

Literature Review

Related Games

Cooperative games: It Takes Two, Portal 2, SnipperClips

Procedurally generated games with co-op modes: Spelunky 2 co-op, Left 4 Dead 2 co-op, Star Citizen co-op, No Man's Sky co-op play, Keep Talking and Nobody Explodes, and Noita Together.

Procedurally generated game levels: Catlateral Damage

PCG for Cooperative Play

1. Borges, Pedro. “**Procedural Content Generation for Cooperative Games.**” (2018)

<https://www.semanticscholar.org/paper/Procedural-Content-Generation-for-Cooperative-Games-Borges/9aeccf54e10ab5b41414b6ec4ffa4b11ee7ad02e>

📺 Geometry Friends AI Competition

📺 Geometry Friends, A Cooperative Game

2. Ramos, Rafael Vilela Pinheiro de Passos. “**Procedural Content Generation for Cooperative Games.**” (2015).

<https://www.semanticscholar.org/paper/Procedural-Content-Generation-for-Cooperative-Games-Ramos/20e96751c7d96511bb506287ce66ef21598009ab>

Geometry Friends website: https://gaips.inesc-id.pt/geometryfriends/?page_id=6

3. Arkel, Benjamin van et al. **“Procedural generation of collaborative puzzle-platform game levels.”** (2015).

<https://www.semanticscholar.org/paper/Procedural-generation-of-collaborative-game-levels-Arkel-Karavolos/eb7b3c9492f3278f02d75a0aacd91916f09373dc>

4. Volkmar, Georg & Mählmann, Nikolas & Malaka, Rainer. . **Procedural Content Generation in Competitive Multiplayer Platform Games** (2019).

https://link.springer.com/content/pdf/10.1007/978-3-030-34644-7_18.pdf

Designing Cooperative Games

1. J. B. Rocha, S. Mascarenhas, and R. Prada. **“Game mechanics for cooperative games.”** ZON Digital Games 2008, pages 72–80, 2008.

<https://www.semanticscholar.org/paper/Game-Mechanics-for-Cooperative-Games-Rocha-Mascarenhas/5a2a3e2945fd9f9928b42386631f88ec615764db>

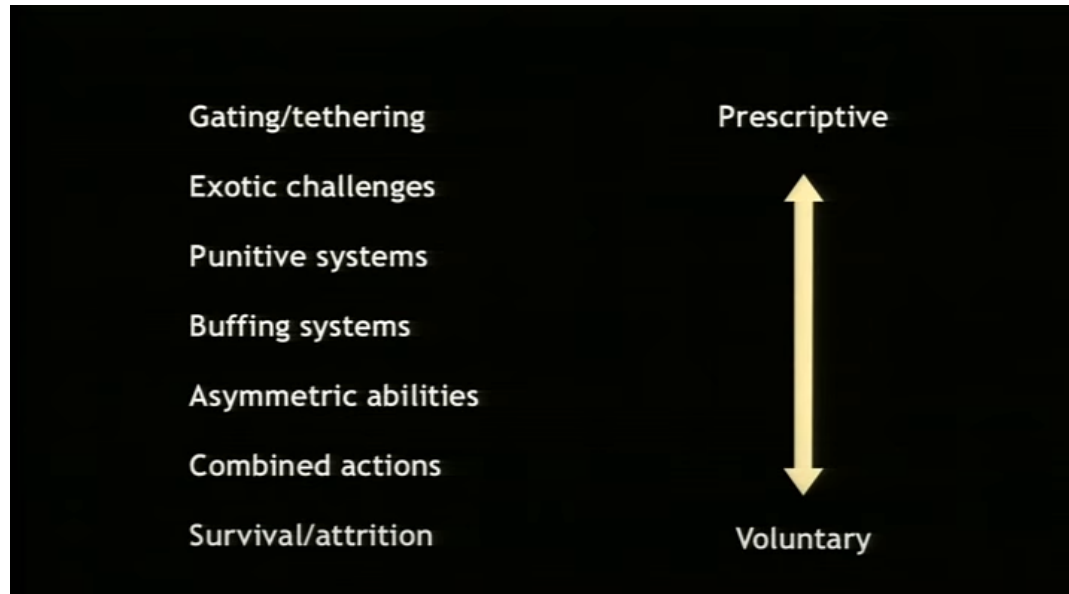
2. M. Seif El-Nasr, B. Aghabeigi, D. Milam, M. Erfani, B. Lameman, H. Maygoli, and S. Mah. **“Understanding and evaluating cooperative games.”** In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pages 253–262. ACM, 2010.

https://www.researchgate.net/publication/221516170_Understanding_and_evaluating_cooperative_games

3.

Keep it Together: Encouraging Cooperative Behavior During ...

Cooperative Dynamics



- **Gating/Tethering** - No players proceed unless all players proceed in the game.
- **Exotic Challenges** - Altered **camera/controls** for some of the players
- **Punitive Systems** - one player is trapped and another player needs come to **rescue**
- **Buffing Systems** - one player is mechanically making another player more powerful
- **Asymmetric Abilities** - Players have different sets of **actions**
- **Combined Actions** - Players need to apply more than one **skillset** at the same time
- **Survival/Attrition** - play can continue for as long as there is at least one player alive

Players skills can be **precision, timing, measurement, resource management, tactical choice, strategy, and puzzle-solving.**

These co-op dynamics sit on a **continuum of coerciveness**. They run the gamut from the top to the bottom of dynamics that are highly **prescriptive** in the sense that the **player can't avoid them**, down to those that are entirely **voluntary**, the player retains control over whether to practice in them or not and **interesting gameplay emerges from that**.

4.

Nicole Lazzaro | Games and the Four Keys to Fun: Using E...

People Fun incorporates other fun keys.

5.

▶ The Importance of Local Multiplayer - Seeing Eye-to-Eye - E...

1. Local multiplayer makes it easy to introduce new people to a game
2. Local multiplayer games are better candidates for DLC as there will be some friendly peer pressure to pick that stuff up

But the most important reason is that **local multiplayer makes us better people.**

- **The toxicity** that we so often wrestle with today comes from the fact that we no longer play games face to face.
- When we play with each other in a real proximal sense, we got to know each other and we had to accept each other as human beings. Other players weren't just faceless entities on the internet, they were people just like you.
- **Empathy** is practically unavoidable.
- More often grudging congratulations on a win or a heartfelt, "maybe next time", on a loss were readily given.
- Frustration slipped away. (see how forgiving the player become about the game when they play together)
- **Genre matters!** Toxicity can still be seen in local fighting games.
<https://www.lasertimepodcast.com/2014/11/12/the-toxicity-of-the-fighting-game-community/>

=====

What people are capable of if they cooperate?

- Nonviolent modern revolution
- Sense of agency is more powerful in multiplayer than in single player - motivation
- Shared intentionality
- Players realize that they have a better chance of success if they work together

6.

▶ Asymmetric Play - Can One Game Cater to Many Playstyles...

7. The four atoms of cooperative video games

<https://www.gamedeveloper.com/design/the-four-atoms-of-cooperative-video-games>

Let's take a simple situation and adapt the design for each atom: The players have to bring a broken car into a closed garage.

- Designing for the Gate: The garage door only opens if 2 players lift the door. Once done, they have to push the car together.

- Designing for the Comfort: The garage door can be opened by one player and the car can be pushed by one player.
- Designing for the Class: The garage door can only be opened by a locksmith and the car can only be driven by a pilot.
- Designing for the Job: The garage door will close if a player doesn't keep it open and any player can push the car.

8. Five problems with co-op game design

<https://www.gamedeveloper.com/design/5-problems-with-co-op-game-design-and-possible-solutions->

Problem 1: Knowledge Mismatch

Problem 2: Skill Mismatch

Problem 3: Public Humiliation

Problem 4: No Protagonist

Problem 5: Jerks

9. Making It Takes Two's Best Level

10. Making It Takes Two's Best Level

11.

Dissecting Design -- A Duo Look at the Co-Op Classic Left 4...

12. Designing Cooperative Gameplay Experiences

<https://www.gamedeveloper.com/design/designing-cooperative-gameplay-experiences>

13.

Level Design Workshop: Singleplayer vs. Multiplayer Level ...

14.

 The Holy Grail of Multiplayer Level Design: Casual and Com...

15.  Game Design Patterns for Building Friendships