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Age-Based Differences in Motivational Factors Affecting Perceived Enjoyment and Playing Continuance in Female Mobile Legends Gamers

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This research investigates the determinants affecting female players' ongoing intention to engage with Mobile Legends, a widely recognized MOBA game. This study examines the influence of presentation characteristics, novelty, and variety mediated by perceived enjoyment. The study examines the roles of escapism and achievement and the moderating effect of age. The study employed a quantitative methodology, surveying 202 female Mobile Legends players aged 17 to over 25 years in Indonesia. Data analysis was conducted using Structural Equation Modeling (SEM). The findings demonstrate that presentation features and novelty have a positive effect on perceived enjoyment, whereas variety does not exert a significant influence. Somehow the positive insignificant influence of perceived enjoyment on continuance intention confirms its mediating role but partially. The study additionally revealed that age influences the relationship between achievement and continuance intention strongly. Players aged 17-29 are predominantly motivated by it than players aged 21 to over 25. The findings underscore the importance of visual appeal, novel content, and the emotional advantages of gaming in maintaining female player engagement in Mobile Legends.

Keywords: Age; Continuance Playing; Female; Mobile Legends; Perceived Enjoym

1. Introduction

Both the online game industry and the number of players are expanding quickly in tandem with technological advancements. The user base is expanding, and online games are becoming more diverse, with options for both single-player and multiplayer experiences. Mobile Legends: Bang Bang is an online game experiencing significant global growth, particularly in Indonesia. The December 2022 survey conducted by Sensor Tower indicated that gacha games, including Genshin Impact, Fate/Grand Order, and Uma Musume, alongside other titles incorporating gacha mechanics such as PUBG Mobile, Pokemon Go, Diablo Immortal, and Mobile Legends, represent the most popular game categories in Southeast Asia (Tan, 2023). Based on data from (ActivePlayer.io, 2024) indicates that the number of Indonesians playing Mobile Legends: Bang Bang has risen by 4%, totaling approximately 20,909,510 individuals in June 2024. The superiority of an online game is evidenced by its user base (Makarawung et al., 2023). This indicates that Mobile Legends remains a prevalent game among Indonesians.

The role of women in the gaming industry has become a trendsetter. The figurative power given by women is so strong that it can equalize their position in the world of esports, where women who like and pursue all game competition events are referred to as pro players by Wibowo & Djohansyah (2021). This data is reinforced by (NikoPartners.com, 2023), which claims that 95% of women in Asia have ventured into the gaming industry and 26.9% of

them occupy the Top 2 genre, namely MOBA. This shows evidence of the growing importance of the female player base in the gaming industry, especially in Indonesia. This phenomenon is corroborated by journal statements regarding consumer segmentation, which assert that women represent a significant force in the advancement of the mobile game industry. Furthermore, they tend to allocate more financial resources to in-app purchases compared to men and frequently engage with games and social applications during leisure periods, such as breaks, travel, and before sleep, to attain an aesthetic experience (Nouvanty et al., 2023; Wang et al., 2017).

Since its release in July 2016, Mobile Legends has generated substantial buzz, especially around its continuous visual improvements (Gröbe & Burghardt, 2019). The game's presentation features including its graphics, sound effects, and overall aesthetic have consistently improved over time, creating an immersive experience for players. Regular collaborations with popular global brands, such as Jujutsu Kaisen, Saint Seiya, Kung Fu Panda, and Sanrio, further enrich the game's visual appeal by introducing diverse, recognizable characters and themes (Rahadiani & Zulfiningrum, 2023). Research shows that visually captivating games positively influence players' enjoyment and their intention to engage with mobile games (Kurnia et al., 2019), highlighting the importance of delivering an enjoyable and engaging gaming experience through enhanced presentation features (Kurnia & Sukarnadi, 2023). In addition to visual elements, Variety and Novelty in game design play crucial roles in fostering play enjoyment and encouraging sustained engagement among players (Pantouw et al., 2019). Variety in game design involves offering a wide range of activities, challenges, and content, such as different characters, levels, and game modes. Novelty refers to the introduction of unique or fresh elements, like innovative gameplay mechanics, storylines, or collaborations with popular franchises that captivate players' interest. Together, these elements help maintain player engagement by minimizing boredom and refreshing the gaming experience. Beyond variety and novelty, two other main factors Escapism and Achievement significantly influence a player's sustained intention to continue engaging with the game (Puspitasari et al., 2018). Escapism describes the tendency for players to use games as a means to escape the stresses and routines of daily life, providing a mental breakthrough in immersive gameplay. Achievement, on the other hand, relates to the sense of accomplishment players feel from reaching in-game milestones, such as completing missions, leveling up, or obtaining rare items (Afiani et al., 2023; Nooripour et al., 2022; Stenseng et al., 2023). Pantouw et al. (2019) found that escapism and achievement significantly impact players' intention to keep playing.

The researcher aims to investigate the phenomenon among female users of the Mobile Legends game, specifically examining the impact of Presentation Feature, Novelty, and Variety, as mediated by perceived enjoyment, Escapism and achievement and the moderating effect of age. This research aims to enhance the understanding of the preferences and interests of female gamers, thereby assisting game developers and marketers in creating more appealing games for this demographic. Consequently, the resulting games will align more closely with the preferences of female gamers, extend their engagement, and create enhanced opportunities for user acquisition.

2. Research method

2.1 Presentation Features and Perceived Enjoyment

Presentation features in gaming refer to elements that shape the overall look, feel, and immersive quality of a game. These include visual design, audio elements, character aesthetics, and virtual items like skins, which enhance the sensory experience and player engagement. Virtual items, particularly skins, go beyond simple visual enhancements; they allow players to customize their in-game avatars, influencing not only the character's appearance but also the player's connection to the game world (Inderasari et al., 2020; Putra, 2023). Skins have become integral in the gaming experience, serving as symbols of status and identity within the gaming community (Böffel et al., 2022). Players view these items as digital investments that represent achievements or personal style, thus heightening their attachment to the game (Suparyawan & Dermawan, 2023). Through these presentation features, games like Mobile Legends create a more personalized and socially

meaningful experience, where aesthetics and character customization foster loyalty and long-term engagement among players, particularly those motivated by social and identity-based rewards.

H1: Presentation Features have a significant influence on Perceived Enjoyment.
H1-a: Age moderation group a (17-20 years old) effect of Presentation Features on Perceived Enjoyment.
H1-b: Age moderation group b (21-25 years old above) effect of Presentation Features on Perceived Enjoyment.
H1-c: There is a significant difference between groups a and b on Presentation Features towards Perceived Enjoyment.

2.2Variety and Perceived Enjoyment

In mobile gaming, variety is a key factor that enhances player engagement by offering a dynamic and customizable experience. Variety can encompass a range of elements such as game modes, challenges, customization options, and social interactions that collectively meet players' psychological needs for competence, autonomy, and social connectedness. Studies by Li (2022) and Öz & Üstün (2022) emphasize that meaningful variety in gaming promotes a sense of comfort and fulfillment. When games provide challenges aligned with players' skill levels, it fosters a sense of competence and accomplishment. Additionally, allowing players autonomy in gameplay choices enables them to feel more in control, catering to their unique play styles. Social features, such as cooperative modes or in-game chats, further enhance the sense of connectedness among players. These elements of variety can increase players' intrinsic motivation, as they find both enjoyment and fulfillment in the gaming experience. Consequently, a variety that is thoughtfully integrated into mobile games can encourage players' long-term engagement, providing a foundation for examining its role in fostering sustained involvement, particularly in games like Mobile Legends: Bang Bang.

H2: Variety has a significant influence on Perceived Enjoyment.
H2-a: Age moderation group a (17-20 years old) has a significant influence Variety on Perceived Enjoyment.
H2-b: Age moderation group a (21-25 years old above) has a significant influence Variety on Perceived Enjoyment.
H2-c: There is a significant difference between groups a and b on Variety towards Perceived Enjoyment.

2.3 Novelty and Perceived Enjoyment

In gaming, novelty refers to the introduction of fresh and unique elements that differentiate gameplay from routine experiences, aiming to engage players by sparking curiosity and motivation. Novel elements may include new levels, mini-games, character skins, or innovative mechanics. The allure of novelty lies in its ability to create dynamic, memorable experiences that keep players returning for new challenges. Research has consistently highlighted novelty as a key factor in sustaining player engagement. Thai et al. (2023) emphasize that novelty is crucial for fostering engaging and memorable experiences, while Chao et al. (2023) note that novel elements spark curiosity and encourage exploration, heightening enjoyment and motivation by allowing players to face fresh challenges. Moreover, Prakosa & Sumantika (2022) demonstrate how virtual items, such as distinctive skins, serve as attractive novelty elements, enhancing visual appeal and offering players a means of self-expression. These perspectives suggest that periodic content updates, new game modes, and innovative visual/audio effects are not merely add-ons; they actively contribute to an immersive and satisfying gaming experience by continuously renewing the gameplay environment.

H3: Novelty has a significant influence on Perceived Enjoyment.
H3-a: Age moderation group a (17-20 years old) has a significant influence Novelty on Perceived Enjoyment.
H3-b: Age moderation group b (21-25 years old above) has a significant influence Novelty on Perceived Enjoyment.

H3-c: There is a significant difference between groups a and b on Novelty towards Perceived Enjoyment.

2.4 Perceived Enjoyment and Continuance Playing

In mobile gaming, perceived enjoyment is understood as the pleasure and satisfaction a player feels during gameplay, which often drives their desire to continue playing. This concept suggests that when players experience high levels of enjoyment, they feel a sense of comfort, relaxation, and happiness, leading to sustained engagement with the game. Research has shown that perceived enjoyment acts as a significant motivator for long-term player loyalty, as it reinforces positive emotions associated with gaming. Kurnia & Sukarnadi (2023) highlight that enjoyment is a core factor in continuance intention, emphasizing that games designed to evoke pleasure and relaxation foster a stronger desire to keep playing. Similarly, Tuzzahra & Edastama (2024) describe enjoyment as being tied to a player's comfort, suggesting that when games provide a pleasurable experience, players are more inclined to stay loyal. This is consistent with findings by Gultom et al. (2020), who also found that high perceived enjoyment not only encourages players to play more frequently but extends their playing duration. In a broader consumer context, Priyanto & Heriyadi's (2023) study on brand loyalty in KFC consumers supports this by suggesting that a pleasurable experience can create a sense of loyalty and consistent product engagement, showing that positive emotional responses are essential in driving continued use across different domains.

H4: Perceived Enjoyment Has Significant Influence on Continuance Playing.

H4-a: Age moderation group a (17-20 years old) has a significant influence Perceived Enjoyment on Continuance Playing.

H4-b: Age moderation group b (21-25 years old above) has a significant influence Perceived Enjoyment on Continuance Playing.

H4-c: There is a significant difference between groups a and b on Perceived Enjoyment towards Continuance playing.

2.5 Presentation Features and Continuance Playing with Perceived Enjoyment as a Mediating Effect

Perceived enjoyment refers to the pleasure or satisfaction players derive from a gaming experience, often making it a central factor in their ongoing engagement. In digital gaming, enjoyment is frequently linked to sensory and aesthetic qualities, such as visual design, audio elements, and character features, which enhance immersion and appeal. Presentation features in games create an environment that captivates players, elevates their emotional involvement, and makes gameplay more rewarding. When these features are aesthetically engaging, they significantly contribute to perceived enjoyment, which, in turn, can strengthen players' intention to continue playing. Research has shown that presentation features directly impact perceived enjoyment, thereby influencing players' commitment to a game. Saaty & Hashemi (2022) demonstrated that well-designed visual and audio elements elevate the overall gaming experience, leading to heightened enjoyment and prolonged engagement. Similarly, Wang et al. (2017) found that presentation features enhance players' immersion, creating an enjoyable experience that encourages ongoing play. Building on this, perceived enjoyment acts as a mediator between presentation features and continuance intention, as it channels the influence of aesthetic elements into sustained engagement. (Gultom et al., 2020; Merikivi et al., 2017) observed that perceived enjoyment serves as a bridge that links high-quality game design with players' intentions to keep playing, as enjoyment amplifies players' satisfaction with the game's presentation.

H5: Perceived Enjoyment as a Mediating Effect has a significant influence on Presentation Features on Continuance Playing.

H5-a: Age moderation group a (17-20 years old) has a significant influence Presentation Features on Continuance Playing with Perceived Enjoyment as a Mediating Effect.

H5-b: Age moderation group a (21-25 years old above) has a significant influence Presentation Features on Continuance Playing with Perceived Enjoyment as a Mediating Effect.

H5-c: There is a significant difference between groups a and b on Perceived Enjoyment as a Mediating Effect on Presentation Features towards Continuance Playing.

2.6 Variety and Continuance Playing with Perceived Enjoyment as a Mediating Effect

This enjoyment, in turn, may mediate the relationship between variety and a player's intention to keep playing, as players who derive high enjoyment from varied content are more likely to stay engaged with the game. Past research supports the role of perceived enjoyment as a key mediator in the relationship between game features and engagement. For example, Puspitasari et al. (2018) suggest that enjoyment derived from engaging content increases players' desire to continue engaging with a game, making it a crucial factor in long-term retention. Further, Larche & Dixon (2020) introduced the GameFlow model, which emphasizes that variety can enhance enjoyment by preventing monotony and providing fresh challenges that keep players invested. Additionally, Kurnia & Sukarnadi (2023), Pantouw et al. (2019), and Puspitasari et al. (2018) found that enjoyment mediates the effect of game complexity on continuance intentions, suggesting that enjoyment bridges the experience of diverse gameplay elements with players' loyalty. By contrast, when variety is excessive or poorly organized, it can detract from enjoyment and lead to cognitive overload, potentially reducing engagement (Kaimann et al., 2018). Thus, while variety can stimulate interest, perceived enjoyment is often the deciding factor in whether this variety translates to sustained engagement.

H6: Perceived Enjoyment as a Mediating Effect has a significant influence on Variety on Continuance Playing.

H6-a: Age moderation group a (17-20 years old) has a significant influence Variety on Continuance Playing with Perceived Enjoyment as a Mediating Effect.

H6-b: Age moderation group a (21-25 years old above) has a significant influence Variety on Continuance Playing with Perceived Enjoyment as a Mediating Effect.

H6-c: There is a significant difference between groups a and b on Perceived Enjoyment as a Mediating Effect on Variety towards Continuance Playing.

2.7 Novelty and Continuance Playing with Perceived Enjoyment as a Mediating Effect

When games introduce novelty, such as fresh content, new characters, or updates, they can evoke a sense of excitement and discovery, enhancing perceived enjoyment and motivating players to return. The enjoyment generated from novel elements may thus play a pivotal role in reinforcing players' commitment to ongoing engagement, making it a crucial factor in the relationship between novelty and continuance intention. Past research has shown that novelty in games is a significant driver of engagement, as new and unexpected features can keep the experience fresh and engaging. Chao et al. (2023) highlights that introducing novel content can prevent player fatigue, ensuring continued interest and motivation. Thai et al. (2023) further emphasizes that games that regularly update their features can create a cycle of anticipation and satisfaction, which is essential for long-term retention. Perceived enjoyment has been identified as a key mediator in the engagement process. According to Hull et al. (2013) and Laffan et al. (2016), the enjoyment derived from gaming is closely linked to player loyalty and return intention, particularly when games provide varied, interesting experiences. In this context, perceived enjoyment can amplify the effect of novelty on continuance intention by transforming new elements into engaging experiences. This connection supports the hypothesis that enjoyment significantly mediates the influence of novelty on players' willingness to continue playing.

H7: Perceived Enjoyment as a Mediating Effect has a significant influence on Novelty on Continuance Playing.

H7-a: Age moderation group a (17-20 years old) has a significant influence Novelty on Continuance Playing with Perceived Enjoyment as a Mediating Effect.

H7-b: Age moderation group a (21-25 years old above) has a significant influence Novelty on Continuance Playing with Perceived Enjoyment as a Mediating Effect.

H7-c: There is a significant difference between groups a and b on Perceived Enjoyment as a Mediating Effect on Novelty on Continuance Playing.

2.8 Escapism and Continuance Playing

Escapism refers to the human desire to temporarily disconnect from reality by engaging in activities that provide enjoyment, relaxation, or distraction from daily stressors (Afiani et al., 2023). This concept has long been associated with entertainment, where individuals seek relief from life's challenges by immersing themselves in activities that offer a break from routine and worries. Early research into escapism highlighted its role in offering mental reprieve and enhancing overall well-being, framing it as a beneficial coping mechanism when managed in moderation. In the context of mobile gaming, escapism takes on unique dimensions as players can access immersive, interactive experiences anytime and anywhere. Mobile games provide players with opportunities to explore vibrant virtual worlds, face engaging challenges, or interact socially in online communities all accessible with ease. For many, this provides an appealing outlet to reduce stress and elevate mood by momentarily stepping into a different reality (Prinsen & Schofield, 2021). Within this framework, escapism in gaming is not simply about distraction; it's about engaging deeply with enjoyable experiences that offer a sense of control, progress, or achievement, making it a compelling motivator for player engagement.

H8: Escapism has a significant influence on Continuance Playing.

H8-a: Age moderation group a (17-20 years old) has a significant influence Escapism on Continuance Playing.

H8-b: Age moderation group b (21-25 years old above) has a significant influence Escapism on Continuance Playing.

H8-c: There is a significant difference between groups a and b on Escapism towards Continuance Playing.

2.9 Achievement and Continuance Playing

In gaming research, achievement is a motivational concept that captures players' drive to accomplish goals, complete challenges, and earn recognition within a game. Achievement offers players a sense of progress and mastery, fulfilling fundamental needs such as competence and autonomy. Players driven by achievement motivations often seek validation and feedback through game rewards, status indicators, and progress markers, which contribute to enhanced self-confidence and self-worth. Early studies on achievement in gaming emphasized its role in creating immersive experiences that reward player effort, gradually building skill and reinforcing a sense of accomplishment. This achievement-based satisfaction can heighten emotional investment in the game, leading to prolonged engagement and loyalty. In alignment with this, Hong et al. (2023) found that achievements meet core emotional needs like autonomy, competence, and social connection, which in turn bolster self-esteem and life satisfaction. Similarly, Pantouw et al. (2019) showed that achievement is a critical predictor of engagement and continuance intention; players who attain and are recognized for their achievements are more likely to remain committed to the game. These insights underscore the significance of achievement as both an intrinsic and extrinsic motivator that enhances player retention and satisfaction.

H9: Achievement has a significant influence on Perceived Enjoyment.

H9-a: Age moderation group a (17-20 years old) has a significant influence on Achievement towards Continuance Playing.

H9-b: Age moderation group b (21-25 years old above) has a significant influence on Achievement on Continuance Playing.

H9-c: There is a significant difference between groups a and b on Achievement towards Continuance Playing.

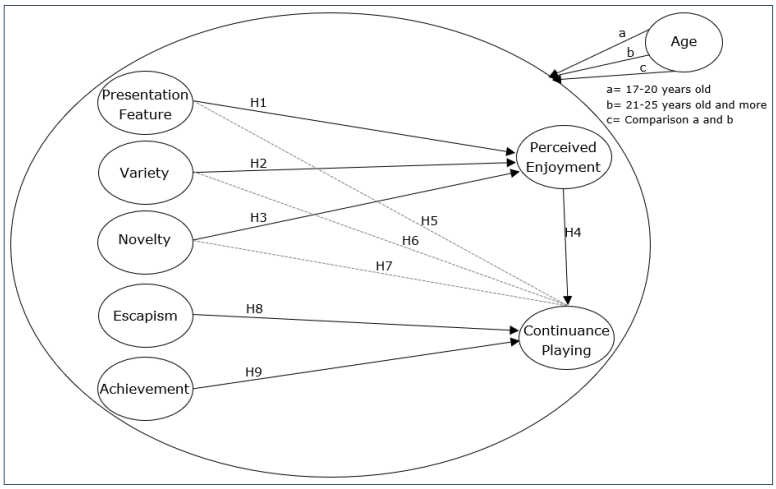

Figure 1. Research Framework

This research employs a quantitative methodology, specifically classified as causal associative research. Its objective is to test and analyze the relationships among variable factors, including presentation features, variety, and novelty, as mediated by perceived enjoyment. Additionally, it examines the relationship between escapism and achievement, moderated by age, in the context of Female Continuance Playing. Primary data was collected by researchers through the distribution of questionnaires to gather essential information from respondents. The measurement instrument employs a Likert scale to assess respondents' levels of agreement with provided statements, ranging from 1 (strongly disagree) to 5 (strongly agree) on a metric scale (Yu & Li, 2023). The inquiries within each variable utilize reference questions derived from three reference journals authored by Kesuma & Princes (2024), Nouvanty et al. (2023), Pantouw et al. (2019), and Purba et al. (2020).

By announcing the necessary respondent characteristics on social media platforms including Instagram, Twitter, Telegram, Discord, Facebook, and WhatsApp, researchers disseminate a Google Form-loaded questionnaire as part of the data collection method. This study's research sample consisted of 202 respondents from various regions of Indonesia. Data processing employs Smart PLS version 4 software utilizing the Structural Equation Modeling (SEM) method. The subjects of this study were women utilizing the Mobile Legends application. Researchers employed a non-probability sampling method, specifically purposive sampling, as the respondents in this study were selected based on specific criteria established by the researcher to obtain the necessary relevant information (Indrawati et al., 2023). For collecting sub-age groups, researchers used the method of bootstrapping Multi-Group Analysis (MGA) data based on Smart PLS version 4 to get the moderating effect amongst all the sub-age groups and to know how strong the effect is towards the sub-age group and how strong the difference between those both. The sample criteria used consist of (1) All Indonesian women aged 17 to 25 years old and above. (2) Mobile Legends users. (3) Owning and playing the Mobile Legends application for at least 1 month.

3. Result

3.1 Characteristics of Respondents

The subsequent table comprises 202 respondent profiles that align with the parameters examined in this research. The data was collected from September 18th, 2024 – October 4th, 2024 by distributing the questionnaires via social media. In Table 1, demographic characteristics are shown as age, domicile, education, job, playing duration, and playing time in a week and a day. It revealed that most of the respondents are university students and often play Mobile Legends: Bang Bang at night. As a categorical variable, initially, the age of respondents was divided into 5 groups, before finally becoming 2 groups because of

the 202 respondents aged around 17-25 years old above, so 3 age groups were not used in the Multi-Group Analysis (MGA) bootstrapping data processing process in the subgroup moderation test which will be tested in group a and group b of each. The comprehensive findings regarding the demographic profile of the respondents are presented in the table below.

Table 1. Characteristics of respondents

Categories	Items	frequency	(%)
Age	17-20 years old	57	28.2
	21-25 years old	145	71.8
	Total	202	100
Domicile	Sumatera	46	22.8
	Jawa	20	9.9
	Kalimantan	96	47.5
	Sulawesi	20	9.9
	Papua	20	9.9
	Total	202	100
Education	Junior High School	7	3,5
	Senior High School	85	42,1
	D1/D2/D3/D4	8	4,0
	Bachelor	99	49,0
	Master Degree	3	1,5
	Total	202	100
Job	Student	31	15.3
	University Student	109	54
	Private Employee	27	13.4
	Entrepreneur	18	8.9
	Other	17	8,4
	Total	202	100
Playtime Duration	Less than 1 hour	61	30.2
	1-2 hours	88	43.6
	3-4 hours	44	21.8
	5-6 hours	5	2.5
	More than 6 hours	4	2
	Total	202	100
Playtime in a Week	Weekend	93	46
	Weekdays	35	17.3
	Everyday	74	36.6
	Total	202	100
Playtime in a Day	All day	15	7.4
	In the morning	2	1
	In the afternoon	15	7.4
	In the evening	16	7.9
	In the night	154	76.2
	Total	202	100

3.2 Evaluation of Measurement Model (Outer Loading)

Convergent and discriminant validity were the two types of validity used to measure the validity test based on the measurement model test results using Smart PLS 4. Table 2 clearly illustrates that all these indicators are valid, with each loading factor exceeding 0.7 (Nasution et al., 2020)Along with the loading factor, researchers also collected all Average Variance Extracted (AVE) with a value reached >0.5, which indicated that all the latent variables meet the needed validity.

Table 2. Convergent Validity Results

Variable	Indicator	Measurement Item	Loading Factor	AVE
Achievement (A) (Nouvanty et al., 2023)	A1	I played Mobile Legends: Bang Bang to reach the highest level	0.872	0.797
	A2	I play Mobile Legends: Bang Bang to have more power or experience than other players	0.907	
	A3	I play Mobile Legends: Bang Bang to have items, cards (skins), or invitation that allows me to reach higher position than other players	0.899	
Continuance Playing (CP) (Merikivi et al., 2017)	CP1	I intend to continue playing Mobile Legends: Bang Bang rather than discontinue its use	0.947	0.902
	CP2	I will keep on playing Mobile Legends: Bang Bang in the future	0.953	
	CP3	I would continue playing Mobile Legends: Bang Bang	0.948	
	CP4	I believe I will continue playing Mobile Legends: Bang Bang	0.951	
Escapism (E) (Nouvanty et al., 2023)	E1	I play Mobile Legends: Bang Bang when I feel frustrated or upset	0.910	0.795
	E2	I like to play Mobile Legends: Bang Bang when I am having a bad day	0.929	
	E3	I play Mobile Legends: Bang Bang to relieve stress	0.847	
	E4	Playing Mobile Legends: Bang Bang is the best way for me to disconnect myself or temporarily leave my real-life activities from the real world	0.879	
Novelty (N) (Merikivi et al., 2017)	N1	The game I most often play is imaginative	0.832	0.772
	N2	The game I most often play is surprising	0.896	
	N3	The game I most often play is innovative	0.899	
	N4	The game I most often play is new	0.901	
	N5	The game I most often play is fresh	0.862	
Perceived Enjoyment (PE) (Merikivi et al., 2017)	PE1	Mobile Legends: Bang Bang is enjoyable	0.885	0.823
	PE2	Mobile Legends: Bang Bang is fun	0.910	
	PE3	Mobile Legends: Bang Bang is entertaining	0.919	
	PE4	Mobile Legends: Bang Bang is a pleasant	0.914	
Presentation Feature (PF) (Laffan et al., 2016)	PF1	Mobile Legends: Bang Bang has interesting sounds and music	0.871	0.779
	PF2	Mobile Legends: Bang Bang has an appealing visual design	0.880	
	PF3	Mobile Legends: Bang Bang has an appealing appearances	0.897	
Variety (V) (Merikivi et al., 2017)	V1	Mobile Legends: Bang Bang has a variety of themes or landscapes	0.898	0.782
	V2	Mobile Legends: Bang Bang has a variety of visual or sound elements	0.879	
	V3	Mobile Legends: Bang Bang has different themes at different level	0.877	

Validity indicators are shown in the figure 2 below.

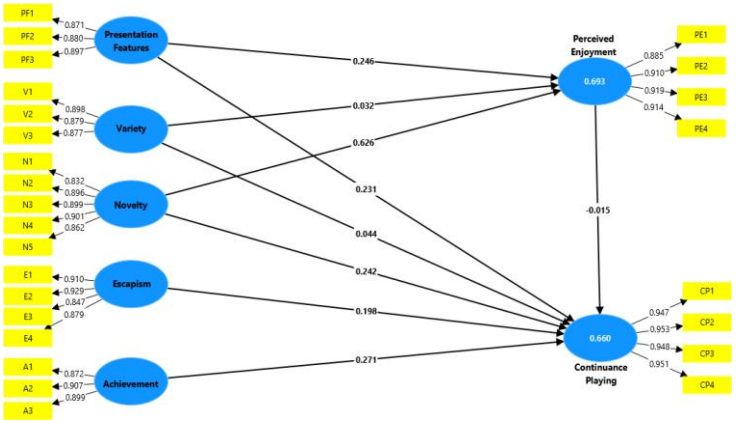

Figure 2. Algorithm model result

3.3 Discriminant Validity

The discriminant validity test presented in Table 3 demonstrates that each variable possesses a Fornell-Larcker criteria value above the correlation values of other latent variables, hence confirming discriminant validity in Smart PLS (Umar & Purba, 2018). At this point, achievement reached 0.893, continuance playing reached 0.950, escapism reached 0.892, novelty reached 0.879, perceived enjoyment reached 0.907, presentation feature reached 0.883, and variety reached 0.885. They happened to be the highest overall correlation value to other variables in each column.

Table 3. Discriminant Validity Fornell-Larcker Test Result

Variable	A	CP	E	N	PE	PF	V
Achievement	0.893						
Continuance Playing	0.685	0.950					
Escapism	0.574	0.652	0.892				
Novelty	0.636	0.716	0.669	0.879			
Perceived Enjoyment	0.654	0.678	0.685	0.810	0.907		
Presentation Feature	0.578	0.676	0.545	0.667	0.684	0.883	
Variety	0.491	0.568	0.466	0.629	0.592	0.678	0.885

3.4 Composite Reliability

The resulting reliability of the composite can be drawn by measuring indicator reliability within a variable statistically (Vanessa et al., 2023). All the result values show that every latent variable has exceeded 0.7 in the composite reliability test (Purba et al., 2020). In the Cronbach's Alpha analysis, all latent variables surpassed a value of 0.6 (Ayodele et al., 2018). The results of the data processing indicate that both composite reliability and Cronbach's Alpha are satisfactory.

Table 4. Reliability Test Result

Variable	Cronbach's alpha	Composite reliability
Achievement (A)	0.873	0.922
Continuance Playing (CP)	0.964	0.974
Escapism (E)	0.914	0.939
Novelty (N)	0.926	0.944
Perceived Enjoyment (PE)	0.928	0.949
Presentation Feature (PF)	0.859	0.914
Variety (V)	0.861	0.915

3.5 Evaluation of Measurement Model (Inner model)

R-Square

Hair et al. (2011, 2021) indicated that R-Square values of 0.75 reflect a strong influence, 0.50 is a moderate influence, and 0.25 is a mild influence. About the inner model presented in Table 6, the R-Square for continuance playing is 0.660 (66%), indicating a substantial effect of the exogenous variables (CP and PE). Conversely, the R-Square for perceived enjoyment was 0.693 (69.3%), indicating a strong influence on its exogenous variables.

Table 5. R-Square

Variable	AVE	R-square	R-square adjusted
Continuance Playing (CP)	0.902	0.660	0.650
Perceived Enjoyment (PE)	0.823	0.693	0.689
Escapism (E)	0.795		
Novelty (N)	0.772		
Achievement (A)	0.797		
Presentation Feature (PF)	0.779		
Variety (V)	0.782		
Average	0.807	0.676	0.669

Alternatively, (Tenenhaus et al., 2005) suggest that the global fit measure in a PLS path model can be evaluated using the global index of fit (GoF). (Wetzels et al., 2009) provide the formula for calculating the GoF index as follows:

GoF = $\sqrt{\overline{AVE}\ x \overline{R2}}$ = √0,807 x 0,676 = 0,739

Wetzels et al. (2009) categorize the GoF index into three levels: small (GoF index = 0.10), medium (GoF index = 0.25), and large (GoF index = 0.36). Accordingly, the structural model in this study qualifies as "large," with a GoF index of 0.739. This suggests that the analyzed data effectively explains the proposed model. The GoF index has also been applied in studies conducted in Malaysia (Hossain & Rahman, 2013) and Indonesia (Suhartanto, 2018).

3.6 Hypothesis Testing

In SEM-PLS analysis, hypothesis testing is conducted using bootstrapping. The complete indicator values are presented in Table 2 (with the Original Sample as β-value).

Table 6. Path Coefficient Results

Hypothesis	Relationship between Variable	Original sample (β)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Description
H1	Presentation Features > Perceived Enjoyment	0.246	0.250	0.092	2.661	0.008	Accepted
H2	Variety > Perceived Enjoyment	0.032	0.039	0.086	0.368	0.713	Rejected
H3	Novelty > Perceived Enjoyment	0.626	0.615	0.102	6.146	0.000	Accepted
H4	Perceived Enjoyment > Continuance Playing	-0.015	-0.019	0.104	0.142	0.887	Rejected
H5	Presentation Features > Perceived Enjoyment > Continuance Playing	0.231	0.235	0.097	2.378	0.018	Accepted
H6	Variety > Perceived Enjoyment > Continuance Playing	0.044	0.051	0.076	0.578	0.564	Rejected

H7	Novelty > Perceived Enjoyment > Continuance Playing	0.242	0.241	0.099	2.447	0.015	Accepted
H8	Escapism > Continuance Playing	0.198	0.189	0.074	2.656	0.008	Accepted
H9	Achievement > Continuance Playing	0.271	0.273	0.070	3.887	0.000	Accepted

The existence of a positive original sample for each variable is demonstrated by the path coefficient test results that are presented in Table 7. Influence-wise, bootstrapping results show presentation features (H1) and novelty (H3) significantly influenced perceived enjoyment with p-values <0.05 of each, which means those are accepted (Ayodele et al., 2018). It doesn't work on variety which means rejected (H2) which came out with a p-value >0.05. The mediating role for perceived enjoyment only worked on presentation features (H5) and novelty (H7) meaning accepted, and it didn't necessarily work on variety (H6) which meaning rejected. Direct paths on perceived enjoyment (H4) show insignificant influence towards continuance playing or rejected with p-values >0.05 but somehow be the opposite on escapism (H8) and achievement (H9) towards continuance playing with p-values <0.05 of each which means accepted.

3.7 Multi-Groups Analysis

Multi-group analysis, also known as multi-sample analysis, is used to compare data analysis across sample characteristics with two or more datasets (Ramírez-Correa et al., 2015). The table below shows the results of the multi-group analysis based on age categories: group A, which includes females aged 17–20, and group B, which includes females aged 21–25 and older.

Table 7. Multi-Group Analysis Result (a: 17-20 years old)

Hypothesis		Path Coefficient (β-value)	t-Value	p-Value	Desc.
H1-a	Presentation Features > Perceived Enjoyment	0.405	2.865	0.004	Significant
H2-a	Variety > Perceived Enjoyment	-0.034	0.326	0.744	Nonsignificant
H3-a	Novelty > Perceived Enjoyment	0.553	4.247	0.000	Significant
H4-a	Perceived Enjoyment > Continuance Playing	-0.099	0.407	0.684	Nonsignificant
H5-a	Presentation Features > Perceived Enjoyment > Continuance Playing	0.011	0.067	0.947	Nonsignificant
H6-a	Variety > Perceived Enjoyment > Continuance Playing	-0.000	0.004	0.997	Nonsignificant
H7-a	Novelty > Perceived Enjoyment > Continuance Playing	0.046	0.276	0.783	Nonsignificant
H8-a	Escapism > Continuance Playing	0.369	2.373	0.018	Significant
H9-a	Achievement > Continuance Playing	0.584	3.592	0.000	Significant

For female respondents aged 17-20 years old, the MGA analysis reveals that certain factors significantly influence perceived enjoyment and continuance playing. Presentation features have a significant positive influence on perceived enjoyment ($\beta = 0.405$, $p = 0.004$), as does novelty ($\beta = 0.553$, $p = 0.000$). However, variety does not significantly influence perceived enjoyment ($\beta = -0.034$, $p = 0.744$). In terms of continuance playing, perceived enjoyment itself does not have a significant direct influence ($\beta = -0.099$, $p = 0.684$), nor do presentation features, variety, or novelty have significant indirect influences on continuance playing through perceived enjoyment. On the other hand, escapism ($\beta = 0.369$, $p = 0.018$) and

achievement (β = 0.584, p = 0.000) both show significant positive influences on continuance playing, indicating that these factors are important motivators for sustained engagement among respondents in this age group.

Table 8. Multi-Group Analysis Result (b: 21-25 years old and above)

Hypothesis		Path Coefficient (β-value)	t-Value	p-Value	Desc.
H1-b	Presentation Features > Perceived Enjoyment	0.147	1.197	0.232	Nonsignificant
H2-b	Variety > Perceived Enjoyment	0.109	0.861	0.389	Nonsignificant
H3-b	Novelty > Perceived Enjoyment	0.641	4.510	0.000	Significant
H4-b	Perceived Enjoyment > Continuance Playing	-0.023	0.209	0.834	Nonsignificant
H5-b	Presentation Features > Perceived Enjoyment > Continuance Playing	0.259	2.123	0.034	Significant
H6-b	Variety > Perceived Enjoyment > Continuance Playing	0.029	0.259	0.795	Nonsignificant
H7-b	Novelty > Perceived Enjoyment > Continuance Playing	0.366	2.803	0.005	Significant
H8-b	Escapism > Continuance Playing	0.126	1.445	0.149	Nonsignificant
H9-b	Achievement > Continuance Playing	0.219	2.884	0.004	Significant

For female respondents aged 21-25 years and above, the MGA analysis shows varied influences on perceived enjoyment and continuance playing. Novelty has a strong positive influence on perceived enjoyment (β = 0.641, p = 0.000), while neither presentation features (β = 0.147, p = 0.232) nor variety (β = 0.109, p = 0.389) significantly influences perceived enjoyment. Perceived enjoyment does not significantly influence continuance playing directly (β = -0.023, p = 0.834), and variety also lacks significant indirect influence on continuance playing through perceived enjoyment. However, both the indirect effect of presentation features (β = 0.259, p = 0.034) and novelty (β = 0.366, p = 0.005) on continuance playing through perceived enjoyment are significant. Additionally, achievement directly and significantly influences continuance playing (β = 0.219, p = 0.004), while escapism does not (β = 0.126, p = 0.149). These results suggest that for this age group, novelty and achievement are particularly influential factors for perceived enjoyment and continued engagement.

Table 9. Multi-Group Analysis Result (Group a and Group b)
17-20 years old and 21-25 years old above

Hypothesis (Comparison)		Path Coefficient (β) (Group a)	Path Coefficient (β) (Group b)	Difference (β)	p-value Group a vs b	Desc.
H1-c	Presentation Features > Perceived Enjoyment	0.405	0.147	0.259	0.170	Nonsignificant
H2-c	Variety > Perceived Enjoyment	-0.034	0.109	-0.143	0.375	Nonsignificant
H3-c	Novelty > Perceived Enjoyment	0.553	0.641	-0.088	0.641	Nonsignificant
H4-c	Perceived Enjoyment > Continuance Playing	-0.099	-0.023	-0.077	0.715	Nonsignificant
H5-c	Presentation Features > Perceived Enjoyment > Continuance Playing	0.011	0.259	-0.248	0.225	Nonsignificant
H6-c	Variety > Perceived	-0.000	0.029	-0.030	0.872	Nonsignificant

	Enjoyment > Continuance Playing					
H7-c	Novelty > Perceived Enjoyment > Continuance Playing	0.046	0.366	-0.320	0.142	Nonsignificant
H8-c	Escapism > Continuance Playing	0.369	0.126	0.243	0.167	Nonsignificant
H9-c	Achievement > Continuance Playing	0.584	0.219	0.364	0.038	Significant

Based on the Multi-Group Analysis (MGA) results comparing the two age groups (17-20 years and 21-25 years), only Hypothesis H9-c (Achievement > Continuance Playing) shows a significant difference between the two groups, with a p-value of 0.038. The path coefficient (β) for Group a (17-20 years) is 0.584, compared to 0.219 for Group b (21-25 years). This indicates that achievement has a significantly stronger influence on continuance playing in the younger age group (17-20 years). The difference in path coefficients between the two groups is 0.364, meaning achievement influences continuance playing 36.4% more strongly in the 17-20 age group compared to the 21-25 age group.

4. Discussion

Result tables provide valuable insights into factors influencing perceived enjoyment and continuance playing among female players of Mobile Legends: Bang Bang across different age groups. Presentation features and novelty emerged as significant predictors of perceived enjoyment, aligning with existing research that highlights how aesthetic and innovative elements play a key role in enhancing user satisfaction. For example, visually engaging designs, character models, and audio elements are particularly important for female players, as noted by Jecius et al. (2022) and Kesuma & Princes (2024), who found that sensory and visual aspects greatly contribute to increased levels of enjoyment. This is consistent with findings by Hull et al. (2013) and Laffan et al. (2016), which suggest that visually appealing design elements correlate with a heightened sense of satisfaction among female gamers. Interestingly, variety defined here as a range of in-game content and modes did not significantly impact perceived enjoyment in either age group. This outcome aligns with research by Kaimann et al. (2018), who argue that excessive content or options, when not well-structured, can overwhelm players rather than enhance their engagement. Additionally, Katherine et al. (2012) suggested that while variety can enhance diversity within a game, it may not be central to female players' loyalty. This indicates that Mobile Legends: Bang Bang players may prefer a focused and cohesive experience, emphasizing visual appeal and innovative elements over an extensive range of gameplay modes. The role of perceived enjoyment as a mediator between presentation, novelty, and continuance playing varies by age group.

Among younger players (17-20 years), perceived enjoyment alone does not significantly influence their decision to continue playing. Instead, these players are more strongly motivated by escapism and achievement. The use of gaming as a means of escape, particularly during challenging life stages, aligns with Prinsen & Schofield (2021) findings that gaming provides an effective outlet for younger players seeking immersion away from real-life stressors. Achievement, another strong motivator for this group, is consistent with findings by Kocurek (2022) and Puspitasari et al. (2018), which indicates that personal progression and goal accomplishment are particularly compelling for female players. Through in-game achievements, these younger players experience validation and a sense of progression, fulfilling a need for recognition and personal growth. For the older group (21-25 years), novelty appears to have a more substantial impact on perceived enjoyment than presentation features. This suggests that as players mature, they may seek more complex and novel gameplay experiences, consistent with findings by Kim & Kim (2019), who highlighted that new characters and innovative mechanics not only heighten enjoyment but also contribute to the game's longevity. The importance of novelty in retaining players was further emphasized by Chao et al. (2023) and Thai et al. (2023), who

found that the introduction of fresh content such as character updates, balance changes, and new skins keeps players engaged over time. This trend was evident in Mobile Legends: Bang Bang, where an expanding player base reached nearly 5 million active players by June 2024 (ActivePlayer.io, 2024). In contrast, older players showed less motivation from escapism and were more driven by goal-oriented achievements. This reflects findings by Puspitasari et al. (2018), which suggests that extrinsic motivations, such as personal progression, are more influential in determining sustained engagement among female players. For these older players, Mobile Legends: Bang Bang may serve as a platform for achieving specific goals or demonstrating skills, which aligns with an increasing focus on accomplishment as players move into adulthood.

The Multi-Group Analysis (MGA) reveals a significant age-based difference in the influence of achievement on continuance playing, with younger players showing a substantially stronger response to achievement-related motivations. This suggests that younger players in Mobile Legends: Bang Bang place a higher value on in-game accomplishments, such as leveling up or ranking, compared to older players, for whom professional or academic accomplishments outside the game may fulfill a similar need. As suggested by Laffan et al. (2016) and Schell (2019), achievement-oriented gaming can be highly engaging, particularly when in-game milestones are prominently rewarded and celebrated, which Mobile Legends does effectively through competitive ranks and seasonal achievements.

5. Conclusion

This study provides valuable insights into the motivations driving female players' enjoyment and continued engagement with Mobile Legends: Bang Bang, particularly examining age-based differences. Findings reveal that presentation features and novelty significantly influence perceived enjoyment for both younger (17-20 years) and older (21-25 years) players, while variety in content does not significantly impact enjoyment. For younger players, escapism and achievement are major motivators for sustained play, aligning with their developmental need for immersion and goal accomplishment. Older players, however, place greater importance on novelty and are more motivated by achievement, possibly reflecting a shift towards goal-oriented and personal growth experiences as they mature. From a theoretical perspective, this study extends existing frameworks on gaming motivation, particularly by reinforcing the importance of aesthetic appeal, novelty, and structured rewards in enhancing engagement. It also suggests that age-based differences in motivation align with theories like self-determination and flow theory, supporting the notion that motivators shift over time and with experience. These insights contribute to a nuanced understanding of how intrinsic and extrinsic motivators function across different stages of player development. Practically, the findings have direct implications for game developers and designers. Given that visual appeal and novelty drive perceived enjoyment, developers can focus on high-quality graphics, dynamic character designs, and regularly updated features to maintain interest among female players. Additionally, since younger players are particularly drawn to escapism and structured achievements, games could include richly immersive environments, engaging storylines, and meaningful progress rewards. For older players, maintaining engagement could involve more sophisticated and unique content updates, such as new characters, novel gameplay mechanics, and customization options, which align with their interest in novelty and goal-oriented challenges.

6. Limitation And Suggestion

This study has several limitations that future researchers could address. First, it focused exclusively on female players of Mobile Legends: Bang Bang, which may limit the generalizability of findings to other games or mixed-gender populations. Additionally, the study only considered age as a demographic factor, excluding other potentially influential factors such as cultural background, gaming experience, and personality traits, which may also shape gaming motivations. The reliance on self-reported data introduces the possibility

of response bias, as participants might have misunderstood or misrepresented certain survey items. Future researchers could expand upon this work by including a more diverse participant group, exploring different game genres, or examining male and mixed-gender player samples to assess whether similar motivational factors apply. Studies could also investigate additional demographic factors, such as cultural background, socio-economic status, and gaming experience, to offer a more holistic understanding of gaming motivations. Longitudinal studies tracking changes in motivations over time could provide valuable insights into how gaming engagement evolves with age or as new content is introduced. Qualitative methods, such as interviews or focus groups, could further enrich the understanding of player experiences and motivations, potentially uncovering nuanced aspects of engagement that surveys might overlook.

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