PHIL309P
Philosophy, Politics and Economics

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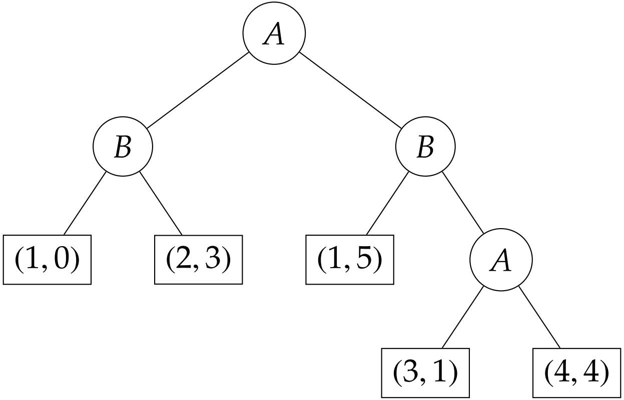
Announcements

- Course website
  https://myelms.umd.edu/courses/1133211
- Reiss, Ch 7

Backward Induction



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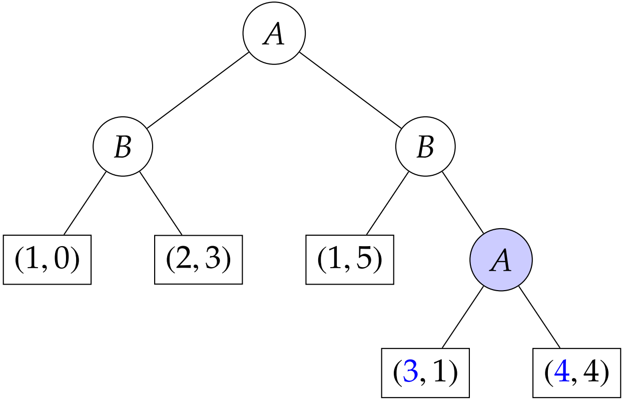

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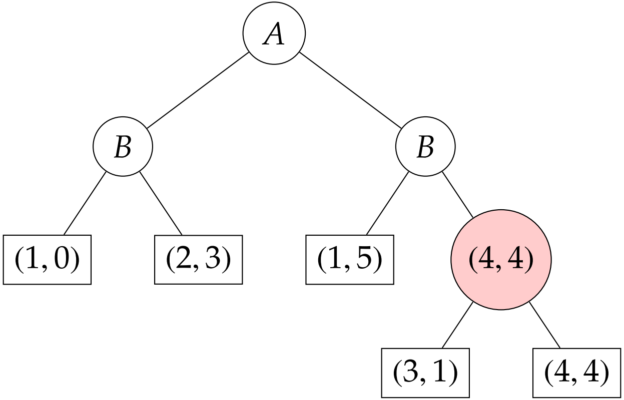

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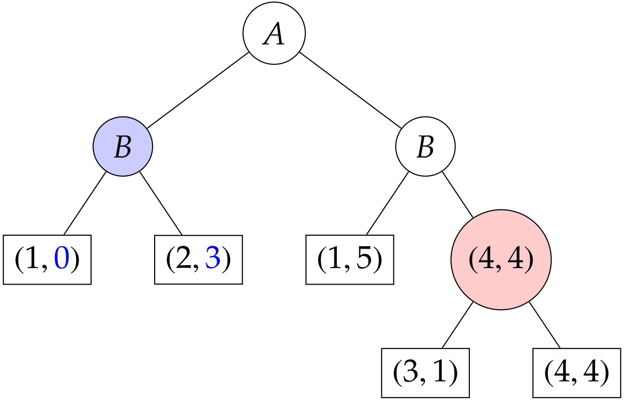

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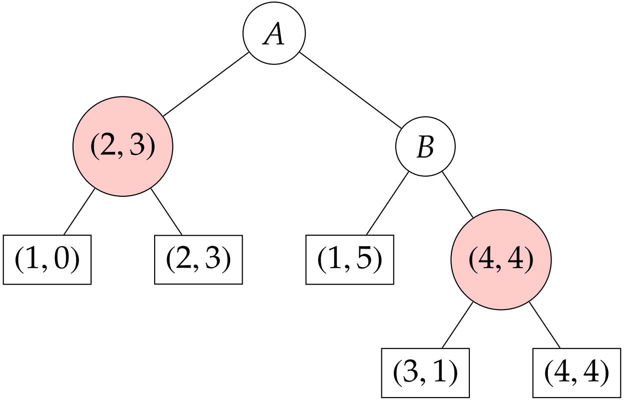

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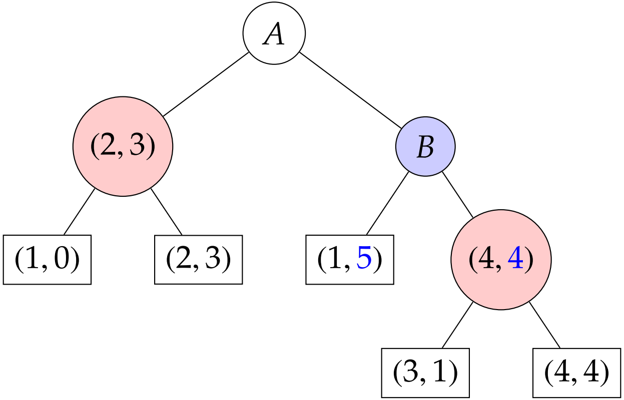

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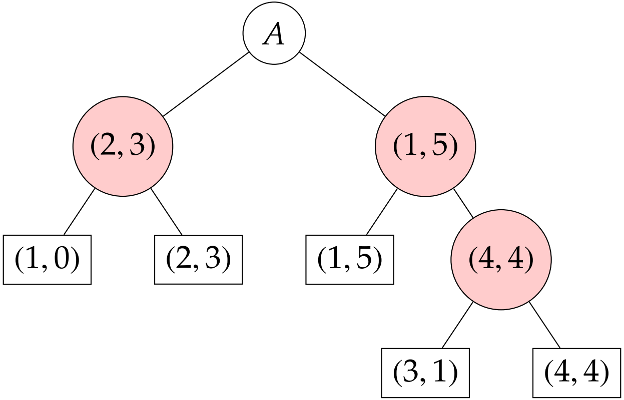

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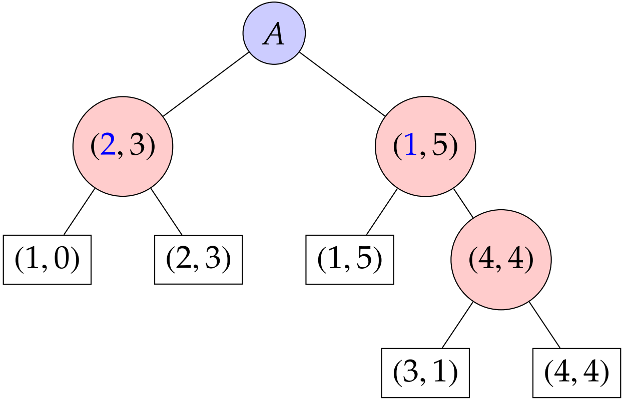

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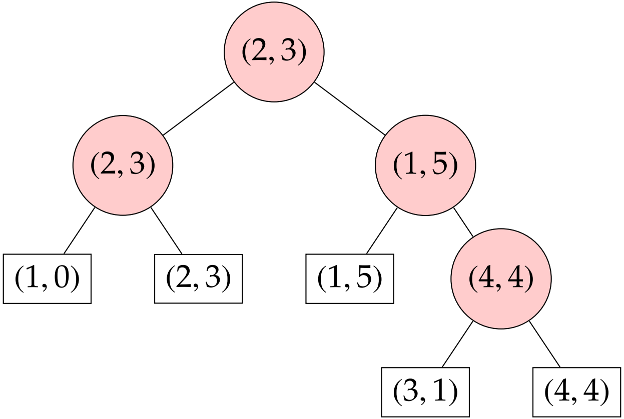

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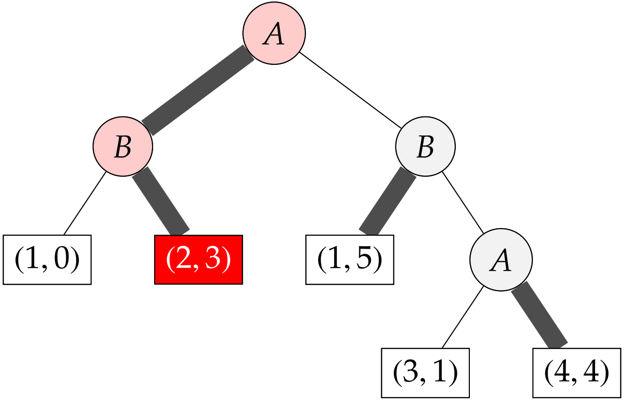

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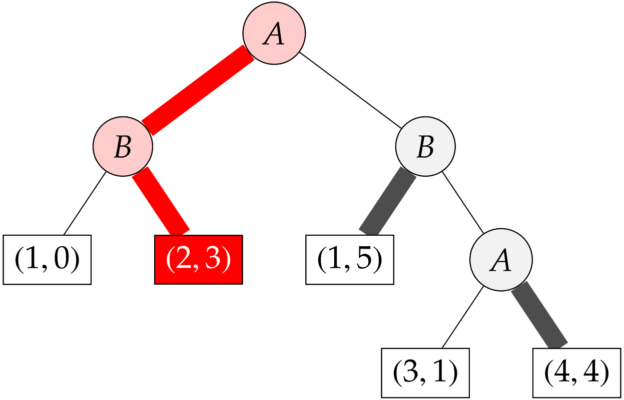

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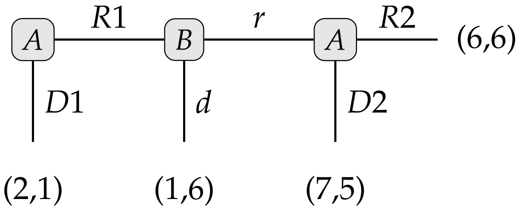

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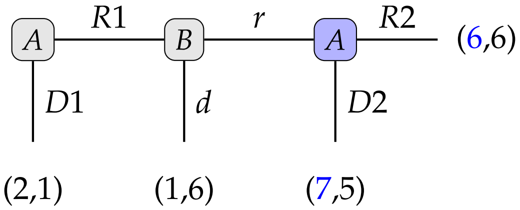

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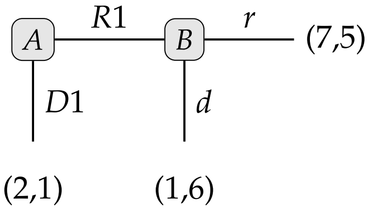

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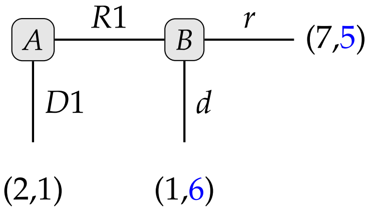

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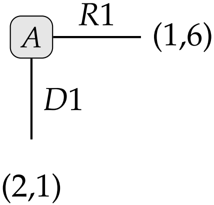

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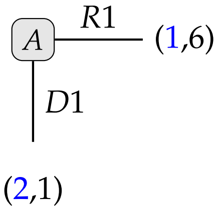

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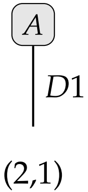

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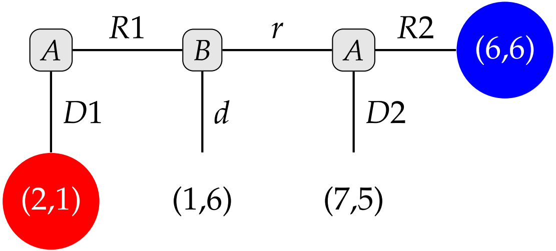

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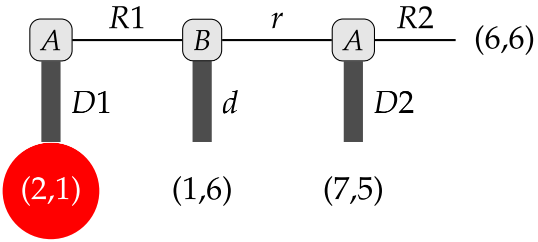

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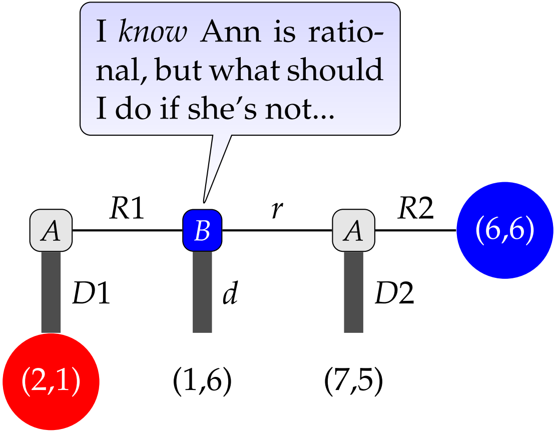
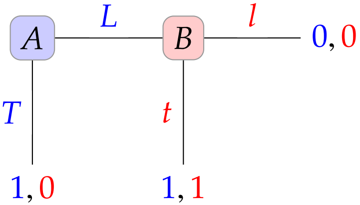


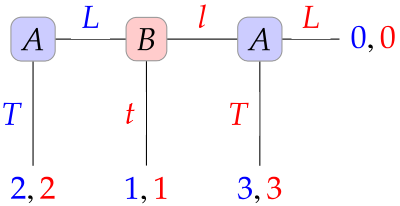
I *know* Ann is rational, but what should I do if she's not...
A
R1
B
r
A
R2
(6,6)
D1
d
D2
(2,1)
(1,6)
(7,5)

		Bob	
		t	l
Ann	T	1,0	1,0
	L	1,1	0,0



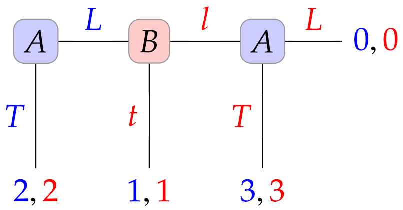
- Both strategies of both players is rationalizable.
- Only T is perfectly rational for Ann and t is perfectly rational for Bob.

		Bob	
		t	l
Ann	T	2,2	2,2
	LT	1,1	3,3
	LL	1,1	0,0

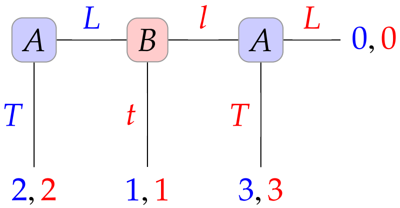


- Suppose that Bob believes that Ann will choose T with probability 1; what should he do? This depends on what he thinks Ann would on the hypothesis that his belief about her is mistaken.
- Suppose that if Bob were surprised by her, then he concludes she is irrational, selecting L on her second move. Bob's choice of t is perfectly rational.

Ann \ Bob	t	l
T	2,2	2,2
LT	1,1	3,3
LL	1,1	0,0



- Suppose Ann is sure that Bob will choose t, which is the only perfectly rational choice for Bob. Then, Ann's only rational choice is T.
- So, it might be that Ann and Bob both know each other's beliefs about each other, and are both perfectly rational, but they still fail to coordinate on the optimal outcome for both.



- Perhaps if Bob believed that Ann would choose L are her second move then he wouldn't believe she was fully rational, *but it is not suggested that he believes this*.
- Divide Ann's strategy T into two TT: T, and I *would* choose T again on the second move if I were faced with that choice" and TL: "T, but I *would* choose L on the second move..."
- Of these two only TT is rational
- But if Bob learned he was wrong, he would conclude she chooses LL.

“To think there is something incoherent about this combination of beliefs and belief revision policy is to confuse epistemic with causal counterfactuals—it would be like thinking that because I believe that if Shakespeare hadn’t written Hamlet, it would have never been written by anyone, I must therefore be disposed to conclude that Hamlet was never written, were I to learn that Shakespeare was in fact not its author”

(pg. 152, Stalnaker)

1. If Shakespeare had not written Hamlet, it would never have been written.
2. If Shakespeare didn't write Hamlet, someone else did.

1. is a causal counterfactual, and 2. is an expression of a belief revision policy.

1. General Smith is a shrewd judge of character—he knows (better than I) who is brave and who is not.
2. The general sends only brave men into battle.
3. Private Jones is cowardly.

I believe that (1) Jones would run away if he were sent into battle and (2) if Jones *is* sent into battle, then he won't run away.

1. Ann cheats — she has seen her opponent's cards.
2. Ann has a losing hand, since I have seen both her hand and her opponent's.
3. Ann is rational.

So, I conclude that she will not bet. But how should I revise my beliefs if I learn that Ann did bet?

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It may be perfectly reasonable for me to be disposed to give up 2.

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So, I conclude that she will not bet. But how should I revise my beliefs if I learn that Ann did bet?

It may be perfectly reasonable for me to be disposed to give up 2.

I believe that (1) I Ann *were* to bet, she would lose (since she has a losing hand) and (2) If I were to learn that she *did* bet, I would conclude she will win.

Pure Coordination

		Bob	
		L	R
Ann	U	1,1	0,0
	D	0,0	1,1

Hi-Low

		Bob	
		L	R
Ann	U	3,3	0,0
	D	0,0	1,1

Focal Points

> *"There are these two broad empirical facts about Hi-Lo games, people almost always choose A [Hi] and people with common knowledge of each other's rationality think it is obviously rational to choose A [Hi]."*
>
> [Bacharach, *Beyond Individual Choice*, 2006, pg. 42]

See also chapter 2 of:

C.F. Camerer. *Behavioral Game Theory*. Princeton UP, 2003.

N. Bardsley, J. Mehta, C. Starmer and R. Sugden. *The Nature of Salience Revisited: Cognitive Hierarchy Theory* versus *Team Reasoning*. Economic Journal.

Focal Points

‘primary salience’: players’ psychological propensities to play particular strategies by default, when there are no other reasons for choice.

pickers: choose between labels without any incentive to choose one rather than the other

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labels vs. *options*

$\{water, beer, sherry, whisky, wine\}$

$$\{water, beer, sherry, whisky, wine\}$$

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Task 1: pick an option

{**water**, *beer*, *sherry*, *whisky*, *wine*}

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Task 1: pick an option
Task 2: guess what your opponent picked

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Task 1: pick an option
Task 2: guess what your opponent picked
Task 3: try to coordinate with your (unknown) partner

{**water**, *beer*, *sherry*, *whisky*, *wine*}

Task 1: pick an option
Task 2: guess what your opponent picked
Task 3: try to coordinate with your (unknown) partner

	pick	guess	coordinate
water	20	15	38
beer	13	26	11
sherry	4	1	0
whisky	6	6	5
wine	10	4	2

"The basic intellectual premise, or working hypothesis, for rational players in this game seems to be the premise that some rule must be used if success is to exceed coincidence, and that the best rule to be found, whatever its rationalization, is consequently a rational rule." (Thomas Schelling)

	Confess	*Deny*
Confess	8 years,8 years	0 years,10 years
Deny	10 years,0 years	1 year,1 year

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acquittal > 1 year > 8 years > 10 years

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	L	R
U	2,2	4,1
D	1,4	3,3

Utility is a function of the material payoffs:

$$U = U(M)$$

where M designates the material outcomes of a came

Ultimatum Game

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Suppose the players meet only once. It would seem that the Proposer should propose 99% for herself and 1% for the Disposer. And if the Disposer is instrumentally rational, then she should accept the offer.

Ultimatum Game

But this is not what happens in experiments: if the Disposer is offered 1%, 10% or even 20%, the Disposer very often rejects. Furthermore, the proposer tends demand only around 60%.

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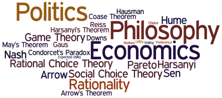

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A typical explanation is that the players' utility functions are not simply about getting funds to best advance their goals, but about acting according to some norms of fair play. But acting according to norms of fair play does not seem to be a goal: it is a principle to which a person wishes to conform.

Dictator Game

Similar to the ultimatum game, there is a proposer and a second player. The proposer determines an allocation of some pot of money (say $100). The second player simply receives the portion of the money from the proposer (i.e., the second player is completely passive).

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Proposers often allocate some money to the second player...

D. Kahneman, J. Knetsch, and R. Thaler. *Fairness And The Assumptions Of Economics.*. The Journal of Business, 59, pgs. 285- 300, 1986.

Can the decision problem be *separated* from the game situation?

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Are strategies merely neutral access routes to consequences?

utility must be measured *in the context of the game itself*.

I. Gilboa and D. Schmeidler. *A Derivation of Expected Utility Maximization in the Context of a Game*. Games and Economic Behavior, 44, pgs. 184 - 194, 2003.

The following two outcomes are not equivalent:

- "I get \$90"
- "I get \$90 and choose to leave \$10 to my opponent"

The following two outcomes are not equivalent:

- "I get \$10 and player one gets \$90, and this was decided by Nature"
- "I get \$10, player one gets \$90 and this was decided by Player one".

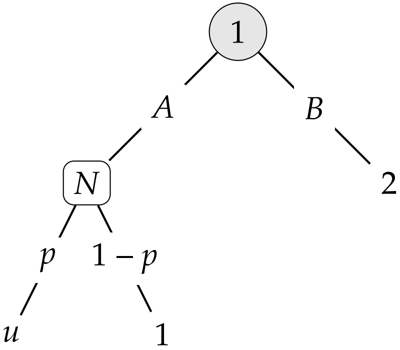
Can a player assign subjective probabilities to strategies under the control of other players who have their own objectives?

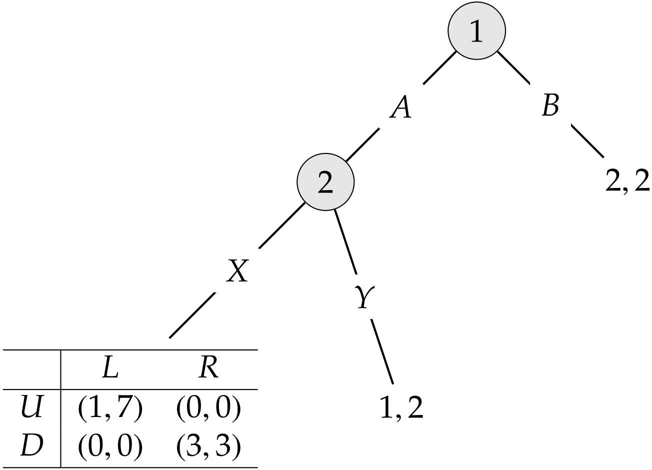
M. Mariotti. *Is Bayesian Rationality Compatible with Strategic Rationality?*. The Economic Journal, 105: 432, pgs. 1099 - 1109, 1995.

M. Mariotti. *Decisions in games: why there should be a special exemption from Bayesian rationality*. Journal of Economic Methodology, 4: 1, pgs. 43 - 60, 1997.

P. Hammond. *Expected Utility in Non-Cooperative Game Theory*. in *Handbook of Utility Theory*, 2004.

Games as consequences: "A decision maker prefers to be player i in game G_1 to being player j in game G_2"


1
A
B
N
2
p
1 − p
u
1



	L	R
U	$(1,7)$	$(0,0)$
D	$(0,0)$	$(3,3)$

Any theory needs **bridge principles** in order to be applicable to empirical phenomena for theory testing, prediction and explanation.

1. Assumptions about the form of people's utility functions.
2. Elicitation of the players' preferences. Preferences are estimated without necessarily assuming that utility functions must have some specific forms.

Economists do not like to make substantial assumptions of this kind. Their theory of rationality is "formal", not a "substantial" theory we are told. Thus, bridge principles which provide the theory with substance are added on an ad hoc basis.

R. Aumann. *What is game theory trying to accomplish?*. Frontiers of Economics, 1985.

Thus we cannot expect game and economic theory to be descriptive in the same sense that physics or astronomy are. Rationality is only one of several factors affecting human behavior; no theory based on this one factor alone can be expected to yield reliable predictions.

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In fact, I find it somewhat surprising that our disciplines have any relation at all to real behavior. (I hope that most readers will agree that there is indeed such a relation, that we do gain some insight into the behavior of *Homo sapiens* by studying *Homo rationalis*.)

...the validity of utility maximization does not depend on its being an accurate description of the behavior of individuals. Rather, it derives from its being the underlying postulate that pulls together most of economic theory; it is the major component of a certain way of thinking, with many important and familiar implications, which have been part of economics for decades and even centuries.

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Reading: Reiss, Ch. 7