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**An analysis of achievement completion rate of open world role-playing games through a new taxonomic method**

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## **Abstract**

Previous research has studied game achievement with focus on their forming elements, the taxonomic method based on design perspective, studying the relationship between their completion rate with factors including their name and average play time. This research focuses on creating a new taxonomic method on game achievements based on how they get triggered and using it to study the relationship between their completion rate and other factors with the help of data analysis. The result shows that game achievements reflect good intra-group consistency and inter-group differences after classification. And the analysis on their completion rate reveals that game achievement completion rates are correlated with game companies, platforms, their triggers, and player preferences.

**Key words:** game achievement, completion rate, ORPG, taxonomy, data analysis, platforms, game company

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# 1 Introduction

Research on game achievement falls into two main categories. One is to analyze the characteristics of game achievements from the designer's point of view, including the elements of game achievements and the detailed classification of game achievements (Jakobsson, 2019; Juho & Veikko, 2011).

There are other options - what about structural analysis of the games, or connecting to previous research on achievement types and typologies? For example, analysis of global completion rates has become an approach to study game achievements in past few years (Haewoon, 2022; Eric & Kazunori, 2019; Sofiiia & Joseph, 2019). The global completion rates of game achievements allow researchers to obtain average completion rates for some in-game objectives of many players.

Both attempts are very helpful for a lot of further research like studying player behavior and improving the design of game achievement systems, but there are some obstacles when combining these two attempts. The achievement design of any two given games may be very different, and it is also difficult to obtain player data outside of what specific game companies provide. Despite these complexities, the analysis of achievement completion rates and game achievement design theory have the potential to complement each other. The achievement completion rate provided by those platforms based on many player data could be used as a verification of the achievement design theory (Juho & Veikko, 2011), for example how trigger actions of achievement influence players' behavior. At the same time, achievement design theory can also guide researchers to classify game achievements and help them better analyze the data.

This thesis is an attempt to realize the analytic potential of combining these two approaches of constructing an in-depth taxonomy of game achievements and obtaining insights by analyzing game achievements completion rates under the taxonomy created in this thesis. To do so, this paper begins by designating 4 open world games as the study objects: (1) *Assassin's Creed Odyssey (ACOD)*. (2) *Assassin's Creed Origins (ACOR)*. (3) *Cyberpunk 2077 (2077)*. (4) *The Witcher 3: Wild Hunt (TW3)*. Then, a taxonomy for categorizing these games' achievements will be built based on three regarded factors, which are playthrough experience, trigger actions, and required abilities. Then, to validate the proposed taxonomy, the global completion rates from two platforms *Steam* and *PSN* will be studied to verify whether there is statistical similarity between achievements in same groups. This paper will also analyze those achievements based on the taxonomy to compare the distribution features with three methods, including normal distribution test, Pearson correlation coefficient and IQR analysis. By doing so, the differences between achievements from different games through the lens of game achievement design and the relationship between these differences will be studied. Finally, it will discuss the results of the analysis and its limitations.

## 1.1 Problem statement

The problem this thesis is trying to solve is concerned with taxonomy and data analysis of game achievements. As an achievement completist (Players who will not feel that they have finished a game before they have collected everything in the game including all the achievements. [Jakobsson M, 2009]), I as the researcher started to realize that many achievements are very similar in design in the process of collecting them. Based on some theories of game achievement design that defined what achievement is (Juho & Veikko, 2011; Lucas, 2006), a more detailed attempt to classify game achievements becomes possible. At the same time, the public achievement completion rates on *Steam*

and *PSNprofiles* give researchers including me an opportunity to obtain data about many players outside of the game company. The combination of the two may lead to a more nuanced analysis of game achievements and the design ideas behind them. Such an attempt is helpful for possible future research on player behavior and the proposal of a new game achievement design methodology.

Based on the above reasons, this thesis proposes the following aim and research question:

Aim: To develop a taxonomy that classify achievements in open world role-playing games.

Question: What characteristics will the completion rate of game achievements under this taxonomy present?

## **1.2 The Context**

There is not a clear theoretical framework that is suitable for the research. This research will combine the attempt of previous studies (Sofia & Joseph, 2019; Chia-Yen, 2017) and some aspects of game design to form the achievements taxonomic standard. The hypothesis of this study is based on Reciprocal determinism from Albert Bandura's social learning theory (Bandura & Albert, 1977). The basic assumption of the theory is that the interrelationship and effect of environment, individual and behavior is a process of mutual determination. Individuals are neither passive responders who is completely controlled by the environment, nor a completely free entity who can do whatever they want. The individual and the environment are mutually determined. In the case of games, the environment is replaced by the content of the game, including the design of in-game mechanics and dynamics. Individuals refer to players.

The theory suggests that there would be an interaction between the content of the game, players, and player behavior which could be presented by the completion rates of different achievements. Based on this hypothesis, this study assume that different achievement designs will affect player behavior, which would be presented by the completion rate of related achievements. And players' characteristic will also influence the completion rate of some game achievements even they have similar designs.

## **1.3 The Methods**

To verify the interactive relationship between game content, players and player behavior, this research needs to obtain relevant data and analyze it. The result will be obtained by analyzing the achievements completion rates of different games on two platforms. These results will then be analyzed by Pearson correlation coefficient and IQR analysis.

For game content, this thesis will select several open world games as its research objects. Because these titles all share a genre with a particular set of conventional gameplay features, they have roughly the same game content but of course differ in specific mechanics and story settings. This thesis will determine the similarities and differences of the players through the selection of publishers and platform. For player behavior, this thesis will use the completion rate of in-game achievements as data. These achievements will be categorized by the trigger action to reflect player actions.

This research will start by categorizing game achievements. The criteria for this taxonomy were refined from relevant literature studies. After completing the formulation of this taxonomy standard, this study will first conduct a normal distribution test on the completion rate data within all achievement groups. There are two reasons for performing a normal distribution test. The first is that the normal distribution test can be used to detect whether the completion rate distribution of different

achievement groups has different data characteristics. Ideally, the completion rates of the same type of achievements in different games should show the same data characteristics, while the completion rates of different types of achievements should show different data characteristics. The second is that the normal distribution test will lay the foundation for subsequent correlation analysis. For the achievement group that conforms to the normal distribution, this study will use the Pearson correlation coefficient analysis. For achievement groups that do not conform to a normal distribution, this study will use IQR analysis.

In general, the whole article will be divided into four parts. The first part is the formulation and verification of game achievement taxonomy standards. The second part conducts normal distribution test on the different groups of achievements. The third part will be the Pearson correlation coefficient analysis and IQR analysis. The fourth part discusses the analysis results and draws conclusions from the perspective of game design.

#### **1.4 The Outcomes**

The importance of this research lies in unearthing the relationship between player behavior and game design. This study will attempt to uncover the link between game achievements completion rates and game design. For other researchers, based on this research, they can further expand the scope of game achievements research and explore a more detailed taxonomy of game achievements that suits more genres of games. For designers, this research can help them understand the information in the game's achievement system. As a player who collects game achievements, this research will have a more accurate judgment on the taxonomy and the trigger conditions of game achievements. This will help people categorize game achievements. At the same time, game designers can analyze the obtained data and draw conclusions from the perspective of game design.

The limitation of this study lies in multiple aspects. First, to avoid having too many misjudgments on the triggering conditions of game achievements which would affect the taxonomy results, I only selected open world role-playing games that I am familiar with for analysis. Secondly, the game achievement taxonomy standard meets great challenges in facing of different genres of games, which also forces me to focus on only one game genre to ensure the universality of the game achievement taxonomy standard. Due to time and energy constraints, I can only select games with a small sample size for research. Finally, the data analysis method I adopted is to conduct distance analysis on the distribution of game achievements completion rates. This method of analysis can only reveal the connection of values in limited aspects.

## **2 Background**

As was mentioned earlier, me as the author of this thesis is an achievement completist. In the process of collecting game achievements, I realized that these achievements have some intrinsic connections. At the same time, I found that some gaming platforms provide the average achievement completion rate of global players. After reviewing some literature, I think it is possible to study achievement completion rates using a multi-layer taxonomy. To help the article to convey the content more accurately, this chapter will first define and explain some key terms.

### **2.1 Definition of terms**

The relevant terms in the following part of this articles will be defined and explained in this chapter.

#### **2.1.1 Game Achievements**

Game achievements first appeared in around 1990, at the time game achievements refer to some bonuses points if player accomplished some side requirements. One of the earliest game that has in game achievements was E-Motion on the Amiga in 1990. It has five achievements called bonuses, like completing a level without rotating to the right.

The achievements involved in this article refers to those who has the following features: (1) Signifier with Name, (2) Visual, (3) Description, (4) Completion Logic with Trigger, (5) Pre-requirements, (6) Conditions and Multiplier, (7) Rewards. (Hamari J & Eranti V, 2011)

#### **2.1.2 Steam**

*Steam* is a digital distribution service platform for video games launched by *Value Corporation*. Players can buy and play games on it, earn achievements, and dress up their profiles.

#### **2.1.3 PlayStation Network Profiles (PSNprofiles)**

*PlayStation Network* is a digital media entertainment service provided by Sony Interactive Entertainment.

#### **2.1.3 Global Completion Rates**

It refers to a function on *Steam* and PSNprofiles that allow players to see the global completion rates of games. It shows the average progress of all the players on achievements unlocking of certain games.

#### **2.1.4 Open World Game**

In video games, an open world is a virtual world in which the player can approach objectives freely, as opposed to a world with more linear and structured gameplay (Booker & Logan, 2008). While games have used open-world designs since the 1980s, the implementation in *Grand Theft Auto III* (2001) set a standard for the concept which has been used since (Muncy & Jake, 2017).

#### **2.1.5 DLC**

Downloadable content, referred to as DLC, also known as additional download content, is a form of digital media distribution through the Internet. Its main function is to add additional expansion content to an already independently released video game, thereby increasing the playable content of the game (Betty & Huaxin, 2016).

### **2.1.6 Ubisoft**

Established in 1986, it is a multinational game publisher, producer, and distributor. In 2008 it was the third largest independent game developer in Europe and the fourth largest independent publisher in North America. This study selected two games developed by them for research.

### **2.1.7 CD Project Red (CDPR)**

CD Project AG is a video game developer, publisher and distributor headquartered in Warsaw, Poland. CD Project Red, the department responsible for developing original games, was established in 2002 and is known for developing the *Witcher* series. This study selected two of their games for research.

## **2.2 Data Source**

### **2.2.1 Steam Store**

This study utilizes achievement data from video games released on both *Steam* and *PlayStation* as the primary source of information to determine achievements completion rates. These two platforms publicly display data on the rarity of each achievement, in the form of the percentage of players who have unlocked it. If an achievement signifies the achievements completion rates of a game's single-player content, then its rarity is an indicator of the rate at which players complete that content. The choice of these two platforms was based on its provision of publicly accessible data, but it is important to note that results may not be the same on other platforms like *XBOX*. Additionally, the game achievement achievements completion rates selected at the time of the study is time-sensitive and only reflects the value at that moment. These values may fluctuate in the future as players continue to play.

### **2.2.2 SteamDB**

*SteamDB* can query all game achievements of games on *Steam*, including some achievements that are displayed and hidden on the *Steam* platform. This research will use *SteamDB* as a reference platform for comparison with the achievements completion rates data obtained on *Steam* and to match the achievements one by one. This can ensure the accuracy of information such as the number, names, and trigger conditions of achievements.

### **2.2.3 PSNprofiles**

As a derivative website of *PSN*, *PSNprofiles* provides a lot of data available for query, includes completion rate for game achievements. Achievement completion rate data from *PSNprofiles* will be used to compare with data from *Steam*. It should be noted that, compared to *Steam's* achievement system, there will be one more achievement on *PSNprofiles* which is to complete all achievements. This study does not include this achievement in the analysis.

## **2.3 Themes and Sub-themes**

### **2.3.1 Play-through Experience**

This thesis discusses the relationship between player experience and achievement completion rates. The research method is to divide the achievements of the game into four categories. The first is to distinguish the main game from the DLC. Because there are fewer players who buy DLC than players who buy the main game. At the same time, some games did not have DLC when they were released, which made the playing time of the main game and DLC separate. After distinguishing

between main game achievements and DLC achievements, this research will classify game achievements that were included in the main game body again. Those achievements will be divided into three categories, namely progression achievements, main achievements, and subordinate achievements. The progression achievements are bound to the chapters of the game plot. It is the only achievement category with an obvious order among the four achievement categories. Main achievements refer to achievements that players can easily unlock through a single playthrough. Subordinate achievements refer to those achievements that require the players to play multiple times or deliberately chase to unlock. The classification of main and subordinate achievements has more subjectivity, based on researcher's own experience and some game playthroughs of the chosen games.

### **2.3.2 Trigger Action**

According to the components of game achievements, this study will explore the relationship between the completion rate of game achievements and the trigger actions. The trigger actions here refer to the physical way of triggering, such as how many operations need to be performed. This research divides the trigger actions into four categories, which are single trigger, multiple same actions, multiple different actions, and multi actions with a progress bar. In the theory, the difficulty of completing achievement with a single trigger action should be relatively low. The achievement of completing the same operation for multiple times may be more favored by collector type of players.

### **2.3.3 Required Abilities**

The triggering conditions of game achievements will test different abilities of players. In this study, the required abilities of achievements are divided into four different types for research. The four categories are: Challenge, Choice, Random and Reward. This allows the study of the relationship between different trigger requirements and completion rates.

### **2.3.4 Platform**

The relationship between different game platforms and game achievement completion rates was also discussed by this study. Different platforms have different achievement system icon designs, additional achievements, different mainstream input methods and different player groups. This study will focus on comparing the impact of different platforms on game completion rates.

### **2.3.5 Game Company**

This study will also explore the relationship between different production companies and game achievement completion rates. Different production companies have different production habits. The game's system and achievement system will also be different.

## **2.4 Complementary Previous Research**

There isn't a widely accepted taxonomy for game achievements. Many studies on players' behaviors and preference have been carried out using the achievements completion rates of game achievements provided by different game platforms but these studies all built their own taxonomies. For statistical or algorithm-based research, their taxonomy was simplified in many aspects to help with later data analyzing (Sofia & Joseph. 2019). For some research based on game design theories, they have more complicated taxonomy but there's no validation on their universality (Lucas, 2004).

Although taxonomies exist in almost every branch of learning, they vary a lot depends on the subject. There is no general method on how to build a taxonomy, nor do they always get fully validated (Daniel et al, 2020). And for the subject, game achievements system is evolving rapidly. For example, game achievements on *PlayStation* only have trophies as their icons, while on *Steam* they have different graphic icons that has more social potential, which adds another dimension for the taxonomy. The question of whether these different would affect the completion rate of game achievements is also a focus of this research.

Game achievements has some common features. A study (Juho & Veikko, 2011) that has a data of over 1000 hours of participant observations of playing 9 games in the *Steam* platform. The finding of the design pattern of achievements: (1) Signifier with Name, (2) Visual, (3) Description, (4) Completion Logic with Trigger, (5) Pre-requirements, (6) Conditions and Multiplier, (7) Rewards.” has been wildly quoted by other works. These features can be seen as a wildly accepted way of defining an achievement. There are also some other ways of disassembling game achievements. For example, adding some extra aspects from game designing (Lucas, 2011).

Then comes the following list of achievement categories is created on background of a thread created on psnprofiles.com (Aabom, H. T. 2014), where the users were asked to come up with all the types of tasks and challenges that they have experienced were requirements for achievements (Aabom, H. T. 2014).

Based on their answers the following 12 achievement categories were defined: (1) Normal play achievements: Achievements that are unlocked by playing the game normally. (2) Difficulty dependent: Achievements that requires the player to play a game on a certain difficulty setting. (3) Choice dependent: Choice dependent achievements. (4) Collectible achievements: Achievements that unlock when the player finds x amount of collectibles. (5) Defeating enemies: Achievements that are unlocked when the player defeat x enemies. (6) Time dependent: Achievements that are unlocked when the player does something within a specific timeframe. (7) Level and upgrades: Achievements that are unlocked when the player gets to a certain experience level or gets a certain upgrade. (8) Perfection achievements: Achievements that requires the player to do something to perfection, i.e., not getting any negative feedback throughout his/her attempt to do the task. (9) Luck dependent: Luck-based achievements require the player to get lucky at something. (10) Negative achievements: Achievements that are unlocked by doing something that is against the game's objective of progression. (11) Challenges and tasks: Challenge and task achievements, this category covers the achievements that have not been mentioned thus far and requires the player to do activities that he/she is unlikely to be doing without the knowledge of the achievement. (12) Multiplayer achievements: Achievements that require the player to play with other players either online or offline.

This gives me another source to look for the taxonomy. But some of them would need more specification, for example, the Challenges and tasks type.

Another [publication](#) (Lukas et al, 2019) mentioned divided games into types of linear, slightly linear, nonlinear games. And they chose linear game as their focus since linear games have a simple and straight-forward gaming structure. Then they divided achievements in linear games into progress achievements and optional achievements. Based on that binary taxonomy, they carried out some findings with the methods Process Mining.

There are also some other sources that this research could study from. The article (Lucas, 2004) provides a more complicated 14 binary aspects of game achievements. The taxonomy of achievements in this article are: (1) Expected vs Unexpected Achievements. (2) Timing of Achievement Delivery (during or after). (3) Incremental and Meta achievements. (4) Performance orientation or learning orientation.

Based on these models, to build a taxonomy that meet both the requirements from game design and data analysis, this study comes up with the following methodology.

### **3 Methodology**

#### **3.1 Positionality**

My positionality in this research is a gamer as well as a game designer. I also had some statistical training. And the main platform I'm going to look at is *Steam*. Because this platform has enough games on it to support my research and the achievements completion rates for game achievements is open for everyone to check. And I also spend most my time playing games on this platform. I'm as well an achievement completist, which means I tried to accomplish game achievements as much as possible while playing. I once worked as an intern at *Ubisoft Chengdu* Studio for half a year and participated in the testing of *Far Cry 6*.

#### **3.2 Reflexivity**

The reflexivity of myself in this research is that I have limited background in data analysis, which means I can't go into data analysis methods. But the depth of my data analysis wouldn't be as professional as other researchers with more capable background. And I assume that, based on my experience as a gamer and a game design student, the game achievements system should have some identifiable patterns that allows researchers to classify them into groups. And behind that group, a clear data evidence could be found. These assumptions are all based on my personal experience. And based on my research limitation and the working plan, my research is not likely to cover a large part of the study area. And since I have only the data that could be collected from outside game companies, the data analysis for this research is very basic. It might reveal more data pattern and statistic logic behind this research if there is more data to be collected more than just average achievements completion rates of game achievements. But there are still a lot of genres of games that I haven't tried, for example sports games and racing games. To avoid misclassifying achievements for games I hadn't tried (guessing their properties based on their names and descriptions of trigger conditions, rather than unlocking them by playing), I chose to abandon this part of the genres to avoid the rigors of research. This makes the absolute coverage of game types inadequate, even though my study attempts to include a wide enough variety of games.

#### **3.3 Taxonomy**

This research will first build a taxonomy that can be applied to the study objects. All the taxonomy building attempt will be guided under the methods of Taxonomic analysis. Taxonomic analysis involves three processes: (1) organizing or grouping similar or related categories into larger categories, (2) identifying differences between sets of subcategories and larger or overarching categories, and (3) representing the relationships among the categories and subcategories (Denzin & Lincoln, 2008).

The games that this research would like to take as the study object are: (1) *Assassin's Creed Odyssey*. (2) *Assassin's Creed Origins*. (3) *Cyberpunk 2077*. (4) *The Witcher 3: Wild Hunt*. The reason of picking these games is because they are all open-world games but slightly different from each other in the aspects of developers, story, and mechanics. Also, as a player, I unlocked all the achievements in the above game through my own play, which helps me to have a better understanding while making the taxonomy.

The taxonomy created in this research has three different layers. These layers are independent and do not affect each other.

### **3.3.1 Player experience**

The first layer is player experience layer with four different categories: (1) Progression achievements: For games with a main storyline, progression achievements are achievement that records the completion of main story chapters. They are sequential compared to other achievements. (2) Main achievements: For open world games, from starting a new game until finishing the game (unlocking the credits), main achievements refer to those achievements that players must or have very high probability to unlock. For example, in a shooting game, this thesis believes that killing a small number of enemies with firearms is considered an achievement with a very high probability of being unlocked. Unless players deliberately avoid it. (3) Subordinate achievements: Subordinate achievements are achievements that require multiple playthroughs or special attention to complete. They include some side quests that don't affect the completion of the level, or some challenging and random achievements. (4) DLC achievements: DLC achievements refer to those achievements that are not included in the game body but related to the DLC content. In general, DLCs in open-world games are series of large-scale side missions.

### **3.3.2 Trigger action**

The second layer is trigger action layer with four different categories. We first define that the action here refers to some very simple operations. Such as walking, jumping, attacking, digging, putting on gear and so on. Defeating an enemy is considered as a sequence of actions involving movement, attack, and decision-making: (1) Single action (Single): The trigger requirement to unlock this achievement only include a single action. (2) Multi-actions with similar tasks for multiple times (Mws): The trigger requirement to unlock this achievement is doing the same action for multiple times. (3) Multi-actions with different tasks combined (Mwd, multi different actions): The trigger requirement to unlock this achievement is doing series of different actions. (4) Multi-actions with progression bar (Mwp): The trigger requirement to unlock this achievement is to complete a series of tasks to fill a progress bar. Such as experience bar.

### **3.3.3 Required abilities**

The third layer is about trigger requirement. Different trigger actions are based on different requirements. Here this thesis states four different requirements to complete the action. (1) Challenge based: Challenge based requirements mean that the player needs to meet some technical requirements to complete the action. These technical requirements include but are not limited to Timing, Balancing, Precision, Reflexes, Tactical, Strategy, Management, Cleverness. (2) Choice based: A choice-based requirement means that players need to choose one of several different options based on their preferences. Usually there are no technical challenges involved. (3) Random based: A random based requirement means that the action of unlocking the achievement happens randomly within the game. This requirement is basically independent of player actions and choices. (4) Reward based: Reward based requirements relate to rewards that players receive in the game. For example, to obtain some equipment or materials.

## 3.4 Methods

### 3.4.1 Data collecting

This research first collects those achievements of the chosen games, including their name, in-game ID, trigger requirement, and completion rate from *Steam*, *SteamDB*, and *PSNprofiles*. And enter them into an *Excel* table to facilitate subsequent processing.

### 3.4.2 Achievements coding

Based on the taxonomy method mentioned above, this study will classify the collected achievements. The taxonomy result will be expressed as a sheet of codes. This coding method is specifically expressed as (X means undetermined number): (1) Progression achievements: 1 00 00. (2) Main achievements: 2 XX XX. (3) Subordinate achievements: 3 XX XX. (4) DLC achievements: 4 00 00. (5) Single action: X 10 XX. (6) Multi-actions with similar tasks for multiple times: X 21 XX. (7) Multi-actions with different tasks combined: X 22 XX. (8) Multi-actions with progression bar: X 23 XX. (9) Challenge based: X XX 10. (10) Choice based: X XX 20. (11) Random based: X XX 30. (12) Reward based: X XX 40.

For example, an achievement with a coding number of 32110 means it is a subordinate achievement with a trigger requirement of performing a challenge-based action for multiple times.

### 3.4.3 Statistical analysis

After classifying achievements, this study will calculate the Means(M) and interquartile range (IQR) of completion rates in different achievements categories. These two values are mainly used to compare the relationship between the completion rate of game achievements with several factors, including publishers, game mechanics and background settings. They will also be used to compare a part of the relationship with the platform. The analysis on the relationship between platform and achievement completion rate should be studied through the correlation analysis in the next section. However, because more than half of the data obtained in this study does not conform to the normal distribution, the correlation test using the Pearson correlation coefficient cannot be completely credible. Therefore, the correlation result will also be combined with the data analysis in this part to give a comprehensive explanation.

### 3.4.4 Correlation testing

Pearson correlation analysis and IQR analysis on game achievements will be conducted in this research. And because one of the selected analysis methods is the Pearson correlation coefficient, it is necessary to verify whether the data meet the antecedent conditions of normal distribution as the pre-requirements of applying Pearson correlation coefficient to the data sets. The results of the normal distribution test can also tell whether the data are natural and random. Completion rates of different types of achievements and their correlation between the two platforms were tested. This research will first conduct a normal distribution test on the completion rates of those achievements. This step is necessary for subsequent data analysis. In this study, the Shapiro-Wilk Test (Shapiro, 1965) was used to test the normal distribution of the data. The test data table in this article comes from the Real Statistics website. The result of the S-W test will be a P-value (p). It shows how significant this set of data exhibits the characteristics of a normal distribution.

Then This study used the Pearson correlation coefficient (r) for analysis. r is a number between -1 and 1. When r tends to 1 or -1, we consider the two sets of data to be correlated. If r tends to 0 then the two sets of data are irrelevant.

## 4 Results

The entire results section will consist of three parts. The first part analyzes all the achievements of the four games together, presented in means and linear graphics. The second part analyzes the relationship between the game achievement completion rate and the platforms. This part contains normal distribution test, Pearson correlation coefficient analysis and IQR analysis. The third part analyzes the relationship between the completion rate of game achievements and game companies. This section contains mean and range comparisons.

### 4.1 Taxonomy results

A total of 282 achievements from four games were included in this study. Because each achievement was considered on two distinct platforms (*Steam* and *PSN*), there were a total of 564 completion rates to consider. More detailed achievement classification results can be found in the Appendix. This part of the analysis contains Means (M) and the number of achievements in different categories as the main results. More detailed findings on the correlation and comparison of achievement completion rates on the two platforms will be presented in later sections.

#### 4.1.2 Taxonomy results based on playthrough experience

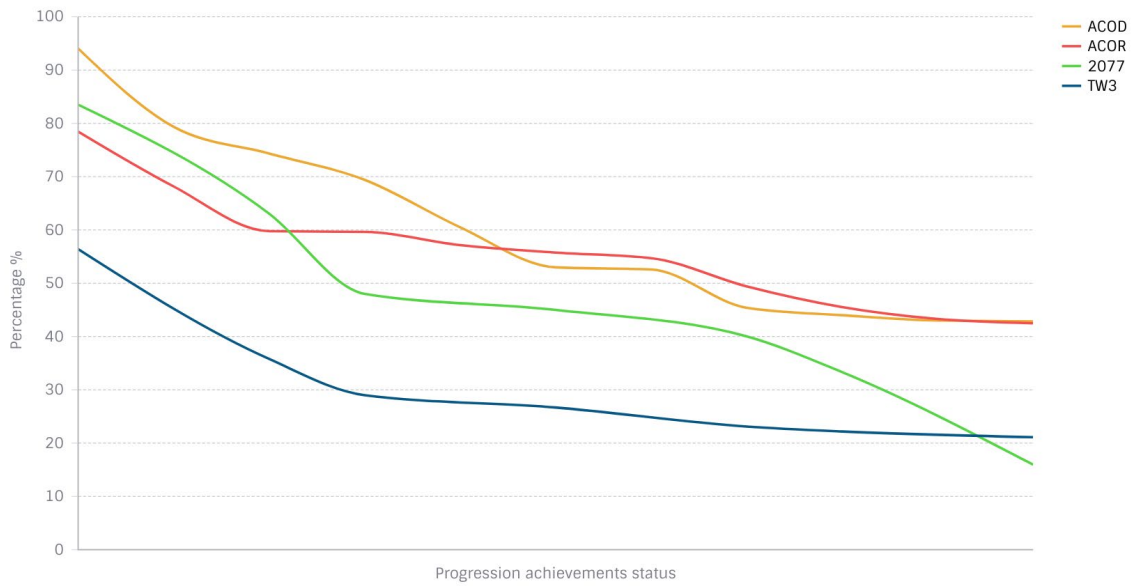
The classification results of these achievements are transformed into the following table (Table 1). Among them, the number of subordinate achievements is the largest, accounting for 37.2% of all achievements. The number of DLC achievements is next, accounting for 30.4%. These two achievements together account for half of the total number of achievements. It should be noted that *Cyberpunk 2077* has no DLC achievements at the time of this research (its first DLC will be released in late 2023).

This study averaged the completion rates of progress achievements on *Steam* and *PSN*. (Fig. 1) Overall, the two games from *Ubisoft* had a higher average completion rate of progression achievements. Both games from *CDPR* have a lower Progression achievement completion rate. Also, *Cyberpunk 2077* has an unusually large drop in completion rate at the end of the game.

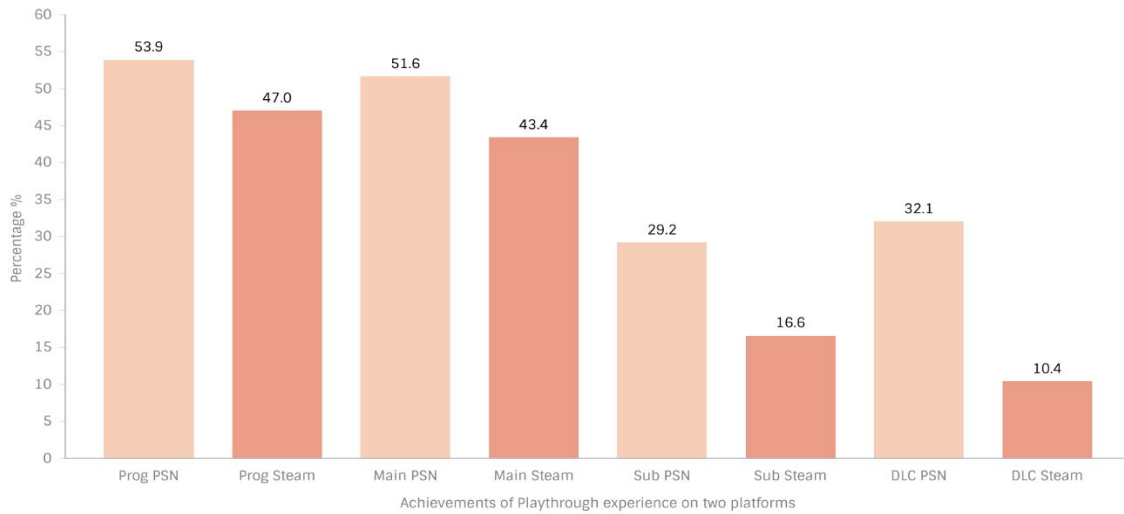
On average, DLC achievements are the most numerous achievements in these games. The average completion rate of this whole category of player experience is consistently below 60%, and the lowest completion rate appears at DLC achievements on *Steam* (Fig. 2). Progression achievements and main achievements have similar averages. The average completion rate of Subordinate achievements is less than them, only about half of the former two. The average completion rate of DLC achievements is similar to that of subordinate achievements, but there is a large difference in the platform variable.

**Table 1. Taxonomy of achievements based on playthrough experience:**

Playthrough experience type	Average number	Total number	Percentage %
Progression achievements	9.75	39	13.8
Main achievements	13	52	18.4
Subordinate achievements	26.25	105	37.2
DLC achievements	28.6	86	30.4



**Fig. 1. Completion rates of progression achievements**



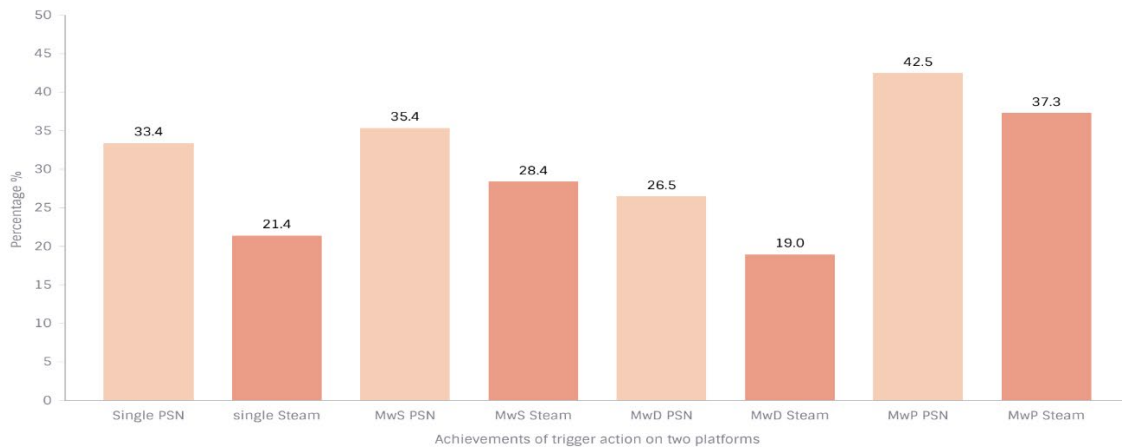
**Fig. 2. Completion rates under playthrough experience taxonomy**

#### 4.1.2 Taxonomy result based on trigger action

In this study, Progression achievements and DLC achievements are not involved in trigger action and required ability classification. A total of 157 achievements participated in the trigger action and required ability categories. They are all Main and Subordinate achievements. The number of achievements under the trigger action category is shown in the table below (Table 2). Among them, multi-actions with different tasks combined is the most, accounting for 67.5%.

**Table 2. Taxonomy of achievements based on trigger action:**

Trigger action type	Total number	Percentage %
Single action	23	14.6
Multi-actions with similar tasks for multiple times	21	13.3
Multi-actions with different tasks combined	106	67.5
Multi-actions with progression bar	7	4.5



**Fig. 3. Completion rates under trigger action taxonomy**

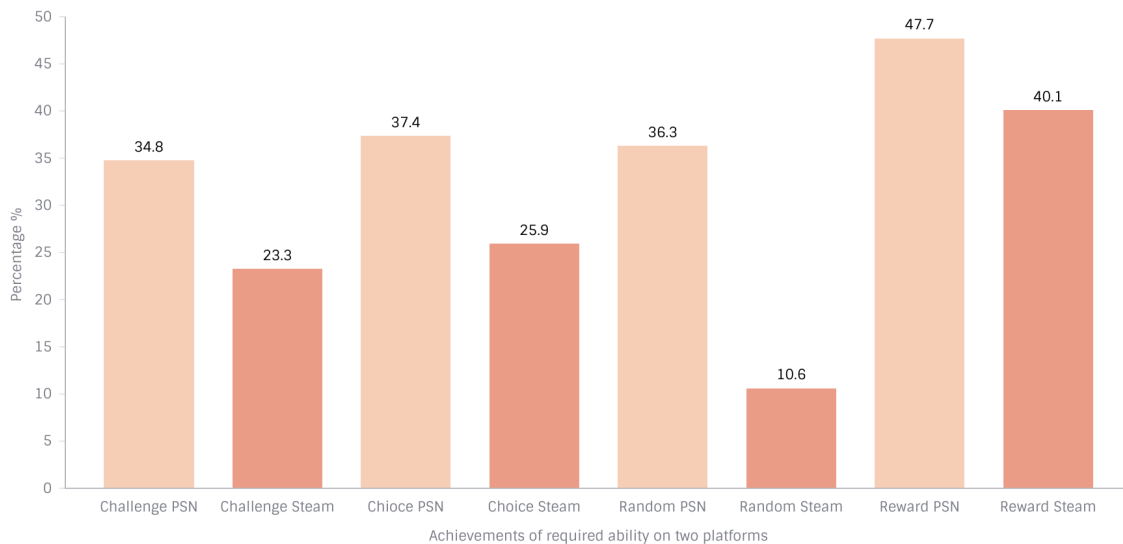
#### 4.1.3 Taxonomy result based on required abilities

As was seen in the trigger action category, the total number of achievements under the required ability category is also 157. Their numbers are shown in the table below. (Table 3). Under this category, challenge based has the highest proportion of achievements, reaching 73.9. It is worth noting that there is only one random-based achievement in this category.

In the chart (Fig. 4), the reward-based achievements have the highest average completion rate. The distribution of challenge-based achievements and choice-based achievements is basically the same. Since there is only one random based achievement, it is difficult to eliminate its specificity. Therefore, it is not compared with other achievements in this study.

**Table 3. Taxonomy of achievements based on trigger action:**

Trigger action type	Total number	Percentage %
Challenge-based	116	73.9
Choice-based	22	14
Random-based	1	0.6
Reward-based	18	11.5



**Fig. 4. Completion rates under trigger action taxonomy**

## 4.2 Completion rates and platforms

This study focusses very much on comparing the impact of different platforms on game achievements completion rates.

### 4.2.1 Normal distribution test

In this study, a total of six representative achievement types were selected in each game for normal distribution testing (*Cyberpunk 2077* only has five types selected, because it has no DLC achievements when this research was carried out). These six achievement types include the four achievement types of playthrough experience and the achievements of multi-actions with different tasks combined and challenge-based achievements. The reason for choosing the latter two achievement types is that they accounted for 67.5% and 73.9% respectively in their own achievement taxonomy layers.

The normal distribution test results show that almost all the progression achievements, main achievements and DLC achievements of the four games conform to the normal distribution. This allows us to conduct a Pearson correlation coefficient test later for this part of the achievements to obtain their degree of correlation. For subordinate achievements, multi-actions with different tasks combined achievements and Challenge based achievements, they are basically not normally distributed at all. The only exception is *Assassin's Creed Odyssey*. Its multi-actions with different tasks combined achievements and Challenge based achievements all present a significant normal distribution.

**Table 4. Normal distribution test result for different achievements groups**

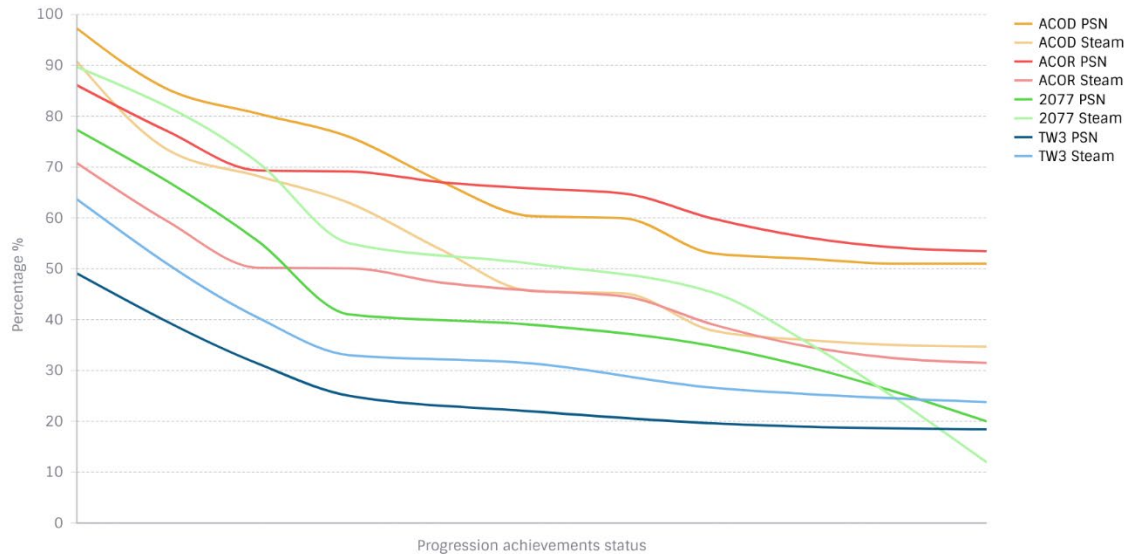
Game	Achievements Groups	p value (PSN)	p value (Steam)
Assassin's Creed Odyssey	Progression achievements	0.891	0.891
Assassin's Creed Odyssey	Main achievements	0.95	0.933
Assassin's Creed Odyssey	Subordinate achievements	0.865*	0.921
Assassin's Creed Odyssey	DLC achievements	0.936*	0.934*
Assassin's Creed Odyssey	Multi-different actions	0.96	0.946
Assassin's Creed Odyssey	Challenge based	0.947	0.97
Assassin's Creed Origins	Progression achievements	0.938	0.935
Assassin's Creed Origins	Main achievements	0.88	0.883
Assassin's Creed Origins	Subordinate achievements	0.89**	0.825**
Assassin's Creed Origins	DLC achievements	0.948	0.898
Assassin's Creed Origins	Multi-different actions	0.878**	0.858**
Assassin's Creed Origins	Challenge based	0.917*	0.916*
Cyberpunk 2077	Progression achievements	0.927	0.988
Cyberpunk 2077	Main achievements	0.914	0.948
Cyberpunk 2077	Subordinate achievements	0.773**	0.863**
Cyberpunk 2077	Multi-different actions	0.871*	0.857*
Cyberpunk 2077	Challenge based	0.833**	0.858**
The Witcher 3. Wild Hunt	Progression achievements	0.767*	0.793*
The Witcher 3. Wild Hunt	Main achievements	0.91	0.91
The Witcher 3. Wild Hunt	Subordinate achievements	0.836**	0.909**
The Witcher 3. Wild Hunt	DLC achievements	0.942	0.927
The Witcher 3. Wild Hunt	Multi-different actions	0.832**	0.915**
The Witcher 3. Wild Hunt	Challenge based	0.841**	0.922*

\*\* p < 0.01; \* p < 0.05.

#### 4.2.2 Progression achievements line graph

Of these four categories, only progression achievements have certain unlock orders. They are great for keeping track of how well players are completing the game. Statistics for progress achievements show that almost all games have the same progression characteristic on *Steam* and *PSN*, even though they have different averages. At the same time, in the previous research results, the progress achievement of *Cyberpunk 2077* showed a huge drop in the average completion rate of the final chapter. But in this more detailed analysis stage, we found that this sharp decline is more obvious on the *Steam* platform. (Fig. 5)

There are two special cases worth noting. The first is that the game completion rates of the two companies have opposite characteristics based on the platforms. The progression achievements of the two games from *Ubisoft* were higher on the *PSN*. But the two games from *CDPR* have higher average progression achievements completion rates on *Steam*. The second point is that among all the games, only *Cyberpunk 2077* has a sharp drop in the completion rate of the ending achievement on both platforms. In other games, the decline in the completion rate of the ending will gradually flatten out.



**Fig. 5. Completion rates of progression achievements on two platforms**

#### 4.2.3 Correlation testing

According to the normal distribution test completed before, this study conducted a Pearson correlation test between the two platforms for the three achievements that conform to the normal distribution. These three achievements are progression achievements, main achievements and DLC achievements.

Among them (Table 5), the correlation degree of Progression achievements reached 0.996. The correlation degree of Main achievements was 0.972. The correlation degree of DLC achievements was 0.822. We found that the data correlation of the completion rate of DLC achievements on the two platforms was significantly lower.

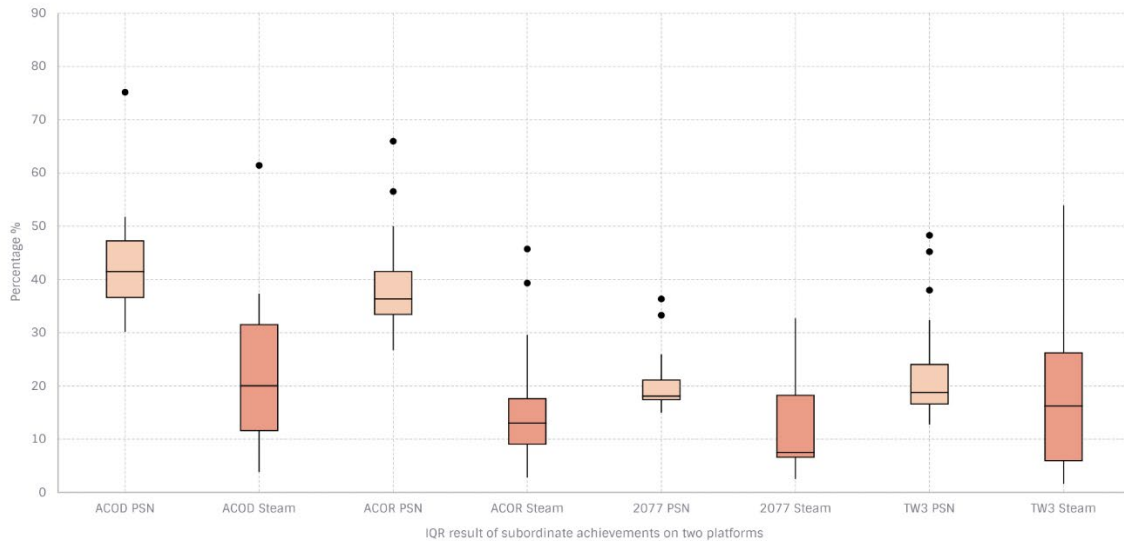
**Table 5. Pearson's coefficient between completion rates on two platforms**

Game	Achievements Groups	Pearson's coefficient
Assassin's Creed Odyssey	Progression achievements	0.999
Assassin's Creed Odyssey	Main achievements	0.956
Assassin's Creed Odyssey	DLC achievements	0.861
Assassin's Creed Origins	Progression achievements	0.9998
Assassin's Creed Origins	Main achievements	0.965
Assassin's Creed Origins	DLC achievements	0.806
Cyberpunk 2077	Progression achievements	0.987
Cyberpunk 2077	Main achievements	0.981
The Witcher 3. Wild Hunt	Progression achievements	0.997
The Witcher 3. Wild Hunt	Main achievements	0.984
The Witcher 3. Wild Hunt	DLC achievements	0.798

#### 4.2.4 IQR analysis

For subordinate achievements, multi-actions with different tasks combined achievements and Challenge based achievements, which do not satisfy the normal distribution of game achievement types, this study will use the IQR to compare their distributions. Comparing the IQR result (Fig.6; Fig.7; Fig.8) of the three achievement types, it is found that the subordinate achievements, multi-actions with different tasks combined achievements and Challenge based achievements of *The Witcher 3, Wild Hunt* are highly overlapping. While for the two *Assassin's Creed* games, their multi-actions with different tasks combined achievements and Challenge based achievements are highly overlapping. At the same time, the study of all IQR test results found that the completion rate of the three types of achievements has a higher degree of dispersion on *Steam* than on *PSN*.

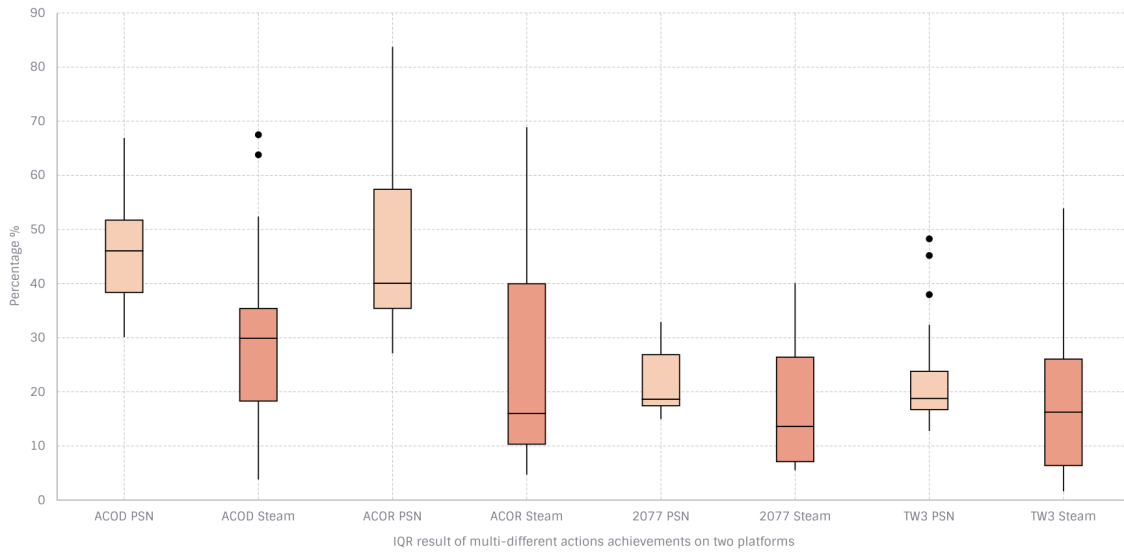
Meanwhile, the black dots in the graph (Fig.6; Fig.7; Fig.8) represent some special data distributions. The achievements represented by these singularities are also summarized into a table (Table 6; Table 7; Table 8). These singularities are all achievements with extremely high completion rates. They have an unusually high completion rate compared to other achievements in their group. Therefore, they are marked as a singularity in the IQR test.



**Fig. 6. IQR result of subordinate achievements on two platforms**

**Table 6. Singularities of subordinate achievements in IQR result**

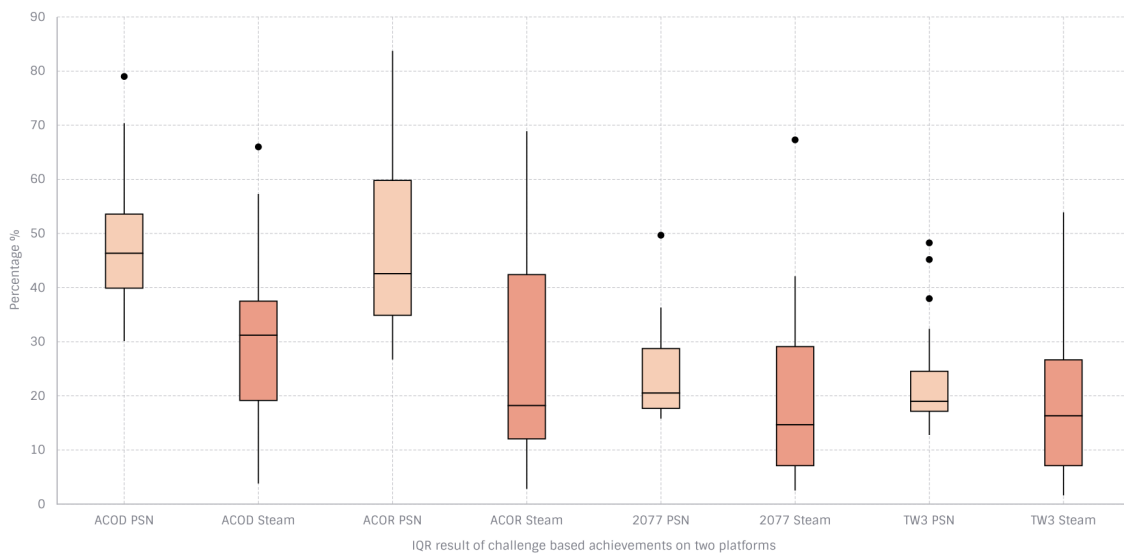
Game	Achievement name	Completion rate	Platform
ACOD	Aphrodite's Embrace	75.14/61.4	PSN/Steam
ACOR	Triathlete	65.94/45.7	PSN/Steam
ACOR	I'm Done Learning	56.5/39.3	PSN/Steam
2077	Christmas Tree Attack	36.32	PSN
2077	Gun Fu	33.26	PSN
TW3	Fist of the South Star	48.27	PSN
TW3	Butcher of Blaviken	45.19	PSN
TW3	Can't Touch This!	37.96	PSN



**Fig. 7. IQR result of multi-different actions achievements on two platforms**

**Table 7. Singularities of multi-different actions achievements in IQR result**

Game	Achievement name	Completion rate	Platform
ACOD	I am Legend	67.5	Steam
ACOD	Fashion's Creed	63.8	Steam
TW3	Fist of the South Star	48.27	PSN
TW3	Butcher of Blaviken	45.19	PSN
TW3	Can't Touch This!	37.96	PSN



**Fig. 8. IQR result of challenge based achievements on two platforms**

**Table 8. Singularities of challenge based achievements in IQR result**

Game	Achievement name	Completion rate	Platform
ACOD	Ramming Speed	79.01/66	PSN/Steam
2077	Right Back At Ya	49.68/67.3	PSN/Steam
TW3	Fist of the South Star	48.27	PSN
TW3	Butcher of Blaviken	45.19	PSN
TW3	Can't Touch This!	37.96	PSN

#### 4.2.5 Data dispersion

The mean results (Table 9) for representative achievement categories across the four games show that *Ubisoft* games have a higher average completion rate on *Steam* than on *PSN*. For *CDPR* games, the progression achievement and main achievement completion rate on *PSN* is higher than that on *Steam*, but other achievements are still higher on *Steam*.

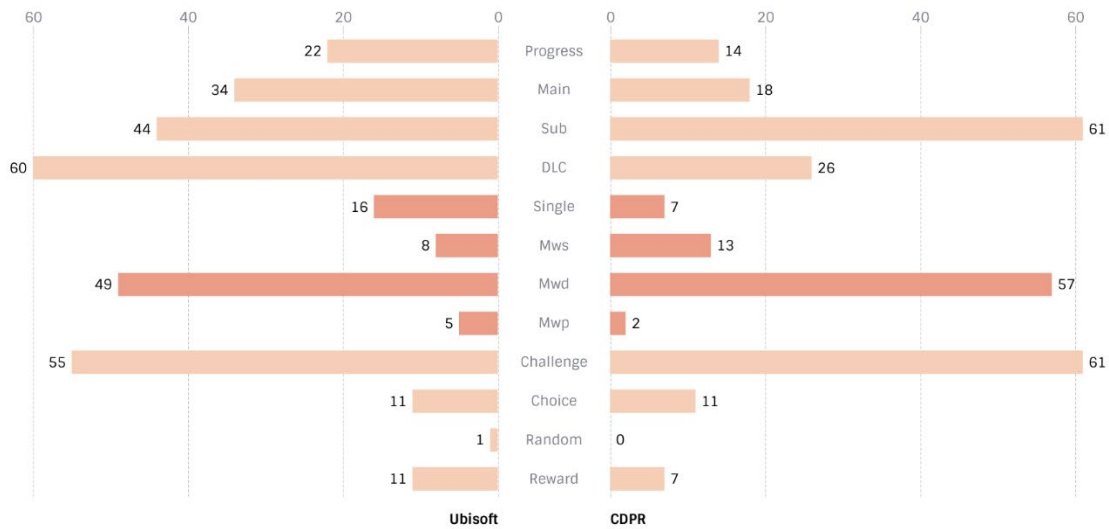
The results of standard deviation (Table 9) show that, in general, the completion rate distribution of the four games on *Steam* is more fluctuating than on *PSN*. The two exceptions are the DLC achievements of *Assassin's Creed Odyssey* and *Assassin's Creed Origins*.

**Table 9. Means and standard deviation of different types of achievements**

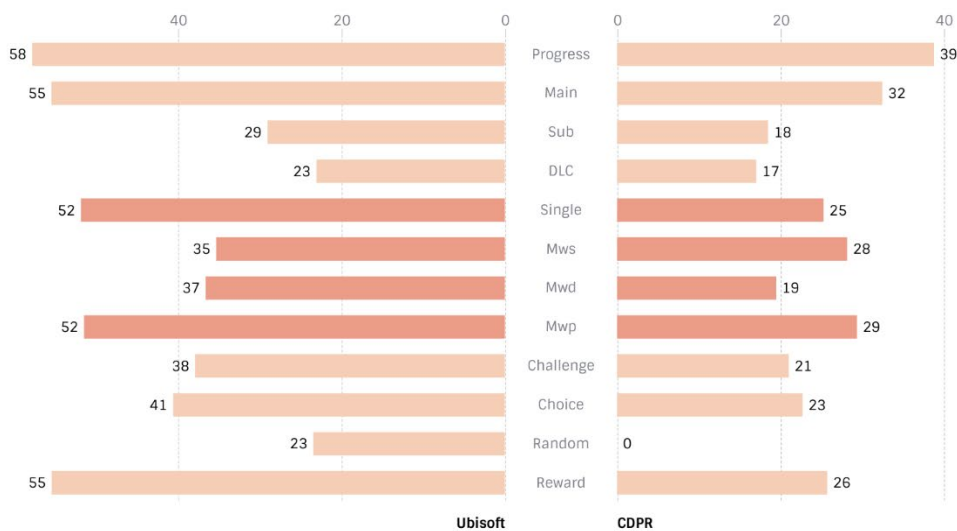
Game	Achievement types	M (Means)		S <sup>2</sup> (standard deviation)	
		PSN	Steam	PSN	Steam
ACOD	Progression	66.7	53	15.9	18.6
ACOD	Main	61	48.2	12.5	15.8
ACOD	Subordinate	42.8	22.4	10.8	14.8
ACOD	DLC	36.7	11.9	6.5	5.8
ACOD	Multi-different actions	46.1	28.8	10.2	16.3
ACOD	Challenge based	48.2	30	12.5	16.1
ACOR	Progression	65.7	46	9.9	11.8
ACOR	Main	66.2	48	9.8	9.7
ACOR	Subordinate	38.7	15	8.6	10.1
ACOR	DLC	31.5	8.4	5.4	4.2
ACOR	Multi-different actions	46.6	24.8	16.2	19.2
ACOR	Challenge based	47.5	26	16.2	19
2077	Progression	35.8	39.5	18.8	28
2077	Main	30.5	34.6	9	15.3
2077	Subordinate	20.5	12.7	5.5	8.5
2077	Multi-different actions	21.6	16.7	5.6	11.2
2077	Challenge based	24.1	19.8	8.2	15.8
TW3	Progression	26.3	34.9	11	13.9
TW3	Main achievements	30.5	34.1	10.1	10
TW3	Subordinate	21.6	17.5	8.3	13.5
TW3	DLC	24.8	9.2	4.4	5.7
TW3	Multi-different actions	21.5	17.7	8.2	13.4
TW3	Challenge based	22.2	18.5	8.5	13.9

### 4.3 Completion rates and game company

From the perspective of the number of achievements (Fig.9), the number of progress achievements and main achievements designed by *CDPR* is less. But the number of subordinate achievements they design is more. In terms of the number of DLC achievements, since *Cyberpunk 2077* has no DLC yet, it seems that *CDPR's* DLC achievements will be less. In terms of trigger action achievements, the single action achievements and multi actions with progression bar designed by *Ubisoft* have more achievements, and the multi-same actions have fewer achievements. Both *Ubisoft* and *CDPR* have designed many multi-different actions achievements. Regarding the abilities needed to trigger achievements, both *Ubisoft* and *CDPR* have designed many achievements as challenge based.



**Fig. 9. Achievements numbers of games from two companies**



**Fig. 10. Average achievements completion rate (%) of games from two companies**

From the achievement completion rate (Fig.10), the achievement completion rate of *Ubisoft* games is higher than that of *CDPR* games. They are almost identical in distribution characteristics. The only difference is that the completion rate of single action achievements in *Ubisoft* games will be higher than that of *CDPR*.

## 5 Discussion

This thesis is aimed to explore an aim and a question. The aim of this thesis is to develop a taxonomy that classifies achievements in open world role-playing games. The question is to determine what can be learned from using this taxonomy to study the completion rate of game achievements.

Having outlined the methodology and the results of this study, it is now time to provide answers to these questions. Firstly, by analyzing the data characteristics of the completion rate of all achievements under the three taxonomic layers, we will try to explore the rationality and generality of this taxonomy. Then we will re-examine some interesting patterns which emerged in the results section. First, we will analyze the relationship between game achievement completion rate and game platform under this taxonomy. Second, this article will attempt to compare the relationship between game completion rates and game publishers.

### 5.1 Taxonomy result

The results show that this taxonomy performs very well on these four open world role-playing games since all achievements in these four games were able to be categorized through the taxonomy. We will now go through each type of achievement to discuss some specific details which emerged from this process.

#### 5.1.1 Playthrough experience

At this level of taxonomy, the distribution of these four types of achievements is relatively even. Among them, the subordinate achievement accounts for the largest proportion. This is due to the design characteristics of open world role-playing games. This kind of game uses a fragmented narrative, with many side missions and side areas. And most of those side quests and side areas have achievements.

The chapter completion rates of all games show slowly declining curves. This is the same conclusion obtained in other studies [6]. Ideally, there should be a smooth, gradual decline in chapter completion across all games. In this study we found that this was not the case. All curves are not smooth. Compared to games from *CDPR*, *Ubisoft* games have a higher chapter completion rate on average. We think this is because the achievements in the two *Ubisoft* games are easier to accomplish. And in the game *Cyberpunk 2077*, the completion rate of the ending chapter has an unusual drop.

For the problem of curve smoothing, we believe that there are two factors that lead to the unsmooth curves. The first is that the sample is too small. The chapter completion rate for a single game will fluctuate with the quality of the games' chapters themselves, but if more enough games are counted, this noise should be eliminated. The second is that the interval between game chapters and chapters denoted by achievements is not the same. Some chapters take longer play time to complete, while others take much less. Whereas in this study, we considered the spacing of all chapters to be the

same. This is also why the data is not smooth. This research would be able to obtain more detailed results if the average player play time corresponding to the completion of each achievement could also be obtained.

Regarding the unusual decline in the ending chapter of *Cyberpunk 2077*, this research found that this is due to its particular narrative structure. *Cyberpunk 2077* is the only one of the four games that has multiple endings. It has a total of four different ending achievements. Adding the completion rates for these four achievements will give you the completion rate for the ending chapter if all players have only completed the game once. However, since many players play multiple times and unlock multiple ending achievements, adding them together is insufficient and inaccurate. This study also considered a special case. That is, according to the proportion of players who have completed all achievements on *PSNprofiles*, game players are divided into those who only play once (achievement casual players) and those who will unlock all achievements (achievement hunter players). In this case, the calculated result is still completely wrong. So, in the end, this study can only use the average to approach the completion rate of *Cyberpunk 2077*'s ending chapter. This result is not accurate but the closest we can approach. From here two conclusions can be drawn. One is that *Cyberpunk 2077*'s ending chapter completion rate is calculated differently than other games, so they cannot be compared with each other. The second is that for the game *Cyberpunk 2077*, its players cannot simply be divided into two, that are who will complete the game once and who will unlock all the achievements. Many players have unlocked more than one but not all endings.

For the distribution of chapter completion rates involving platforms. The completion rate of progression achievements on *PSN* is higher than that on *Steam*, and *PSN* players prefer to complete subordinate achievements and DLC achievements. We think this may be related to the purchase policy of different platforms and achievement system design. Since games on the *PSN* cannot be refunded after purchase, players will be more cautious in their purchase decisions. This deliberate decision made them more motivated to complete the game. As for the subordinate achievements and DLC achievements, the extremely high completion rate on *PSN* compared to *Steam* is likely to be caused by a special achievement design on the *PSN*. That special design allows *PSN* players to get an additional "platinum" achievement after completing all achievements. *Steam* does not have this design. The design of this additional achievement may make *PSN* players more inclined to complete all achievements, which would explain the difference on achievement completion rates.

### 5.1.2 Trigger action

The classification effect at this level is average. A large number of achievements are classified as multi-actions with different tasks combined, accounting for 67.5%. We believe this is due to the design of open world role-playing games. Many achievements are related to completing a series of tasks or defeating a boss. In this study, completing a series of requests and defeating a boss are having many different tasks combined. For other genres of games, the situation may be different. If someone wants to study game achievements in open world role-playing games more accurately, a more detailed achievement taxonomy method will be needed.

These three achievements in *Cyberpunk 2077* (Fig. 11, Fig. 12, Fig. 13) belong to multi-actions with different tasks combined achievements under the existing taxonomy. But they also have some possibilities that can be further classified. Defeating a boss or completing a quest is considered a combination of multi-different actions. But they can also be considered as a single task. If the level of task is added, then multi-different actions can be further subdivided. The achievement *Frequent Flyer* (Fig. 11) requires the player to unlock all fast travel points on the game map. The unlocking of these fast travel points are independent tasks, they will not affect each other. So, this achievement could be classified as achievement with parallel tasks.



**Frequent Flyer**  
Find all fast travel dataterms.

14.81%  
RARE



**Fig. 11. Achievement with parallel tasks**

The achievement *Judy vs Night City* (Fig. 12) is a series of tasks, and the new task will only appear after the previous task been completed. And it could be considered as an achievement with a sequel of tasks.



**Judy vs Night City**  
Complete Judy Alvarez's storyline.

27.67%  
UNCOMMON



**Fig. 12. Achievement with a sequel of tasks**

The achievement *Greeting's from Pacifica!* (Fig. 13) includes the two task types above at the same time. It has both parallel and sequels of tasks.



**Greetings from Pacifica!**  
Complete all gigs and NCPD Scanner Hustles in Pacifica.

17.35%  
RARE



**Fig. 13. Achievement with both parallel tasks and sequel tasks**

### 5.1.3 Required abilities

At the taxonomy layer of required abilities, the distribution of achievements is more extreme. 73.9% of the achievements in this layer are challenge based. This study believes that this again has something to do with the design of open world role-playing games. This research has tried to refine the challenge and divide it into several different types including timing, balancing, precision, reflexes, tactical, strategy, management, and cleverness. But since a large number of challenge-based achievements involve multiple different challenges, those attempts to classify all achievements in a more granular manner are not ideal. And because the sample size is not large enough, a too detailed classification will also be excessively influenced by noise. Therefore, in the end, this research only generally classifies many achievements as challenge based. And there is only one random based achievement, which shows an achievement design preference of open world role-playing games.

### 5.2 Platform

This section compares the classified achievements with the platform as a variable. The achievement completion rate characteristics on *PSN* and *Steam* platforms have very similar characteristics but are still distinct from each other in certain ways.

This section selects six out of twelve achievement groups as research objects, because these six groups have dominated percentage in their layers thus could reflect the over-all picture of the study objects. First, this study conducted a normal distribution test on the six achievement groups. The test results will be used as a reference to observe whether the data set is natural and uniform. Secondly, this study conducted a Pearson correlation coefficient test on the achievement groups that conform to normal distribution. The results will be used to describe how similar the completion rates of those achievement groups are on the two platforms. Thirdly, this study conducted an IQR analysis on the achievement groups that did not satisfy the normal distribution. The results of the analysis were also used to compare the data characteristics of the completion rates of those achievement groups on the two platforms. Finally, the study compares the average completion rates and standard deviations

across the two platforms for the six achievement groups. The results will be used to characterize the distribution of these data.

### 5.2.1 Normal distribution test

An important research tool in this study is the Pearson correlation coefficient. The first condition for using this coefficient is that the data satisfy a normal distribution. Therefore, this study conducted a normal distribution test on the achievement of the same six taxonomic groups. The result of the test is that almost all progress achievements, main achievements and DLC achievements conform to the normal distribution. And almost all subordinated achievements, multi-different actions achievements and challenge-based achievements do not conform to the normal distribution. For identically distributed independent samples, the standardized sample mean tends towards the standard normal distribution [31]. The achievement completion rate in this study ranges from 0% to 100%, which can be regarded as the same as the standardized results. So theoretically, if the distribution of a group of achievements is generally close to a normal distribution, then we can consider this composition to be independent random variables. If a set of achievements is far from the normal distribution, we think that the completion of this set of achievements has a certain pattern rather than random.

Among the six classification groups, the progress achievement also satisfies the normal distribution. But we clearly know that the progress achievements are not independent of each other. They are in sequence with each other, and previous achievements affect later ones. This study considers that the reason why the progress achievement satisfies the normal distribution is a coincidence. They are too few in number, averaging less than 10 progression achievements per game. This makes normal distribution detection on them have a wide range of accuracy. While the average number of main achievements and DLC achievements is greater than 10, we believe that the normal distribution test results of these two types of achievements are more credible.

Judging from the results, the main achievements and DLC achievements are relatively more natural, while the completion rates of subordinate achievements, multi-different actions achievements and challenge-based achievements are not. One possible reason for this is that players don't go out of their way to unlock the main and DLC achievements. These achievements will be unlocked with natural game progression and thus obey a natural distribution. As for subordinate achievements, multi-different actions achievements and challenge-based achievements, some players will deliberately chase them, and some players will not. So, their completion rates are not a product of natural randomness. This point also verifies the accuracy of the taxonomy of achievements in this study. Through the inspection of the normal distribution of the completion rate of different groups, the data characteristics of most groups are consistent with their taxonomic standards.

### 5.2.2 Progression achievements line graph

In the previous mixed statistics, this study found that the completion rate of *Cyberpunk 2077*'s ending achievement has dropped sharply. However, after analysis, we believe that this sharp decline is caused by the unique ending achievement structure of *Cyberpunk 2077*. In this part, this research studies the completion rate of the progress achievement of each game on the two platforms.

First, the trend of the progression achievement completion rate of all games on *PSN* and *Steam* is basically the same. They just have an almost constant interpolation in the completion rate for each chapter. We think this shows that gamers are equally enthusiastic about advancing the game's chapters across platforms. The only difference is that there is a higher percentage of players started the game but didn't advance to the first chapter on *Steam*. If we only look at players who have completed the first chapter on *Steam* and *PSN*, the proportion and data characteristics of their

continued advancement to subsequent chapters are the same. The only exception came with *Cyberpunk 2077*. Although *Cyberpunk 2077*'s ending achievement design is different from other games, and so it cannot be used as a comparison between games. But comparing *Cyberpunk 2077* ending achievement completion rates with itself on the two platforms is possible because they both went through the same data processing. The results of the comparison show that the completion rate of *Cyberpunk 2077*'s ending achievement on *Steam* has dropped significantly compared to that on *PSN*. After comparing the data, we found that the drop in the completion rate of ending achievements on *Steam* is caused by one of the ending achievements. It is the achievement 07, called *The Devil*, which requires players to help Takemura avenge the death of Saburo Arasaka. In the *Steam* version, due to lack of information or game bugs, players are likely to miss a key point dozens of hours before the end. If player made the wrong decision (not to help Takemura) at that key point, they will end up not being able to unlock this achievement. The completion rate of this achievement has dropped weirdly compared to other achievements, which in turn lowered the average completion rate of all *Cyberpunk 2077* ending achievements on *Steam*.

For the company, *Ubisoft* games always have a higher progression achievement completion rate on *PSN*. And *CDPR*'s games always have a higher progress achievement completion rate on *Steam*. We think this may be due to the platform preference of the players of the two game companies.

### 5.2.3 Correlation testing

For the completion rates of the three types of achievements that meet the normal distribution, this study conducted a Pearson correlation test. The results of the testing will be used to illustrate how similar the completion rate distribution characteristics of a certain achievements group are on *Steam* and *PSN*. These three types of achievements are progression achievements, main achievements and DLC achievements. From the results, the correlation coefficient of the progress achievement completion rate on the two platforms is always the highest. Its average correlation performance reaches 0.996. The closer the Pearson correlation coefficient is to 1, the more relevant the two sets of data are. This shows that the correlation between the completion rate of the progress achievement on the two platforms is extremely high. This is consistent with the conclusions of the previous graph analysis and normal distribution test. This study believes that the completion rate of the progress achievement of all games has nothing to do with the platform type, and they all show the same data characteristic. The only difference is on their average completion rate. Thus, this result follows the previous assumption of the only difference on progression achievements on two platforms is the percentage of players that started the game.

For the main achievements, their correlation is also very high, reaching an average of 0.972. Their correlation is between the progress achievement and the DLC achievement in all games. But we think they're also very relevant. We can say that players on two platforms also have the same pattern on completing the main achievements. This is because main achievements are very close to progression achievements. And the conclusion on this is for players on both platforms, their behavior of the game playthrough is the same.

For DLC achievements, the correlation between their completion rates between the two platforms is 0.82 on average. This data is significantly lower than the correlation data for progression achievements and main achievements. This study believes that there is a big difference in the completion rate of DLC achievements on the two platforms. The data graphs and average analysis of

DLC achievements also show the same characteristics. We think this also reflects the huge difference in players' enthusiasm for DLC achievements on different platforms.

#### 5.2.4 IQR analysis

Subordinate achievements, multi-actions with different tasks combined achievements and challenge-based achievements do not conform to the normal distribution. This study used IQR to visualize their data. From the results, the completion rate of the three types of achievements always has a greater degree of data dispersion on *Steam*. This shows that *Steam* users have greater variance in completing achievements. At the same time, the IQR analysis of these three achievements also found some outliers.

*Assassin's Creed Odyssey* has three outliers. The first outlier is an achievement called *Aphrodite's Embrace* in the subordinate achievements group. It requires players to spend the night with another character. The completion rate of this achievement is so high compared to other subordinate achievements. The way to complete this achievement is to choose to have a relationship with a character after completing a series of tasks (you can also choose not to have a relationship). This shows that players have a high interest in adult content in the game. The second outlier is the two achievements in the multi-actions with different tasks combined achievements group. They are an achievement called *I am Legend* and an achievement called *Fashion's Creed*. *I am Legend* requires players to equip 1 legendary melee weapon and 5 legendary armor pieces. *Fashion's Creed* requires players to equip a legendary Armor set. The extremely high completion rates for these two achievements suggest that *Steam* players tend to favor better gear (if they have any) with a higher gear level. The third achievement is *Ramming Speed* in the challenge-based group. It requires the player to cleave a ship in half. The high completion rate of this achievement is related to the game mechanism design of a lot of naval battles in this game.

*Assassin's Creed Origins* has a total of two outliers. The first is the *Triathlete* in the subordinated achievement group. It requires the player to swim for 1500m, ride for 40km and run for 10km. The second is *I'm Done Learning* in the subordinate achievement group. It requires the player to activate a master ability (the highest level of ability) in the skill tree. These two achievements are classified as subordinate achievements, but in terms of completion rate, they are closer to the main achievement. This has something to do with the game system design of *Assassin's Creed Origins*. The setting of these two achievements demonstrates some limitations of the study. Taking the *Triathlete* as an example, it is not easy to distinguish whether it belongs to the main achievement or the subordinate achievement through its trigger action. Most open world role-playing games are designed on the scale of real-world people. But the difficulty of completing an achievement related to moving distance may vary greatly for different game designs. For example, if there is an achievement asking avatar in the game to advance 1,500 meters, which could be challenge for a game based on human scale. But if the game is based on space war, this achievement may become very simple.

*Cyberpunk 2077* has three outlier achievement. The first one is called *Right Back At Ya*. This achievement requires the players to kill or incapacitate an enemy who threw a grenade at them. This achievement has a very high completion rate on both *Steam* and *PSN* platforms. The reason for this result is that there is a lot of combat in the game, and the frequency of enemies throwing grenades is relatively high. In most cases, players will unlock this achievement naturally during normal play without pursuing it specifically. The second outlier is *Christmas Tree Attack*. This achievement has a very high completion rate on the *PSN* platform. It requires the player to complete a breach protocol

with a minimum of 3 daemons uploaded. This achievement is related to a technology genre in the game. Players using this genre will mainly use the hacking technology in the game to advance the progress of the game. The extremely high completion rate of this achievement shows that *PSN* players prefer to choose the hacking genre in the game compared to *Steam* players. The third achievement is called *Gun Fu*. This achievement has an extremely high completion rate on *PSN*. This achievement requires the player to kill or incapacitate 3 enemies in quick succession with a revolver or pistol in close combat. The best way to unlock this achievement is through one of the main missions in the game. In this mission, the player will play as Jonny Silverhand (an NPC in the game) and get a powerful pistol. And because *Cyberpunk 2077* on the *PSN* platform has the option of assisted aiming, it will be easier for players to quickly hit enemies.

*The Witcher 3: Wild Hunt* has three outliers in total. They are *Fist of the South Star*, *Butcher of Blaviken* and *Can't Touch This*. Looking at the graph (Fig. 6, Fig. 7, Fig. 8), we can find that the upper line segment of *The Witcher 3: Wild Hunt*'s IQR result on *Steam* is the same as the outlier points on *PSN*. So, the reason why the completion rates of these three achievements become outliers on *PSN* is not that they are different, but because the completion rate distribution of other achievements is too concentrated at below. The takeaway here should be that all three achievements are relatively easy and therefore have high completion rates.

### 5.2.5 Data dispersion

This study compares the mean and data dispersion of achievement completion rates across the two platforms for each of the six major groupings of games.

In *Ubisoft's* two games, the average completion rate of the six major achievement groups on *PSN* is higher than that on *Steam*. Subordinate achievements, DLC achievements and multi-different actions achievements and challenge-based achievements have a larger mean gap than progression achievements and main achievements. For the two games of *CDPR*, the average completion rate of their progress achievements and main achievements on *Steam* is higher. The other types of achievement completion rates are higher on *PSN*. Both statistics show that players on the *PSN* prefer to complete achievements that require extra effort and attention.

Combined with data dispersion, the completion rates of the DLC achievements of the two *Ubisoft* games have unique characteristics. Data dispersion reflects the degree of discreteness of the data. Higher numbers indicate more spread-out data, in this case more variance in game completion rates. For both *Ubisoft* games, the dispersions of achievement completion rates on *Steam* are always greater than on *PSN*. This shows that *Steam* players are more heterogeneous about completing achievements. But only in the completion rate of DLC achievements, the data of *Steam* players has less dispersion. Combined with the lower average completion rate of DLC achievements on *Steam*, this study concludes that *Steam* players are equally inactive about completing DLC for both *Ubisoft* games. Achievement completion rates on *Steam* are almost always more discrete for the two *CDPR* games. This fits with our observation that *Steam* players have greater variance in their attitudes toward game achievements.

### 5.3 Completion rates and game company

To show the relationship between game achievements and game companies, this research compares the number and average completion rate of different types of achievements in two games of *Ubisoft* and two games of *CDPR*.

The results of the research on the number of achievements in different types of games show that the number of progress achievements and main achievements designed by *CDPR* is less. This suggests that *CDPR*'s achievements are more about extra and non-essential content. On the trigger action of game achievements, *Ubisoft*'s has more achievements triggered by single action. Both companies have designed a lot of multi-actions with different tasks combined achievements and challenge-based achievements, and almost no random based achievements. This shows that the difference between the two companies is that *Ubisoft* designed more simple achievements that are easy to unlock as the game progresses. On the other hand, *CDPR* has designed more achievements that deviate from the main body of the game and have more complicated trigger conditions. The similarities between the two companies reflect the design characteristics of open world role-playing games. A large number of challenge-based achievements indicate that the achievement system is highly bound to in-game tasks in open world role-playing games. The very few random achievements indicate that both companies believe that they need to give achievements a relatively certain unlocking condition. This design may be related to the player's playing mentality. Achievements are an additional reward system with clear unlock descriptions, where too much randomness will bring negative emotional experience to players.

The comparison of the average completion rate shows that the achievement completion rate of *CDPR*'s games is lower than that of *Ubisoft*. This is consistent with the conclusion above. *Ubisoft* prefers to design achievements related to the main line of the game, while *CDPR* likes to design more independent achievements with more complex trigger actions. This also makes *Ubisoft*'s achievement completion rate higher and *CDPR*'s lower. Comparing the achievement completion rates between groups, we can find that the achievements of *Ubisoft* and *CDPR* all reflect the same characteristics between groups. For example, progress achievements and main achievements have a higher completion rate than subordinate achievements and DLC achievements. The conclusion based on the result should be there is only an average difference in the completion rates of each group of achievements of the two game companies, but the graphic characteristics shown by the average completion rates of all achievement groups are the same.

## 6 Conclusion

This thesis is aimed to develop a taxonomy that classifies achievements in open world role-playing games and see the characteristics presented by the completion rate of game achievements under this taxonomy.

The classification of game achievements in previous studies is too simple, and at the same time, the design elements behind game achievements are not considered, which limits the analysis of game completion rates to a rather small range. At the same time, due to the lack of a unified standard, the classification criteria of all studies are not the same and have not been validated. So, this research tried to design a more diversified game achievement classification standard, and then tried to verify the accuracy of this classification standard. Finally, based on this classification, the game achievement completion rate is analyzed.

As reflected in the design section, this research classifies game achievements into three levels: playthrough experience, trigger action, and required abilities. The classification results were tested by normal distribution test. The results of the tests show that this classification is scientific. Under this classification standard, achievements of the same category in different games show similar distribution characteristics. Different categories of achievements show different distribution characteristics. And these results are consistent with the logic behind the taxonomic criteria. For future research, it is recommended to start from the following three aspects. The first is to try to apply this taxonomic standard to more games to test the robustness of it. The second is to continue to refine this classification at the level of trigger actions and required abilities. The final one is to use more classified game achievement data to test the performance of this taxonomy in a larger amount of data.

For the research aim, that is to design a taxonomy that can classify achievements in open world role-playing games, the attempt of this research is successful. All achievements in the four games selected for this study can be classified under this taxonomy standard. In the follow-up data analysis, the data characteristics of the completion rates of the same type of game achievements are similar, and the data characteristics of the completion rates of different types of game achievements can also be identified. All progress achievements, main achievements and DLC achievements conform to the normal distribution. And almost all subordinated achievements, multi-different actions achievements and challenge-based achievements do not conform to the normal distribution. This means that these two types of achievements may own different design features, or players' attitudes towards them are very different.

This classification method has the potential to be further applied to more games rather than just open world role-playing games. There are two aspects in which this taxonomy does not perform well. The first is that it is difficult to be used in games with multi-threaded narrative and no narrative structure, such as interactive movie games with multiple endings and multiplayer online battle arena games. The second is that the last two layers of the taxonomy standard may be further refined, because non-multi different-actions achievements and non-challenge-based achievements only accounted for 32.5% and 26.1% after the classification.

For the research question of the study, that is to explore the characteristics presented by the completion rate of game achievements under this taxonomy, the results were very good. This study

divides the analysis of achievement completion rates into two parts. The first part is about the relationship between achievement completion rate and platforms. This study found that *PSN* players and *Steam* players have very similar performances in advancing the game's main storyline and unlocking achievements related to the main storyline. However, there is a large variance in the performance of completing DLC achievements. The data shows that *PSN* players are much more enthusiastic about completing DLC achievements. This is likely due to the non-refundable rule on *PSN* purchases of games and the additional achievement on *PSN* that will be given to players who unlocked all the achievements.

The second part is about the relationship between the completion rate of game achievements and game companies. This study finds that *CDPR* prefers to design achievements that deviate further from the main plot and have more complicated unlocking conditions. Research on the degree of data dispersion shows that players are quite uninterested in the DLC of Ubisoft games. And this study has found that the relative characteristics of different achievement groups have nothing to do with game companies. We can't predict the absolute value of the achievement completion rate only through the game achievement taxonomic group, but we can roughly predict their completion rate relative to other achievement groups of the same game.

Finally, the study also uncovered some concrete achievements through the data, which have lead to unusual data features. By analyzing of their trigger requirements, some conclusions that can be further explored have been revealed. For example, in-game achievements related to adult content have seen unusually high completion rates. And bugs in the game may significantly affect the completion rate of game achievements. Finally, the input method of the game player's preference will also affect the player's play preference, and then change the unlocking of some game achievements.

In summary, this study reveals the relationship between the game achievement completion rate and the design of the game itself, the platform it is released on and the game companies that released them through the analysis of the achievement completion rate of four open world role-playing games on *Steam* and *PSN*. The findings of the research could be used to guide game designers to improve the achievement system and provide some ideas for researchers to study player behavior through the lens of analyzing achievement completion rate.

## 7 References

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## **8 Ludography**

*Assassin's Creed Odyssey* (PC & PlayStation 4) [Video game]. (2019) Ubisoft Entertainment.

*Assassin's Creed Origin* (PC & PlayStation 4) [Video game]. (2017) Ubisoft Entertainment.

*Cyberpunk 2077* (PC & PlayStation 5) [Video game]. (2020) CD Project Red.

*The Witcher 3: Wild Hunt* (PC & PlayStation 4) [Video game]. (2015) CD Project Red.

## Appendix

Game	Achievements name	PSN	STEAM	Category
ACOD	This is Sparta!	97.3	90.8	10000
ACOD	An Odyssey in the Making	85.31	73.4	10000
ACOD	Past Mistakes	80.47	68.2	10000
ACOD	Evil Unearthed	75.91	62.9	10000
ACOD	The Bright Minds	67.21	53.8	10000
ACOD	From the Ashes	60.37	45.6	10000
ACOD	Democracy Falls	59.96	45.2	10000
ACOD	Legend in the Making	51.95	36	10000
ACOD	Taking Back Athens	51.12	35	10000
ACOD	Odyssey's End	50.9	34.7	10000
ACOD	Going For Gold	53.36	37.8	10000
ACOD	Scourge of the Aegean	70.39	57.3	21010
ACOD	Ramming Speed	79.01	66	21010
ACOD	Hero for Hire	68.59	55.3	21010
ACOD	Make It Your Own	77.55	64.4	21040
ACOD	You Work for Me Now	71.29	61.7	21040
ACOD	Shiny!	84.47	79.8	21040
ACOD	Harder, Better, Faster, Stronger	79.81	67	21040
ACOD	The Midas Touch	56.3	43.3	21040
ACOD	Legacy Restored	43.14	26	22210
ACOD	The Cult Unmasked	43.2	26	22210
ACOD	In Perseus's Image	46.34	29.9	22210
ACOD	A-maze-ing Victory!	50.41	34.4	22210
ACOD	Eye on the Prize	49.23	32.7	22210
ACOD	Riddle Me This	51.91	35.4	22210
ACOD	One Head Down...	55.42	40.7	22210
ACOD	Birthright	55.25	39.3	22210
ACOD	War Master	66.33	52.4	22210
ACOD	I am Legend	66.9	67.5	22240
ACOD	Fashion's Creed	62.56	63.8	22240
ACOD	Infamous	61.19	43.2	22310
ACOD	Demigod	49.15	34.2	22340
ACOD	Godly Power	54.46	39.7	22340
ACOD	Blood Sport	51.62	35.7	31010
ACOD	Aphrodite's Embrace	75.14	61.4	31020
ACOD	Stink Eye	39.52	10.9	31040
ACOD	Child of Poseidon	30.12	3.8	32210
ACOD	Are You Not Entertained?	47.23	32.1	32210
ACOD	Top of the Food Chain	46.04	31.2	32210

ACOD	Hermes's Homie	30.48	4	32210
ACOD	Lord of the Seas	36.6	21.8	32210
ACOD	Master of the Hunt	43.11	25.1	32210
ACOD	Everybody Benefits	38.35	14	32210
ACOD	Trust Me, I'm a Doctor	34.6	11.6	32210
ACOD	A Pirate's Life for Me	32.77	7.6	32210
ACOD	I Have the Power	41.45	18.3	32210
ACOD	Misthios in Training	42.04	20	32210
ACOD	Island Hopper	36.84	14.4	32210
ACOD	Wrath of the Amazons	50.3	31.5	32210
ACOD	The Argonauts	51.73	37.3	32220
ACOD	The Show Must Go On	37.73	13.4	40000
ACOD	Lightning Rod	59.32	31.9	40000
ACOD	Divine Intervention	42.32	17.2	40000
ACOD	Volcanic Sunscreen	46.89	23.3	40000
ACOD	The Image of Faith	35.43	13.3	40000
ACOD	The Daughters of Lalaia	40.06	17.7	40000
ACOD	A Poet's Legacy	32.8	11.7	40000
ACOD	A Brother's Seduction	38.34	16.3	40000
ACOD	A Friend Worth Dying For	37.82	16.4	40000
ACOD	The Heir of Memories	37.94	19.8	40000
ACOD	One Really, Really Bad Day	30.77	12.3	40000
ACOD	Every Story Has an Ending	30.59	13.8	40000
ACOD	Old Flames Burn Brighter	26.33	9.8	40000
ACOD	Lone Lion	28.59	5.1	40000
ACOD	Without a trace	48.65	23.9	40000
ACOD	The Start of a Legacy	41.57	15.9	40000
ACOD	Breaking the Limit	28.45	5.8	40000
ACOD	Predator and Prey	38.78	14	40000
ACOD	Rain of Arrows	27.81	3.9	40000
ACOD	Fire on Water	35.72	12.3	40000
ACOD	Parry to Carry	27.84	3.4	40000
ACOD	Blood of Leonidas	42.09	13.2	40000
ACOD	Stormculler	39.48	11.9	40000
ACOD	Seeing Red	38.88	14.8	40000
ACOD	Bittersweet Beginnings	39.24	12	40000
ACOD	Surgical Sniper	24.92	2.6	40000
ACOD	Kingmaker	36.54	10.7	40000
ACOD	For Love of Persia	37.04	10.8	40000
ACOD	No More Rulers	41.37	12.2	40000
ACOD	In the Face of the Gods	40.99	12.1	40000
ACOD	Blasphemer	33.16	6.4	40000
ACOD	Gathering Strength	41.46	12.3	40000

ACOD	The Conqueror	34.27	8.6	40000
ACOD	Bad Dog!	40.2	11.3	40000
ACOD	Guardian of the Underworld	29.69	5.2	40000
ACOD	The One	35.09	8.9	40000
ACOD	Gathering More Strength	38.08	10.5	40000
ACOD	A True Ruler	37.8	10.4	40000
ACOD	Your Own Medicine	27.09	2.5	40000
ACOD	Isu Bloodline	37.32	8.8	40000
ACOD	Hephaistos's Apprentice	34.14	7.4	40000
ACOD	Gathering Full Strength	37.49	9	40000
ACOD	1 Versus 100	36.68	8.5	40000
ACOR	First Steps	86.11	70.8	10000
ACOR	I'm Just Getting Started	77.03	59.3	10000
ACOR	The Sea	69.15	50.1	10000
ACOR	The Scarab	69.34	50.2	10000
ACOR	The Hyena	67.03	47.3	10000
ACOR	The Crocodile	59.82	39	10000
ACOR	The Lizard	64.82	44.6	10000
ACOR	The Siege	56.25	34.8	10000
ACOR	Wake Up!	65.81	45.7	10000
ACOR	Almost There	54.18	32.4	10000
ACOR	The End	53.46	31.5	10000
ACOR	Slasher	55.35	37	21010
ACOR	Shadow of Egypt	59.68	43.6	22110
ACOR	Run For Your Life!	67.79	45.8	22110
ACOR	Smash!	67.85	47.4	22120
ACOR	The Festival	80.23	62.9	22210
ACOR	Raider of the Lost Tomb	83.74	68.9	22210
ACOR	Defy Authority	60.16	42	22210
ACOR	Handy Man	64.49	48.1	22210
ACOR	I'm a Legend	48.38	34.5	22220
ACOR	Rider's Licence	70.19	49.2	22220
ACOR	You still need 8880...	69.95	51.7	22310
ACOR	Free as a Bird	66.28	45.3	22320
ACOR	Fatality!	44.27	18.8	31010
ACOR	The Harder They Fall	34.21	13	31010
ACOR	Rooooaarrrrr!	40.84	13.8	31010
ACOR	Overheating	36.31	10.6	31030
ACOR	The Arrow Whisperer	44.65	27.1	32110
ACOR	BOOM!	26.7	2.8	32110
ACOR	Reporter	39.89	8.9	32120
ACOR	Reduce, Reuse, Recycle	31.19	7.4	32120
ACOR	Namaste	35.19	9.4	32120

ACOR	I'm Done Learning	56.5	39.3	32210
ACOR	For Those About to Die...	35.53	9.1	32210
ACOR	Ben-Hur	43.03	17.5	32210
ACOR	Road Rage	39.7	13.5	32210
ACOR	Words of Wisdom	32.01	9	32210
ACOR	Seven Farmers	42.1	18.7	32210
ACOR	Set-up Date	32.51	5.6	32210
ACOR	Where's My Black Flag?	32.63	10.1	32210
ACOR	Overdesign	29.58	4.7	32210
ACOR	Triathlete	65.94	45.7	32210
ACOR	Archer of the Month	36	14	32210
ACOR	Old Habits	27.11	5.1	32210
ACOR	Elementary, My Dear Bayek	50.02	29.6	32210
ACOR	Stargazer	40.24	17.7	32210
ACOR	Master Diver	35.1	12.7	32210
ACOR	I Know My Land	39.85	14.5	32220
ACOR	I Can See My House From Here!	38.84	13.4	32220
ACOR	Circle of Life	35.62	10.4	32240
ACOR	What Time is It?	24.76	3.2	40000
ACOR	Zip it Off	23.88	3	40000
ACOR	Prison Break	32.34	15.2	40000
ACOR	Team Play	34.53	12	40000
ACOR	Walls of the Ruler	33.74	10.7	40000
ACOR	Surgical Strikes	37	12.9	40000
ACOR	New Recruits	34.39	11	40000
ACOR	The Greater Good	37.05	12.8	40000
ACOR	First Visit	42.82	9.5	40000
ACOR	Archeologist	24.05	2.5	40000
ACOR	Polymorph	27.98	2.9	40000
ACOR	Lift the Curse	32.56	9.6	40000
ACOR	Higher Power	32.84	10.8	40000
ACOR	Dark Horse	26.09	4.1	40000
ACOR	Sting in the Tale	26.64	5.2	40000
ACOR	Project Comet	35.64	11.7	40000
ACOR	Pyromaniac	29.25	6.3	40000
2077	The Fool	77.33	89.7	10000
2077	The Lovers	55.32	70.8	10000
2077	The Hermit	38.66	50.8	10000
2077	The Wheel of Fortune	41.34	54.9	10000
2077	The High Priestess	34.77	45.3	10000
2077	The World	30.83	35.8	10000
2077	The Devil	17.3	5.7	11020
2077	The Star	22.73	16.9	11020

2077	The Sun	20.3	14.7	11020
2077	Temperance	19.62	10.4	11020
2077	Right Back At Ya	49.68	67.3	21010
2077	True Soldier	32.63	42.1	22110
2077	True Warrior	26.63	29.1	22110
2077	Stanislavski's Method	44.13	52.4	22120
2077	To Protect and Serve	26.87	26.4	22210
2077	To Bad Decisions!	20.58	12.2	22210
2077	Judy vs Night City	27.54	29.1	22210
2077	Life of the Road	32.91	40.1	22210
2077	Bushido and Chill	29.14	32	22210
2077	Full Body Conversion	28.56	32.6	22220
2077	Ten out of Ten	16.56	13.6	22220
2077	Legend of The Afterlife	30.87	38.1	22310
2077	Gun Fu	33.26	23	31010
2077	Christmas Tree Attack	36.32	32.7	31010
2077	Gunslinger	17.39	5.2	31010
2077	Two Heads, One Bullet	20.46	26.9	31010
2077	Rough Landing	15.8	2.5	31010
2077	V for Vendetta	17	6.2	31010
2077	Daemon In The Shell	17.71	5.8	32110
2077	The Quick and the Dead	20.56	17.1	32110
2077	Must Be Rats	19.91	10	32110
2077	Master Crafter	23.1	24.7	32120
2077	It's Elementary	18.23	7.3	32210
2077	I Am The Law	25.92	18.6	32210
2077	Greetings from Pacifica!	17.47	6.9	32210
2077	The Wasteland	17.14	6.5	32210
2077	Little Tokyo	17.9	7.1	32210
2077	Mean Streets	17.43	7.2	32210
2077	The Jungle	18.62	7.1	32210
2077	City Lights	17.68	7.7	32210
2077	Autojock	16.04	5.5	32220
2077	Breathtaking	21.28	15.3	32240
2077	The Wandering Fool	25.94	20.1	32240
2077	Frequent Flyer	14.96	15.2	32240
TW3	Lilac and Gooseberries	49.12	63.7	10000
TW3	A Friend in Need	24.94	33.1	10000
TW3	Necromancer	21.97	31.4	10000
TW3	Family Counselor	31.28	40.3	10000
TW3	Something More	19.6	26.6	10000
TW3	Xenonaut	18.95	25.4	10000
TW3	The King is Dead	18.42	23.8	10000

TW3	Mutant	26.15	28	22120
TW3	Bookworm	41.56	43.1	22120
TW3	Let's Cook!	43.65	48.4	22140
TW3	Bombardier	29.81	35.6	22140
TW3	Passed the Trial	18.79	23.8	22220
TW3	Munchkin	22.77	25.7	22340
TW3	Geralt: The Professional	16.34	10.5	32210
TW3	Kingmaker	20.97	26.8	32210
TW3	Assassin of Kings	17.45	16.3	32210
TW3	Friends With Benefits	31.37	36.8	32210
TW3	Full Crew	18.63	20.3	32210
TW3	The Enemy of My Enemy	13.29	2.6	32210
TW3	Humpty Dumpty	13.15	1.9	32210
TW3	Environmentally Unfriendly	28.19	31.6	32210
TW3	Kaer Morhen Trained	21.64	4.1	32210
TW3	Can't Touch This!	37.96	45.1	32210
TW3	That Is the Evilest Thing	15.29	3.1	32210
TW3	Butcher of Blaviken	45.19	53.9	32210
TW3	Triple Threat	32.38	33.6	32210
TW3	Brawler	18.97	16.2	32210
TW3	Overkill	13.22	2.9	32210
TW3	Master Marksman	12.76	1.6	32210
TW3	What Was That?	18.53	2.6	32210
TW3	Even Odds	20	10.2	32210
TW3	Globetrotter	24.58	26.5	32210
TW3	Pest Control	15.13	9.1	32210
TW3	Card Collector	14.74	4.8	32210
TW3	Gwent Master	18.28	11.5	32210
TW3	Power Overwhelming	18.7	5.1	32210
TW3	Brawl Master	18.33	14.4	32210
TW3	Fast and Furious	16.85	10.4	32210
TW3	Fire in the Hole	26.05	27.9	32210
TW3	Fist of the South Star	48.27	46.7	32210
TW3	Geralt and Friends	23.54	17.6	32210
TW3	All In	22.62	16.6	32210
TW3	Shrieker	29.71	33.1	32210
TW3	Fearless Vampire Slayer	22.57	23.4	32210
TW3	Woodland Spirit	17.55	13.4	32210
TW3	Fiend or Foe?	18.77	19.1	32210
TW3	Ashes to Ashes	20.33	21	32210
TW3	The Doppler Effect	24.49	25.9	32210
TW3	Ran the Gauntlet	12.75	6.8	32220
TW3	Walked the Path	13.07	3.6	32220

TW3	Dendrologist	16.85	7.5	32220
TW3	Armed and Dangerous	22.78	18.5	32240
TW3	I'm Not Kissing That	31.83	20.2	40000
TW3	Let the Good Times Roll!	24.21	9	40000
TW3	Shopaholic	26.23	9.8	40000
TW3	Curator of Nightmares	24.86	11.4	40000
TW3	Pacta Sunt Servanda	27.41	17.6	40000
TW3	When It's Many Against One...	20.57	2.3	40000
TW3	Return to Sender	22.82	3.4	40000
TW3	Can Quit Anytime I Want	22.16	3.8	40000
TW3	Wild Rose Dethorned	22.79	7.1	40000
TW3	I Wore Ofieri Before It Was Cool	19.58	2.5	40000
TW3	Moo-rderer	22.03	2.6	40000
TW3	Rad Steez, Bro!	32.91	13.9	40000
TW3	Killed It	27.33	5.5	40000
TW3	The Witcher's Gone South	35.02	20	40000
TW3	Last Action Hero	23.18	13.9	40000
TW3	Kling of the Clink	17.25	2.8	40000
TW3	A Knight to Remember	24.88	12.1	40000
TW3	Embodiment of the Five Virtues	24.88	12.7	40000
TW3	Playing House	25.6	14	40000
TW3	Turned Every Stone	20.83	7.9	40000
TW3	I Have a Gwent Problem	21.21	7.2	40000
TW3	The Grapes of Wrath Stomped	23.28	10.1	40000
TW3	Dressed to Kill	29.37	9.5	40000
TW3	Weapon "W"	31.62	15.6	40000
TW3	Hasta la Vista™	20.46	2	40000
TW3	David and Golyat	22.91	2.8	40000