug and psychosocial therapists pay for objective checks on long term effects**

Legal Remedies?

- **No drug-related journal citations allowed in government grant applications**
- **Portion of grants for those from drug companies partitioned**
 - a) **moderately**
 - b) **totally, ie zero socialising and commitment on no future jobs with them**

Whistle-blower assistance increased

Whiffs of Danger / Risk Starvation in Alcoholism

- Each act is risky - possible good and bad outcomes that are learned **later**
- Good decisions from learning which acts have too high a possibility of a bad outcomes **later**
- Parents who protect or confine offspring too much or by erratic/violent behaviour distort outcomes prevent their offspring from learning the bad outcomes of excess alcohol that come **later**
- Offspring then focus not on these longer run bad outcomes, instead on the excitement pleasure in the **immediate** pre-outcome period - **nervous, instant gratification, unrealistic efforts at ultra good outcomes**

Alcoholism Research to Date

Former ideas found to be false with controlled experiments

- a) Nervousness, depression, fear of new experiences, fear of socialising, aggression.
- b) Poverty

In double blind experiments, a) and b) are effects of alcoholism not causes

Genuine contributors to ↑ alcoholism

1 Poor laws facilitating excess drinking

2 Culture of excess drinking, eg alcoholic parents

1 and 2 make environment too chaotic for people to get whiffs of danger and grow into sensible responsible decision makers.

Instead they take foolish risks and dodge sensible risks of socialising

Alcoholism Research to Date

Misses over-protection - failure to encourage the autonomy of risk taking

eg Vaillant *Alcoholism Revisited* asks if mothers are nurturing and encouraging of autonomy.

To detect over-protection we must separate

1 nurturing from 2 encouraging of autonomy

in questionnaires and in our research/therapies

Modern ideals of motherhood and fatherhood

– **too much protection**

– **risk-starved children who cannot develop the autonomy of learning good decisionmaking**

Research Programme

Investigate Over-protection

as a contributor to

Depressions, dementias, alcoholism

ie separate the good 1 from the bad 2

1 nurturing from 2 encouraging of autonomy

in parents risk-starving idolised
precious child

(questionnaire method)

in state risk-starving with money to sit in
front of TV and not contribute to society
(from public records – yes for depressions,
dementias)

Research / Therapy Programme

- 1 Introduce little chances and challenges missing from current therapies in physical, intellectual, social, psychological and ethical areas, and compare with progress of a control group not given these extras – in short term, medium term and in long term
- 2 Inform patients that their problem is risk-starvation and that the therapist is there to help them take appropriate risks and thus gain courage (not foolhardiness) and confidence in their ability and responsibility to contribute to society. **le therapists should be nurturing but not overly protective at present** (The lesson of McCabe of the 1970s research that protectively nurturing juvenile delinquents damages them is being ignored)