**Gen Z in the Gaming World – A Statistical Analysis of Game Consumption Behaviors Among Generation Z**

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July 21, 2022

# 1. Abstract

Generation Z (GENZ), which is merely 18% of the Chinese population, are responsible for 50% of purchasing in the video game and virtual entertainment. Understanding the consumption preference of GENZ is critical to evaluate the potential of the video game and entertainment market. This study provides insight into the consumption habit of GENZ in the video game and offline game market. To evaluate their preference, we constructed a model from Baidu Index and Steam Stats to further investigated the preference of GENZ in mobile and PC game. Using this model, we found MOBA game to be the most popular in the mobile market (with market share of 38.55%), and FPS game to be the most popular in the PC market (54.19%). We also found that RPG game is becoming increasingly attractive to younger population in China.

# 2. Introduction

While the Millennials may still be deemed to the very picture of the grown-up new generation, Gen Z is slowly taking the helm of this title. Generation Z (hereinafter referred to as “Gen Z”) is defined to be people born between mid to late 1990s and the 2010s, the group ages between 12 – 27[1] as of 2022. From a psychological perspective, this age group belongs adolescence and early adulthood, of which both are indispensable stages of shaping life habits and spiritual views. Young adults at this age are expeditiously absorbing culture, information, and many other factors of influence to form their own code of behaviors. One other key fact that makes this generation exceptionally distinctive is the environment that they grow up in. From year 2000 and beyond, tons of new things arise from all industries; pre-existed technologies such as the internet became more sophisticated and popularized; the expansion of diversity in both the material and spiritual world has destined that Gen Z has the opportunity of enriching their sights more than any other generations. Since having the freedom to make purchasing decision can be considered as the major difference between children and young adults, consumption behaviors reflect the true desire of Gen Z. Combing the benefits of having the most access to technology and information in the most curious and rapid-growing age, it is worth studying how has Gen Z formed unique views and how has those reflected on their consumption behaviors.

We choose the gaming industry to be our focus area because it is the most popular entertainment among young people, especially Gen Z. According to the Digital 2022: Global Overview Report published by WeAreSocial, Hootsuite and DataReportal in January 2022, 86.4% of females and 91.9% of males aged between 16 - 24 play video games on any devices. These percentages are the highest among all age groups. Another study done by Newzoo examines how different generations engage with video games, it has concluded that 25% of Gen Z leisure time is spent on gaming, which is longer than any other form of entertainment. Multiple research projects have suggested that the majority of Gen Z play games, which makes gaming consumption a cogent topic to analyze since the results will represent the vast majority of Gen Z. Therefore, we pinned down our project topic to Gen Z in the Gaming World – A Statistical Analysis of Game Consumption Behaviors Among Generation Z.

# 3. General trend of Gen Z’s purchasing habits on Games

## 3.1 Choosing Game – Preferences on formats, and devices of Games

### 3.1.1 Choice Formats.

The format of a game is the general type that it belongs to, also known as the genre. In nowadays, most games can be classified into several format such as simulation, shooting, MOBA and many others. Using the data collected by Digital 2022 Global Overview Report, people aged 16 to 24 has the preferences summarized in the following chart: Note that the percentage here is the share of all internet users, which includes those who do not play games at all.

Chart, bar chart

Description automatically generated

Figure 1: GWI Q3 2021, this chart was remade from Digital 2022 Global Overview Report p.70 to focus on the Gen Z section.

Data is collected using a broad global survey that asked internet users aged 16-64 about their preferences on games. The sample is then divided into 5 different age group, 16-24, 25-34, 35-44, 45-54, and 55-64. The first age group captures most population in Gen Z, thus we use this group as our major analysis target. As demonstrated in the bar plot, 60% of internet users of this age are playing shooter games, which makes it the most popular game genre. Action-adventure is at the second place with a 56%. It is obvious that these two genres stand out from the rest and almost double the percentage of people playing puzzle and action platform. Simulation, Racing, Battle Royale, M.O.B.A. and Strategy have similar percentages of players. From this, we can also conclude that most gamers play more than one type of game.

With this ranking of genres, we further researched and ranked the top 5 specific games that are most welcomed by young players of this age. According to a survey by YPluse done in November 2020, 1000 young consumers aged 13-39 were asked about their favorite games. Since we are interested in Generation Z, data of consumers aged 13-19 and 20-29 are used, which each corresponds to the first and second half of Gen Z.

Table

Description automatically generated

This result fully agrees with the previous analysis. *Call of Duty (CoD)* is a first-person shooter game, and it ranks top in both age group. *Grand Theft Auto*, another game that ranks high on both lists, is an action-adventure game. It creates an open world where players complete missions to proceed in the story line. *Minecraft* is one of the most famous sandbox games. In this type of game, players usually don’t have a specific goal or mission, instead there could be multiple components that allow the players to create, explore and experiment within the world. The nature of this game falls between action adventure and simulation. *The Sims* is undoubtedly an iconic simulation game. *Fortnite*, however, it is a battle royal game. While this type of games only has 36% of players, there is a major difference between *Fortnite* and the rest that makes it popular. Despite all common characteristics of a bottle royale game is has, *Fortnite* incorporates elements of competition and social contact. It is a survival game that allows users to play in two or groups, and the way to win is to defeat the other 99 online players. *Super Mario Bros* is the only platform genre games in the list. But the along with many other Nintendo gamers, players can invite several friends to join the same game, this further assured the importance of social contact in gaming. *Among us* is a multiplayer social deduction game, players each have different roles and goals and try to disclose the secret roles of others.

At this point, the data reveals some common characteristics of games that are more welcomed by Gen Z. The foremost factor is competition. Shooter games such as *Call of Duty*, *CS: GO* and *PUBG* all provides a setting where players are made to teams and compete against other teams. During the game, players need to always stay 100% focus since any enemy hidden in a corner that suddenly comes out may cause the loss of the game. This pressure has helped to evoke excitement and the desire of victory, with attracts young players. The second factor is immersive experience. Shooter, action adventure and simulation games create a thorough world and let the players enter this environment that temporally separate them from the real world. The game world could be made with realistic graphic, or in a completely different style. Cartoon-like elements and mythological backgrounds are often seen in games. Gen Z also consider freedom when choosing games. Open-world games such as *Genshin Impact*, *Minecraft* and *the Legend of Zelda* allow players to freely explore the game world. There are multiple story lines that get uncovered as the player proceed through the game. No concrete missions are given, tasks can be completed in various of ways. Games usually incorporates many features such as battles, gardening, construction, dress up and map exploration, the type of the game in fact depends on how players choose to play it. Therefore, open world games attract people with any interests. The last and most unique characteristic of Gen Z in the gaming world is the need of social activities. This explains why strategy and puzzle platform games are not so popular as they give very limited to zero opportunity of communicating to other players. Young population generally prefer to have a sense of community in the game, where players are free to talk within the community either by text or voice. This type of games establishes a platform for them to make new friends, share interesting findings difficulties they encountered in the game. Although Gen Z players are active in many disciplines of games, competition, immersion, freedom and community are indispensable in affecting their decision.

### 3.1.2 Choice of Devices.

To meet the needs of more players, most developers will launch their games on multiple devices and platforms. These devices include but not limited to PC, smart phone, tablet, VR, Nintendo Switch, PlayStation4/5 and Xbox. The Digital 2022 Global Overview Report summarized the percentage of internet users aged 16-64 who play video games on each kind of device. 68.1% use smartphone, 36.8% use laptop or desktop, 25.8% use game console, 17.2% use tablet, 13.6% use hand-held gaming device, 9.7% use media streaming device and 8.7% uses virtual reality headset. Smartphone users are the largest group of gamers while VR devices owns least players. From the data, we also concluded that most gamers use or own multiple gaming devices.

There are three key factors that seem to affect the choice of gaming devices. Convenience is the most decisive among all three. Smartphones are easy to carry, this portability allows gamers to play on the device at any place, anytime. Unlike most game consoles that require a separate screen to display, smartphones are much handier as the controls and display are made into one single screen. Another way to explain convenience is whether this gaming device requires extra investment. Cell phones, laptops, and desktops are not only gaming devices but also provide many other functionalities that make them a necessity for many teenage students and young workers. This means that playing games on smartphones or computers brings doesn’t have any extra cost, except to buy the game itself, because people have the devices already. Secondly, the variety of games also determines what device is more welcomed. As of 2022, most popular games don’t support VR devices. There are many VR games in the market, but they are usually designed just for VR, meaning that users cannot play with people using other devices. This limitation almost isolates the VR community from all game users. By contrast, the smartphone game market is noticeably larger. Despite those games developed for smartphones, many PC games launched their mobile version in the past few years. For instance, *League of Legends*, *PUBG* and *Call of Duty*. The rising popularity of mobile gaming has attracted companies and developers to launch their games in this market, and the variety of games attracts more players. This virtuous cycle continues and is growing larger. The third and last factor is price. While some foregoers in Gen Z may have gone completely independent and made their own money, most people at this age still somewhat rely on financial support from their families. Thus, the price of a gaming device is directly related to its popularity. As previously mentioned, smartphones and computers are already owned as studying or working devices by most people, their popularity has less to do with the price. If we compare game consoles to VR, the result is quite obvious. A complete set of VR devices easily cost $800-$1000, while the Xbox series, Nintendo Switch and PlayStation all price within the range of $200-$500. This difference in price reflects in their percentages, only 8.7% of people use VR while console users triple that number.

## 3.2 Paying for Game – Consumption Habit in Games

### 3.2.1 Game market user demographic

According to Maslow's Hierarchy of Needs, after satisfying physiological needs and security needs, people start to pursue social needs, respect needs and self-actualization needs. GENZ were born in an era when food and clothing were not a concern, they put entertainment at the part of their lives. So as GENZ grew up, the game industry also became increasingly prosperous. China has a large population, and Chinese university students are representative of Gen Z gamers worldwide. According to the research report on Chinese online game market users, the largest group of game consumers in China is 23-25 years old. The Research and Analysis of College Students' Game Consumption Survey were conducted in 2019 at a university in Hefei with 100 questionnaires distributed to students of various grades and majors, and 93 valid questionnaires were recovered. The questionnaire results show that, except for 19.35% of students who explicitly said they did not like playing games, most of the other interviewed students expressed their preference for games to different degrees. Among the types of games that students like, 59.14% are mobile online games, followed by platform games. Meanwhile, iiMedia Research data shows that 59.6% of college students in China favor playing games in 2021. This means that nearly 60% of Gen Z are already online gamers, and they are attracting their friends to play games which increases the size of this group.

In addition to online games, social entertainment games are also well-received among Generation Z. Since a work called Death Wears White was introduced from Britain as the first *Murder Mystery Game* in China in 2013, and after the broadcast of the celebrity deduction reality show "Who’s the Murderer" launched in China in 2016, Murder *Mystery Game* have rapidly taken off in China. iiMedia Research data show that nearly 50% of the post-90s and more than 55% of the post-00s have experienced the new offline game entertainment. According to the data of Meituan Research Institute, the main participants of the immersive offline entertainment social games of scripted kill and secret room escape are 18-28, whose percentage is as high as 83.86%. A large number of players and consumers has given rise to the rapid development of the *Murder Mystery Game* industry. by the end of 2019, China’s *Murder Mystery Game* offline stores were 12,000; by 2020, the scale reached 30,000. In 2020, China’s *Murder Mystery Game* market scale has reached RMB 11.74 billion, and by 2022 so far, China’s *Murder Mystery Game* industry market scale will have exceeded RMB 20 billion. Based on the expected single consumption of 100 RMB per person, the *Murder Mystery Game* consumption in 2020 is 117.4 million times, which indicates its huge consumer group.

Worldwide, *Escape* Rooms have become a daily pastime for Gen Z before *Murder Mystery Game*. In 2014, there were approximately 24 *Escape Room* facilities in the United States. And in 2015 the number of *Escape Room* facilities grew by 317% to 100, and in 2016 it grew again by 800% to 900. The number of *Escape Room* facilities operating in the U.S. (excluding temporary closures) remains stable at 2,250 as of today. We can speculate that the year-on-year increase in the number of *Escape Room*s on the graph below and the gradual growth of the consumer base are positively correlated to the gradual growth of each individual in Generation Z and their ability to consume.

Since *Escape Room* businesses always appear to shut down or open suddenly for various reasons, there are no official statistics on how many *Escape Room*s there are worldwide. But the clear trend is that the more densely populated countries are, the more *Escape Room*s exist.

### 3.2.2 Frequency of games

In 2019, China Youth Network Campus News Agency conducted a questionnaire survey on the daily online game playing hours of 682 college students who play online games nationwide. The survey results show that 12.61% of the respondents said it was more than 3 hours, 45.45%said it was within 1-3 hours, and 41.94% said it was within 1 hour. 58.06% of the respondents play games for more than 1 hour a day. In the same questionnaire, 43.11%of respondents claimed that they had no experience with game consumption, 37.83%of respondents had a total consumption of less than 500 RMB, 8.06%of respondents had a total consumption of 500-1000 RMB, 3.81%of respondents had a total consumption of 1000-2000 RMB,3.23%of respondents' total consumption is 2000-5000 RMB, and 5000-10000 RMB accounts for 1.32%. In addition, 2.64%of college students spend more than 10000 RMB on games. For most college students, online games are just a tool to spend their free time or a bridge to bring them closer to their friends around them. Therefore, more than half of Generation Z would be willing to perform a small amount of top-up behavior for online games to show their support for the game or to get a better sense of the gaming experience.

Compared with online game recharge or purchase, most GENZ are more willing to spend money on offline social games. Social game players can be roughly divided into three categories: hardcore players, moderate players and mass-market players. Most hardcore players of *Murder Mystery Game* play it at least 2-4 times a month, with an average of 3-5 hours of playtime; moderate players participate in the game about 2 times a month on average, while mass-market players are often invited by their friends who's the moderate players or hardcore players to participate in the game once every two months. Similarly, before *Murder Mystery Game* arrives in China, the players of the *Escape Room* have the same nature, only the average game length is 1-2 hours. If we estimated spend of per person per game is 100 RMB, Chinese detective game hardcore players spend 200-400 RMB per month on this type of consumption.

Detective games such as *Murder Mystery Game* and *Escape Room* have established a stable market and player base in China, but *Blood on the Clocktower*, a large social board game originated from Australia, has recently become a "hit" in this market and community. *Blood on the Clocktower* is similar to *Mafia*, also divided into the good guys camp and the evil camp, players in the night and day alternating confrontation, each game contains for 5 to up to 20 players; a game down about 30-90 minutes. The game is said to have 100+ characters, each with unique skills. Unlike the easy-to-play *Mafia* where everyone can be the narrator, the Storyteller in the *Blood on the Clocktower* is the most important character in each game, and they lead everyone into a world full of mysteries. Each Storyteller's story is unique, and the Storytellers balance the situation for the players based on the strengths and weaknesses of the camps on the field. As you can see, like *Dungeon Maste* in the *Murder Mystery Game*, the storyteller requires a certain level of expertise and thorough preparation. Therefore, Gen Zer chooses to do *Mafia* themselves at parties, but are willing to pay to go out and participate in the *Blood on the Clocktower* (Concerned about the blood-stained clock tower crowd mainly concentrated in the 20-29 years old, accounting for 66%; under 19 years old accounted for 13.4%). Currently, the average market price of *Blood on the Clocktower* in China is about 100 RMB, and its avid fans can play the game almost 4-5 games a week, which means that some people spend nearly 2000 RMB on the game in a month. Again, being the social board games, *Blood on the Clocktower* also has a unique social attribute - the social attribute of strangers. Because the game requires private communication, which gives strangers a logical reason to add social media to each other.

In summary, Gen Zer has more complex needs for companionship, expression and personal identity, bringing a new generation of social games that are personalized and willing to pay for them.

### 3.2.3 Average monthly total consumption vs. Average monthly consumption on Games of Gen Z

Since Generation Z spends a lot of money on entertainment, what position does this spending occupy in their total daily spending? According to the "2020 China College Student Consumption Behavior Survey Report", most of the 15,860 college students surveyed from more than 100 colleges and universities across China had monthly disposable living expenses in the range of 1,000-2,000 RMB, and the average monthly disposable living expenses of all college students surveyed was 1,954 RMB. These financial sources for college students are mainly given by their parents (family members), while other sources also include scholarships and subsidies, part-time jobs outside of school or work and study. According to statistics, the first and second largest cities in China in terms of living expenses for college students are Beijing and Guangzhou respectively, with the average living expenses of college students in Beijing reaching RMB 2,928.5 and those of college students in Guangzhou around RMB 2,500. The first and second-tier cities have relatively complete public transportation systems, convenient travel, and relatively large numbers and wide coverage of entertainment and leisure venues such as shopping malls, cinemas, KTV, and escape room script kills. It is not difficult to find that at such a level of living expenses, GENZ are not stingy in spending for the game.

# 4. Methodology

We used the monthly active user index (MAU) from Asotools, Steam Stats, and as a measure of the popularity of the game in the general population for mobile game and PC game.Based on the general popularity data, we constructed Target Group Index for generation Z () and Monthly Active User for generation Z () to investigate the preference of generation Z consumer.

We acquired the age data of each game from Baidu Index, and augmented the data set to the data into desired age bands. We assumed the age distribution to be a continuous function which can be approximated using differences of gaussian algorithm. With the following mathematical equation,

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|  |  | (1) |

Where is a positive integer which denotes to the age of distribution, denotes to the set of the raw age distribution with a 10-years age sensitivity, denotes to two positive constants, is a tuple with the median age and percentage distribution at 1st and 2nd entry, respectively. The R code realization is on GitHub **(Supplementary Material)**.

The percentage user that is generation Z for a specific game () is calculated as following:

We used GENZ MAU as another indicator of the preference of the GENZ user, defined as following:

The MAU of each type of game were acquired from different sources with different criteria, and therefore cannot be compared directly.

Furthermore, we defined to be:

# 5. Results

## 5.1 Mobile Game

We categorized games into six different genres, respectively multiplayer online battle arena game (MOBA), first-person shooter game (FPS), real-time strategy game (RTS), role-playing game (RPG), turn-based role-playing game (TBRPG), and massively multiplayer online role-playing game (MMORPG).

图表, 条形图, 直方图

描述已自动生成

**Figure 2. a). Calibrated age distribution of user of fifteen games by categories. The shadowed orange area indicates generation Z (age 12-27). b). Number of Gen-Z users of the fifteen games. The x,y axis respectively represents the MAU and the monthly income of the games from Appstore. The size of the circles represents MAUZ, and the transparency indicates TGIZ of each game. The x and y axis are on logarithmic scale. All the games are free to download with in-game purchase. C). Total number of MAUZ by game genre. Different color indicates different game operators. d). Distribution of TGIZ of games by categories. Darker color indicates higher MAUZ across the genre.**

We studied the three most popular mobile games in China from five game genres - MOBA, FPS, RTS, RPG, and TBRPG. MMORPG was not surveyed due to its relatively low popularity. iii The average TGIZ across all mobile games is 308. The 15 games were developed and operated by five different companies, with a total MAU of 18.47 and a total monthly income of 765.3 million USD.

The most popular fifteen Chinese mobile games are operated by five companies: Feiyu, MiHoYo, NetEase, Supercell, and Tencent. Tencent and NetEase each hold five games. The three popular games, Honor of Kings, Mobile PUBG, and Mobile League of Legends, ranked 1, 2, and 4 among all 15 games by MAU, are all from Tencent.Supercell and MiHoYo follows up, each owning two.

We observed clear specialisation of each company in different genres. The five categories, MOBA, FPS, RPG, RTS, and TBRPG, was specialized by Tencent, Tencent, MiHoYo, Supercell, and Netease, each with the MAU market share of 98.7%, 95.4%, 100%, 82.9%, and 100%, respectively.

The TGIZ of each genre is relatively consistent (var < 0.15), except for RPG games with a variance of 0.60 (Figure 3 D), indicating presence of outliers (Genshin Impact). TBRGB, although being the least popular, has the highest average MAUZ. MOBA game has the most representative distribution of TGIZ while having the highest MAUZ.

Across the genres, MOBA has the largest number of players across all age groups, with its high popularity it holds the highest MUAZ. However, while having the largest total MUAZ (4.0), it attracts users from all age bands, bringing TGIZ down to 279, the lowest across all genres. At the same time, TBRPG ranks the lowest with an MAU of 0.28. FPS and RTS have similar popularity amongst GENZ users, each with MAUZ of 2.47 and 2.2, which ranked second and third. However, FPS has significantly higher TGIZ of 343, which is 19% higher than RTS (288).

RPG game has the highest TGIZ amongst all game genres (383), while being relatively popular with the popularity index of 219. However, the two less popular games in the genre, Honkai Impact and Arknights, has significantly lower TGIZ (210 and 273) than Genshin Impact (396).

Genshin Imapct holds the highest TGIZ of 3.96 across all the games, while having the fourth-highest MAUZ, significantly higher than the game that ranks higher in MAUZ. Its TGIZ is significantly higher than its competitors in the same genre, Honkai Impact (2.1) and Arklight (2.73).

## 5.2 PC Games

图表, 条形图, 直方图

描述已自动生成

**Figure 3. a). Calibrated age distribution of user of fifteen games by categories. The shadowed orange area indicates generation Z (age 12-27).****[[1]](#endnote-2) b). Number of Gen-Z users of the fifteen games. The x,y axis respectively represents the number of MAU and MAUZ from steamstat. The size of the circles indicates MAUZ, and the transparency indicates TGIZ. The x and y axis are on logarithmic scale. The black line is where the ratio of MAUZ/MAU equals one. Closer to the line indicates higher TGIZ. C). Total number of MAUZ by game genre. Different color indicates different game genre. d). Distribution of TGIZ of games by categories. Darker color indicates higher MAUZ across the genre.**

We picked the 15 most played games from Steam China and recorded their corresponding MAU. The 15 games can be categorized into four distinct genres – seven FPS games, four MMORPG games, three RPG games, and one MOBA game. The 15 games were developed and operated by 13 different companies. The average TGIZ across all games is 3.17, with a total MAU of 45.54.

FPS is the most popular genre in the list with a total MAUZ of 24.62 and highest unweighted TGIZ of 3.50. Besides, the age distribution of FPS game player has its highest frequency fell within the range of GENZ, except PUBG. The distribution of TGIZ and MAUZ both demonstrated some extent variance, indicating a clear pattern of preference.

MMORPG has 4 games ranked second both of total number of games and GENZ users with a MAUZ of 3.93 and TGIZ of 3.34. Most of the four games have relatively high TGIZ, except for MIR4 with TGIZ of 2.1, causing the skewed distribution. After removing the outlier, the weighted average of TGIZ of the category becomes 3.51, the highest of all the genres. The user age distribution pattern of each game is very consistent within the genre, except for MIR4.

The GENZ users of genre of RPG games is ranked the lowest but very close to the MMORPG game with MAU of 3.37 and 3.93. RPG games had a relatively compact distribution of TGIZ, with an average of 3.37, while being the least popular category by MAUZ. The age-distribution pattern is also very consistent.

DOTA is the only MOBA game that ranked into the top-15 list. It has the lowest average TGIZ of 2.89, making MOBA the least preferred game genre of the four.

Apex legend has an extremely high TGIZ of 4.06, indicating that over 73% of its players are GENZ, comparing to its competitor PUBG (with only 45% of the players as GENZ). The two games also share same sub-category of Battle royale, while they contrasted each other as the most and the least GENZ-favored game.

# 6. Discussion

## 6.1 MOBA game is still the most popular on mobile, but RPG is catching up

We found MOBA to be the most popular game. We suspect that there are 2 reasons: firstly, PC game League of Legends (LOL) was going virus globally which gives the large user base of the MOBA game. The map and skills of heroes even the mechanism is directly copied from LOL. This makes the some of the players already familiar with the game to some extent and help the mobile game easily get the first few rounds of players and spread quickly. Secondly, MOBA game is new-players-friendly. Basically, players only need to know how to move, go straight up to hit enemies and destroy the turret then the game is playable. Moreover, it is worth to notice that Genshin Impact, a mobile Chinese RPG game, gain a huge number of fans due to its perfect video quality, exciting scenes and famous IP characters. No such an RPG mobile like mobile Genshin Impact before in the Chinese market and thanks to it more and more Chinese RPG games are launched and impact the new generations.

## 6.2 FPS game is most popular across the PC platform

We also found FPS game is the most popular one in the PC game. FPS games bring strong visual effect and make an intensive atmosphere, especially when people get killed or kill other players the screen will flash red which makes it look like players are bleeding. This will make players more exciting and gradually get addicted to them. Also, FPS is an early-invented game genre which already have a mature set up for game design and world competitions like CS 1.6. FPS games always are accompanied with socialization. Young love to play with their classmates or friends in the weekends or after school. Nowadays, more and more new FPS games come out with new game design like PUBG and APEX legends which add some skills and larger map.

## 6.3 Limitations

Our study is subject to some limitations. We believe there is substantial underascertainment of the number of GENZ user due to the latest regulation which restricts younger individuals from accessing the game during weekdays.

The underascertainment might also vary depending on the specific regulation announced by the government. Although the time limit might differ, time is significantly restricted for people under 18. Thus, some young adult will likely ask their parent to use their facial recognition and identity to sign up for the games. Such a behavior greatly influences our result since the age distribution of GENZ will decrease, and the number of players aged 30 or above will increase. We observed that the Honor of Kings might reflects this fact. Tencent is the very first few companies being strictly regulated due to many players.

Furthermore, some keywords of Game are not covered in the Baidu Index. We are not able to access all the games, and this leads to change the design of methodology. We have pick games with representative, so we tried two different strategies. Search the top 3 games of each genre and top 15 games among all the genres. The disadvantage of both is that 15 games are still not enough to perfectly conclude a result. For example, when we analyse the MOBA game in PC, we only get one sample which barely reflect the fact between the GENZ and the PC MOBA game.

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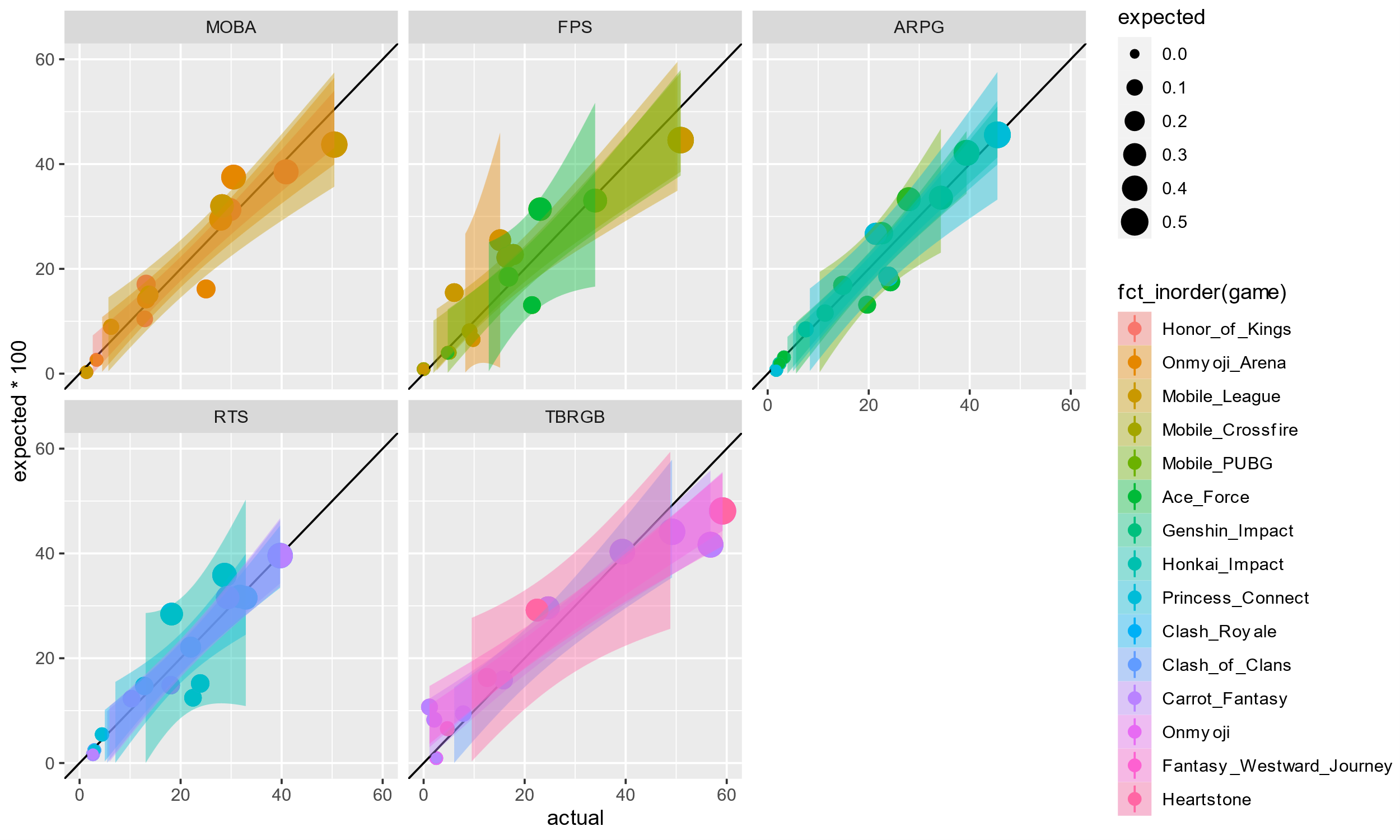
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# Supplementary Materials

We set the regression model with the following parameters. The value of each game is given in the same order as the order in the previous discussions. A single figure will be given if all the game in these categories was given the same parameter. The R-code realization and all raw data is available.[[2]](#footnote-2)



**Figure S1. Model robustness check**

1. [↑](#endnote-ref-2)
2. https://github.com/blairyeung/KPMG-Contest [↑](#footnote-ref-2)