Fail and Retry: A Taxonomy of Player Challenge and Failure in Virtual Reality Games

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Introduction

Player failure is core to the player experience in most video games. In previous work, a taxonomy of fail and retry/death and rebirth was developed by analyzing 62 platformer games. It consisted of five major aspects:

Obstacles → Death Conditions → Aesthetics →
Player Progress Changes → Respawn Location

However, it did not account for games without respawning mechanics.

While the taxonomy for failure in platformer games now exists, we were curious whether it could be applied to other game genres and platforms, such as embodied virtual reality (VR) games. We observed and coded 26 VR games to similarly develop a taxonomy that identifies design patterns of player failure and retries in the platform. Most importantly, the selected VR games consisted of other game genres:

- shooters   - rhythm games   - MMOs
- story-driven puzzles   - simulations

This ensured that the new taxonomy would uncover as many challenge and failure design patterns across most games.

Through the process of observation and coding, we found that there are three main components of the failure process in VR games:

1. *Player Challenges*
2. *Mini Failure Loop*
3. *Critical Failure State*

Using this taxonomy could help determine how the structure of failure affects the player experience, such as engagement and perceived game difficulty, or be used towards researching and designing processes such as dynamic difficulty adjustment.

Research Questions

- Can the previous fail and retry taxonomy be generalized to other game genres outside of platformers?
- Can the taxonomy also be extended to other game platforms, such as embodied games in virtual reality (VR)?
- Are there additional aspects of challenge and/or failure in terms of design patterns to consider for VR?

Methods

We observed each of the 26 VR games by watching an online video playthrough or playing it ourselves.
For each game, we:

1. noted the game's process of failure
2. used codes derived from the previous taxonomy work
3. wrote new codes for additional design patterns that we observed
   - Ex: critical and mini failure conditions, their accompanying aesthetics, obstacle types, and unique VR actions
4. observed if any social elements involved in failure
5. noted if any rule changes for failure could be made

Thus, we applied conceptual memoing along with a hybrid approach of deductive and inductive coding.

Then, we performed axial coding to identify relationships among our open codes to determine our initial set of categories.

Through discussion sessions and selective coding, we pieced together our findings into the resulting three main components in our new taxonomy as well as the relationships between them.

Findings

We found that there are three main components of the failure process in games: when a game starts, *Player Challenges* (Game Modes, Obstacles, and Embodied Actions) determine how players will approach gameplay. Depending on failure conditions (e.g. running out of health) in the game, players can either: (1) enter the *Mini Failure Loop* which feeds back and forth into further challenges until a critical failure state (i.e. player is dead), or (2) directly reach *Critical Failure State*, which leads to the game ending. The player, then, has the opportunity to retry the game.

The following includes a more detailed breakdown of the taxonomy components:

Player Challenges

Game Modes: whether someone plays solo, against, or cooperate with others
- *Single Player*, *Cooperative Play*, or *Competitive Play*

Obstacles: hurdles that a player must overcome to progress in the game
- *Damage Obstacles*: hurts the player (e.g. enemy attacks, traps)
- *Environmental Obstacles*: barriers that block the player (e.g. puzzles)

Embodied Actions: physical motions in VR that pair virtual and real-life action
- *Arm*, *Hand*, *Body*, and *Head Motions*

Mini Failure Loop

Mini Failure Conditions: Criteria met when a player faces a setback in gameplay that hinders game progression. This loops until Critical Failure is reached.
- *Fixed*: Criteria that is static and does not change during gameplay
  - Player health decreases
  - Input the wrong puzzle solution
  - Ongoing poor performance (e.g. in sports games or simulations)
  - Has "died" but needs co-op revive
- *Flexible*: Criteria that changes based on adaptable game rules
  - Depends on game mode, game level, player modifications (e.g. weapon choice), or player selected difficulty (e.g. easy, hard)

Feedback Aesthetics: How mini failures are depicted to the player
- *Player Status Display*: Visibility, Location (e.g. in VR, wrist, look down)
- *Sensory Phenomena*: Visual (often red marks), Audio

Critical Failure State

Critical Failure Conditions: Criteria met when a player completely fails the game and can no longer progress until another retry. (Most identified in previous taxonomy work, except mental fatigue)
- *One-hit/Instant Death*: Failure state after a player dies immediately after a single injury/mistake
- *Out of Health/Health Points*: Failure state when a player dies gradually after a series of sequential injuries/mistakes until player life is at zero
- *Mental Fatigue*: Failure state met in games without dying or respawning

Feedback Aesthetics: How critical failures are depicted to the player
- *Sensory Phenomena*: Visual (often colors turn to black & white), Audio

This is the taxonomy at still a high-level overview. There are many more examples that entail most components mentioned above. However, this *Taxonomy of Player Challenge and Failure* demonstrates that the previous *Death and Rebirth Taxonomy* can be extended to other game genres and platforms.

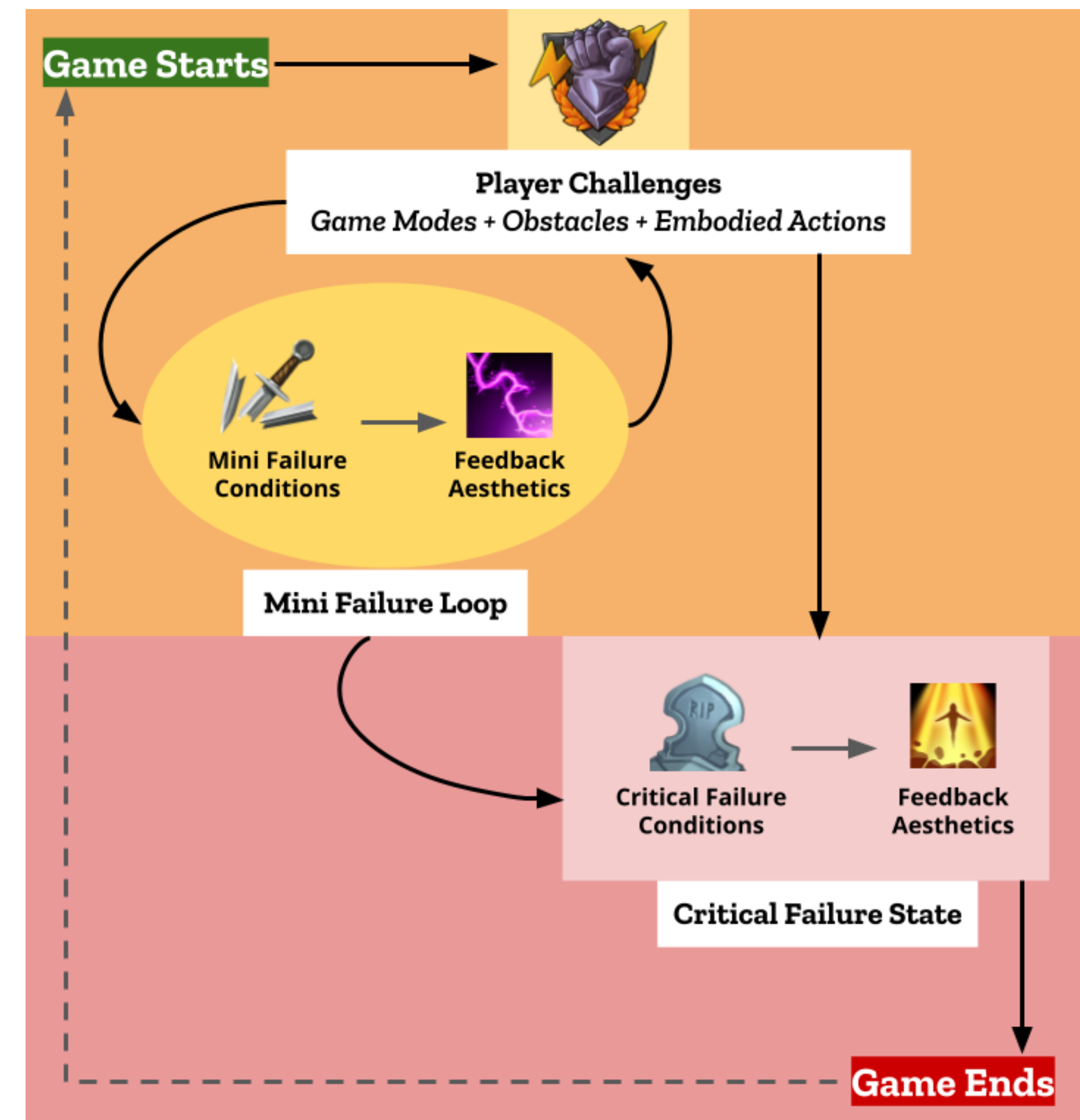## Taxonomy of Player Challenge and Failure

Figure 1. *The Taxonomy of Player Challenge and Failure*. When the game starts, Player Challenges either lead to: (1) a Mini Failure Loop that goes back and forth into further player challenges until reaching Critical Failure State or (2) directly to Critical Failure State. Player, then, has the option to retry again.

Conclusion

We utilized a hybrid approach of deductive (based on previous existing taxonomy) and inductive coding to develop the Taxonomy of Player Challenge and Failure. We identified three overarching components of player failure processes in games: *Player Challenges*, *Mini Failure Loop*, and *Critical Failure State*. Our goal was to extend the previous taxonomy to other game platforms and genres, beyond platformer video games. Another goal was to provide a means for game designers and researchers to break down and analyze failure design in a general sense. Future work could include how challenge design relates to story-driven or games without failure.

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