"Do Hyper-Casual Players Always Hate Hard-Core Action Games?": A Collective Characteristic Analysis of Gaming Experience with Player Group Profiling and Extra Gaming Genre Categorization

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Research Area: Computational Media and Arts → Player Experience, Games User Research

Abstract: As the research of player experience (PX) deepened, a lot of interdisciplinary and scientific user-testing approaches have been adopted to evaluate gaming experience to ensure the optimal quality of games and virtual entertainment products. However, previous research mostly focused on a single aspect of either player assessment or game genre analysis, not much effort was exerted in jointly exploring how the playing experience of different player groups would vary towards different genres of game products. This research aims at providing a generalizable categorization standard for game products to supplement the traditional genre division, along with a useful player profiling questionnaire, to reveal the collective characteristics of playing experience among different player groups and gaming genres. It will give future researchers transcendental knowledge on how to better organize the experiment setting considering the inherent influences of game genre and player type, as well as provide the practitioners insights on the common attitude of different player groups toward different game genres so that they can have a clearer direction to refine the game design to better serve core players and attract a richer user base.

CCS Concepts: • **Applied computing** → **Computer games**; • **Human-centered computing** → **User studies**.

Additional Key Words and Phrases: Player Experience, Games User Research, Interdisciplinary Approach, Human-Computer Interaction

1 INTRODUCTION

The experience of playing video games is generally considered a subjective relationship between the player and the video game product [17]. The implementation of a game is an integrated process that is highly connected to the machine it runs on, the devices used to control it, and the game's interface for users to interact with. However, the experience of playing the game is affected by more than these factors, and it is also considered as a personal, complicated relationship that might vary from person to person [9]. The ability to accurately assess the experience of players during the playing of games is vital for building more high-quality and commercially successful video games, understanding the influences of video game playing, and extracting design principles found in the gaming domain to apply them effectively in other fields. As a result, exploring scientific and effective methods to measure player experience, hence to better understand the key factors that constitute and influence the game experience is an increasing area of focus among both video game researchers and developers [3, 8, 10, 11].

Understanding this relationship could be problematic under a scientific scope since personal and subjective knowledge does not allow a theory to be generalized or falsified [33], but from the academic domains of human-computer interaction, human factors, and social psychology, some robust, interdisciplinary, and scientific user-testing approaches have been adopted in the game industry field called games user research (GUR) to investigate and evaluate such relationships to ensure optimal quality of the user experience (UX) in games and virtual entertainment products [29]. However, previous explorations and analysis are mostly single-aspect-oriented, either applying multiple evaluation methods upon participants with diverse characteristics to explore the robustness and feasibility of different approaches in assessing

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the player's gaming experience [5, 24, 31, 32, 38, 42], or focusing on the game genre study itself in finding the distinctive features across various game products to reveal their potential effect on PX [1, 4, 6, 14]. Not much effort was exerted in exploring how the intertwined relationships between game genre and player characteristics could affect the player experience. For example, will a group of players who share the preference on a specific game type hold a consistent attitude towards another type of game? More specifically, some individual players who love hyper-casual games might find it frustrating in playing soul-like action games [43], but no further experiment was conducted to investigate if such phenomenon corresponds beyond the individual level and keeps consistent on the other hyper-casual game lovers. Such potential group characteristics in player experience under the joint effect of game type and player type remain mostly undiscovered, but it is of great significance to both researchers and practitioners as it can provide empirical knowledge for better experiment setup and core game feature design.

The major challenges of such exploration accommodate in 3 aspects:

- *The conclusions drawn from experiments toward limited game products are hard to generalize to more game genres.* The experiment setting in previous games user research usually only selected one or very few game products to adapt to the specific experimental objectives, especially in the feasibility exploration of PX evaluation methods [34, 42]. The divergence of mechanisms in different game genres could lead to significant PX influences but these factors are difficult to describe, compare and generalize if the experiment setting doesn't cover plenty enough game products.
- *The difficulty in profiling the player's gaming background in-depth.* The necessity of diversity of research participants in the PX evaluation is widely recognized across multiple experiments [5, 24, 31, 32, 42], pre-game interviews or surveys are usually used to profile the player's playing background and characteristics. But the questions are mainly focused on general aspects like frequency of playing or preference of game genres, differences in players' perception of games are not covered very well, and the participants' understanding of different game genres could vary across individuals hence leading to bias in their self-reported results to the survey or questionnaire.
- *The challenge of cross-corroboration between in-depth individual analysis and statistical group analysis.* Using methods like self-reported questionnaire to gather responses from more participants and perform statistical analysis for a specific group of players can give insights on common cognition towards PX related questions, but such insights will be limited to the pre-designed questions, and phenomenons out of the researcher's perception and knowledge will never be discovered under such form of evaluation [34]. On the contrary, a combined method with multiple forms of data collected during the playing session of individual players will give the researcher a more comprehensive understanding of the player's gaming experience [42]. However, as the number of subjects grows, the effort required to analyze the data increases dramatically, especially when there are multiple forms of data like video and physiological data involved in the process of individual-level assessment of PX. How to achieve the balance between individual analysis and group analysis to draw more reliable conclusions with cross-corroboration is another big challenge to be solved.

Because of these challenges, the knowledge of the relationship between game genre, player type, and PX has not been discovered sufficiently. It is necessary to experiment with broad enough combinations of players with different game playing backgrounds and games under different genres to give solid empirical knowledge on such relationships. It will give the future researchers some transcendental knowledge on how to better organize the experiment setting considering the inherent influences from game genre and player characteristic, as well as provide the practitioners

insights on the common attitude of different groups of players toward different genres of games, and what aspects of the gameplay will contribute to the positive playing experience for their target customers, so that they can pursue a better schedule in polishing and designing the game to attract richer user base under restricted budget and time.

2 OBJECTIVES

As the experience of playing video games is a complementary process built upon the interaction between the game product and the player [43], to evaluate such experience, we should take factors from both aspects into account to get a more comprehensive understanding. To avoid ambiguity, the phrases "player characteristic" and "player's game playing background" are mutually equivalent in describing the concept of player's characteristics in playing video games hereinafter.

This proposal aims to investigate how the divergences of players in their game playing background affect their opinions and experience in playing different genres of game products, which inherently have their common characteristics in gameplay mechanisms. It involves the answering of below questions:

- Is current industrial classification for game types, or so-called game genres, like FPS, RTS, ACT ... sufficient enough for such analysis under a scientific scope?
- Regarding the player's various background in game playing, is the traditional metrics like the number of hours of gaming per week, most frequently played game genre ... sufficient enough to profile the playing background of the player?
- What conceptual framework and evaluation method should be employed to examine and reflect the joint effect of game genre and player's playing background in the context of player experience evaluation while maintaining a balanced perspective of both individual analysis and group analysis?

The first question is raised upon the fact that the vague but widely-accepted definition of game genre can only provide a most common characteristic for a group of game products while numerous variations within the same genre make such classification not generalizable enough. For example, one of the most popular game genres FPS game which refers to first-person shooter game only provides a summary of such genre in the players' viewing angle, while the mechanism of this game genre could vary from online competitive shooting to casual virtual environment exploration. A pre-test interview or questionnaire to profile the player's playing background was proved to be able to collect the genre preference information [43], for example, the player's preference of game genre is FPS, but this doesn't guarantee that the players who stated the same FPS genre preference are playing the actual same kind of game. A player always playing FPS games like *the Hunter: Call of the Wild*, which the majority of its gameplay is exploring and investigating under the first person angle in the virtual wild environment while shooting is only the last small step to kill the prey, and another player who always playing *Counter Strike*, which involves an intensive player to player competition requiring good instantaneous reaction and high-level body coordination to win out [22], would both high likely to consider themselves an "FPS player", but such divergence in the perception of game genre, which could attribute to the ambiguity of game genre definition itself, will lead to uncertainty and contradiction when selecting a target game for testing and profiling the player's playing background. So it is necessary to explore a scientific and useful categorization method oriented in the aspects that proved to be essential to the PX, to supplementarily describe a game product's characteristic along with traditional game genre division.

The second question complements the first question to some degree as it also involves questions related to the game genre, but it has its own emphasis which is more relevant to the player rather than the game product. The

necessity of diversity of research participants in the PX evaluation is widely recognized across multiple experiments [5, 24, 31, 32, 42], however, which metrics to use for profiling the players' playing background to further reflect such diversity varies a lot across different literature and almost no empirical conclusion or principle is explored to be shared for researchers and practitioners. A typical player profiling from Adam J. Toth [43] includes below questions: the duration participants spent playing games, the types of games they played most often, the type of gamer they identified as, the preferences they had for demands of a game, and the abilities they perceived to be required to meet those demands. The gamers are novelly defined as "casual", "core" and "hardcore", and these identities are built on work by Scharkow and colleagues [37] who identify that, given the broad genres and access to games, traditional dichotomous definitions of gamer identities may be insufficient. However, the inextricable relation of game genre definition and game genre preference in player profiling is still not well deconstructed and explored. The preference profiling was also not fine-grained enough as it didn't reflect the behavioral and cognitive differences of participants. For example, the player who reported a high frequency of play in FPS games might just because they are lack exposure to other game types, their actual preference in the game mechanism could be hidden under such scope of survey. Besides, the research context under e-sport field probably narrows down the participated gamers' demographics so that the participants might already share a big similarity in their playing background.

The final question aims at the determination of the conceptual framework and methodology used to analyze and build the relations between player experience, players' playing background, and game genre. The conceptual framework used for analyzing the player experience gives scales in detailed aspects and elements of the gameplay [17], so that how different opinions regarding different elements of the gameplay which further affects the overall assessment of the playing experience can be independently evaluated and compared across different player types. Analyzing the advantages and disadvantages of these methods from the perspective of group analysis and individual analysis can also help us choose methods that better meet our research needs. A more precise explanation will be given in the next section of previous work review.

3 RELATED WORKS

3.1 Conceptual model and evaluation method on player experience

Massive effort has been exerted into the construction of conceptual framework of game experience, the model Jari Takatalo built [41] revealed the experiential cycle in which UX characteristics evolve and be affected by the user background and designer purpose; the Mechanics, Dynamics and Aesthetics (MDA) model [18] tried to bridge what the designer is creating with what the player is expecting from the game by dividing them into three complementary parts; the Sensory, Challenge-Based and Imaginative (SCI) immersions for the game-play experience model [13] integrated the different aspects of game-play that have an effect on the experience, and deconstructed the PX into 3 aspects of immersion; the CEGE model concluded the player experience as affected by the player's perception of elements from video-game and puppetry, specified as the sense of control, ownership and facilitator in puppetry along with environment and gameplay in video-game itself [17]; The PIFF model assessed the presence [28], i.e. perception of and attention to the game world, and involvement [44], i.e. the measure of gamer motivation, as well as the flow [7], i.e. subjective, cognitive-emotional evaluation of the game and gave a valid questionnaire for evaluating in practice. All above conceptual models give us directions of analysis as well as scales for measuring the overall player experience, and could also give us insight on what dimensions need to be included to further categorize the games. The factors of

control, narrative, and achievement are commonly emphasized in all these models although some of them divided these concepts into more detailed aspects.

As the research of PX deepened, various techniques from HCI and other different disciplines like psychology and physiology have been adapted to better measure the playing experience. Traditional methods like think-aloud protocol originated in the usability test, low-cost post-game questionnaires, and classic psychological research approach like retrospective interviews are widely used to evaluate player experience [20]. A new method called *The Sensual Evaluation Instrument (SEI)* are also used in the PX research to capture broader emotional responses to the game [34], this method provides a set of objects with different sizes and shapes to the participants, and they can pick up whichever they want to nonverbally indicate their feeling and emotion during the experiment [27]. The usage of these objects can be treated as a symbol of emotional resonance between the player and the game designer so that the researchers can clearly record the changes in the participants' playing experience. Additionally, the cost of biometric sensors has reduced a lot with the development of biotechnology, making it more feasible for PX researchers to utilize these techniques to gather objective biological metrics as supportive data to better understand and evaluate the playing experience [30]. For example, a nonintrusive tool "All the Feels" introduced by Robinson, et al [35] utilized an off-the-shelf wearable device to record players' physiological data during game playing, then combined such data with the player's facial expression recognized by facial recognition software to jointly analyze the player's experience. Such combined novel approach was later proved to be valuable in revealing user feelings and experience when playing games if applied simultaneously with other techniques. [34]. Other researchers also found it more practical and efficient to use the combined method to give a clearer picture of the participant's responses to further analyze their game experience. Tan, Chek Tien, et al [42] and Lennart [30] have separately conducted experiments to combine traditional methods like think-aloud protocol to get qualitative data along with physiological instruments for quantitative data to integratedly analyze the experience and get a more comprehensive understanding of the players' responses which might be hidden under a single method. So to better reflect the effect of each factor and collect richer dimensions of data, a combined method should be used as well in our future exploration.

3.2 Game Genres and Player Experience

Although more and more attention is focused on the research of video games, how the player experience is correlated with different game genres remains relatively unclear [15]. Elliot and colleagues [12] explored the connection between specific game genres and problem video game playing, which mainly reflected in 3 aspects: playing longer than planned, negative feelings when not playing, and avoiding other activities to play. The research indicated that the majority of all the participants with problematic playing are players of the genres of FPS, action adventures, role-playing, and gambling games. Although such problems only happened on a small proportion of all the studied samples, the positive correlation between game genre and problematic playing behavior was highlighted by the authors to emphasize that the inherent characteristic of specif game genres could play an important role in affecting its player. Another research towards examining the motivations for playing has also found some connection between game genre and playing experience. For online games, the achievement received during playing was the major motivation of FPS players, while RPG players cared more about the immersion [15]. For games with both online and offline modes, Johnson and colleagues found that presence and autonomy are more attractive to players of strategy and role-playing games rather than to shooting, sport, and simulation games [23]. In a follow-up study, they further investigated the flow and immersion experience in more game genres and found that flow was harder to achieve when playing sports, racing, and fighting games, and immersion experience varied across all genres [25]. However, both studies are limited in terms of combining genres of

games because of the small sample size and hence being unable to identify how the player experience differs between individual genres. Another limitation to these findings was that the participants in the study of each game genre were only limited to the players who like or played the target genre recently, a across coverage of player group for each genre was missing.

3.3 Player Groups and Player Experience

Though the importance of diversity of participants is well-recognized in the PX research, there are fewer experiments oriented toward how the participants' characteristics or playing background would affect their playing experience. The experiment in evaluating player's emotional response conducted by Raquel [34] reveals that the players' expressivity will affect their response to the game as well as to the researcher, so conclusion from traditional observation methods of PX evaluation like think-aloud or interview might be affected because of the participants personal characteristic. The experiment conducted by C. Si et al [39] recruited a wide range of participants with different playing backgrounds to explore how different players react in spatial exploration and the connection of such behavior with their playing background and found that gender, weekly gameplay time, and real-life navigation ability had significant effects on their spatial exploration behavior in the virtual world. But the test was only performed on a single game StarCraft: BroodWar. The experiment of BAILEY Eric Nelson [31] indicated that recruiting the video game live streamers, who generally are more outgoing and usually better in describing their thoughts, as participants for PX evaluation will lead to a more accurate and sufficient evaluating process if conducted via methods requiring verbalization skills like think-aloud. However, such participant-oriented explorations were usually conducted on a single or limited game product or the game factors on PX were not considered in the analysis.

4 METHODOLOGY & RESEARCH IDEAS

The research objectives are highly connected to 4 aspects, 1) the game genre and the elements related to genre division which might affect the player experience, 2) the player profiling which gives the researcher a more detailed understanding of the player's perception towards different game genres as well as their gaming preference on abstract gameplay concepts, 3) the method to use for getting a comprehensive understanding of the playing experience not only about the overall assessment but also detailed elements, 4) the commonality analysis and contingency analysis for the collected data. The proposed experiment process will be as shown in Figure 1:

For each of the aspect, the proposed research ideas and methodologies are as below:

4.1 Propose an extra categorization of games in supplementary of traditional game genre division

The current industrial division of game genre is usually based on aspects like the goal of the game, the existence of player-to-player competition, the view angles of players, the platform it runs on ... which focuses more on the perspectives of how the game is presented or how the mechanism of the gameplay is organized [1, 2, 16, 40]. However, such division of game genre sometimes will introduce ambiguity when describing the games' key features and profiling the players' playing background, and the conclusion built upon such division might face a problem of lacking generalization for a wider range of game product variations as the experiment usually cannot cover plentiful enough industrial game genres.

So we try to propose a novel rough categorization of games oriented on the elements which were commonly recognized and considered to both constitute and affect the game experience in multiple theories, to keep it representative enough for describing the game's key features while generalizable and referential for other games that are not actually tested

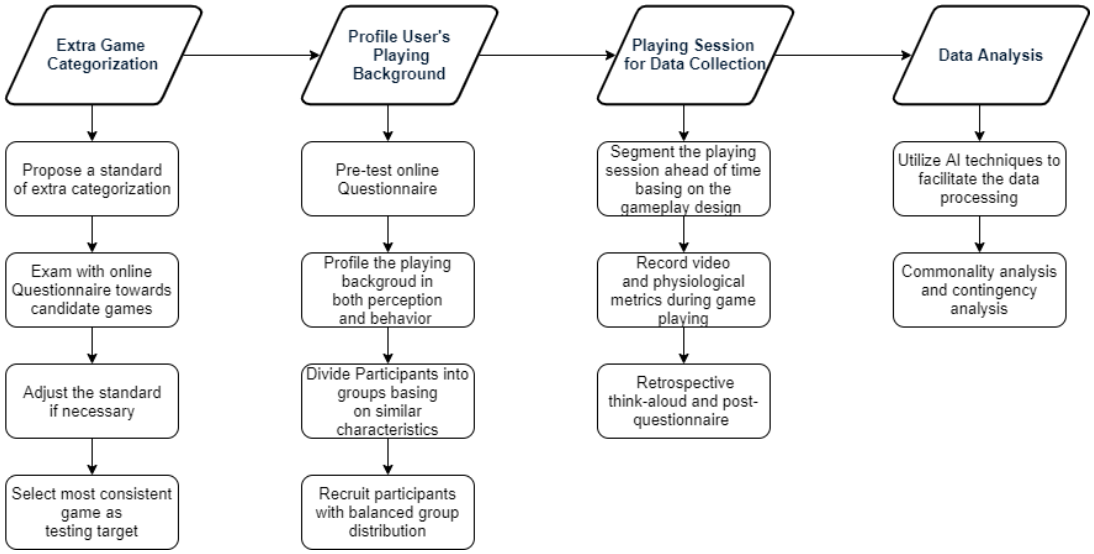

Fig. 1. The proposed experiment process

but share a similarity in our provided dimensions of categorization. Such categorization is based on previous works of building the conceptual framework of game experience [7, 13, 17, 18, 28, 41, 44], and we extract the most common elements from the aforementioned models and deliberately simplify them into 2 uppermost dimensions for categorizing different games in supplementary of traditional game genre division, the dimensions include:

- `The intensity of required player input`: which is a simplified reflect of sense of control and gameplay in video games from the CEGE model, Challenge-based immersion in SCI model and Dynamics in MDA model, the PIFF model also indicates this dimension with the existence of interaction and control in it.
- `Narrativity`: which is also a simplified projection of aesthetics from the MDA model, imaginative immersion from SCI model, and aesthetic value in the facilitators of puppetry from the CEGE model, the PIFF model reflected this dimension with its variables of role engagement and co-presence.

To examine the generality of categorization based on these 2 dimensions, a perception test on person-to-person variance will be conducted first in the form of a simple online questionnaire, which includes 2 questions both with three-point Likert scale, we will measure these 2 dimensions for around 30 games across different traditional game genre, each genre with more than 2 candidate games. The initiated questions and options will be as Table 1.

The participants of the above questionnaire should be selected from those who have played the tested game with at least 8 hours of playtime to obtain an essential understanding of the game to make a reasonable response to the questionnaire. The data collected will be used to confirm the validity of such division in 2 directions. Firstly, to make sure the definition and standard of the 2 dimensions for categorizing games are consistently feasible across different traditional game genres and ideally also consistent for variations under each genre; Secondly, the collected results will also provide insights on selecting candidate games that should be highly consistent in the aspects of the intensity of required player input and narrativity so that they can be used as target game for future test in next stages.

Table 1. Questionnaire of our extra game categorization method

Dimension	Question	Answer Options
Intensity of required player input	In the middle of the game playing where the player is exerting continuous control input, if the player input suddenly stopped, which situation is most likely to happen?	The avatar of the player will die or the gameplay will fail/be terminated in a short period within a few minutes or shorter
		The avatar of the player will die or the gameplay will fail/be terminated in a moderate period like tens of minutes or longer
		No obvious event will happen on the avatar of the player and/or the gameplay will NOT fail/be terminated, you can pick up to continue at any time later
Narrativity	Regardless the form of interaction and gameplay of the game, do you agree that a clear and complete story will be revealed with the proceeding of the game progress?	I agree
		Neither agree nor disagree
		I disagree

4.2 Profiling the game playing background of participants

Basing on the work of Adam [43], Scharkow and colleagues [37] and Kuttinen and colleagues [26], we propose a gaming perceptions survey to profile the participants' game playing background, the survey will adapt part of the questions from previous research along with some new questions customized with our aforementioned additional game categorization. We try to profile the players' game playing background with 3 types of questions, generic gaming background, traditional game genre preference and additional preference under our categorization standard, and gameplay preference questions.

The core changes of our survey are focusing on the part of traditional game genre preference and additional preference under our categorization standard, which should provide more concrete and accurate profiling of the player's game preferences from both behavioral and cognitive perspectives. The questions will cover multiple selected traditional game genres separately, use FPS as a sample, part of the initiated questions for each genre that will be used are as Appendix A.

The questionnaire are organized to profile the users' preference in games both in their actual playing experience before and willingness to try the game if never played. Besides, for those never played, test their perception for the specific game genre which might give clues on analyzing their later behaviour and playing experience toward that game genre.The customized questions also aims at giving a more fine-grained profiling of the participant's playing background like if they have a clear preference of game types which have similarity in our provided dimensions under the same industrial genre division. The structure of above questions can be mirrored to different traditional game genres that will be investigated in later research depending on if that genre have rich enough variations that will lead to divergent results in our categorization method. A proposed list of game genres to be studied will include FPS, RPG, MOBA, visual novel under casual game category and hyper-casual games since 3 out of the 5 genres can usually be

clearly categorized with our additional categorization method while the variations in FPS and RPG genre provides rooms for comparative analysis.

Such profiling of playing background will be conducted via online questionnaire to a larger number of participants, then they will be divided into several groups by their self-reported results in the questionnaire basing on their game genre preference and other shared characteristics. Finally, according to their availability of face-to-face playing test, balanced amount of subjects from each group will be recruited to join the next stage of experiment where an actual game playing and PX evaluation will be performed. The other initiated questions could be found in Appendix B.

4.3 Evaluate the playing experience under various combinations of game type and player type with combined methods

The selected games and the actual testing part of the game will be played through first by researchers to give the playing process a rough segmentation basing on the gameplay design and sentimental change which was proved to be beneficial for later data processing [42] in previous research by Chek Tien, et al.

A sample of combination of game type and player type could be described as below: a selected FPS game which is consistently categorized by most of the participants in the categorization questionnaire as left graph in Figure 2, and the players recruited to play this game for PX evaluation could be the group that prefer to play FPS game but their frequently played games are the opposite category under our categorization standard as right graph in Figure 2, the result of PX evaluation on such combination could probably give us insights on how the large differences in game mechanics affect the experience of certain groups of players.

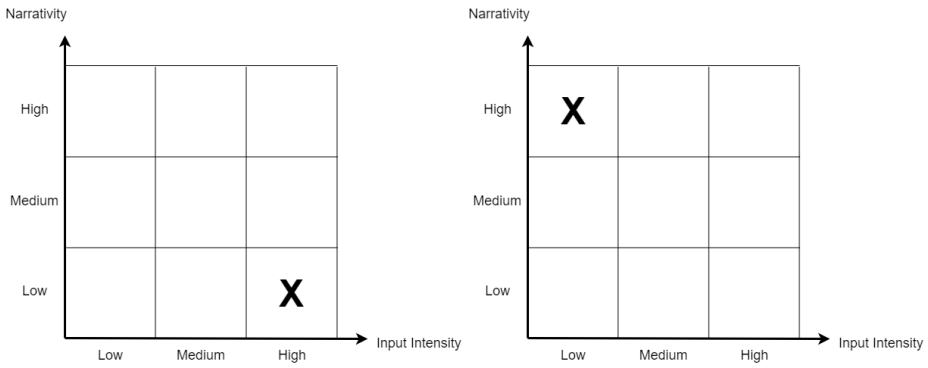

Fig. 2. Left graph could be the categorization result of a sample FPS candidate game; Right graph could be the actual preference of the group of FPS players recruited to play this game

In each of the combinations, the participants will be instructed to play through the selected part of the candidate games, these games should have already been examined in previous categorization questionnaire that they can be clearly categorized under the 2 dimensions of "The intensity of required player input" and "Narrativity" with consensuses from participants. They should also belong to the proposed industrial game genres of FPS, RPG, MOBA, visual novel under casual game category and hyper-casual.

As proved by previous research, a combined method will give a richer data for analysis including contextual and cultural information [34], so the methods to be used in the future experiment will include concurrent think-aloud, retrospective interviews, the Sensual Evaluation Instrument, and "All the Feels" system [21, 27, 35]. The participants

will be instructed to play through the selected part of the game, think aloud their thoughts and use the SEI objects to express their emotional feelings whenever they want. The program "All the Feels" should be running in the background, recording the players' physiological data during the whole playing session. At the end of the test, we will also conduct a retrospective think-aloud, as well as ask the participants to finish a post-questionnaire to self-assess their playing experience.The post-questionnaire will utilize a customized version from Player Experience of Need Satisfaction (PENS) [36] and Game Experience Questionnaire (GEQ) [19] to evaluate the PX quantitatively.

4.4 Proposed directions of Analysis

The major purpose of this study is trying to get some insight into how different combinations of player type and game type will affect the playing experience, so there are 2 proposed directions to analyze the collected data. The first direction is exploring if and how the playing experience of different types of players with various playing backgrounds will vary towards the same game genre, like a potential situation that some elements of the gameplay constitute a better playing experience for one group of players while another group of players thinks it ruined the playing. Inversely, the second direction is to discover if and how the players with similar playing backgrounds react towards different genres of games with their distinctive inherent features, will they share a common feeling of the experience within the same genre of game? All these questions remain to be revealed in future explorations.

5 POTENTIAL THEORETICAL SIGNIFICANCE & PRACTICLE IMPORTANCE

The potential findings of this proposed research will give the future researchers some transcendental knowledge on how to better organize the experiment setting considering the inherent influences from game type and player characteristic, for example, when experimenting on a specific genre, how to better profile the participants to shortlist the candidates to better serve the research purpose. Besides, as the gaming market is emerging rapidly, the competition within different game genres also becomes more and more fierce, our research can provide the practitioners insights on the attitude of different types of players towards different types of games and what aspects of the gameplay will contribute to a positive playing experience for their target customers so that they can pursue a better schedule in polishing and designing the game under restricted budget and time to serve their core players better along with attracting a richer user base for greater commercial success.

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A QUESTIONS OF TRADITIONAL GAME GENRE PREFERENCE AND ADDITIONAL PREFERENCE UNDER OUR CATEGORIZATION STANDARD

Questions and options:

1. Please indicate how often you play FPS games (Never / Rarely / Sometimes / Often / Always)

(Skip 2 to 6 if never played FPS games)

2. For the FPS games you played, name 2 that you enjoyed most?

3. For the FIRST FPS games you named in #2, imagine in the middle of the game playing where you are exerting continuous control input, if your input suddenly stopped, which situation is most likely to happen?

- The avatar of the player will die or the gameplay will fail/be terminated in a short period within a few minutes or shorter
- The avatar of the player will die or the gameplay will fail/be terminated in a moderate period like tens of minutes or longer
- No obvious event will happen on the avatar of the player and/or the gameplay will NOT fail/be terminated, you can pick up to continue at any time later

4. For the FIRST FPS games you named in #2, regardless the form of interaction and gameplay of the game, a clear and complete story will be revealed with the proceeding of the game progress?

- I agree
- Neither agree nor disagree
- I disagree

5. For the SECOND FPS games you named in #2, imagine in the middle of the game playing where you are exerting continuous control input, if your input suddenly stopped, which situation is most likely to happen?

- The avatar of the player will die or the gameplay will fail/be terminated in a short period within a few minutes or shorter
- The avatar of the player will die or the gameplay will fail/be terminated in a moderate period like tens of minutes or longer
- No obvious event will happen on the avatar of the player and/or the gameplay will NOT fail/be terminated, you can pick up to continue at any time later

6. For the SECOND FPS games you named in #2, regardless the form of interaction and gameplay of the game, a clear and complete story will be revealed with the proceeding of the game progress?

- I agree
- Neither agree nor disagree
- I disagree

(Skip below If you didn't select "Never" in the first question)

7. How willing you are to try to play an FPS game? (Very reluctant / Reluctant / Neither Reluctant nor willing / Willing / Very willing)

(Skip all below if select “Very reluctant” or “Reluctant” in question 7)

8. Imagine in the middle of playing an FPS game where you are exerting continuous control input, if your input suddenly stopped, which situation is most likely to happen in your perception?

- The avatar of the player will die or the gameplay will fail/be terminated in a short period within a few minutes or shorter
- The avatar of the player will die or the gameplay will fail/be terminated in a moderate period like tens of minutes or longer
- No obvious event will happen on the avatar of the player and/or the gameplay will NOT fail/be terminated, you can pick up to continue at any time later

9. In your perception, regardless the form of interaction and gameplay of a FPS game, do you agree that a clear and complete story should be revealed with the proceeding of the game progress?

- I agree
- Neither agree nor disagree
- I disagree

B OTHER QUESTIONS FOR PROFILING PLAYER’S PLAYING BACKGROUND

B.1 Generic Gaming Background

Questions and options:

1. What is your age? (18–24 / 25–34 / 35–44 / 45 +)
2. What is your gender? (Male / Female / Other)
3. How many hours per week (on average) do you spend playing video games? (1–7 / 8–15 / 16–23 / 23 h and over)
4. Which of the following gamer types do you feel best describes you? (Casual Gamer / Core Gamer / Hardcore Gamer)

B.2 Gameplay Preference

Questions and options:

**Response options for questions in this section include (Strongly Disagree / Disagree / Neither Agree or Disagree / Agree / Strongly Agree)*

1. In my opinion the most compelling part of gaming is competition against other players.
2. When gaming I like to become immersed in the game world
3. I prefer playing games in which I am required to work as part of a team to overcome challenges and obstacles.
4. I enjoy gameplay which requires careful planning and strategic thinking.
5. I enjoy gameplay which is fast paced and exciting.
6. I enjoy gameplay that requires me to perform precise actions using input devices.
7. I enjoy gameplay which requires long-term planning and patience.
8. I enjoy gameplay which requires quick reactions to rapidly changing in game conditions.