The Psychology of Game Design

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Psychology

- Study of human behavior and its influences
- Regularity or patterns in behavior
Game Design

• Series of constraints and choices and systems presented to a player
• Induce a behavior or response
Talk Overview

- Attention and its Failings
- Arbitrary Nature of Preference
- Cognitive Biases
- Choice Blindness and Internal Reflection
- Cognitive Dissonance and Player Toxicity
- Player Agency
- Motivation
Attention and its Failings
Attention

• We attend to far less of the world than we think we do
• Focusing attention is effortful
• What are the implications for game design?
How To Capture Attention

• Certain things capture attention:
  • Sudden appearances
  • Color changes
  • Looming motion
  • Size changes

• Attentional goals matter
Implications for Game Design

• Very salient objects can be hidden in plain sight
• Understand the attentional goals of your player
  • Create surprises when attention is focused elsewhere
  • Don’t be surprised when they miss very obvious things
The Arbitrary Nature of Preference
Preference

• Is preference arbitrary or deliberate?
• Why do players choose to favor:
  • A particular game?
  • A particular strategy?
  • A particular character/weapon/level/game-mode?
Rank Your Favorite Heroes

... Original
Playerbase Rankings

... Playerbase
Influenced Rankings

... Original

... Playerbase

... Influenced
Implications for Game Design

• Social proof will anchor preference
• How you display information to players impacts their preferences
• Players will choose the ‘default’ option
• If you want to understand a map’s true popularity or quality, randomize its placement in your game
Cognitive Biases
Cognitive Biases Overview

• We are neither as smart nor as rational as we think we are
• Our brain uses predictable heuristics (for the sake of efficiency)
• Not everything reaches conscious awareness
• How can game designers use these biases to make more informed decisions?
Cognitive Biases - Anchoring

• We make decisions and evaluations comparatively
• We anchor to an initial piece of information
• This anchor doesn’t have to be related to our decision
Anchoring Example

• I asked coworkers for the last two digits of their SSN (00-99)
• Divide responses into two groups:
  • Group 1: 00-49
  • Group 2: 50-99
• How many heroes are there in DOTA?
  • Group 1: 100
  • Group 2: 115
  • Actual Answer: 112
Game Mode Description:
Commit to a full match that affects your Skill Group.
Buy new weapons each round with money earned and win the round by eliminating the other team or completing the objective.

- Friendly fire is ON
- Team collision is ON
- Armor and defuse kits are purchasable
- Best out of 30 rounds

Dust II
Expected Wait Time: 1:12

Train
Expected Wait Time: 4:48

Mirage
Expected Wait Time: 2:45

Nuke
Expected Wait Time: 4:35

Cobblestone
Expected Wait Time: 2:30

Overpass
Expected Wait Time: 3:53

Cache
Expected Wait Time: 1:49

Inferno
Expected Wait Time: 3:27

Aztec
Expected Wait Time: 4:55

Dust
Expected Wait Time: 6:00

Vertigo
Expected Wait Time: 5:05

Office
Expected Wait Time: 3:25

Italy
Expected Wait Time: 5:30

Assault
Expected Wait Time: 4:54

Military
Expected Wait Time: 9:32

1:12 vs 4:48
Cognitive Biases – Framing

• The manner of presentation of a choice affects the response
• People are averse to losses and oriented to gains
Framing in WoW

• To encourage players to take breaks, XP earned was reduced
  • Basic playtime: 100% XP gain (1000 XP per hour)
  • Reduced playtime: 50% XP gain (500 XP per hour)

• Players responded poorly, so . . . Blizzard rescaled things
  • Basic playtime: 200% XP gain (1000 XP per hour)
  • Reduced playtime: 100% XP gain (500 XP per hour)

• The actual XP gained was identical, but players liked the second approach
Cognitive Biases

- Recency Bias
- Confirmation Bias
- False-Consensus Effect
- Hindsight Bias
- Endowment Effect
- Mere Exposure Effect
- Bias Blind Spot
- Peak-End Rule
Implications for Game Design

• Decisions can be influenced and shaped in predictable ways
• Be aware of the anchor
  • Understand the basis for comparison
  • Decisions and optimizations will shift
• Be aware of the reference frame
  • The presentation style of a trade-off matters
  • Frame positively (favor gains over losses)
• Always say the first number in a negotiation
Choice Blindness and Internal Reflection
Choice Blindness

• How reliably do people know why they do what they do?
• How reliable is the feedback you receive from players?
Choice Blindness Example

• You are asked to choose one of two alternatives:
  • Attractive faces
  • Jams
  • Gambles
  • Moral Judgments

• You are then distracted

• You are then asked to justify the choice . . .
  of the alternative you did not choose

• More than half of you will
Implications for Game Design

• Be wary of self-reports
• Measure behavior
Cognitive Dissonance and Player Toxicity
Cognitive Dissonance

• When thoughts and behaviors are inconsistent or opposing, discomfort arises.

• We seek to reduce that discomfort by altering the antagonistic thought or behavior.

• We can make use of this dissonance to change behavior in our games.
[ALLIES] Binder: Hello, good sir, I am new to DOTA. Any advice for playing Helicopter Man?

[ALLIES] Piggles ULTRAPRO: Greetings DOTA citizen! I relish the opportunity to share my expertise with a new player!

[ALLIES] Binder: Fantastic! In others news, I have recently died.

[ALLIES] Piggles ULTRAPRO: Not a problem, friend! I will prepare some rational and constructive feedback to help you learn the game.
Negative Interactions in DOTA

• Anonymous accounts
• Significant time investment
• Many opportunities to latch onto a teammate’s mistake
• Dunning-Kruger Effect
• ...
SELECT A CATEGORY

Communication Abuse
They were abusive over a communication channel (text or voice)

Intentional Ability Abuse
They intentionally used abilities to the detriment of their own team

Intentional feeding
They intentionally died repeatedly to hurt their own team

MORE INFORMATION

Leave a comment...

Reports Remaining: 3
Total Reports Submitted: 0

Cancel [Submit]
MATCH QUALITY

Please rate your enjoyment of the match:

⭐⭐⭐⭐⭐

No Thanks
TEAMMATE COOPERATION

Please rate the cooperation your teammates displayed in the last match:

⭐⭐⭐⭐⭐

No Thanks
YOUR COOPERATION

Please rate the cooperation you displayed towards your teammates in the last match:

1 2 3 4 5

No Thanks
Results

• Around 137,000 (12.5%) fewer reports per day
• Across millions of players
• And millions of games
Implications for Game Design

• Inducing dissonance can lead to meaningful behavior change
• Can be done cheaply and with subtlety
• Think about the attitudes you are priming in your players
Player Agency
Player Agency

• We like to feel like we can exert control in our environment
• We want our actions to have an impact
• When you design, how much agency are you giving to players?
REPORT PLAYER

SELECT A CATEGORY

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MORE INFORMATION

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Cancel  Submit
Thank You

We've recently taken action against one or more players you've previously reported for bad conduct. You have received an additional report submission to use. Thanks for your help in making the Dota 2 community a friendlier place.
Implications

• Close the loop whenever you can
  • This action $\rightarrow$ This consequence
  • Here is evidence of that consequence

• Small amounts of agency can be as valuable as large amounts
Motivation
Motivation

• What drives behavior?
• How do you keep players engaged with your game?
Intrinsic vs. Extrinsic Motivation

• Internally motivated vs. External rewards

• Intrinsic behaviors
  • Persist longer
  • More difficult to extinguish
  • Lead to greater enjoyment

• Extrinsic behaviors
  • Useful for shaping behavior
  • Risk shifting the motivation for playing
Fostering Intrinsic Motivation

• Give players autonomy/agency
• Skill progression should be apparent
• Feedback on performance
• Opportunity for positive social comparisons
Implications for Game Design

• Work on intrinsic motivation
• Use extrinsic rewards to incentivize behavior
• Be aware that you may shift a player’s motivation
Thanks!!!

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