Tampere University of Applied Sciences

Balancing Randomness in Action Roguelike Game Design

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BACHELOR'S THESIS
May 2025

Bachelor's Degree Programme in Media and Arts
Interactive Media

ABSTRACT

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HANNULA, RAMA:
Balancing Randomness in Action Roguelike Game Design

Bachelor's thesis 36 pages
May 2025

Action roguelike is a popular genre in the growing indie game market. They rely heavily on randomness in their core game design and are defined by features such as procedurally generated environments and randomized enemy and item layouts.

Randomness creates uncertainty in gameplay and can affect the player experience in many ways, depending on various of factors. These often revolve around the feeling of challenge, player agency, and fairness, which due to the unpredictable nature of randomness, can be difficult for the developer to balance.

The objective of this study was to understand how randomness affects the gameplay experience in the action roguelike genre, and how game designers balance randomness to create more fair and enjoyable experiences for the players. The design choices of many popular action roguelike games were examined from the perspective of their effect on game balance. In addition to popular action roguelikes, the author’s own action roguelike game Ants Took My Eyeball was looked into.

The findings suggest that having more randomness adds variety and improves replayability, which are both important aspects of the action roguelike genre. Having more randomness can also affect the experience negatively by making it unpredictable and unfair, but this can be countered to some extend by giving the player more agency and freedom of choice.

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1 INTRODUCTION

Video games are a huge business in the entertainment industry, generating approximately 455 billion U.S. dollars in 2024 (Statista, 2024a). Large AAA game studios often spend tens or even hundreds of millions of dollars developing and marketing their games (Statista, 2024b). With massive budgets, these games are also expected to generate a lot of revenue for the company, making it quite risky.

Independent games, or *indie games*, created by small development teams with comparably tiny budgets, have become increasingly popular, while large AAA games, well-funded by big corporations, have grown stale and less attractive to the customers, due to their unwillingness to take risks and innovate (Wu, 2025). On the Steam digital distribution platform, the revenue share of indie games has been steadily growing for years, reaching 48% in 2024, as shown in figure 1 (Video Game Insights, 2024). There is a big demand for indie games and the video game industry is currently looking bright for indie developers.

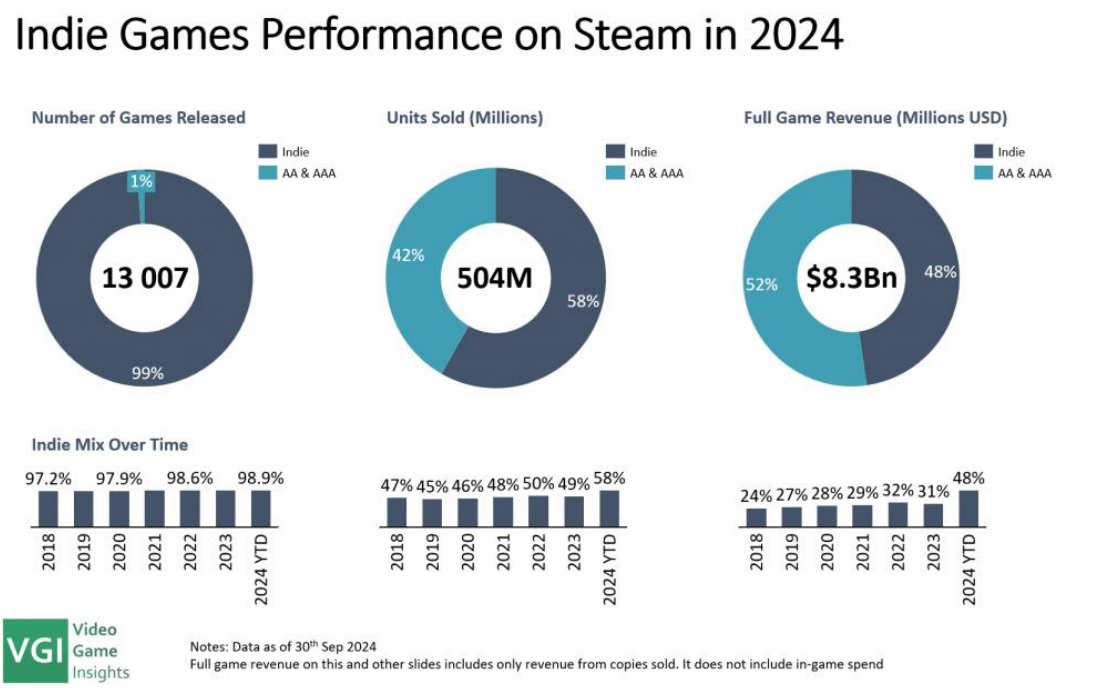


FIGURE 1. Indie Games Performance on Steam in 2024 (Video Game Insights, 2024).

Instead of relying on large marketing budgets, many successful indie games have gained popularity simply because they are good, high-quality games, and people

enjoy playing them. On digital distribution platforms, such as Steam, games with many positive reviews gain more visibility on the platform, which leads to more players discovering the game and thus more sales (Chang, 2023). For this reason, making a high-quality, well-balanced game, that will receive as many positive reviews as possible on the platform, is crucially important for most indie games' success.

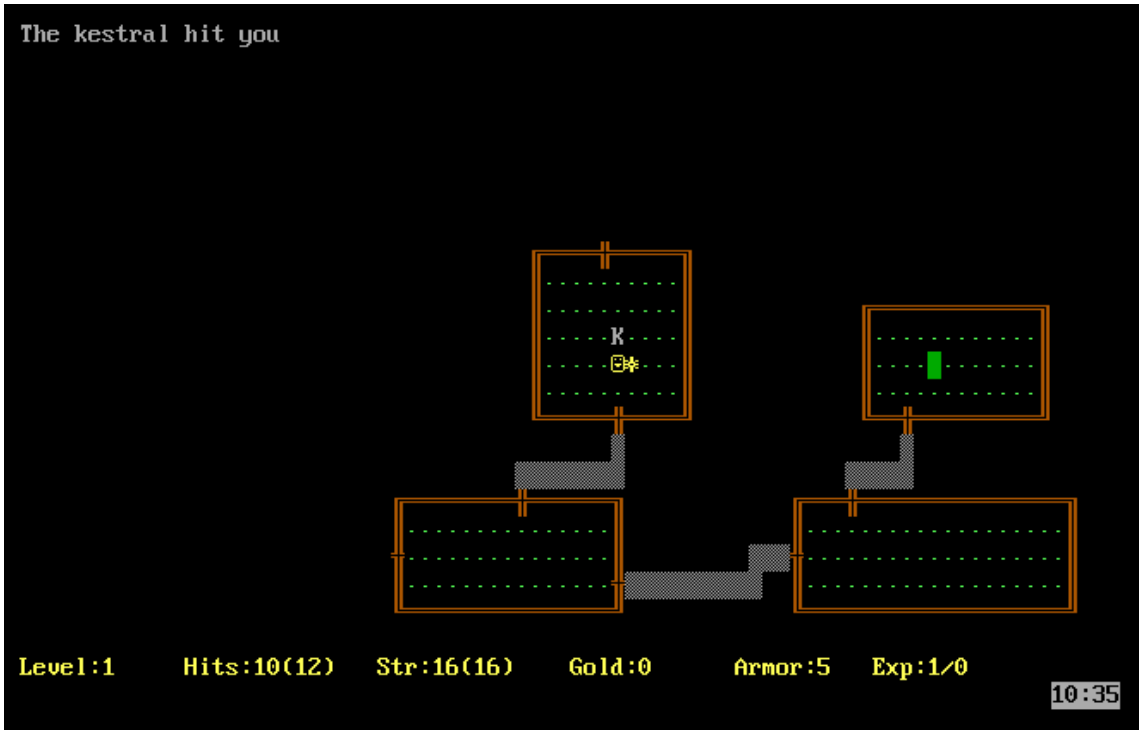
Roguelikes are a video game genre that is almost entirely dominated by independent studios, perhaps due to their rather niche appeal and relatively small market share, which make them riskier for larger studios. In the indie gaming space however, interest in roguelikes has grown with the huge success of games like Hades (2020), The Binding of Isaac (2011), Dead Cells (2018) and Enter the Gungeon (2016).

In this thesis I look at the role of randomness in roguelike game design, especially in the context in action roguelikes. By examining successful roguelike games and the design choices behind them, I aim to provide insights into how randomness affects the gameplay experience, and how it can be balanced. Additionally, I discuss the approach taken in the development of my own action roguelike game, Ants Took My Eyeball (2024).

2 ACTION ROGUELIKES

2.1 What is a Roguelike?

Roguelikes are a genre of video games that, as the name suggests, resemble the 1980's game Rogue (1980). The original game, show in picture 1, is a 2D turn-based role-playing game, where you explore dungeons, collect loot and fight monsters, very much like in most role-playing games of the time. What separates Rogue from your typical role-playing game though, is that the dungeons are procedurally generated, meaning that instead of a game designer manually designing the levels, they are algorithmically generated using a random number generator. In other words, they are generated randomly, meaning that every time you play the game, the dungeons are different and unpredictable.



PICTURE 1. A dungeon in the original Rogue. Add an alternative text to the figure to enable accessibility.

Permanent death mechanic, or permadeath for short, is another core feature of Rogue, and of the roguelike genre. In role-playing games in general, the player is usually penalized for losing the game, for example in the case of the player losing all their hit points. In a non-roguelike game, this often means being sent back to a checkpoint or a previous save state, so that the player can retry the

section, or try another path. On the contrary, as the name suggests, permadeath means that the player character is permanently eliminated and loses all their progress upon dying. This means that any items, stats or other progression the player has gained is lost, and the player must restart the game from the very beginning. (Brown, 2019)

For example, in the game Diablo IV (2023), the player is sent to their last checkpoint location upon death, and does not lose any game progress. They can retry the section again, with all their equipment and abilities intact. In Spelunky (2013), on the other hand, the player loses any progress they have gathered, and always starts with the same resources, always having 4 health, 4 bombs and 4 ropes, no matter how many times they have played the game.

The gameplay loop of a roguelike, due to the rather strict constraints of these core mechanics, is usually as follows: the player starts the game from the very beginning of the game, and proceeds through randomly generated levels, collecting items and growing stronger, until they either win or lose the game. This singular gameplay session from the beginning to the end is called a run. Whether the player wins or loses the run, the next run they'll have to start from the beginning again, without any progression carried over from their previous runs. Since the game environments are procedurally generated, each run is different.

With the two core ideas, randomly generated levels and permadeath, roguelikes are all about mastering the game mechanics, no matter the genre. When each run is different and unpredictable and the player cannot keep any in-game progress, the player also cannot memorize the level layouts or rely on previously gathered items and skills. This means that the only way to progress is to get better at the game by gathering knowledge, learning enemy patterns and improving mechanical skill. The player needs to be able to adapt, improvise and try different playstyles depending on what they encounter during each run. (PepperHead, 2023)

Roguelikes are sometimes divided into two categories depending on how closely their game mechanics resemble the original Rogue. A roguelike, sometimes called a traditional roguelike, follows these mechanics very strictly with turn-

based role-playing, while roguelites on the other hand take more freedoms and can blend the core roguelike mechanics of procedural generation and permadeath with different genres (Dabirian, 2024). They might for example have real-time gameplay and some meta-progression that carries over between runs, like in Hades, where the player can purchase permanent meta-upgrades between runs.

In modern gaming landscape, there exists a huge variety of different roguelikes and roguelites. On the other end of the spectrum, we have very traditional roguelikes, like Cogmind (2017), which closely resembles Rogue both visually and mechanically (picture 2). On the other end, we have games like Noita (2020), which instead of turn-based combat, simulates each pixel separately in real-time (picture 3), resulting in all kinds of unpredictable emergent situations, or Die in the Dungeon (2025), which lets the player use various dice to fight hostile insects almost like a puzzle game (picture 4).

PICTURE 2. Cogmind resembles the original Rogue. (Steam, n.d.)

PICTURE 3. Noita simulates each pixel separately in real-time. (Steam, n.d.)

PICTURE 4. Die in the Dungeon almost feels like a puzzle game with its dice allocation mechanics. (Steam, n.d.)

2.2 Action Roguelikes

Action roguelikes are a subgroup of roguelikes, which in addition to the typical procedural generation and permadeath, also feature fast-paced real time combat and often some other twists to the traditional formula. Harry Ted Sprinks (2024) from GameRant has described them as follows:

> “Action roguelikes and roguelites are known for fast-paced action and high-intensity gameplay that contradicts the slower pace of traditional roguelikes. This generally shifts the focus from strategy to skill expression, to varying degrees.“

Many action roguelikes can thus be considered roguelites, as they are played in real-time instead of turns, and often have some meta-progression. However, the term roguelike is often used as an umbrella term for both traditional roguelikes and roguelites.

Some examples of popular action roguelikes are Dead Cells, which is a side-scrolling platformer (picture 5), and Enter the Gungeon, which is a top-down bullet hell (picture 6). While they are mechanically very different, both feature fast-paced combat and rely heavily on player skill.

PICTURE 5. Dead Cells is an action platformer. (Steam, n.d.)

PICTURE 6. The top-down perspective of Enter the Gungeon. (Steam, n.d.)

2.3 What Makes a Good Roguelike?

It is notoriously difficult to define fun, and what contributes to the feeling of fun in video games, as it can be a very subjective experience and is heavily dependent both on the genre and the player. When it comes to roguelikes however, there are some key qualities that are often considered to be important parts of a good roguelike. These are unique, varied runs and emphasis on player skill and mastery of game mechanics. Together they contribute to replayability, making players want to replay the game over and over again (Creswell, 2022).

The fun in roguelikes relies heavily on intrinsic motivation, meaning they are played for the inherent satisfaction of playing, rather than extrinsic motivation, such as audiovisual spectacle or achievements, which have no effect on the actual gameplay. The experiences of overcoming challenges, learning and seeing yourself improve are inherently fun, no matter if the run ends in a victory or a defeat. Unlike most video game genres, where losing repeatedly causes frustration, roguelikes are designed around this cycle of losing and learning, encouraging players to try new strategies and improve. (Fischer, 2016).

In a good roguelike, each run must feel different to another, and the player shouldn’t be able to predict how the runs turn out. Randomly generated levels

add variety by having different layouts each run and providing a sense of exploration every time. This can be further improved by having an interesting and wide cast of enemies and traps, that provide different kinds of challenges for the player. (PepperHead, 2023)

Most action roguelikes provide the player with various abilities that enhance their power. These upgrades can be in many forms, such as items, skills or blessings, but ultimately the result is the same: they make the player stronger. A good variety of abilities also adds to the replayability and keeps the gameplay fresh. The player should be able to find different synergies between abilities that allow for varied builds and playstyles (PepperHead, 2023). For example, a flaming sword that deals fire damage would synergize well with a magical ring that boosts fire damage, and finding such synergies can be fun and rewarding. While different synergies can be stronger or weaker, the stronger ones shouldn't be too easily obtainable, or they can make the weaker ones irrelevant (PepperHead, 2023).

Especially with action roguelikes, player skill should be the primary factor that determines the outcome of each run, or whether the player wins or loses. While randomness always plays a large role in roguelike game design, luck should have smaller impact than skill, thus a skilled player should be able to complete any level without taking damage or making mistakes. (Doan, n.d.). A part of player skill is also knowledge of the game. Between the runs, the player should be able to gain new information and get better a understanding of the mechanics, so that they are better prepared for the next run (Creswell, 2022).

2.4 Ants Took My Eyeball

I worked as a game designer and artist for the action roguelike Ants Took My Eyeball, which was released on the Steam digital distribution platform in April 2024. The team also included a programmer, Aapo Nikkilä and a musician, Henri-Mikael Turunen. The game is quite similar to many other action roguelikes, and takes inspiration from popular games such as Risk of Rain, Hades and Enter the Gungeon. It has fast-paced melee and ranged combat, and some meta-progression that can be unlocked between runs. Mechanically Ants Took My Eyeball is a 2D platformer, like Dead Cells. It is set in an anthill, and much like

most roguelikes it has randomly generated levels and permadeath. During a run, the player encounters various enemies and bosses and collects items.

During the development, the team had to consider how to implement randomness in a balanced way. Since the game was heavily inspired by existing action roguelikes, understanding how these games handle randomness in their design was important for also ensuring the balance in Ants Took My Eyeball. To further balance the game, player feedback was gathered by organizing multiple rounds of playtesting and releasing a public demo on Steam and itch.io platforms. After the release of the game, player feedback from Steam reviews has also been used to improve the balance.

3 GAME BALANCE

3.1 Defining Game Balance

Game balancing is the process of adjusting the game mechanics and content to achieve an appropriate level of difficulty, and provide a fair and meaningful gameplay experience (Brazie, n.d.). Defining fairness and meaningful gameplay can be difficult, but a well-balanced game should be consistently enjoyable and provide a sufficient challenge throughout the experience. Players perceive balance differently depending on their skill and playstyle, and thus perfect balance is an ideal that is impossible to achieve. Instead, game designers should aim for marginal balance, where all choices are somewhat equally balanced, withing a certain margin. (Sanfilippo, 2023)

Even though there are numerous elements that affect the balance depending on the genre and mechanics, there are some general balancing concepts which are present in most games. For example, balance in an online multiplayer shooter can be very different from balance in a single player farming simulator. Becker and Görlich (2020, p. 37) found that in discussion about game balance, difficulty, meaningful decisions and symmetry are often considered to be contributing to game balance. However, from these three concepts, symmetry is mostly relevant in the context of player versus player multiplayer games. In a symmetrical game, each player has equal starting conditions, increasing the impact of skill and reducing the impact of luck (Becker and Görlich, 2020, p. 33). In the context of singleplayer games, we can talk about the concept of fairness instead.

3.2 Difficulty

Perhaps the most obvious of the three balancing concept is difficulty, which is the level of challenge presented to the player (Brazie, n.d.). A beginner might find a certain game very difficult while a skilled player might find the same game too easy. A common way to make the game more accessible to a wider audience and for various skill levels is to have multiple difficulty settings, such as easy, medium and hard, so that the player can choose a difficulty setting that gives them a good challenge.

A well-balanced difficulty plays a large role in retaining the player's interest. A game that is too difficult can feel frustrating and impossible to win, leading to the player abandoning the game. Similarly, a game that is too easy quickly turns boring, leading the player to stop playing. (Brazie, n.d.)

The goal of difficulty balancing is to find the middle ground, to keep the player in a flow state, by steadily growing the difficulty (Becker and Görlich, 2020, p. 26). This gradually increasing difficulty is often called a difficulty curve, and it allows the player to learn the game mechanics and improve their skill before the game turns too difficult, thus preventing frustration.

Roguelikes are often purposefully difficult, since runs are designed to be relatively short, and mastery of mechanics should be required to beat the game. This encourages replayability, as the player shouldn't be able to beat the game on their first few tries, but instead gradually get better and better at the game, progressing further with consecutive runs. Making the game too easy leaves no room for the player to improve their skill, which is one of the main sources of intrinsic motivation, ultimately resulting in boredom (Fischer, 2016).

3.3 Meaningful Decisions

Player agency is the player's ability to make decisions that lead to different consequences, and it's an important aspect of video games (Thue et al., 2010, p. 210). It provides a sense of control over the experience by allowing the player to create their own path, within the boundaries set by the game developers (Brazie 2023). Player agency can be divided into two categories, *theoretical agency*, or the objective ability to change the experience, and *perceived agency*, or the subjective feeling of having the ability to change the experience (Thue et al. 2010, p. 210).

What actually is a meaningful decision is heavily dependent on the game and its mechanics, but they should make the player feel that they are making an impact (Brazie, n.d.). The player shouldn't face redundant choices, that don't either have any impact, or are considerably worse than the other options (Sanfilippo, 2023).

For example, if the player is offered two items, one of which gives a bonus of +5 damage, and the other a bonus of +10 damage, the former option is rendered redundant by the latter, which is simply more powerful. However, if the player is given the choice between an item that gives a bonus of +5 damage and an item that gives a bonus of +5 health, the choice is much more interesting, as the decision depends on which option the player sees more beneficial given their current situation and playstyle. Such redundant options trivialize the decision-making process and reduce the perceived player agency.

In roguelikes, the importance of theoretical agency is emphasized, as decisions and their consequences are repeated numerous times over multiple runs. With constantly increasing understanding of the underlying game mechanics, the player will be able to tell whether a decision will have any meaningful impact, and redundant choices become obvious.

3.4 Fairness

While mostly relevant to multiplayer games, fairness means that the player always has a chance of winning, no matter how difficult the game is. Equally skilled players should have equal chances of winning, even if they are given different options (Sirlin, n.d.). If the player encounters a situation where they feel like they had no chance of winning, the game feels unfair, resulting in frustration.

In roguelikes, the player is essentially competing against themselves, trying to progress further than before each run. In this context of self-competition, it is important to ensure that the player is given somewhat equal chances of winning each run. The player should be given approximately the same number of resources each run, and the difficulty should not vary wildly between runs. However, a game doesn’t have to be perfectly balanced and fair, and having small imbalances can encourage the player to try different strategies (Becker and Görlich, 2020, p. 37).

Fairness is crucial for roguelike balance, as roguelikes are often difficult and punishing in their core design, and the stakes are high due to permadeath. Dying means having to start all over again and dying to an unfair encounter can feel

very frustrating. In a game without permadeath, with a save and load system, if the player encounters an extremely difficult battle and dies, they can simply load the game and completely avoid or carefully prepare for the battle. In a roguelike game with permadeath, there is no way to retry the battle. Because of this, it is even more important to make sure the game is fair, and that the player always has a chance to win or progress in the game, if they are skilled enough.

4 RANDOMNESS IN GAMES

4.1 Uncertainty

Uncertainty is one of the primary characteristics that make playing games interesting. If the outcome is already known to the player, they will quickly lose interest (Costikyan, 2013, p. 9). If we think of a game of chess with two equally good chess players as an example, the game stays interesting as long as both players have a decent chance of winning. However, if the skill difference between the players is too high, the game soon turns uninteresting, as the more skilled player is almost guaranteed to win. In a similar way, a video game that is too easy and poses no challenge, or is so difficult it feels unbeatable, can easily turn uninteresting.

Randomness is a possible source of uncertainty in games, but this doesn't mean the outcome should be completely determined by chance. Randomness of outcome is mostly relevant in gambling context, where the outcome is determined almost completely by chance. For example, when playing a slot machine, the player starts the game and is then presented with randomly chosen results, either winning on losing, without the player having any impact on the result. This limits the player's ability to affect the outcome and can make the gameplay feel dull. Most non-gambling games instead spread out the randomness into multiple smaller random tests with lower impact. This way the outcome is likely to balance out in the long term, while adding uncertainty to the moment-to-moment gameplay. (Costikyan, 2013, p. 83)

4.2 Input and Output Randomness

Randomness in games can be divided into two types of randomness, depending on when the random element is applied: input and output randomness. (Brown, 2020). Input randomness is when random elements are introduced before the player makes a decision (Zhang et al., 2021). In this case, the player gets to make their decisions based on the results of randomization. This way they have a fair chance to react to the random input, and there is no uncertainty in the consequences. Procedurally generated levels are a good example of input

randomness. First the level is randomly generated and then the player gets to play the level.

Output randomness on the other hand, is when the random element is introduced after the player decision (Zhang et al., 2021). The player choice is used as the input, and randomized results are given as the output. In a way, it adds a layer of noise to the player input, where the result is not clear before making the decision, and is only revealed afterwards. This can make the game more unfair, by making the consequences of player actions be based on luck.

To better visualize the difference between these two types, both are compared in in figure 2. On the left (figure 2a) we see that with input randomness the random element is added before any player action, thus resulting in an inconsistent starting input, but in whichever way the player reacts to the input provides a consistent output. With output randomness (figure 2b) the situation is the opposite. The input has no randomness, but randomness is added to the output after the player action.

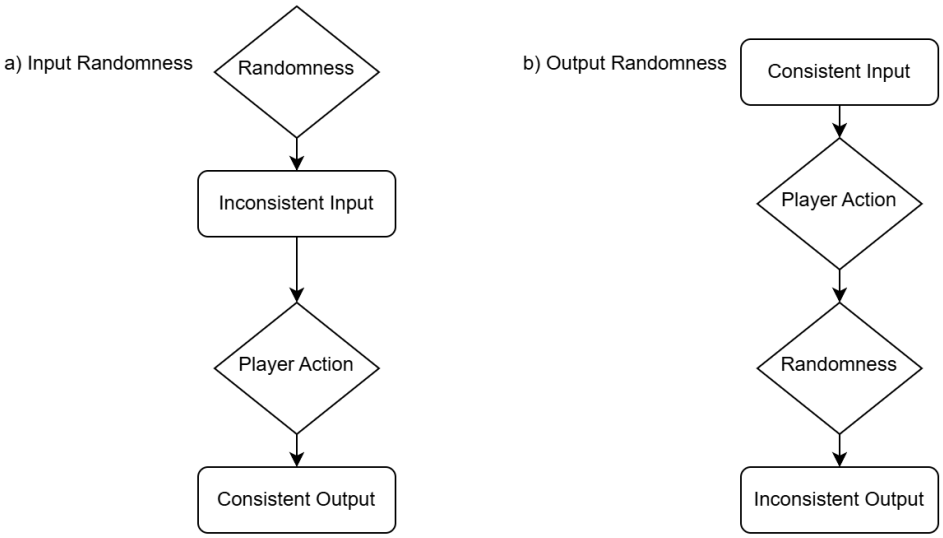


FIGURE 2. Comparison of input and output randomness.

Both types of randomness have their uses in game design, and many games involve both. Output randomness is best used in a gambling context for excitement, or for simulating complex behaviour that has unpredictable results. For example, in many tabletop role-playing games, the player rolls dice to see if

they fail or succeed, to simulate the complex nature of their actions, which would be impossible to evaluate otherwise. After the dice has been rolled, the player must accept the output, and thus has no agency over the end results, but instead which actions they want to perform. On the other hand, input randomness throws the player into unpredictable and varied situations and lets them solve those situations in a predictable way. This promotes adaptability, which is a desirable feature in roguelikes.

5 HOW ROGUELIKES BALANCE RANDOMNESS

5.1 Game Balance in Roguelikes

As discussed in the previous chapters, roguelikes are based on repetition, replayability and variety. Emphasis on player skill and learning the game mechanics provides the intrinsic motivation to play the game. Randomness plays a large role in providing this variety and making each run feel different. However, randomness also causes uncertainty, which can affect the difficulty and fairness by making things inconsistent. Many action roguelikes use similar strategies for balancing out these inconsistencies introduced by randomness.

A common way to guarantee a degree of fairness in action roguelikes is to mix some handcrafted elements with purely randomly generated content. This introduces more consistency and ensures certain key elements are always present, regardless of random generation. For example, many games of the genre have fixed boss fights, that the player always encounter at specific times. This helps balance out the difficulty curve by introducing more the powerful boss fights at fixed intervals, making sure that they don't appear too early or too late. It also emphasizes the learning and mastery of the game, as the player can learn when these boss fights occur and be better prepared during later runs.

Adaptive difficulty is one way to approach balancing in games but is rarely used in roguelike games. With adaptive difficulty, the game dynamically adjusts the difficulty based on player's performance. For example, if the player is low on health, the game might spawn more health items, or less enemies. Helping a player who's doing poorly is quite opposite to the idea of repetition and mastering the game mechanics, which most roguelikes are built around. However, instead of adaptive difficulty, many roguelikes offer additional challenges instead for those players who find the game too easy otherwise. Hades (Supergiant Games, 2020) for example has the Pact of Punishment system (picture 7), which allows the player to choose various extra challenges, or heat, for their run, in order to gain more meta-progression rewards. Tiny Rogues (RubyDev, 2022) also has a similar Cinder system (picture 8), which increases the amount of meta-currency gained. Not only does this kind of additional challenge system help balancing the

difficulty, but it also provides more variety, as these conditions directly affect the gameplay.

PICTURE 7. The player has chosen various extra challenges to fill up the heat gauge in Hades.

PICTURE 8. The player has chosen 10 extra challenges to increase their experience gain.

5.2 Level Generation

Randomly generating levels is an important feature of roguelikes, which adds to variety and replayability. It is considered input randomness, as the generated level is presented to the player as an input. There are some roguelike-specific considerations when generating balanced levels.

Most importantly, generated levels should always be winnable since the stakes are high and the player only has one chance to beat the level. It is especially important to make sure there is a path from the beginning of the level to the end, so that level is solvable, and the player doesn't get stuck. The algorithm should be designed in a way that it doesn't produce levels that are unsolvable, or if it does, they should be discarded and regenerated until a solvable level is generated. If the generated level is unsolvable, the game is no longer fair, as the player is unable to beat the game, no matter their skill level.

Generated levels should also be balanced in difficulty, by being consistently challenging. If the level generator creates levels that are wildly inconsistent in their difficulty, player skill and mastering the game mechanics becomes less relevant, and luck starts playing a larger role. If the generated levels are too easy, the need for improvement is lost, and the game becomes boring. If they are too difficult, the game could feel unfair, causing frustration.

Many action roguelikes use manually designed pieces and stitch them randomly together to form levels. This way the level designers have more control over the levels, while still retaining some randomness and variety. If the pieces are well designed, the difficulty is easier to balance, and the levels are always winnable.

In Risk of Rain (Hopoo Games, 2013) and Risk of Rain 2 (Hopoo Games, 2020), the levels are pre-made by a level designer, with only some changing set pieces and loot locations. This means that the level designer could carefully design the levels, and the levels are guaranteed to be well balanced. On the other hand, there are only a dozen of these manually designed levels, meaning less variety.

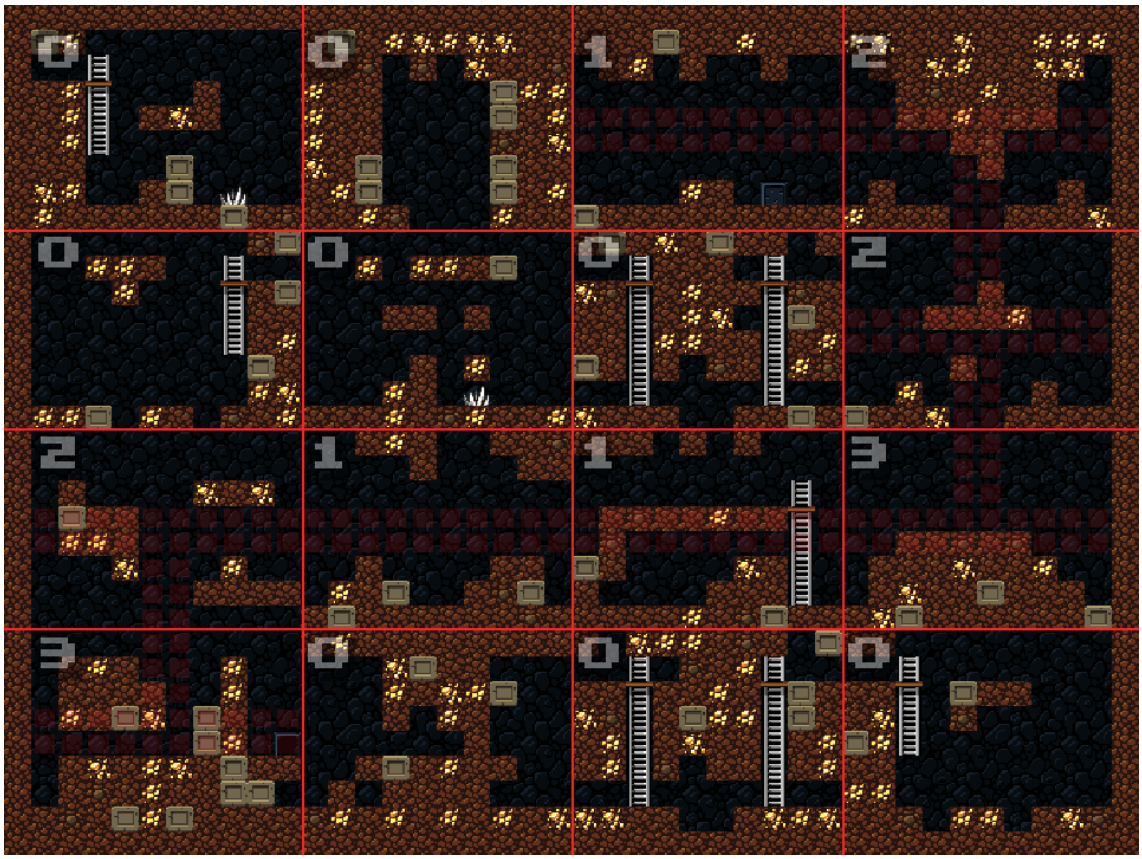
In Hades, the levels consist of a linear series of consecutive small, manually designed rooms. Normally each rooms contains a fight, with randomized enemy spawns, and the player is only able to move to the next room after all the enemies have been defeated. This way, the rooms can be carefully designed with a lot of intricate detail, but variety is also provided by chaining together random combinations of rooms and having randomized enemies inside these rooms.

In Enter the Gungeon (Dodge Roll, 2016), the levels consist of multiple randomly selected rooms with battles (picture 9), but unlike in Hades, they are not linear but have a more complex layout. The player can move back and forth between room, after the room has been cleared of enemies. This allows each individual room to be manually designed, but the nonlinear design gives the player more space for exploration and discovery.

PICTURE 9. A map in Enter the Gungeon consists of interconnected rooms. (Official Enter the Gungeon Wiki, n.d.)

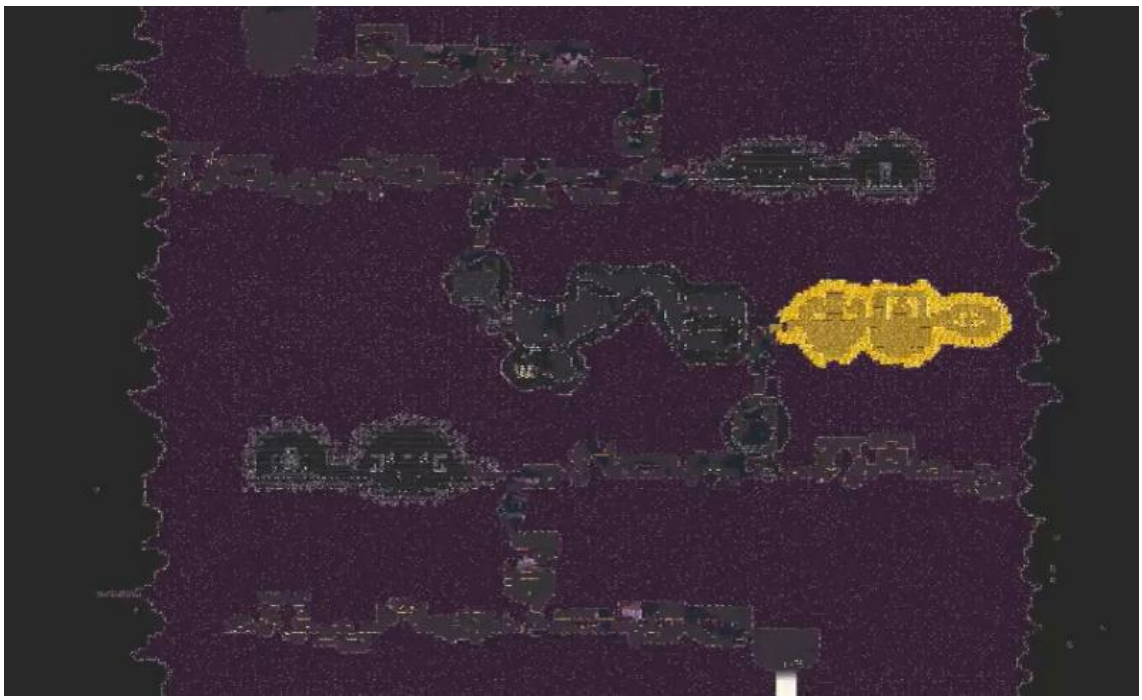
Spelunky (Mossmouth, 2013) generates its levels by stitching together a grid of multiple uniform sized rooms, forming one continuous level, as shown in picture 10. The player can seamlessly move between these rooms, which gives more space for the fast-paced movement and combat. Some elements can randomly

spawn at specified locations within these rooms, such as enemies and traps. This approach gives even more variety, while still retaining most benefits and control of having manually designed rooms. In Spelunky, the layout is always a grid, which weakens the exploration aspect of the level.



PICTURE 10. A level in Spelunky consists of a grid of randomly picked rooms.

In Ants Took My Eyeball, the decision was made to have a system that combines the nonlinear, complex map generation of Enter the Gungeon with Spelunky's seamless levels. Each level is generated from multiple manually designed room templates, which are stitched together to form a complex dungeon shape, shown in picture 11. These rooms are different shapes and sizes, and they have varying appearance rates, meaning some of them are more common than others. This way the rooms could be manually designed, yet they could be chained together in a varied way to form complex and unpredictable results, which gives the result a more organic feel. There are some rooms that have very low weights, meaning they are much less likely to appear. This rarity makes them more interesting for the player when they do finally appear.

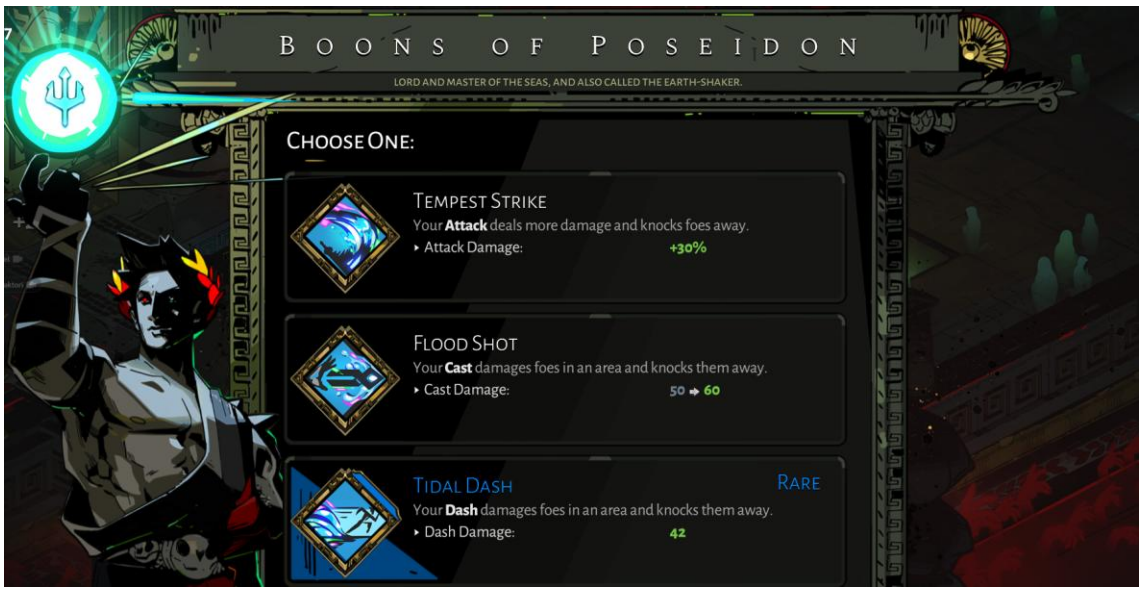


PICTURE 11. A level generated in Ants Took My Eyeball.

5.3 Choice in Abilities

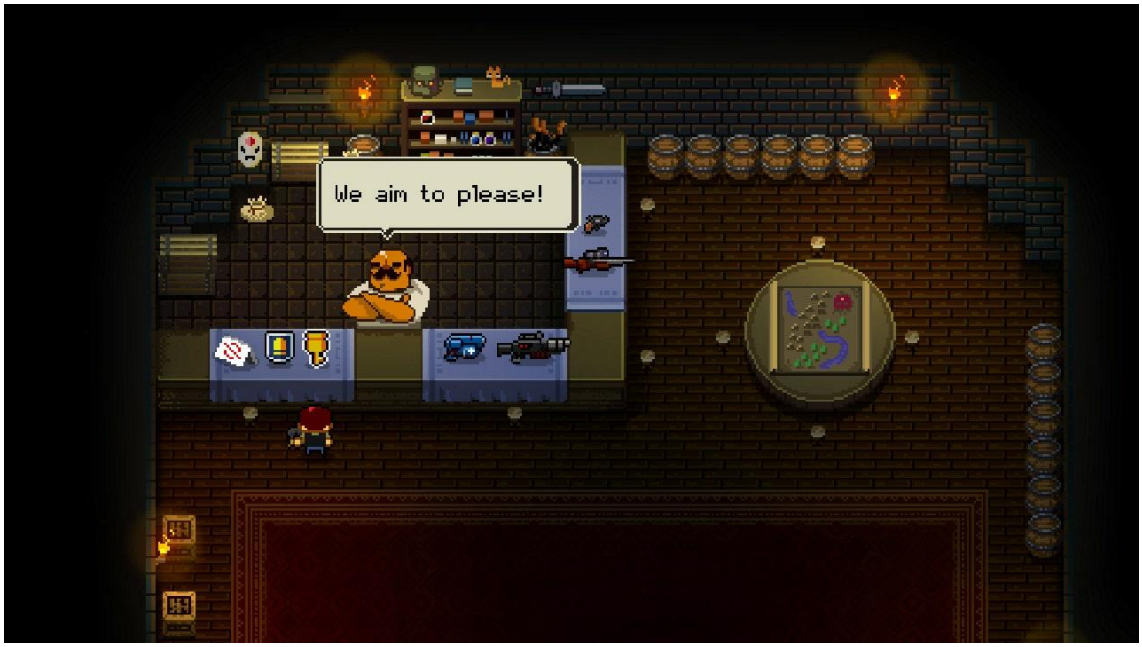
A common way to balance out the fairness with randomly given abilities, and to give player more agency over their build and synergies, is to give them multiple choices. For example, when the player is rewarded with an ability, many roguelikes let them pick from a couple of randomly selected options instead of just giving them an ability at random. This turns the output randomness of giving the player random loot, into input randomness, where the player gets to make a choice of random selection of loot.

Since the decision should always be meaningful, the options provided should be somewhat equally viable. If one of the options is considerably stronger than the others, it can make the other choices redundant, and the decision-making trivial. Ability synergies however make this more complicated, since different synergies can change which abilities the player finds useful at a specific time. This means that not all loot has to be always equally viable, but instead some choices can be situational. For example, whenever the player gets a new boon in Hades, they are given the option to pick from three boons (picture 12). All these boons are offered by the same god, and thus somewhat comparable, and ultimately the decision is often based on which synergies they contribute to.



PICTURE 12. Hades lets the player choose one of three options.

Some action roguelikes also have shops, where the player may spend in-game currency to buy abilities from a randomly generated selection. For example, in Enter the Gungeon, the player encounters shops, as shown in picture 13, where they can buy items with money they have gathered during the run. What the shop offers is decided at random, but the player has the choice of which items to buy and can even decide not to buy anything and instead save their money.



PICTURE 13. A shop in Enter the Gungeon offers various items for the player to choose from (Playstation, n.d.).

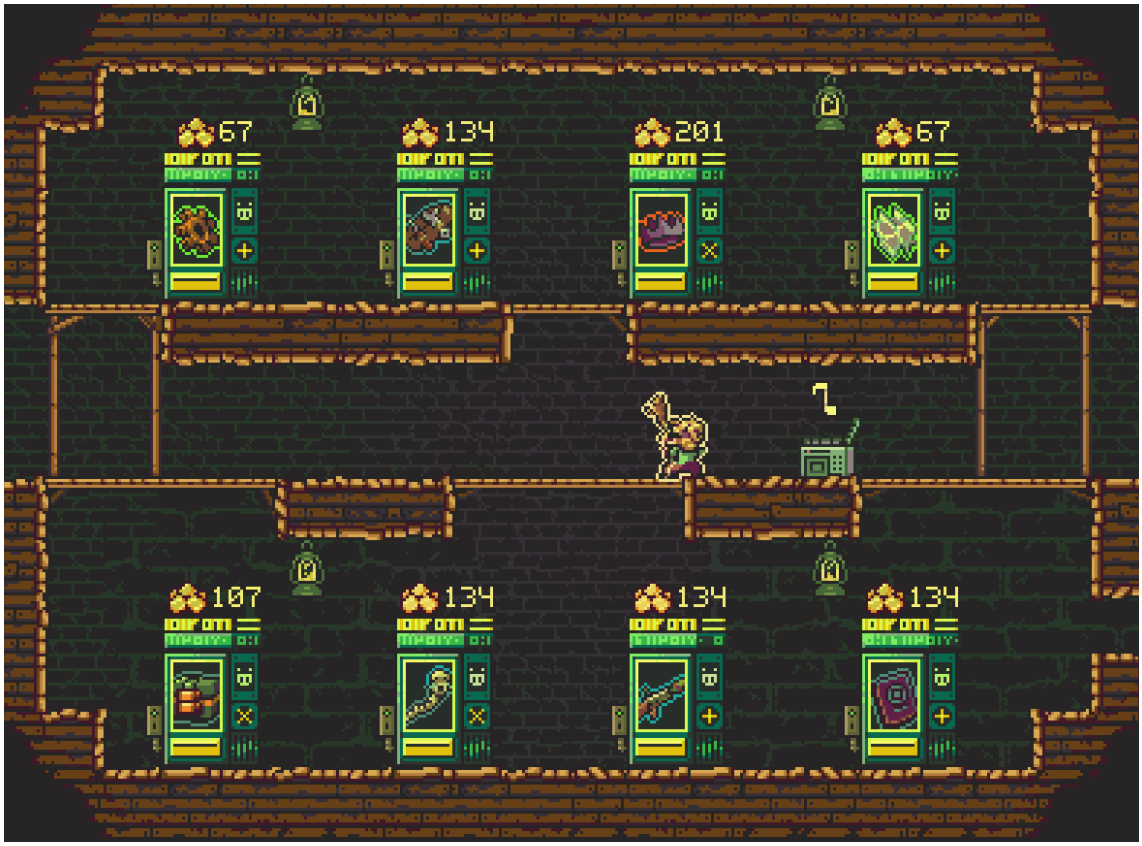
One problem with giving the player more choice in which abilities they pick is that they will have access to a larger portion of the ability pool, making any dominant synergies easier to find. If the player can consistently find these dominant synergies, that makes the other synergies redundant, reducing meaningful decisions. To counter this problem, the game needs to have a large enough pool of abilities, so that consistently finding the specific abilities for these synergies becomes unlikely. This way even if these powerful synergies exist, the player is encouraged to build synergies based on the abilities they manage to find.

Another way to control the randomness is probability weighting. By giving some abilities higher chance to appear than others, the designers can control the frequency of their appearance. Many action roguelike games have a rarity system to categorize abilities into groups of different power levels. Weaker abilities are more commonly found and often more basic in their functionality, while rare abilities are more powerful and exciting.

In Ants Took My Eyeball, the team wanted to have a combination of all these features. While the player is sometimes given items purely randomly, there are also many occasions where the player gets to pick one out of three items. For example, when the player sacrifices enough items at an altar, they are rewarded with a selection of three items, form which they can pick one (picture 14).

PICTURE 14. The player can pick one of the three options.

In addition, shops spawn between levels, where the player may spend gold, the game's currency, to purchase items from a random selection of items (picture 15). The selection is always guaranteed to have items of different categories and price points, providing variety consistently. This makes sure that the player has meaningful decisions to make.



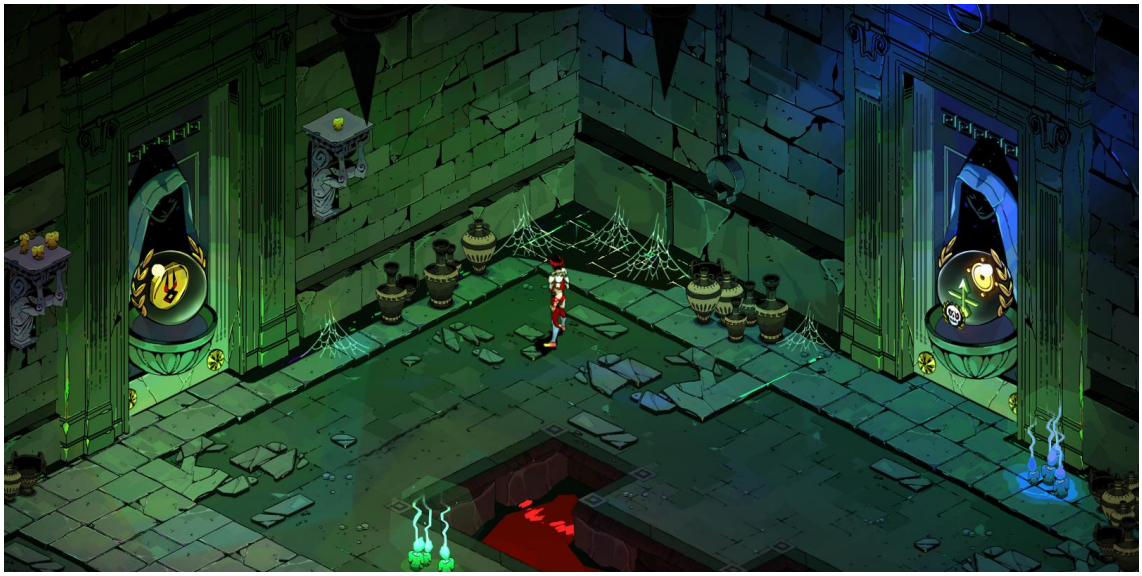
PICTURE 15. The shop in Ants Took My Eyeball always has eight items to choose from.

5.4 Alternate Paths

In some roguelikes, the player is given the choice to pick their path from multiple options. This increases player agency as the player can choose which way to go depending on what kind of rewards and challenges they are likely to encounter. This also supports learning, as the player can become more knowledgeable about the consequences of picking specific paths by playing the game.

Hades lets the player pick from multiple paths after each room. This selection only gives a little information about the next room, the main thing being the type of reward the player can expect to find. More difficult rooms are marked with a

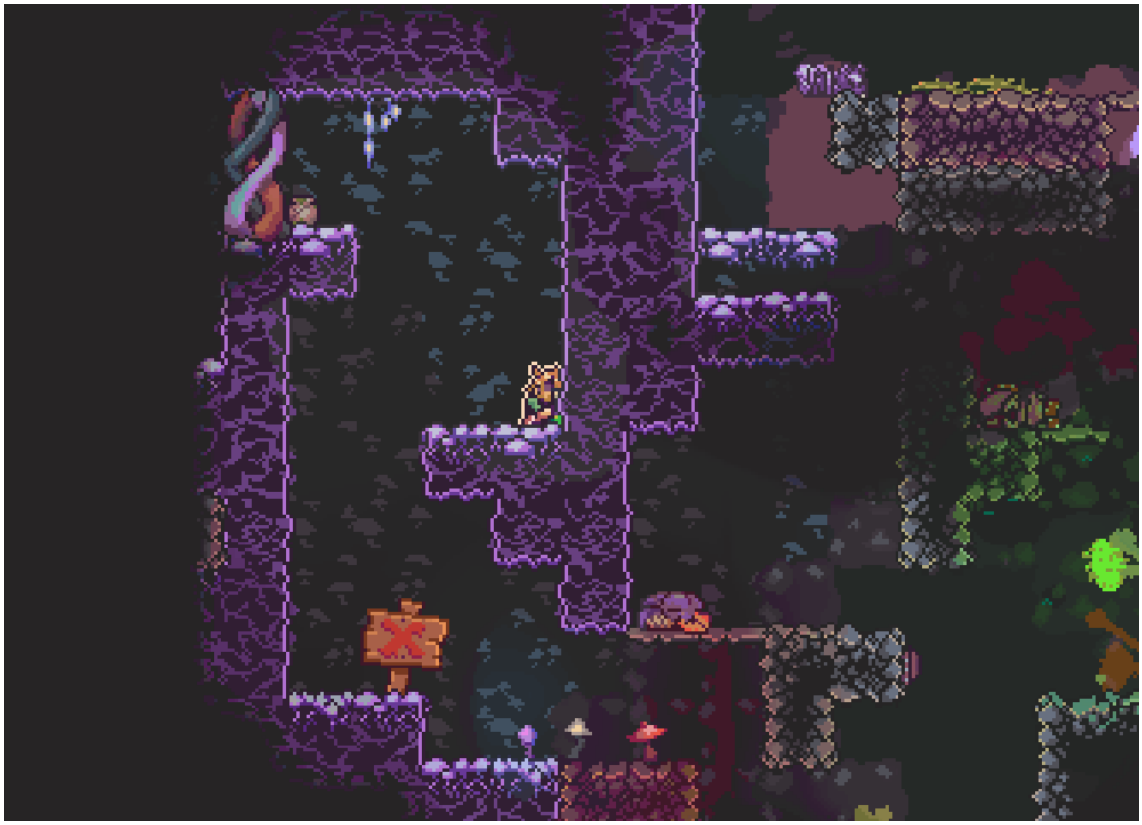
skull (picture 16), to inform the player about the added challenge, but also increased reward. This way the player can make the decision based on their performance and current build. For example, they can decide to go for a specific type of reward that is the most likely to complement their build, or they can decide to avoid a difficult room if they are low on health.



PICTURE 16. The player is given the choice between money or a more challenging fight with extra rewards.

Risk of Rain on the other hand randomly selects the path for player and sends them to the next level without involving any player decisions. While this method adds variety by having multiple different paths, it lacks any player agency. The benefit of this fully randomized method is that it forces variety, as there are only a few level variants, and if given the choice, the player might always pick a specific level.

In Ants Took My Eyeball, the player must always go through the same level structure in the same order. However, at each level there are optional side paths, with varying biomes and enemies. Some side paths are more difficult than others, like the mushroom side path shown in picture 17, but also the reward at the end is of higher quality than on an easier side path. This gives the player the option to find more powerful abilities, but on the other hand risks taking heavy damage. A player with higher skill is more likely to be able to go through multiple side paths without dying. Being knowledgeable about these different side paths can be very helpful



PICTURE 17. The entrance to the difficult mushroom side path in Ants Took My Eyeball is completely optional.

5.5 Player Agency and Skill

In action roguelike design, player skill should always ultimately decide the outcome. A skilled player should be able to win, even if they have been unlucky with all the previously mention aspects. Giving more freedom to the player helps balance out potential unfairness caused by randomness. Action roguelikes are often highly skill-based, emphasizing player skill, and rewarding for mastering the mechanics. Thus, the player already has a lot of freedom when it comes to their ability to move and fight, which allows player skill to counter some unfairness that can result from randomness. However, in many action roguelikes, there are additional ways for players to make decisions, which can help them overcome the potential unfairness of randomness.

Spelunky for example gives the player ropes and bombs that can be used traverse the procedurally generated level. If the player falls into a pit for example, they can climb out using a rope or blow out a wall with a bomb. These resources

are limited though, so the player must consider carefully when to use them. In addition to ropes and bombs, there are many other items the player can find, which help navigate the levels. In Hades, dashing makes the player briefly invincible, giving a skilled player a powerful tool for avoiding damage if they can time the dash perfectly.

In Ants Took My Eyeball, the team decided to give the player a freedom of movement. The player can double jump mid-air, dash in any direction, hang onto wall and wall jump without limits. This way a skilled player can always reach any place, dodge any incoming hazards, and theoretically beat the game without taking any damage. However, completely avoiding all damage is extremely difficult, and the player often has to rely on finding powerful item synergies to perform well in the game.

5.6 Reception of Randomness in Ants Took My Eyeball

During the development of Ants Took My Eyeball, the team performed multiple playtesting sessions, and the randomness was balanced according to the feedback. For example, the randomly generated levels were criticized for being too long, and this was balanced by having less rooms per generated level.

Since its release in April 2024, the game has been well liked by the users. After a year, the game had received 209 Steam reviews, 92% of which were positive, and the rest negative. While most of these reviews are short and do not go into much detail, some of them have commented on the randomness and the elements related to it.

The randomly generated levels have been perceived as enjoyable and fitting for the anthill theme. One user describes the randomly generated levels as well-designed, providing consistency with some persistent key elements (appendix 1). Another user enjoyed the exploration and secrets aspects of the levels (appendix 2).

The item choices and synergies have also been well received. One user said that there is a wide variety of builds, which keeps the gameplay interesting (appendix 1). Another user commented how they liked how much agency there is over the builds (appendix 6). One the other hand, quite many users have felt that there's not enough variety (appendix 3, appendix 5, appendix 7, appendix 8). Users have also reported that they feel that randomness of items has too much impact on their chances of winning (appendix 4).

While the feedback has been very positive overall and many elements have been well-liked by the users, the biggest criticism has been centred around the lack of variety and replayability. This issue can be solved by adding more content such as new items and areas for the players to encounter, thus making runs feel more different from each other. Based on this feedback, the development team has been adding new items to the game after the launch.

6 DISCUSSION

In roguelike games, randomness enhances the gameplay experience by providing unique experiences and variety each run. With randomly generated levels, each run is different, and the player cannot memorize the level layouts. Instead of memorizing exact layouts, the player must gain knowledge of the game mechanics and improve their skill to be able to progress. If done badly, randomness can negatively impact player experience by creating inconsistent difficulty and reducing replayability. This is especially true because of how the permadeath mechanic increases the stakes and prevents the player from immediately trying a new approach after they fail. Being able to learn the game is an important aspect of the genre, and inconsistent randomness can leave the player confused, not understanding the consequences of their actions.

Providing players with choices that influence the outcome of random events can increase their perceived agency and reduce potential frustration caused by randomness. By relying more on input randomness than output randomness, the player has a fair chance to react to whatever the randomization throws at them. Having a wide selection of abilities available, the player has to make meaningful decisions and adapt to whatever they can find to build synergies.

In developing Ants Took My Eyeball, the team applied these principles to balance randomness and player experience. The way the random level generation was designed ensures that generated levels feel organic, while letting us design each individual room with care and detail. This way the end result is rather consistent but feels different each time. Additionally, the team incorporated many chances for meaningful decisions where players can choose between different paths and upgrades, enhancing their agency and allowing them to build synergies. Player skill plays a large role, and the player always has a fair chance to win the game.

While Ants Took My Eyeball has been generally well-received, it has also been criticised for the lack of variety and replayability. Based on this feedback, the development team has been adding more items after the initial. In the future, adding other types content such as new areas, enemies and secrets could further increase variety, though their effect on meaningful choice and synergies has to

be balanced by making sure no old content is rendered redundant with the addition of new content.

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APPENDICES

Appendix 1. Steam review by the user Bloodmoss.
Bloodmoss. Positive review on Steam. Retrieved 6.5.2025. https://steamcommunity.com/id/bmoss/recommended/1627890/

“I really enjoy this game! It's one of the better roguelites out there. The combat feels excellent, offering various strategies for different situations. The randomly generated levels are well-designed, with certain key elements remaining consistent, which adds a sense of familiarity. The game ramps up in difficulty quickly, which I find enjoyable, it really provides a good challenge. There's a wide variety of builds you can create, keeping the gameplay interesting.

If I were to compare it to something, I'd say it feels like a combination of Dead Cells and Vagante. It has Vagante's visual scale with Dead Cells build diversity and item mechanics, which works very well. The music is also fantastic.

It works perfectly with Steam Deck as well, although I couldn't find any cloud sync feature. As a result, progression on Steam Deck and PC is separate. Hopefully, cloud sync will be added later. EDIT: There is a cloud sync now! :)

I can highly recommend this game if you like action roguelites.”

Appendix 2. Steam review by the user Harlack.

Harlack. Positive review on Steam. Retrieved 6.5.2025. https://steamcommunity.com/id/harlack/recommended/1627890/

“Tight controls, stacking power ups, and enough exploration and secrets to keep you coming back.
Playing “Ants Took my Eyeball” now, feels like when I first played “Spelunky” or “Binding of Isaac” back in the 2010s.

It’s arcade-y so it’s fast and frenetic with power ups that make runs unique. But it’s also does a great job of slowing you down, enemies can really mess you up and you’ll want to dig into every corner for secrets.
If you like a game that makes you say:
“What’s this??? Oh ♥♥♥♥ oh ♥♥♥♥ oh ♥♥♥♥!!!!l” then Ants Took My Eyeball is for you.”

Appendix 3. Steam review by the user Ted Bunny.
https://steamcommunity.com/profiles/76561198451223232/recommended/1627890/

“Finally, someone nailed the roguelite metroidvania.

+ It's fun and un-frustrating to control the character. Ranged and close combat feel nearly flawless. Platforming feels a little bit clunky to me, but only because it reminds me so much of Nikujin, an old favorite. But generally, most mistakes feel like actual mistakes rather than fumbling with a game that doesn't feel right.

+ Audiovisual experience is very satisfying. Gunplay mechanics and general aesthetic remind me of Metal Slug, but not in a copycat way.

- Variety is pretty low for a roguelite. I am sure I haven't seen or unlocked everything, but I feel like I have. The various weapons all feel pretty unique though, so I appreciate that the lack of variety is probably due to the amount of care they took getting each one right.

- Once you have the tier 1 upgrade of all the home base assets, progression slows down greatly. The next tiers require several runs to earn, at least if you are good at dying like me.

*- Starting a new run is slow. You have to run through the tutorial level and pick up your base equipment. It takes less than a minute, so it's only *relatively* annoying. Quickstart option is par.*

- On a related note, no way to start at a later level yet. It's not unfair to have to start each run from the beginning, but replaying level 1 can feel pretty monotonous.

- I've only unlocked one of three doors but it looks like there will only be three run mutators. Hopefully I'm wrong, because that's not much variety for this genre.”

Appendix 4. Steam review by the user nicholasimon.
https://steamcommunity.com/id/unklnik/recommended/1627890/

“It is good and definitely worth playing if you like roguelike games and there are not a lot of good roguelike platformers around as well. Lots to unlock and items stack and can be upgraded which is great. It is pretty difficult, more especially the later levels. I haven't finished it and don't think I will, there is one big problem with the game IMO, the length of time to complete a run can be very, very long. Not sure how long an entire playthrough is from start to finish though I would imagine it could take more than an hour easily. The 2nd issue is the randomness (RNG) of the game, runs are very dependant on the roll of the dice and if you get rolled bad items/weapons you might as well restart and try again as the difficulty later on means you are really going to need good equipment to have any real chance. That said, if you are into more hardcore roguelikes with a higher difficulty level then this is definitely one to play. Not easy and definitely not short so if you are looking for a casual game for a few minutes in the evening might not be the right choice.”

Appendix 5. Steam review by the user LeMal.
https://steamcommunity.com/id/LeMal/recommended/1627890/

“I like it a lot, but it's also not perfect. Some of the details are AMAZING. It's smooth, reactive, feels fair in most cases.

What feels a little ... eh.... is the variety at time. It's sort of a limited roguelite with a great difficulty spike. But ... Noita is almost better in all other ways :P”

Appendix 6. Steam review by the user squeeb.
https://steamcommunity.com/profiles/76561198310191557/recommended/1627890/

“one of my favorite things in rogues is when it feels like you have agency over your runs. RNG is fun but i do really like having things that can manipulate the RNG allowing me to actually make builds instead of having to stumble across a build.

this game does that perfectly. it kinda feels like vagante with risk of rain loot and pacing. really fun!!”

Appendix 7. Steam review by the user MrJBeetle.
https://steamcommunity.com/id/jbeetle/recommended/1627890/

“It feels like it gets repetitive quickly, even for a roguelike. This isn't a hard dislike, but if I had to choose, I'd pass.”

Appendix 8. Steam review by the user Game Knight.
https://steamcommunity.com/id/gameknight420/recommended/1627890/

“It's okay, but it's pretty boring and repetitive really quickly, which is a bad sign for any Roguelike.”