

Game Design tidbits



Admin



- Project Questions? Concerns?
- Schedule?
- Reference
 - A lot of the material was distilled from
 - Gametek by Geoffry Engelstein published by Harper Collins Publishers
- For these and last please read chapters 4-5 in your book

Rock, Paper, Scissors

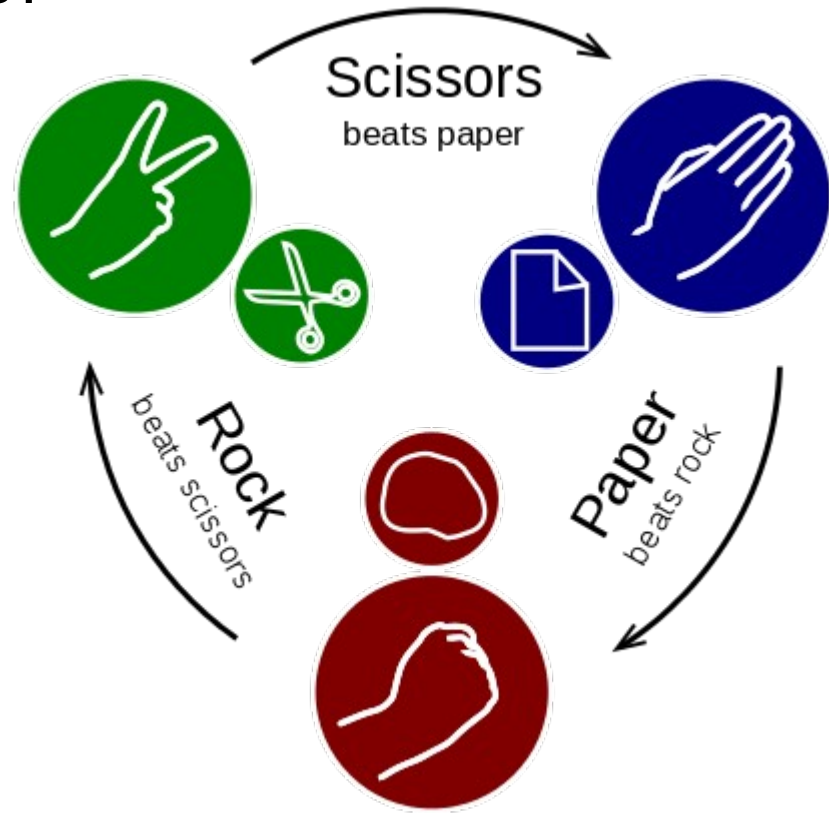


- How Do you win a Rock Paper Scissors?
- First lets describe the game

Rock, Paper, Scissors



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- So what is the mathematically optimal strategy for rock paper scissors?



Rock, Paper, Scissors

- How Do you win a Rock Paper Scissors?
- First lets describe the game
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- So what is the mathematically optimal strategy for rock paper scissors?
 - Throw out each 1/3 of the time in **true random** order
 - Anything else and you open yourself up to 'exploitative' play where someone knows to throw the counter to your favorite.
 - Even exploiting someone else can leave you in trouble for the big play



Biofeedback



- It turns out, to optimize play, it is best for a player to pay attention to their 'gut'
 - Players often realize subconsciously something is wrong before it pecculates to the conscious mind.
 - Iowa Gambling Task
 - Subject starts with \$XX
 - Four decks of cards, subject gains or loses money based on card drawn
 - Two of the decks are 'rigged' to give poorer results.
 - Subjects asked to count their heartbeats while 'playing'
 - Those good at counting heartbeats detected their stress at choosing from 'bad decks' and stopped drawing from those quicker.
 - Could we use this in game design?

Game Theory



- Game Theory
 - Either a branch of mathematics, or the intersection of Math and Psychology that often live in Economics.
 - Most famous problem in game theory formulated in current form in 1950
 - Prisoner's Dilemma
 - What is prisoner's dilemma in a nutshell?

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 - What is prisoner's dilemma in a nutshell?
 - You have to prisoners, separated and give them a choice, rat on the other, or else
 - If both rat on each other, they both get a bad outcome -5 (both go to jail for 5 year say)
 - If neither rats, they both get a mild bad outcome -1 (both get misdemeanor and a fine)
 - If one rats and the other doesn't
 - The rat gets a good outcome +3 (reward for capture)
 - The other gets a very bad outcome -10 (long sentence)
 - What are the issues at play for a game?

Game Theory



Prisoner's Dilemma

prisoner's dilemma in a nutshell?

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 - Biggest issue – do you do this negotiation once or many times in a game?
 - Best strategy if once?
 - Best if you do this many times?

Game Theory



Prisoner's Dilemma

- What are the issues at play for a game?
 - Biggest issue – do you do this negotiation once or many times in a game?
 - Best strategy if once?
 - If you only do this once, best strategy is to 'defect' to 'rat' out other player
 - Best if you do this many times?
 - If you do this many times, best strategy is to
 - Be 'nice' the first interaction
 - For every later interaction, act the way that person treated you last time.
 - Game design can help to force better behavior on players
 - Think about it as you start to design your own games.

Reputation



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 - Game reputation is limited by "Dunbar's number"
 - Anyone familiar with it?

Reputation



- Being able to use this optimal solution to the prisoners dilemma relies on your 'game reputation'
 - Game reputation is limited by "Dunbar's number"
 - It is known/shown, that in a group, once a group gets above about 150 people, it is impossible for people to keep track of everyone's reputation
 - So subgroups form.
 - Example from my grad school and graduate student lab.
 - How can you add game features to help deal with the limitations of Dunbar's number?

What is part of gameplay?



- Is card-counting ok?
 - Why or why not?

What is part of gameplay?



- Is card-counting ok?
 - Why or why not?
 - It is within the rules, but some people have a better memory than others.
 - Is it ok if those with the better memory use it?
- What about if I start writing down the cards we've seen so far on a pad with a pencil? Will that work?
 - What is the difference then?
- What if I bring a calculator to a game to do the probabilities so I don't have to do math in my head?

Miller's Magic number 7



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 - What did Dr. George Miller discover?

Miller's Magic number 7



- Students who have had Cognitive psychology classes and most of my former students remember this
 - What did Dr. George Miller discover?
 - People (or Harvard Undergraduates in the late 1950s) can keep roughly 7 'things' in their short term memory.
 - What is a thing? A chunk
 - Give example from gametek page 44.
 - So try to build your games to make it easier for players to 'chunk' information
 - In Scifi game
 - This fleet is XXXXX (rather than keeping all 5 ships in the players head)
 - This planet is doing YYYY
 - Etc.

The 'innovation limit'



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 - But how many exciting new games really make it big?

The 'innovation limit'



- We like exciting new games
 - But how many exciting new games really make it big?
 - Not talking about tech innovation, but gameplay
 - Sid Meier's Civilization spawned a new domain
 - So did Warcraft Orcs vs Humans
 - Sim City
 - Minecraft
 - But for all of these superhits that were really innovative, many games tried but didn't have the same success?
 - Examples from students?

Innovation limit.



- Most games can afford to do one thing that is really new and interestingly different
 - Without putting off all but the most rules accepting players.
 - Blizzard at their best (granted some years ago) took a genre of game and aspired to make a genre-like game with some special quality.
 - This worked really well.
 - Other examples?

Managing Choices



- A game
 - "Free play within constraints"
 - Making meaningful choices to affect (or maybe even effect) a(winning) outcome
- Beware 'analysis paralysis'
 - Player has so many choices, they can't make any
 - Iyengar and Lepper: 6 or fewer choices are better, more and quality of decision goes down dramatically.
 - <https://psycnet.apa.org/record/2000-16701-012>
 - What does that remind you of?

Or in pictures



- Ever open your steam library, open a 'sandbox' game, wonder what to do and leave?
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- <http://thenocturnalrambler.blogspot.com/2017/04/open-world-games-suck.html>
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