

The Psychology of Game Design

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Steam Dev Days

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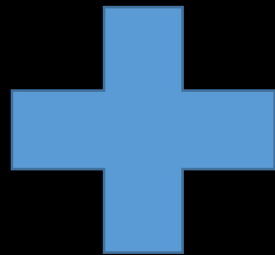
Psychology

- 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



https://www.youtube.com/watch?v=JOFPb_7xxXA

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

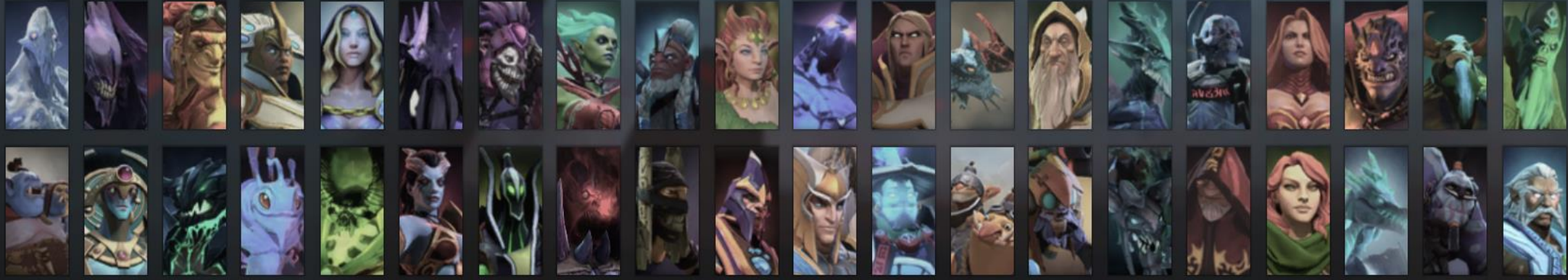
STRENGTH



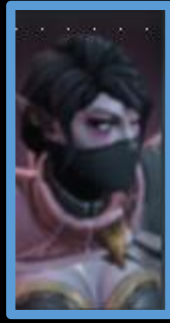
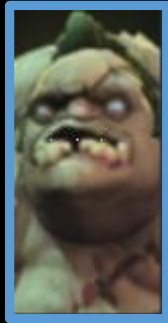
AGILITY



INTELLIGENCE

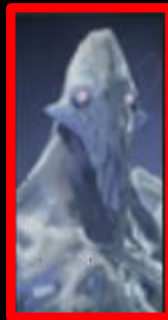
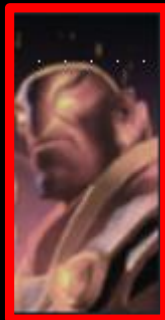


Rank Your Favorite Heroes



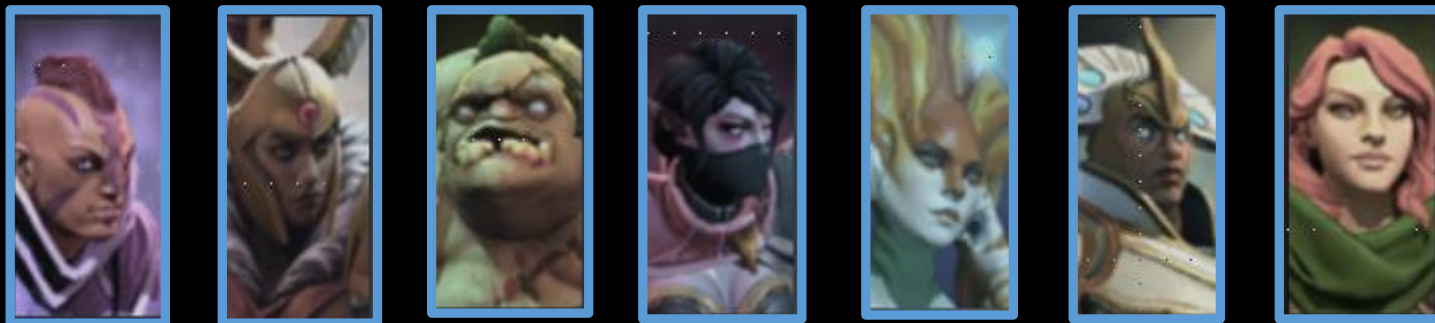
... Original

Playerbase Rankings



... Playerbase

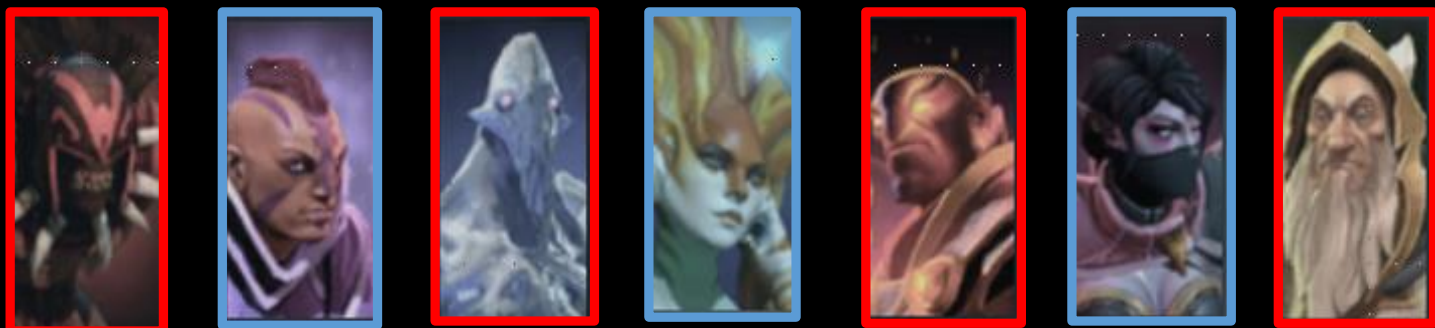
Influenced Rankings



... Original



... Playerbase



... Influenced



1

MECHANICS



2

DRAGON KNIGHT



3

SNIPER



4

SHADOW SHAMAN



5

CO-OP MATCH



6

MULTIPLAYER MATCH

ENCLAVE GAMING RE... 42

- ENCLAVE.Avixim.Element
Lich 3 / 10 / 19
- ENCLAVE.CheekyMonkey.Ele...
Drow Ranger 8 / 8 / 16
- [U-T].Beetlesmuffins
Clockwerk 12 / 9 / 17
- ENCLAVE.Cunning Plan.Element
Vengeful Spirit 3 / 11 / 15
- ENCLAVE.Gilbert.Element
Tinker 15 / 6 / 15



44 PERILOUSRAZE

- RAZE.Bulmey.LetItGoxd
Invoker 12 / 6 / 17
- RAZE.JAE.Rum
Juggernaut 19 / 7 / 13
- RAZE.Nutty63.Rum
Centaur Warrunner 1 / 11 / 29
- RAZE.Kiibble
Rubick 5 / 11 / 21
- Decerss
Ogre Magi 6 / 7 / 24

Find A Game

Common

Workshop

Deathmatch

Arms Race

Demolition

Casual

Competitive

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 1:03	 Train Expected Wait Time 3:51	 Mirage Expected Wait Time 1:30	 Nuke Expected Wait Time 3:46	 Cobblestone Expected Wait Time 2:48
 Overpass Expected Wait Time 3:12	 Cache Expected Wait Time 1:57	 Inferno Expected Wait Time 2:13	 Aztec Expected Wait Time 8:01	 Dust Expected Wait Time 7:58
 Vertigo Expected Wait Time 6:37	 Office Expected Wait Time 4:19	 Italy Expected Wait Time 8:39	 Assault Expected Wait Time 8:39	 Militia Expected Wait Time 9:43

PRIME MATCHMAKING
You are not enrolled in Prime Matchmaking

60

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

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 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 6:01
 Vertigo Expected Wait Time 5:05	 Office Expected Wait Time 3:25	 Italy Expected Wait Time 5:52	 Assault Expected Wait Time 4:54	 Militia Expected Wait Time 6:32

1:12

VS

4:48



PRIME MATCHMAKING

Exclusively search for Prime matches

GO

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

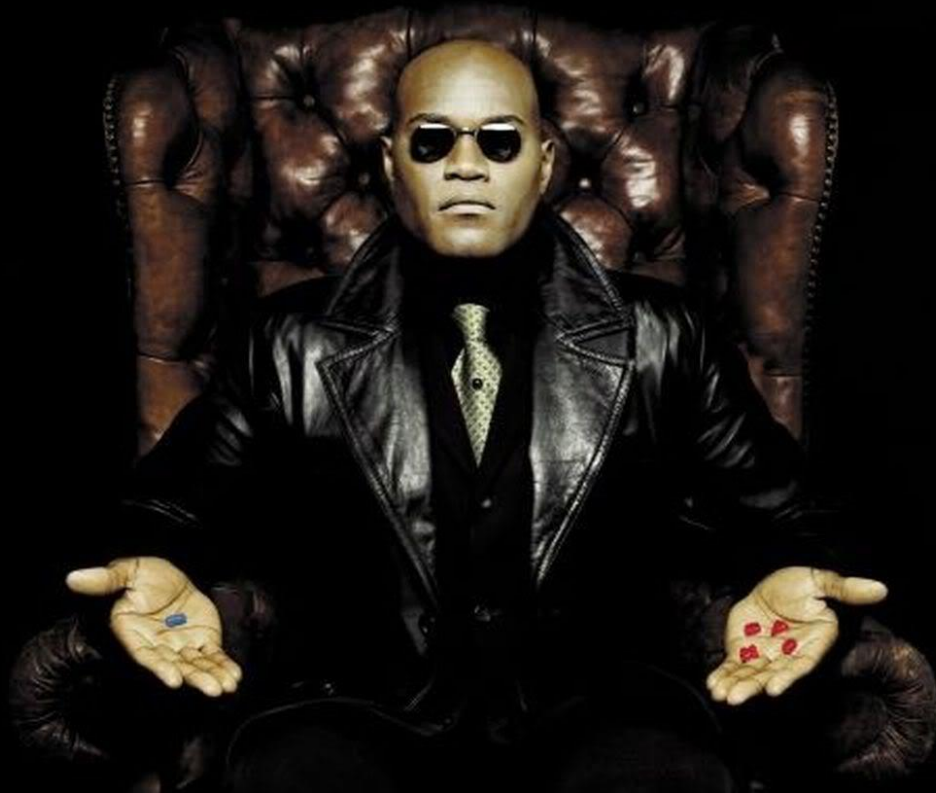
Implications for Game Design

- 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

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[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.



Say (TEAM)

Negative Interactions in DOTA

- Anonymous accounts
- Significant time investment
- Many opportunities to latch onto a teammate's mistake
- Dunning-Kruger Effect
- ...



REPORT PLAYER

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:



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?



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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.

OK

Implications

- Close the loop whenever you can
 - This action → 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?



NEW ITEM ACQUIRED!

YOU COMPLETED A CONTRACT AND RECEIVED:

ITEM
#1



THE CONCEALED KILLER WEAPONS CASE

The Case is locked and requires a Gun Mettle Key to open.

Contains an item from the Concealed Killer Collection.

Contents may be Strange or Unusual.

OPEN BACKPACK...

OK, RESUME GAME



Achievement Unlocked!

Against All Odds



Achievement Unlocked!

"V" for Victory



Achievement Unlocked!

Army Commendation Medal



INVENTORY

6 New Items!

FEATURED / TREASURY / BROWSE

Search for Treasures

PREV VIEW ALL TREASURES NEXT

FALL 2016 BATTLE PASS

FALL 2016 TREASURE I

PURCHASE TREASURE \$1.99 Qty: 1

PURCHASE INFUSER \$1.99 Qty: 1

LEVEL 1 BATTLE PASS REWARD

PURCHASE BATTLE PASS

EACH TREASURE CONTAINS 1 OF THESE ITEMS

EACH TREASURE CONTAINS 1 OF THESE ITEMS

SLARK - Kindred of the Umizar Crawler

VENOMANCER - Fatal Bloom

NIGHT STALKER - Unfettered Malevolence

PUCK - Ethereal Monarch

OMNIKIGHT - Sacred Light

You will not receive duplicates until you get one of each.

WITH A CHANCE TO RECEIVE BONUS ITEMS

ANTI-MAGE - Guilt of the Survivor VERY RARE

WARLOCK - Chaos of the Infernal Maw EXTREMELY RARE



LEVEL: 2



Current: 1037 xp

1500 xp

Intrinsic vs. Extrinsic Motivation

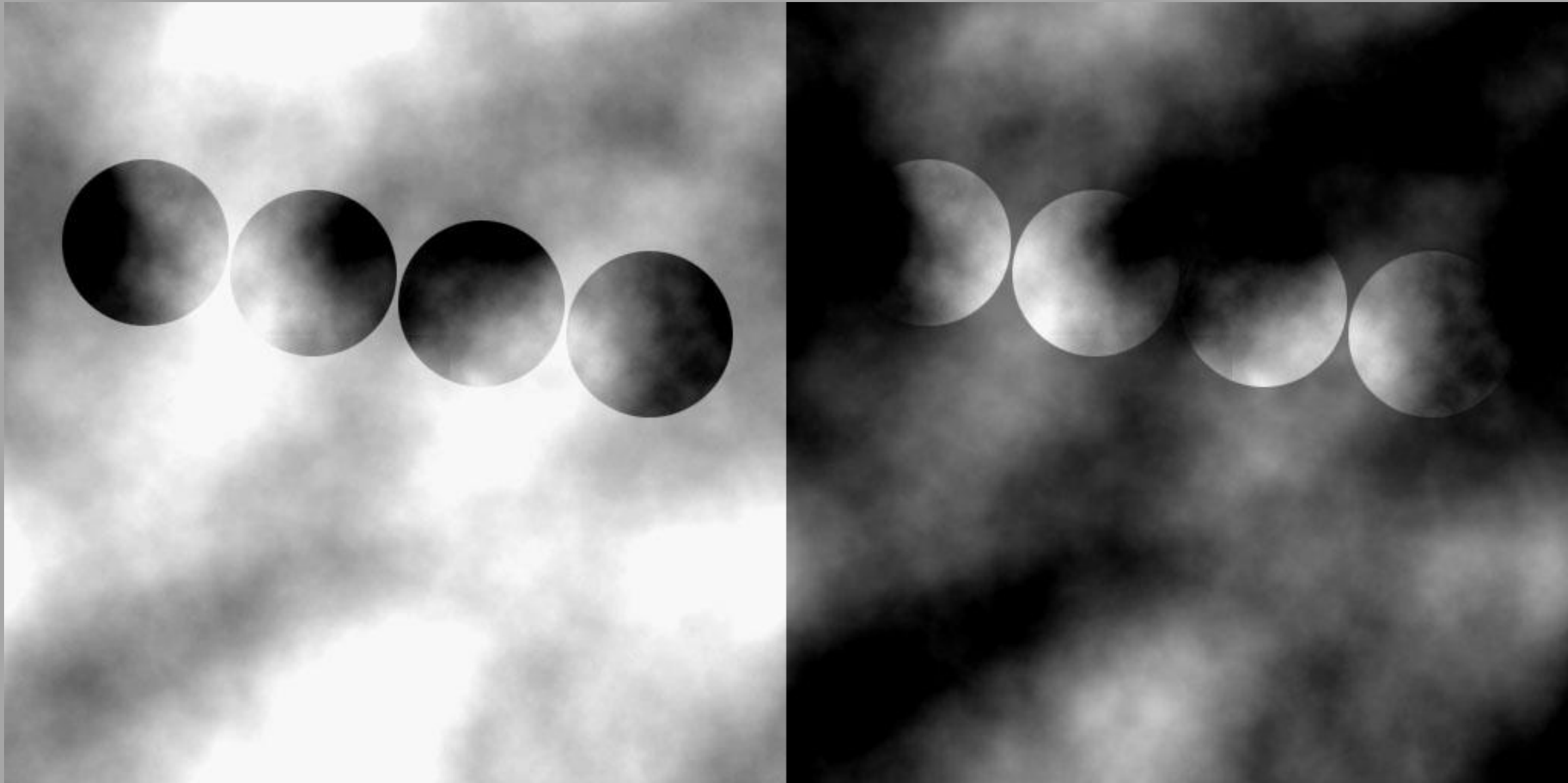
- Internally motivated vs. External rewards
- Intrinsic behaviors
 - Persist longer
 - More difficult to extinguish
 - Lead to greater enjoyment
- Extrinsic behaviors
 - Useful for shaping behavior
 - Risk shifting the motivation for playing

Fostering Intrinsic Motivation

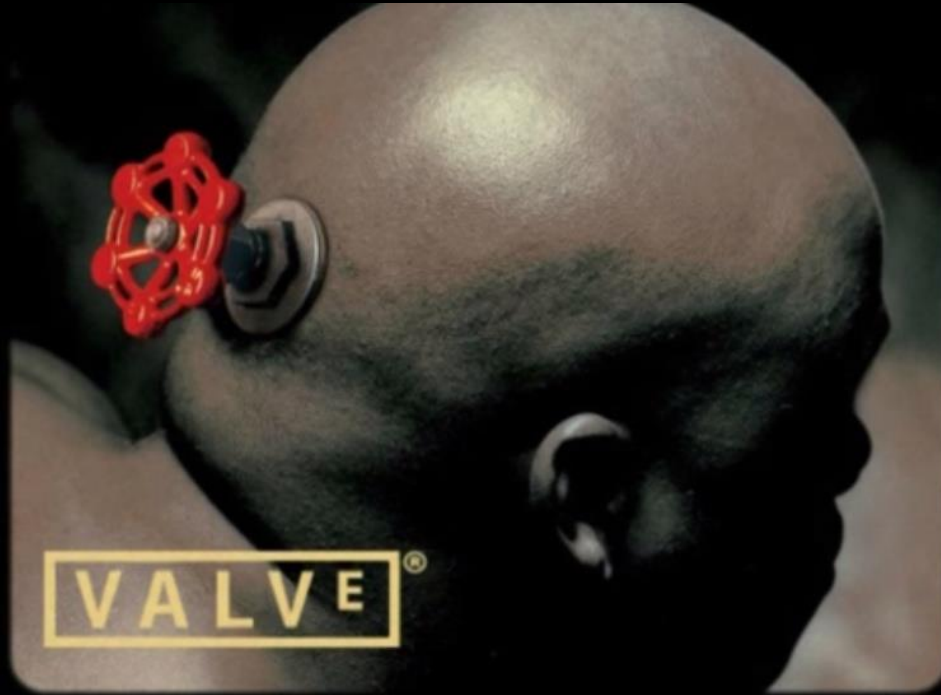
- Give players autonomy/agency
- Skill progression should be apparent
- Feedback on performance
- Opportunity for positive social comparisons

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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