Summary + PDF: A Theory of Fun for Game Design, by Raph Koster
by Allen Cheng


Have you ever been hooked on games like League of Legends, Candy Crush Saga, or Minecraft?

Ever wonder why those games were so engaging when exercise and studying feel like chores?

In A Theory of Fun for Game Design, game designer Raph Koster breaks down what fun is, how successful games achieve it, and what exactly we have to learn from games.

In this book summary, learn:

- why evolution has made games fun for humans
- what skills games actually teach, from statistics to social power and teamwork
- which building blocks are core to all successful games
- why women and men prefer different types of games

Main Points
Humans are evolutionarily programmed to enjoy learning patterns, which increased our survival.
Games are puzzles to teach patterns, in a safe environment with low risk

Fun arises from learning and mastering
Games teach calculation of odds, social power, teamwork, spacial relationships, memory, lateral thinking, and more.
Good games have building blocks consisting of preparation, a core mechanic, a range of challenges, a range of abilities, skill required in using the abilities, and variable feedback.
Games become un-fun when they are too trivial or too difficult. You don’t need to understand it fully - you merely need to see the pattern and understand what it takes to master it to be boring.
Thus to increase fun, you must continuously push the boundary of skill
Different people are suited for different games - e.g. different games cater along gender lines, five-factor personality models.
Games should evolve as a medium to teach more about ourselves, not just provide superficial power fantasies or operate as passive pure entertainment.

On Cognition

Thinking is mostly memory, pattern-matching against past experiences. “This is another one of those.” This conserves energy.
- “The essence of art is forcing us to see things as they are rather than as we assume them to be. Poems about trees force us to look at the majesty of bark and the subtlety of leaf.”
Noise is any pattern we don’t understand.
- Bebop sounds like noise until you understand the underlying patterns in tempo, chord progressions.
Chunking is part of this, where meaningfully linked items are grouped together.
- Example: break down how you got ready for bed. Which teeth did you brush first? From which eye did you remove your contacts from first?

Varied Definitions of Games

Various definitions of games have been offered over decades. In A Theory of Fun for Game Design, Raph Koster is very specific about his definition of games.

- Koster defines games as puzzles that teach underlying patterns for future use by providing live feedback to your actions, in lower stakes than reality.
- Other interesting definitions
  - “A rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable.”
  - “A series of meaningful choices.” - Will Wright
Games are abstracted from reality because they are iconic depictions of patterns in the world. By defining formal systems, they exclude noise, and thus they are readily absorbed. However, games teach aspects of reality, like how to understand yourself, how to understand the actions of others, how to imagine.

Games that rigidly define rules and situations are more susceptible to mathematical analysis. **The more rigidly constructed your game is, the more limited it will be.** Long-lasting games need to integrate math problems we don’t know the solution to, or more variables like human psychology, physics, etc.

### On Fun

As might be inferred given that "fun" is in the title, *A Theory of Fun for Game Design* is very specific about defining what fun is, and what it is not.

- **We receive dopamine when we learn something or master a task. We are evolutionarily programmed to enjoy this,** just like we enjoy sex, because it improved our chances of survival.
- **Fun from games arises out of learning, comprehension, and mastery.**
- **Games are learning in a context where there is no pressure from consequence.**
  - In normal life we like predictability - laws, pasteurized milk, lightning rods.
  - We like unpredictability only in the confines of predictability, like games or TV shows.
- **Babies instinctively play games like hide-the-object in earnest.** They are learning patterns, such as how physics of the world operate.
- **Somewhere in adulthood, we stigmatize games as frivolity.** Yet we continue learning from abstract models of reality.
  - Running fire drills, practicing speeches in front of mirrors.
- **Boredom is the opposite of learning - it’s the brain looking for new data to reinforce existing patterns, or new patterns to learn.**
- **In games, boredom can arise when:**
  - The player groks how the game works before the end, and the game is dismissed as trivial.
  - There is depth to the game, but this is below their level of interest.
  - There seem to be no patterns whatsoever.
  - The game reveals patterns too quickly or too slowly.
  - The player masters the game entirely.
  - The player cheats and finds a more direct path to the goal.
- **Every game is destined is to become boring.**
  - Humans are efficient problem solvers, and they want to reach the goal as expediently as possible by making things predictable. Sometimes this involves cheating.
  - Therefore, know what the game is about, and make sure it teaches that one thing
  - And games need to encourage you to move on - they’re not there to fulfill power fantasies
- **So why are people bored (in school, after work) when there is so much to learn? A few possibilities:**
  - Learning anything isn’t useful - you have to weigh it as important. The pattern of kingdom succession in 8th grade history may not be that important in one’s preferences.
The method of transmission is wrong - we praise teachers who make it fun to learn.
School isn’t fun and for learning, it’s for real - grades, social standing all have material consequences. Same with learning for work.
People are lazy and sometimes don’t want to learn, despite getting neurotransmitter rewards for doing it. They want to feel comfortable with the solution recipe they’ve developed and get in the zone.
All this however is maladaptive, because the world is constantly changing.

Fun vs Enjoyment

- Distinguish between different types of enjoyment:
  - Fun is the act of mastering a problem mentally
  - Aesthetic appreciation - not always fun, but enjoyable
  - Visceral reactions relate to physical mastery of a problem
  - Social status signals

- The 3 other types of enjoyment reinforce fun to give us positive feedback for fun, but are distinct from fun
  - “We went out there to have fun” vs “we went out there to win”
    - The latter is exercising mastery. The former is practicing and learning.

- Aesthetic appreciation
  - Aesthetics is still about recognizing patterns. Delight is when we’re surprised by patterns we recognize.
    - Planet of the Apes when we see the Statue of Liberty
    - A beautiful landscape with an additional surprising wrinkle
  - Delight decays quickly.
    - You can regain delight by distancing from and then returning to the object of delight. But it’s not fun.

- Physical challenges
  - Running and putting one foot in front of the other isn’t fun
  - Breaking a personal record is fun

- Social status often has to do with pushing yourself and others up and down the ladder, and signaling your own value
  - “Signaling theory” argues that many choices we make in our lives are unconsciously aimed at presenting our qualifications as mates and tribespeople to others
  - Schadenfreude - other people go down
  - Fiero - pushing yourself up
  - Naches - someone you mentor succeeds
  - Kvell - emotion when bragging about someone you mentor
  - Social behaviors - like intimacy, feeding other people - represents relative social status

- Games can persist far beyond the point where they teach anything new, because they fulfill mastery and power fantasies.
  - It provides comfort - exercise mastery with little risk, to provide a break from a challenging life
○ People get in the zone and offer false positive feedback to keep going in a static world.
○ This is maladaptive in a changing world

What Games Actually Teach

- Calculation of odds, prediction of events
  ○ Rolling dice, Monopoly, dominoes
- Social power and status
  ○ Playing “house” among kids is about jockeying for social status
  ○ Games about force projection and territory control, like chess or Starcraft
- Spacial relationships: examining the environment
  ○ Understand how it reacts to change to exercise power over it
  ○ True of Super Mario, chess, sports games, and Starcraft
- Memory - recall and manage complex chains of information
  ○ Counting cards in blackjack
- Visceral responses
  ○ Aiming, shooting, moving in response to what’s on screen
- Teamwork
  ○ Counter-strike
- Consider how the above were useful survival skills when humans were tribesmen
  ○ Some skills are no longer immediately relevant, like archery or marathons
- **We could use more games that teach modern relevant skills that might also be counterintuitive.**
  ○ Just as cleaning fluid looks delicious, not revolting compared to what we’ve evolved to find disgusting (green, slimy things)
  ○ Large-scale network building and resource management like Simcity
  ○ Examples:
    - Avoiding xenophobia; Empathizing with people not in our in-group
    - Questioning obedience to leaders
    - Avoiding use of force to resolve problems
    - Complex relationships, like between peace treaties and oil prices
  ○ Some of the examples above do exist, but are niche. Why are they less popular than the ones that teach obsolete skills?
    - Simpler games not requiring thought allow us to stay in the pleasant subconscious
- Games may also teach lateral thinking, aka finding alternative ways to reach the goal.
  ○ Sometimes aka cheating.
  ○ Circumventing rules has been useful in warfare, eg ambushes in Revolutionary War time.
  ○ We preserve fair play and sportsmanship partly because otherwise the game loses meaning - it no longer teaches the “correct” lesson. What you learn in the game by cheating no longer works in the real world.
    - Rules then become a social compact.
- **The author argues that for games to step up to other media, it should provide us with insights into ourselves**
The problem isn’t sex and violence (which literature and film have plenty of), it’s shallow sex and violence that don’t teach anything more

Consider MULE, where off-world colonists compete to be the richest. You could be the richest, but the colony could still perish. This teaches the interaction between individuals and society

Or a game where you gain power on how many people you controlled, but could heal yourself based on how many friends you had. Then include a rule that friends fall away when you gain power. Then the success condition is about the overall survival of the community.

- Now you can be at the top with no allies, or lower in status with more friends.
- Many possible lessons can be taught with this game, not just power projection but also duty, responsibility, and caring for posterity

### On Game Mechanics

- **Game building blocks** - “ludemes” - form the core of successful games
  - Preparation
    - Before facing a challenge, make choices that affect odds of success.
    - Without this, we say it relies on chance
  - Sense of space
    - Landscape of relationships between objects or players
  - Solid core mechanic
    - The intrinsically interesting rule set or puzzle to solve
    - Often involves estimating probability, matching, balancing, classifying
    - Eg moving a piece in chess
  - Range of challenges
    - Content - operates within the rules, does not change the rules
    - Eg enemies in a game
  - Range of abilities
    - Many games reveal abilities over time, until at the end you have many possible strategems to choose from
    - Higher difficulty levels may require utilizing multiple abilities
  - Skill required in using the abilities
    - Bad execution leads to failure in the challenge
    - Without a skill curve, the game becomes tedious
  - Variable feedback
    - Result shouldn’t be predictable; greater skill should lead to better rewards
  - Failure must have a cost
    - At the least, an opportunity cost, or requiring another try
    - In more extreme, you start all over again (eg a roguelike)

- **The holy grail is a game that provides never ending challenges, varied skills, the difficulty curve is perfect and constantly adjusts to your skill level.**
  - AKA life
• Hence why great longstanding games are often competitive head-to-head - it provides a new flow of challenges cheaply
  - A variant tactic is using players to generate content, eg mods in Half-Life
• Not employing skill is a cardinal sin in game design - they fail to exercise the brain.
  - Unfortunately a lot of people prefer games that take no skill
• Types of gameplay paradigms
  - Get to the other side
    - Frogger, Donkey Kong
  - Visit every location - secrets
    - Trains being thorough, requires patience, works against desire to work on final goal
    - Pac-Man, Q-Bert
  - Time limits
    - Trains rote mastery of movements so it becomes subconscious
    - Strategy games rarely have time limits because they’re not about automatic responses
  - Powerups
• Gamification is often layered on top of systems that lack the interpretability of a good game. A good reward structure does not make a good game.
• New games typically improve only incrementally in the play space
  - According to Raph Koster, there have only been 5 fighting games in all history!
    - Rock paper scissors - three moves, one hit kill, no movement
    - Karate champ - allowed movement toward and away
    - Karateka - fight through series opponents while moving sideways
    - Battle arena toshinden - 3D fighting game where you can face an arbitrary angle
    - Bushido Blade - true free roaming 3D fighting games
  - Raph Koster bemoans games that merely add additional complexity to a game genre, which makes it progressively niche and esoteric and unappealing to neophytes.
  - Games without new innovations, like shoot-em-ups, stagnate, because people have learned the mechanic and learned patterns unlikely to be repeated elsewhere
  - Game designers are partial culprits for unoriginality - they sample more games than the average player, build up ludeme blocks, and build from them.
• To innovate in games, find a new dimension to add to the gameplay.
  - Tetris blocks -> hexagons isn’t a big change
  - What about puzzle games that add in a time component rather than space?
  - Try not to focus too much on other games for inspiration
  - Consider extreme constraints - “make a one button game”

Different Games are Fun for Different People

• People with different natural strengths will gravitate toward puzzles they can solve.
  - Hence why some people prefer sports over Scrabble
• Types of intelligences
  - Linguistic
Logical-mathematical
Bodily-kinesthetic
Spatial
Musical
Interpersonal
Intrapersonal

- **Differences between genders**
  - Differences between genders exist in *population averages*. Individual variations are greater than the difference between genders, but general average differences are well documented.
    - Males are worse with language skills. Females are worse with certain types of spatial perception.
    - Men generally tend to have systematizing brains; women have empathizing brains.
      - Some argue that boys suffer disproportionately from autism spectrum because these are extremes of the systematizing brain
    - Men tend to learn by trying; women tend to model others’ behavior.
    - Women have faster reactions to stationary objects, whereas men faster at moving ones
  - Many differences are disappearing over time, so may be acculturated
  - Why have games been historically male-centric?
    - Maybe games historically appealed to young males because it suited their brains, and they were designed by people with the same bias.
    - Female players tend to gravitate to games with more emphasis on relationships, narrative, empathy; and away from complex abstract systems and spatial reasoning.
      - Most popular are puzzle and parlor games
    - As males age, you’d expect to shift over to play styles similar to women (eg due to hormonal shifts)
      - Men convicted of violent crime show higher testosterone levels than nonviolent criminals
  - Research shows girls who plays “boys’ games” like sports tend to break out of traditional gender roles
    - Conversely, coed settings tend to drive each gender away from the areas they are supposed to be weaker in

- **Differences in personality types**
  - People may play games that match their preferences on the Five Factor Model
    - [eg highly conscientious people may find time-limited improvisational games more jarring]
  - Social people play games that interact with others (eg Farmville)
  - [Allen note: This book led me to the revelation that I like games with progressive leveling up of your abilities and progressive goals to achieve...which matches my real life preferences! In contrast, I dislike games that reset progress after each play session, like roguelikes or battle royale games.]

- **Given all this variation, it’s impossible for any game to appeal to everyone**. The difficulty ramp will be wrong for many people and what they teach may not match preferences..
- Since games are formal abstract systems, they bias toward systematizing brains.
  - Just as books are biased - most books purchased by women, half by people over 45.
- **Consider playing games you don’t get, games that don’t appeal to your nature.**
- This might be the area of highest yield to stretch your capabilities.

## Categorizing Human Activities

Aspects of a human activity can be put on a 3x3 grid. *A Theory of Fun for Game Design* gives this example for games:

<table>
<thead>
<tr>
<th>Constructive</th>
<th>Collaborative</th>
<th>Competitive</th>
<th>Solo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Team game design</td>
<td>Commercial game development</td>
<td>Indie development</td>
</tr>
<tr>
<td>Experiential</td>
<td>Co-op gaming</td>
<td>PVP gaming</td>
<td>Single-player games</td>
</tr>
<tr>
<td>Deconstructive</td>
<td>Community unpacking (speedrunning, strategy guides)</td>
<td>Hacking, cheats</td>
<td>Solo deconstruction</td>
</tr>
</tbody>
</table>

More generally, human endeavors follow these patterns:

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<td>Job</td>
<td>Hobby</td>
</tr>
<tr>
<td>Experiential</td>
<td>Performance</td>
<td>Sport</td>
<td>Audience</td>
</tr>
<tr>
<td>Deconstructive</td>
<td>Teaching</td>
<td>Criticism</td>
<td>Analysis</td>
</tr>
</tbody>
</table>

## The Dressing on Games

- Games use fictional metaphors to add variations (eg narrative), but the metaphor is often ignored by players to focus on the underlying pattern
  - Simple example: checkers has “king me” move and the pieces have crowns
  - But games are largely about getting people to see past the superficial variations for the underlying patterns. Hence Raph Koster says “gamers are good at seeing past fiction”
  - The best test of a game’s fun is playing with no graphics, music, sound, or story.
    - If this is fun, then all the dressing will amplify
  - Hence why gamers disagree with arguments about the undue influence of games
    - In GTA, gamers don’t see “run over a hooker,” they see “get a powerup”
- But Raph Koster maintains that the visual representation and metaphor are still part of the experience
  - A game where you throw shaped humans down a pit, and they eat each other when you form a line, is like Tetris, but the experience is different.
  - Much the same way we consider dance to be choreography plus costuming plus narrative etc. Or that Guernica as a painting would be perceived differently if it weren’t about Guernica
  - A mismatch between the core of the game and the dressing can result in experience problems. Eg an aiming-shooting game about social cohesion
  - So game designers have a responsibility, like all media creators, to avoid transgressing
social boundaries

- **Stories in games**

  - **Differences between games and stories**
    - Games tend to teach by experience. Stories teach vicariously
    - Games objectify, quantify, classify. Stories blur, deepen, good at empathy.
    - Games are external - about people’s actions. Stories are internal - people’s emotions and thoughts.
    - Games generate player narratives. Stories provide a narrative.

  - Some weaker games are more narrative than game, like “solving a crossword puzzle to turn the next page of the novel”

  - Often games reflect the core themes of the game. Since many tend to be about power and control, the stories tend to be juvenile.

  - Often stories are merely used to give positive feedback to the player.

  - Games cannot convey the same breadth that literature can, but they provide greater richness, complexity, and interactivity

  - Invert the question - can we make stories fun the way games can be? They would need to be interactive and give fast feedback.

### Are Games Art?

Game designers seem to have a hang-up on whether games can be categorized as art ("we want to be taken seriously!") *A Theory of Fun for Game Design* is unequivocal in its position:

- In contrast to entertainment, which provides comforting, simplistic information, art provides challenging information, that which you have to think about to absorb. Raph Koster argues games certainly fulfill this criterion
- The author rejects the following grounds for or against games as art: their degree of interactivity, their level of fun; their formality of rules or systems.
- All media go through transition period where they’re seen as frivolous indulgences.
  - Paintings robbed reality of their essence
  - Novel was gothic nonsense for housewives
  - Film was trashy kinetoscopes at penny arcades
  - Jazz was devil music leading young people astray
- Apollonian and Dionysian periods - former about developing the medium as a medium, and latter about what could be said with that medium.