# Online to offline social interaction on gaming motivations

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## Abstract

**Purpose** – This research examined the social interactions of online game players based on the proposed motivation model in order to understand the transitions of motivation of online game. The authors also separated samples into four categories to compare the difference of different type of online game players.

**Design/methodology/approach** – This study proposed a motivation model for online game player based on existence–relatedness–growth theory. The authors also analyze the transitions of motivations via first-order and second-order Markov chain switching model to obtain the journey of online to offline socialization.

**Findings** – Teamwork–socialization players preferred to make friends in their online gaming network to socialize. Competition–socialization players were mostly students who played games to compete and socialize and may share experience in online or offline activities. Teamwork–mechanics players purely derived pleasure from gaming and were not motivated by other factors in their gaming activities. Competition–mechanics players may already have friends with other gamers in real life.

**Research limitations/implications** – More samples can be added to generate more generalizable findings and the proposed motivation model can be extended by other motivations related to online gaming behavior. The authors proposed a motivation model for online to offline socialization and separated online game players into four categories: teamwork–socialization, competition–socialization, teamwork–mechanics and competition–mechanics. The category of teamwork–socialization may contribute to online to offline socialization area. The category of competition–mechanics may add value to the area of traditional offline socialization. The categories of competition–socialization and teamwork–mechanics may help extant literature understand critical stimulus for online gaming behavior.

**Practical implications** – The authors' findings can help online gaming industry understand the motivation journey of players through transition. Different types of online games may have various online game player's journey that can assist companies in improving the quality of online games. Online game companies can also offer official community to players for further interaction and experience exchange or the platform for offline activities in the physical environment.

**Originality/value** – This research proposed a novel motivation model to examine online to offline socializing behavior for online game research. The motivations in model were interconnected via the support of literature. The authors also integrated motivations by Markov chain switching model to obtain the transitions of motivational status. It is also the first attempt to analyze first-order and second-order Markov chain switching model for analysis. The authors' research examined the interconnected relationships among motivations in addition to the influential factors to online gaming behavior from previous research. The results may contribute to extend the understanding of online to offline socialization in online gaming literature.

**Keywords** Cybernetics, Sociocybernetics, Social interaction

**Paper type** Research paper

## 1. Introduction

Social network sites (SNSs) are prevalent in daily life such as Facebook, Twitter and Sina Blog (in China), and they effectively expand the range of social networks beyond those possible in real life. An SNS is commonly defined as a closed system in which people disclose personal information fully or partially, are informed of their connections with other users and can view their own connections or those of other users freely (Boyd and Elison, 2007).

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For example, people who are active in real life are active on Facebook because their friends on Facebook are mostly their friends in real life (Hampton *et al.*, 2011). This mode of social interaction indicates a transition of social networks from offline to online environments. Another activity with online social elements is online gaming; such games are usually associated with negative effects, such as obsession, addiction and a lack of offline friends (Liu and Peng, 2009). Today, peoples' perceptions of online games have become more positive; thus, various online games are promoted through word of mouth between real-life friends or through shared content on SNSs (Hutchins, 2008). People play online games to explore the unknown and to compete and collaborate with strangers because experiences and behaviors related to online games are more complex than those in online social networking activities (Teng and Chen, 2014). Particularly, self-expressiveness and self-efficacy of gamers influenced continuance intention of online games (Sharma *et al.*, 2020). Compared with SNSs, which involve offline-to-online social interactions, the social mode that is most relevant to online games is online to offline (O2O).

The O2O concept has been exploited as a marketing strategy; this involves promoting offline products in an online environment to extend its reach to other customer classes. The O2O concept has been applied in social activities (e.g. the SNS 17 Shua), tourism supply chain (He *et al.*, 2019) and omni-channel selection in supply chain management (Liu *et al.*, 2020). In contrast to other SNSs, which limit social interactions to online environments, 17 Shua manages offline meetups initiated by its members. Studies have suggested that online social interactions have negative social effects and make offline social interactions difficult (Miyata and Kobayashi, 2008; Vergeer and Pelzer, 2009; Williams, 2007). However, studies have provided evidence of the positive effects of online social interactions on offline social interactions from various perspectives (Kowert and Oldmeadow, 2015; Trepte *et al.*, 2012). O2O social interactions can deepen an individual's understanding of the personal characteristics of the people with whom they are socializing and can improve the efficiency of offline social interactions. The O2O concept has altered conventional social interactions, and such interactions can be divided into an earlier and a later stage (people first socialize online and subsequently socialize in conventional offline environments).

Studies on online games have focused on three topics: obsession (Snodgrass *et al.*, 2013; Christou, 2014), motivations (Dalisay *et al.*, 2015; Sharma *et al.*, 2020) and social interactions (Ducheneaut *et al.*, 2006; Eklund and Johansson, 2013). Regarding social interactions, most studies have attempted to identify the motivators of the online social interactions of players and their conditions of social interaction (Trepte *et al.*, 2012). Researchers of such studies have generally conducted interviews and observed the social interactions of small groups of players while they were playing online games. In studies on O2O social interactions, researchers have primarily used SNS users (e.g. Facebook and Myspace) as their research subjects. On these SNSs, users disclose personal information for access by others, thus enabling individuals to adjust their approaches to socialization according to the personalities of others with whom they are socializing (Boyle and Johnson, 2010; Emanuel *et al.*, 2014; Nadkarni and Hofmann, 2012).

O2O social interactions are increasingly prevalent because of the emergence of social media and online community. Interactions among online game players usually involve discussing the game and sharing information about their offline lives to strengthen their relationships with others. Studies investigating online games have examined offline social interactions from various context (Kim *et al.*, 2019; Khalis *et al.*, 2018; Chung *et al.*, 2021). However, few have analyzed the differences among players' gaming motivations to explain the transformative process of O2O social interactions (Cole and Griffiths, 2007; Kowert and Oldmeadow, 2015; Lu *et al.*, 2014). The context of O2O social interaction in online games and the journey of motivations still lacks and needs further investigation. This research will examine the social interactions of online game players based on the proposed motivation

model which is established via existence–relatedness–growth (ERG) theory. Finally, Markov chain switching model will be used to analyze the transitions of motivation and investigate the journey of online game players. Hence, the research questions are as follows:

*RQ1.* What are the important O2O motivations of online game players? and

*RQ2.* What is the O2O social interaction journey of online game players?

## 2. Literature review

### *2.1 Online gaming motivations*

Relevant studies have yet to categorize motivations to participate in online gaming. Using a technology acceptance model, Hsu and Lu (2004) revealed that the most common motivator for playing online games was the use of free time; however, that study overlooked the behavior and online social interactions of players when gaming. Yee (2006) proposed three dimensions of online gaming motivations: achievement, social and immersion. These have been commonly analyzed in subsequent studies on online gaming motivations (Billieux *et al.*, 2013; Ding *et al.*, 2014). Yee also conducted a case study on the online game Lineage and categorized its players into three types: community-oriented players, who play for social and collaborative purposes; single players, who enjoy the game itself and seldom interact with others; and off-real-world players, who focus on the wealth and power they possess in the game and consider their in-game development to be equally crucial as their real-life development. Different ranks of online gamers also change game every time (Hyeong *et al.*, 2020) and the motivations of achievement and escapism are positively associated with psychological ownership in the online gaming environment (Wang *et al.*, 2021). In addition, social or asocial of game playing depend on gamers' motivations and playing habit (Reer and Kramer, 2019). Gaming habits are positively associated to motivation to attain gaming goals and perceived price fairness (Liao *et al.*, 2020).

Williams *et al.* (2007) considered online game environments to be independent societies with their own rules that provide a space for players to express themselves freely. Moreover, the unique role of each player in gaming increased the diversity of such environments. Shen and Williams (2011) monitored the communication of players with their families and the amount of time spent on online gaming and argued that online gaming improved the relationships of players with their families; however, that study only investigated the existing offline relationships of players. From the perspective of online game guilds, Kang *et al.* (2013) discovered that players' social motivations were driven based on lasting relationships with other guild members, despite being initially based on concrete incentives. Kardefelt-Winther (2014) considered online game-based escapism to be a normal stress reliever that may not lead to gaming obsession. Xu *et al.* (2012) recruited teenage research participants and revealed that control over gaming skills, a need for fulfilling and escapism increased their online gaming motivation. Dindar and Akbulut (2014) investigated Turkish online gamers and reported that their motivations were not mutually exclusive and that the relationships among motivations required further research. Teng (2010) suggested that games that give players greater freedom to express their personal characteristics were associated with higher player loyalty.

### *2.2 O2O social interactions*

Alex Rampell, cofounder of TrialPay, first introduced the term O2O in 2010 in *Why Online2Offline Commerce Is a Trillion Dollar Opportunity*. However, Walmart shaped the O2O concept in 2006 through its business-to-customer (B2C) strategy, referred to as its site-to-store service; the company used B2C approaches to manage customer orders and online payments, and the customers collected their orders at local Walmart stores. The O2O concept

was previously used in e-commerce, and from a customer's perspective, O2O applications improved product information availability, facilitated contacting sellers for inquiries and order placement, and offered lower prices than physical stores did (Hsieh, 2017; Xiao *et al.*, 2019). From a seller's perspective, O2O applications facilitated higher product exposure online, control over customer purchasing information and the effective management of online orders, as well as reduced the seller's need for optimal physical locations and alleviated stress related to rent payment. The O2O concept has been applied by brick and mortar retailers with an online presence. However, Ranpell (2010) emphasized that the O2O concept can be used to provide services, products and stores that respond to customer needs, leading to social commerce in e-commerce settings. Social commerce involves using an SNS as a medium to facilitate social interactions, harness word of mouth marketing and receive customer recommendations to effectively promote the seller's products and stores (Pan *et al.*, 2017).

Previously, e-commerce businesses collaborated with mature SNSs, such as Facebook and Twitter, to promote their products among large user bases. However, businesses have begun to change their strategy, establishing independent social spaces that only attract certain consumer groups to improve their services provided to target markets. This new strategy has enabled such businesses to reach people with similar interests and promote offline sales. The application of O2O has been extended from e-commerce to online social networking (Chen *et al.*, 2019). By contrast, Internet-based social networks, which have undergone rapid development, are an example of the O2O concept's incorporation into online social interactions. Kim *et al.* (2020) indicated that more information displayed in online platform page resulted in more social referral but less discussion. Offline social interactions positively influence online shopping demand (Kim *et al.*, 2019). In the physical environment, more acceptance by peers was associated with less narcissistic self-presentation on Facebook (Khalis *et al.*, 2018). Offline events may influence online connective actions and foster interactions (Chung *et al.*, 2021).

O2O social media matches people with shared interests. In online game settings, gaming is the mutual interest that brings people together; as such, related interactions can be considered interest-based social interactions. Relevant studies have suggested that deriving offline social relationships from online social interactions is inappropriate (Vergeer and Pelzer, 2009; Lee and Lee, 2010). However, participation in guild or clan events increased the amount of contact among people and enabled participants to establish friendships or even quasi-familial relationships that could potentially be retained in an offline environment. In this study, it was assumed that all social motivations were possible among online players (Trepte *et al.*, 2012). Oh *et al.* (2014) stated that the positive effects of online social interactions counteract the negative effects of offline social interactions. Kowert and Oldmeadow (2015) suggested that online social spaces in online games have transformed approaches to social interaction; people now have more opportunities to maintain autonomy while pursing interpersonal relationships during social interactions. Mazzoni and Iannone (2014) viewed online social interactions as a highly effective source of real-life social capital for teenagers. The gaming behavior of online players affects the O2O transformation of social relationships; thus, the primary focus of this study is the behavioral changes of gamers in online and offline settings.

### *2.3 The proposed motivation model*

This research categorized motivations using ERG theory and explored the causal relationships among these motivations and player behavior. Underpinned by Maslow's hierarchy of needs, ERG theory states that humans have three core needs, namely existence, relatedness and growth (Alderfer, 1969). ERG theory suggests that people can have more than one need at a time and that if higher-level needs are unfulfilled, then lower-level needs become stronger. In contrast to Maslow's hierarchy of needs, with its rigid, hierarchical

structure, ERG theorists consider needs levels to be more flexible. Moreover, the frustration–regression principle of ERG theory indicates that when a need is unfulfilled, people remain at the level at which the need belongs, and when higher-level needs are unfulfilled, they revert to focusing on lower-level needs. ERG theory encompasses all aspects of needs and can thus be applied to gaming motivations, which can be examined from various perspectives because they are not necessarily ordered by urgency.

This research applied the concept of ERG theory to extend online gaming motivations. We relate escapism to the need of existence, role-playing, competition, teamwork, socialization and relationship to the need of relatedness, and advancement and mechanics to the need of growth. Figure 1 presents the interconnections between the eight motivations and indicates

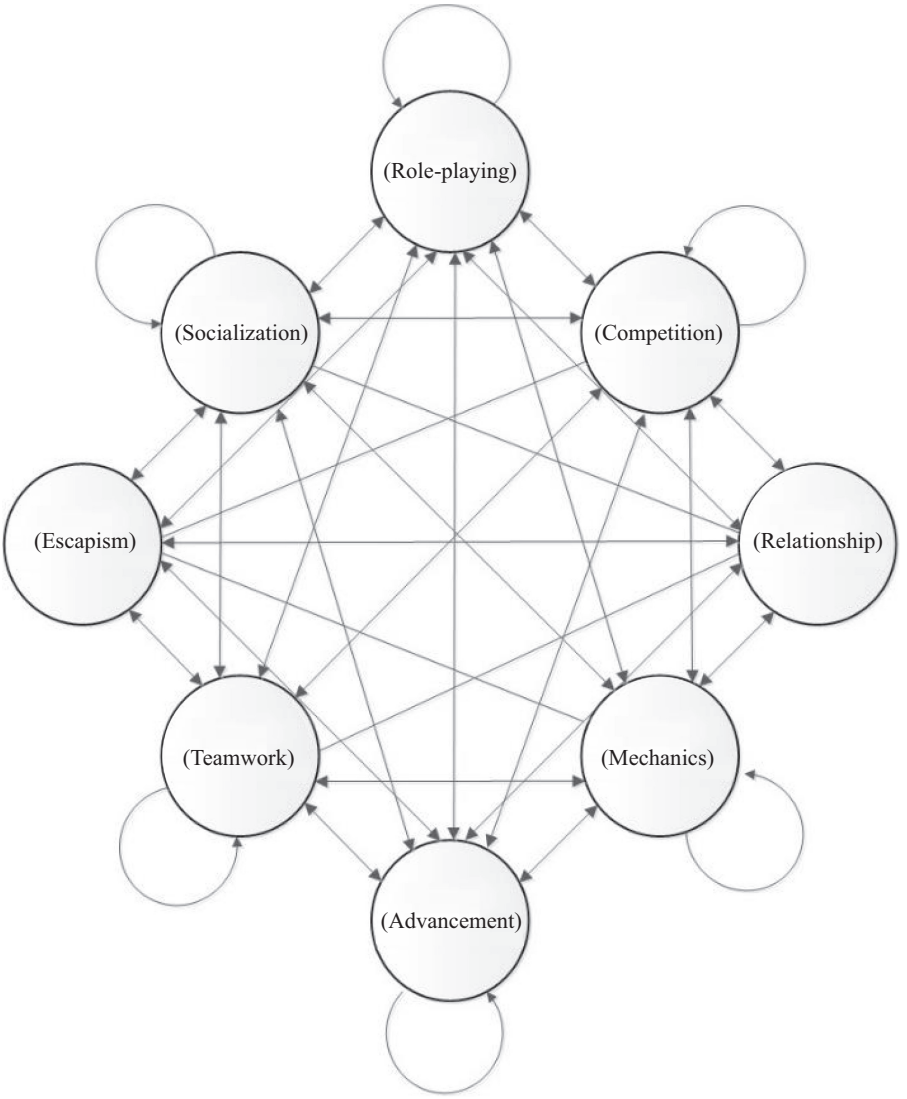


**Figure 1.**
Conceptualization of gaming model

online gamers' possible changes in motivation during gaming. Particularly, when players ceased gaming, they revert to the state of escapism or state of relationship when they had established offline social relationships. First, escapism is a phenomenon in which players avoid their real-life problems by immersing themselves in online environments (Kardefelt-Winther, 2014). Kuss *et al.* (2012) considered escapism to be the primary motivator for socialization in online games. Role-playing involves adopting the identity of another in certain environments. Role-playing in online game environments satisfies existence needs (i.e. protecting and maintaining existence). Hassouneh and Brengman (2014) indicated that role-playing involves establishing social status, improving gaming skills and competitiveness, and strengthening loyalty, evoking a sense of accomplishment and honor. Attractive game characteristics, such as role-playing, leveling and multiplayer interactions, are the main reasons that players enter online game worlds.

Socialization is an interest in helping others and in communicating and interacting with them (Yee, 2006). Some people also play online games to meet new people or maintain and develop their existing real-life friendships (Kuss *et al.*, 2012). When socializing, most people display their positive side to others in the hope that others accept them; similarly, players create a virtual character to represent themselves during online gaming. Teamwork refers to individuals contributing to a group as group members. Kang *et al.* (2013) argued that long-term teamwork strengthened loyalty and established long-term relationships. Gaming involves various stages, including teaming up with others to search for treasure, improving gaming skills to not disappoint their team members, helping others in need and becoming a top player through achieving various goals; such pursuits forge strong connections among online gamers. Joining a team may help players to identify fellow gamers with shared interests, helping them form long-term relationships that are maintained in offline environments/real-world settings.

Relationship refers to the expectation of establishing and developing long-term relationships with others, which corresponds to the need for relatedness, which is the need of establishing a sense of belongingness, connection and relationship with others (Joe and Chiu, 2009). Players may establish long-term relationships, such as those in guilds, to maintain social connections despite it seeming that such relationships are superficially based on competition or teamwork. Relationships developed through gaming may transform into new offline social relationships. Additionally, when players temporarily or permanently leave an online game, the prior relationships established may have a greater chance of being maintained offline than if they continued playing such games (Trepte *et al.*, 2012). Advancement represents players' expectations to become wealthier and more powerful (in game); through advancement, they increase their wealth and in-game statuses (Joe and Chiu, 2009). Players with a mechanics-based motivation analyze the rules of a game to improve their gaming skills. Players explore games in depth to improve their skills and contribute more during gaming competitions or teamwork activities; those with a higher skill level receive admiration from others, increasing their self-worth (Joe and Chiu, 2009). Competition is a person's expectation of facing a challenge with others; it corresponds to the need for growth (i.e. expectations of self-growth and the manifestation of self-worth; Yee, 2006). Competition and teamwork activities, such as bidding, battling, leveling up through grouping, defeating powerful enemies and winning competitions, against rivals are socialization activities embedded in most games (Hassouneh and Brengman, 2014; Teng and Chen, 2014).

## 3. Markov chain switching model

This research used a Markov chain, also known as a as a discrete-time Markov chain, to predict social motivations. This prediction method involves using historical data to predict

future states. A Markov process with discrete times and states is termed as a Markov chain as shown in Eq. (1) which describes the concept of Markov process (Gagniuc, 2017). The subscript of $X$ is unit time, and $X_0$ denotes the state of $X$ at the unit time of zero. $X_{n+1}$ is a function of the preceding conditional probability distribution of $X_n$. A Markov chain is a chain of states and represents the occurrence of each state through a stochastic process. Markov was inspired by the Bohr model in physics, which states that electron motion can occur in one of various electron orbits. Markov's conceptualization of the Bohr model is formalized as follows. Let $X(t) = i$ be the motion state of an electron in the $i$th orbit at time $t$. If the orbit transition of the electron only occurs at discrete time points $(t_1, t_2, t_3, \ldots, t_n)$, and the probability of transition from orbit $i$ to $j$ at time $t_s$ is only related to orbits $i$ and $j$ but not to all previous orbits, then $X(t)$ is a one-level Markov chain.

$$P(X_{n+1} = x|X_0, X_1, \ldots, X_n) = P(X_{n+1} = x|X_n), \tag{1}$$

where $X_0$ to $X_n$ is a sequence of sets representing $N$ actual values.

A Markov process is a probability process in which an experiment or observation has various possible results; each result is referred to as a state, and states are mutually exclusive, collectively exhaustive events. The presence of mutually exclusive variables or events necessitates that among such variables or events, only one can be real or occur at any one time. That events are collectively exhaustive means that all experimental results are necessarily attributed to some state. The set of all states is termed a state space and can be expressed as $S = \{S_1, S_2, S_3, \ldots, S_n\}$; those states with a finite number of elements constitute finite Markov chains and those remaining states constitute infinite Markov chains. The probability of an $n$th transition between some events is usually determined by the transitions preceding probabilities and not related to the preceding two probabilities, which indicates the transition's status as a one-level Markov chain. If a state space is finite, then state $a$ at an assumed time point of $t$ can be presented as $X_t = a$, and its following state is $X_{t+1} = b$. The conditional probability of a transition from a state at one time point $t$ to the next state at $t+1$ can be represented as $P(X_{t+1} = b|X_t = a) = P_{ab}$, where $P$ is both a conditional and transition probability. The probability of undergoing $n$ transitions before changing to a certain state can be demonstrated to be $P(X_{t+n} = b|X_t = a) = P_{ab}(n)$. A square matrix comprising various state transition probabilities is termed a transition matrix as shown in Eq. (2).

$$P = [P_{ab}]_{n \times n} \tag{2}$$

where $P$ is the transition matrix probability and $P_{ab}$ is the probability of transition from $a$ to $b$ ($P_{ba}$ is the probability of transition from $b$ to $a$).

Transition matrices in columns are probabilities at time point $t$, and those in rows are probabilities at the following time point, $t + 1$. The sum of each column is one, $b = 1, 2, 3 \ldots, n$. The probability vectors from each column in a square matrix constitute a vector matrix, and the sum of its components is 1, with every element $(P_{ab})$ satisfying the following condition: $1 \geq P_{ab} \geq 0$. A transition matrix $P$ is a stationary Markov chain that does not change with time if it is a constant and does not change in all states (i.e. $P_1 = P_2 = \ldots P_n$). A transition matrix $P$ that remains unchanged with time is a nonstationary Markov chain. A transition matrix in which every element becomes positive after $n$ transitions is a regular Markov chain. In a regular Markov process, a transition between two states presents the possibility to a convergent state, regardless of the initial state.

This research integrates the proposed motivation model with eight states by Markov chain switching model. We assume the social states of online gamers as continuous dynamic process for prediction. The continuous online gaming behavior of each player may match to eight states in the motivation model. We defined (according to the constructed model) the

notation of each sate such as escapism (state E), role-playing (state P), socialization (state S), teamwork (state T), competition (state C), advancement (state A), mechanics (state M) and relationship (state R). The probability of initial state and transition matrix can be calculated by all observed data. The total number of any pairwise state among observed data will be calculated first in order to obtain the probabilities in the transition matrix. The $8 \times 8$ transition matrix $P$ of the type of player can be denoted as $[P_{ab}]_{8\times 8}$. The first-order and second-order Markov chain process will be used to compare the difference of outcomes. The step by step transitioning process can be calculated via the multiplication of initial probability and transition matrix. Hence, the number of transitioning steps and final convergent state of each type of player will be estimated accordingly.

In addition to the proposed motivation model, we separate online game players into four categories based on the combinations of motivation. We define major activity (teamwork and competition) and a continuous intention to play online games (socialization and mechanics) as two dimensions to form four categories (Table 1). Players in the teamwork–socialization category prefer to play games with others; such players form a specific group with a joint purpose. Players in the teamwork–mechanics category may not stick to a specific team. They are skilled in the game and can only join elite or ultra-competitive teams. Once they achieve a goal or obtain some benefit, they tend to leave the team immediately. Players in the competition–socialization category may stay in a specific team. However, their personal motivations lead them to compete with not only other players but also team members. Players in the competition–mechanics category prefer to play games alone and have low teamwork motivations. They may monopolize all benefits to further their development.

## 4. Results

### *4.1 Data collection and demographics*

An online questionnaire was used to determine the gaming behavior of players; 200 participants were recruited through snowball sampling which is the nonprobability sampling method to reach similar participants in the closed network. The questionnaire was conducted in April 2015 to collect data in Taiwan. Table 2 shows the designed items in the questionnaire and the matching state of motivation. The items were designed based on time sequence to an online game player from beginning, early in-game playing, in-game playing and late in-game playing. In the beginning of the game, how and why questions can understand the initial motivation either socialization or escapism. Early in-game playing presents if the player hides the identity or behavior in the online game (role-playing). In-game playing reveals the important factors to play online games (mechanics or socialization) and the activities while playing (teamwork or competition). Late in-game playing refers to if the player expects to improve gaming skill or become the leader in the game (advancement) and if the player extends online interaction to offline activities. Moreover, two senior professors from business administration and marketing departments were requested to ensure content validity before finalization. Each participant will answer the questions one by one based on time sequence and this research will match them to a state based the proposed motivation model. That is, the

**Table 1.** Four categories of online game players

| | | Major activity | |
|---|---|---|---|
| | | Teamwork | Competition |
| Continuous intention on online game | *Socialization* | Teamwork–socialization (40 participants) | Competition–socialization (30 participants) |
| | *Mechanics* | Teamwork–mechanism (80 participants) | Competition–mechanism (50 participants) |

| Time sequence | Item | Response | Matching state of motivation |
|---|---|---|---|
| Beginning | How did you know this online game? | Recommended by friends and families | S (socialization) |
| | | Advertisement | Null |
| Beginning | Why did you play this online game? | Attracted by games | E (escapism) |
| | | Kill time | Null |
| Early in-game playing | Did you hide your gender in the online game? | Yes | P (role-playing) |
| | Did you act different in the online game (e.g. tones or behavior)? | Yes | |
| In-game playing | What is the important factor to play this online game for you? | Interesting games | M (mechanics) |
| | | Build emotional connection with other players | S (socialization) |
| In-game playing | What kind of activity you frequently did in the online game? | Alone or work with other players for more challenge | T (teamwork) |
| | | Compete with other players | C (competition) |
| Late in-game playing | Did you ever think about being a leader in the online game? | Yes | A (advancement) |
| Late in-game playing | Did you share your real life with other online players? | Yes | R (relationship) |
| | Do you know any offline activity initiated from other online players? | Yes | |
| | Did you participate any offline activity with other players? | Yes | |

**Table 2.** Items in the questionnaire and matching state of motivation

time-series states will be transformed from the designed items as shown in Table 2 and used for Markov chain switching model analysis.

The demographics showed 37%, 32% and 31% of participants were under 18, 19–24 and 20–40 years old. The lower limit to answer the questionnaire was 16; hence, the age group between 16 and 18 refers to senior high school students. 81% of participants were male players and 19% were female players. 70% of participants played online games via recommendation by friends and families and 30% were via advertisement. 59% of participants played multiplayer online battle arena (MOBA) games, 30% played role-playing games (RPG) and 12% played puzzle games. 31% of participants played online games 2–3 h per day, 28% played 1–2 h, 22% played 3–4 h, 13% played more than 5 h, and 7% played less than 1 h 73% of participants spent less than $17 USD on online games per month, 15% spent $17 USD-$33 USD, 10% spent $33-$100 USD and 2% spent more than $100 USD. The occupation distribution revealed 52% of participants were students, 15% were from technology industry, 13% were from service industry, 8% were from traditional industry, 6% were from government, 5% were from general business, 1% were from other industries. Finally, 25% of participant contacted other players offline after playing online games.

### *4.2 Discussion*

This research used two types of results from the Markov chain models (first order and second order). A Markov chain of higher order is a modified model of the Markov model and has Markov property with memory. The type 1 results were based on the assumption of first order Markov chain model that states $t + 1$ depends on state $t$. The type 2 results were based on the assumption of second order Markov chain model that states $t + 1$ depends on state $t$ and state $t - 1$. Hence, the notation R refers to the motivation of relationship for first-order Markov chain and EP stands for the combination of motivation of escapism plus role playing.

*4.2.1 Teamwork–socialization category.* MOBA games and RPGs were the two game types analyzed for the teamwork–socialization category. In the early stages of such games, skilled players may need to "carry" rookies (i.e. to bear most of the burden for completing the game). In other words, most players are first motivated by escapism and then by socialization. There are 40 samples in this category and 75% of them were more than 18 years old. 75% of them played games via recommendations from friends and families and 32.5% of them were students. 27.5% of them participated offline activities 40% of them contacted each other outside games. After calculating the probabilities of each state in the collected data, the initial probabilities in type 1 were as follows: E was 0.5385; S was 0.4615; and P, T and A were 0. In type 2, the initial probabilities were as follows: EP was 0.0769; ES was 0.462; SS was 0.4358974; ST was 0.02564103; and PS, SP, TA, TT and AA were 0. The transition matrix probability was 0.8571 from state E to state S (Figure 2 and Table 3). After initial game interactions among players, players in this category progress to the state of teamwork (i.e. E→S). The steady state in the long term for both type 1 and type 2 players was state A. Type 1 required 14 transitions but type 2 only required 8 transitions to achieve state A (probability = 1). The results indicate that type 2 can help online game companies predict the next move of players quickly. There are 27.5% of players transferred online relationships to offline friendships according to analysis. Those players preferred to make friends in their online gaming network and considered closed networks as their preferred approach to socialize. Through teamwork, they helped each other and strengthened their emotional connections with different players online, which extended to the offline environment.

*4.2.2 Competition–socialization category.* In the competition–socialization category, most players were young students, and MOBA was the major game type. Their motivation to join

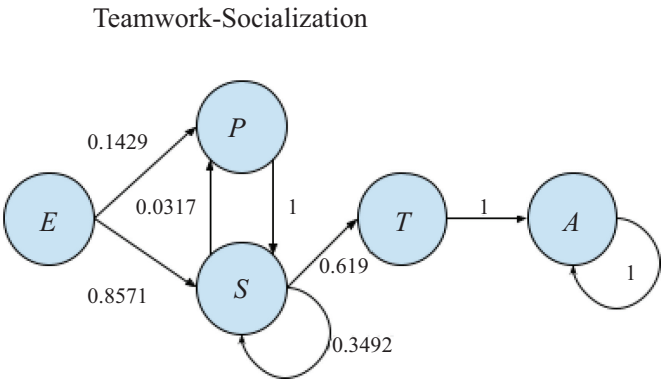


**Figure 2.**
First-order Markov transition probability of teamwork–socialization category

| | EP | ES | PS | SP | SS | ST | TA | TT | AA |
|---|---|---|---|---|---|---|---|---|---|
| EP | | | 1 | | | | | | |
| ES | | | | 0.055556 | 0.166667 | 0.777778 | | | |
| PS | | | | | | 1 | | | |
| SP | | | 1 | | | | | | |
| SS | | | | 0.045455 | 0.090909 | 0.863636 | | | |
| ST | | | | | | | 1 | | |
| TA | | | | | | | | | 1 |
| TT | | | | | | | | 1 | |
| AA | | | | | | | | | 1 |

**Table 3.**
Second-order Markov transition matrix of teamwork–socialization category

the game was to make new friends. Players in this category tend to discuss topics that they are pertinent to real life and strengthen their friendships by playing online games. There are 30 samples in this category and 53.3% of them were more than 18 years old. 83.3% of them played games via recommendations from friends and families and 66.7% of them were students. 30% of them participated offline activities 33.3% of them contacted each other outside games. In type 1, the initial probabilities were as follows: E was 0.5357; S was 0.4643; and P, C and A were 0. In type 2, the initial probabilities were as follows: EP was 0.107; ES was 0.429; SS was 0.464; and PS, SC, CA and AA were 0. The transition matrix probability was 0.8 from state E to state S (Figure 3 and Table 4). The motivation path for this category was from escapism to socialization and from socialization to competition (i.e. E→S→C). MOBAs are a type of competitive game; this path agreed with the fact that young players tend to care about whether they win or lose. The steady state in the long term for both type 1 and type 2 was state A (probability: 1). Type 1 required 12 transitions, but type 2 only required 4 transitions to achieve state A. Particularly, 30% of them transferred friendships from online games to offline environments. Students played games to compete and socialize that may push them to share experience in online or offline activities. This may have given them a higher likelihood of extending online relationships to offline friendships.

*4.2.3 Teamwork–mechanics category.* The players in the teamwork–mechanics category were mostly older than those in other categories and may have had full-time jobs. RPGs were the major game type in this category; such games may be associated with after-work gaming as they are less cognitively taxing compared with other game types. Players can relax by playing this type of game. There are 80 samples in this category and 76.3% of them were more than 18 years old. 61.3% of them played games via recommendations from friends and families and 38.8% of them were students. 20% of them participated offline activities 18.8%

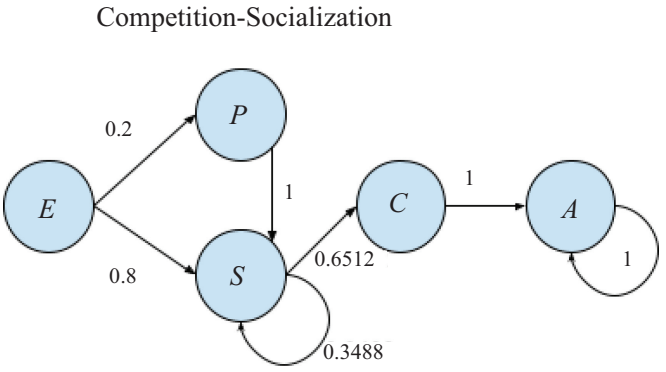


**Figure 3.**
First-order Markov transition probability of competition–socialization category

| | EP | ES | PS | SS | SC | CA | AA |
|---|---|---|---|---|---|---|---|
| EP | | | 1 | | | | |
| ES | | | | | 1 | | |
| PS | | | | | 1 | | |
| SS | | | | | 1 | | |
| SC | | | | | | 1 | |
| CA | | | | | | | 1 |
| AA | | | | | | | 1 |

**Table 4.**
Second-order Markov transition matrix of competition–socialization category

of them contacted each other outside games. In type 1, the initial probabilities were as follows: E was 0.867; S was 0.1325; and P, T, A and M were 0. In type 2, the initial probabilities were as follows: EM was 0.6506; EP was 0.1807; ES was 0.024; PM was 0.012; SP was 0.012; SM was 0.12; and TA, MC, MT, CC, TT, and AA were 0. The transition matrix probability was 0.7606 from state E to state M and 0.2113 from state E to state P (Figure 4 and Table 5). The path of motivation was from escapism to mechanics to teamwork (i.e. E→M→T). The steady states in the long term for both type 1 and type 2 were state C and A. Type 1 required five transitions to achieve state C (probability: 0.012) and state A (probability: 0.988). Type 2 required five transitions to achieve state C (probability: 0.0121) and state A (probability: 0.9872). Type 1 and type 2 paths were extremely similar, and the results indicated no significant difference for either one state or two states with regard to further predictions of status. In addition, 20% of players extended online friendships to offline ones. These players purely derived pleasure from gaming and were not motivated by other factors in their gaming activities. Although teamwork is required in the game, they saw it as a means to an end. They had less interaction with other players, which may have resulted in them having a low transition probability.

*4.2.4 Competition–mechanics category.* In the competition–mechanics category, most players were young students (similar to the competition–socialization category), and MOBA

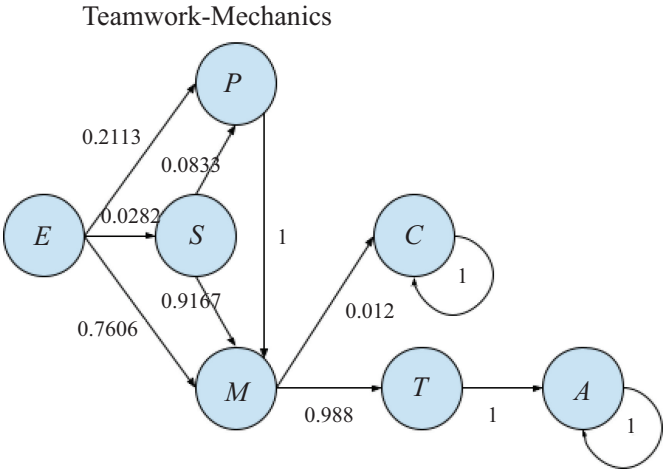


**Figure 4.**
First-order Markov transition probability of teamwork–mechanics category

| | EM | EP | ES | PM | SP | SM | TA | MC | MT | CC | TT | AA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EM | | | | | | | | | 1 | | | |
| EP | | | | 1 | | | | | | | | |
| ES | | | | | 0.5 | 0.5 | | | | | | |
| PM | | | | | | | | 0.056 | 0.944 | | | |
| SP | | | | 1 | | | | | | | | |
| SM | | | | | | | | | 1 | | | |
| TA | | | | | | | | | | | | 1 |
| MC | | | | | | | | | | 1 | | |
| MT | | | | | | | 1 | | | | | |
| CC | | | | | | | | | | 1 | | |
| TT | | | | | | | | | | | 1 | |
| AA | | | | | | | | | | | | 1 |

**Table 5.**
Second-order Markov transition matrix of teamwork–mechanics category

was the major type of game played. There are 50 samples in this category and 30% of them were more than 18 years old. 74% of them played games via recommendations from friends and families and 90% of them were students. 8% of them participated offline activities 16% of them contacted each other outside games. In type 1, the initial probabilities were as follows: E was 0.56; S was 0.44; and P, C, T, A and M were 0. In type 2, the initial probabilities were as follows: EM was 0.46; EP was 0.08; ES was 0.02; SP was 0.08; SS was 0.04; SM was 0.32; and PS, PM, SC, ST, CA, MC, CC, TT and AA were 0. The transition matrix probabilities were 0.8438 from state E to state M and 0.6923 from state S to state M (Figure 5 and Table 6). The initial motivation of players in this category (escapism or socialization) transitioned to that of game mechanics. This is because these players mainly focused on enhancing in-game skills through acquiring in-game items, and winning or losing was not important to them. The path of motivation in this category was from escapism to mechanics to teamwork (i.e. E→M→C). The steady states of type 1 and type 2 in the long term were different. Type 1 required nine transitions to achieve state T (probability: 0.0198) and state A (probability: 0.9802). Type 2 required four transitions to achieve state C (probability: 0.02), state T (probability: 0.02) and

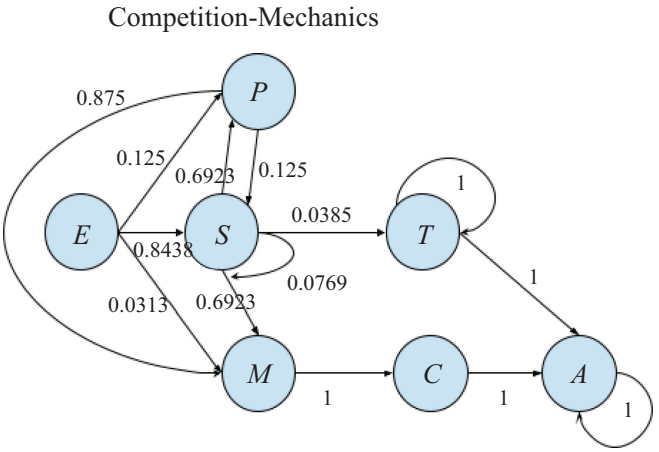


**Figure 5.**
First-order Markov transition probability of competition–mechanics category

| | EM | EP | ES | PS | PM | SP | SS | SC | ST | SM | CA | MC | CC | TT | AA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EM | | | | | | | | | | | | 1 | | | |
| EP | | | | 0.25 | 0.75 | | | | | | | | | | |
| ES | | | | | | | | | | 1 | | | | | |
| PS | | | | | | | | | 1 | | | | | | |
| PM | | | | | | | | | | | | 1 | | | |
| SP | | | | | 1 | | | | | | | | | | |
| SS | | | | | | | | 0.5 | | 0.5 | | | | | |
| SC | | | | | | | | | | | | | 1 | | |
| ST | | | | | | | | | | | | | | 1 | |
| SM | | | | | | | | | | | | 1 | | | |
| CA | | | | | | | | | | | | | | | 1 |
| MC | | | | | | | | | | | 1 | | | | |
| CC | | | | | | | | | | | | | 1 | | |
| TT | | | | | | | | | | | | | | 1 | |
| AA | | | | | | | | | | | | | | | 1 |

**Table 6.**
Second-order Markov transition matrix of competition–mechanics category

state A (probability: 0.96). Type 2 achieved an additional state (C) that type 1 did not, meaning that players sought not only teamwork or advancement but also competition. Only 8% of players extended online friendships to offline ones. This may have been because they were already friends with other gamers in real life, resulting in them having a low transition probability from O2O friendships.

## 5. Implications

The proposed motivation model can benefit to O2O socializing behavior for online game research. The separated four categories can enhance extant research, including teamwork–socialization, competition–socialization, teamwork–mechanics and competition–mechanics. Specifically, the category of teamwork–socialization may contribute to O2O socialization area. The category of competition–mechanics may add value to the area of traditional offline socialization. The categories of competition–socialization and teamwork–mechanics may help extant literature understand critical stimulus for online gaming behavior. By understanding the transition of motivation, researchers can analyze the online game player's behavior from the disciplines of psychology and marketing. Furthermore, our motivation model can furnish a different perspective compared to other theories (e.g. Maslow theory).

In addition, our findings can help online gaming industry understand the motivation journey of players through transition. By understanding the major motivation, companies can focus on channels or features of online games to retain and attract players. Different categories may have various journeys to assist companies in improving the quality of online games. For example, O2O community may be the focus in the category of teamwork–socialization for companies. Online to offline transition of motivation also enables firms to offer official community for interaction and experience exchange. Hence, the stickiness and loyalty of online game players will be enhanced. Understanding the needs (motivations) of target players will sustainably create competitive advantage and profits in the online game industry.

## 6. Limitations

Different online game types were used to separate players, and the participants were not equally distributed into four categories. Hence, more time is required to collect equal sample sizes to furnish more generalizable findings. In addition, the proposed framework of online gaming motivation for socialization was limited to nine elements of ERG theory. In future research, different theories of motivation can be applied to compare more diverse outcomes.

## 7. Conclusion

This study investigated the transition of motivations for online gaming industry and explore O2O socialization. We collected 200 samples and separated into four categories for further analysis in terms of teamwork–socialization, competition–socialization, teamwork–mechanics and competition–mechanics. The findings showed all online game players enter games because of escapism among four categories. Our analysis indicates the outcomes of first-order and second-order Markov switching model are similar. Teamwork–socialization players preferred to make friends in their online gaming network to socialize. Competition–socialization players were mostly students who played games to compete and socialize and may share experience in online or offline activities. Teamwork–mechanics players purely derived pleasure from gaming and were not motivated by other factors in their gaming activities. Competition–mechanics players may already have friends with other gamers in

real life, resulting in a low transition probability from O2O friendships. By understanding the transition of motivation, future research can analyze the online game player's behavior from different disciplines. Online game companies can also offer official community to players for further interaction and experience exchange. This study also integrated socialization on motivations for playing online games with based on the literature. Our findings indicated that socialization is not limited in online game environments (Taylor, 2006). Identifying the patterns of O2O motivations can help online game firms better serve players and understand how they socialize.

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