

### Some Examples of 2x2 Games

Here are some widely used stylized 2x2 normal form games (two players, two strategies each). The ranking of the payoffs is what distinguishes the games, rather than the actual values of these payoffs. I will use Watson's numbers here (see e.g., p. 31).

**Coordination game:** two friends have agreed to meet on campus, but didn't resolve where. They had narrowed it down to two possible choices: library or pub. Here are two versions.

	Player 2		
		Library	Pub
	Player 1		
	Library	1,1	0,0
	Pub	0,0	1,1

	Player 2		
		Library	Pub
	Player 1		
	Library	2,2	0,0
	Pub	0,0	1,1

**Battle of the Sexes:** This is an asymmetric coordination game. A couple is trying to agree on what to do this evening. They have narrowed the choice down to two concerts: Nicki Minaj or Justin Bieber. Each prefers one over the other, but prefers either to doing nothing. If they disagree, they do nothing. Possible metaphor for bargaining (strategies are high wage, low wage: if disagreement we get a strike (0,0)) or agreement between two firms on a technology standard. Notice that this is a coordination game in which the two players are of different types (have different preferences).

	Player 2		
		NM	JB
	Player 1		
	NM	2,1	0,0
	JB	0,0	1,2

**Matching Pennies:** coordination is good for one player and bad for the other. Player 1 wins if the strategies match, player 2 wins if they don't match. Possible metaphor for tennis (down line vs cross court), an advertising war, or any other such competitive situation in which one player is taking an offensive role and the other player is taking a defensive role. Defense wants to pick the defensive position that matches the offensive move.

	Player 2		
		Heads	Tails
	Player 1		
	Heads	1,-1	-1,1
	Tails	-1,1	1,-1

**Assurance:** Two countries are engaged in an arms race. Both prefer the outcome when neither escalates over any other outcome. The countries have differing preferences over the off diagonal outcomes (each prefers being the sole escalator to being the sole non-escalator) but doesn't have a strong incentive to escalate (each prefers not to escalate as long the other country doesn't escalate). Possible metaphor for R&D race, advertising, pricing, speculative attacks on a currency. This is basically a coordination game (like the second one above), but is in a form that's closer to Prisoners' Dilemma below. Note that each player's worst case scenario is that she doesn't escalate when the other does.

Player 1	Player 2		
		Don't Escalate	Escalate
	Don't Escalate	2,2	0,1.5
	Escalate	1.5,0	1,1

**Prisoners' Dilemma:** We have replaced the 1.5s in the Assurance game with 3s, giving each player a strong incentive to escalate (defect).

Player 1	Player 2		
		Cooperate	Defect
	Cooperate	2,2	0,3
	Defect	3,0	1,1

**Chicken** (also called Hawk-Dove): Each wants to be the only one to play "tough" (e.g., to not swerve, in the car driving version), but there is a disastrous outcome if both play tough (the cars crash). Possible metaphor for bargaining with possibility of compromise (strategies are concede, don't concede: if neither concedes, we get a strike (0,0), but if both concede, we get compromise (4,4)). Notice that this is a modification of PD such that when both players defect the outcome is disastrous.

Player 1	Player 2		
		Chicken	Tough
	Chicken	2,2	1,3
	Tough	3,1	0,0

**Stag Hunt:** is a variation on the Assurance game above (change both of the 1s to 1.5). See also Watson p. 71.

**Pigs:** is another asymmetric game (the two players have different preferences). See Watson p. 29.