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## Conference Paper

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# **The 19th ITS Biennial Conference 2012**

## **“Moving Forward with Future Technologies: Opening a Platform for All”**

18 - 21 November 2012, Thailand

### **Leadership Development Through Online Gaming**

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# Leadership Development Through Online Gaming

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## ABSTRACT

The relationship between leadership development and multiplayer online battle arena games (MOBA) are examined using two popular games of this genre: Defense of The Ancients (DOTA) and Heroes of Newerth (HON). Similar existing research notably includes IBM's "Leadership in Games and at Work: Implication for the Enterprise of Massively Multiplayer Online Role-Playing Games" published in 2007, positively concluding the contribution online games have towards leadership development. Close-ended surveys created based on Fred Fiedler's contingency model (1967) and Kurt Lewin's leadership model (1939) were distributed in Thailand both in written and online formats. The targeted respondent demographic is unemployed Thai game players 13 years old or above. Survey content determined the respondent's leadership style (authoritarian, democratic or laissez-faire) and game role (carry, support or ganker). Multinomial logistic regression and factor analyses determined that the 3197 eligible surveys collected shows a relation between MOBA games and leadership development. Based on the findings, it is concluded that those who are characterized as the game role "carry" are more likely to have the authoritarian leadership style and less likely to have laissez-faire leadership style. Those who are characterized as the game roles "support" and "ganker" are more likely to have the democratic leadership style and less likely to have authoritarian and laissez-faire leadership styles. Other demographic data such as age, income and education level are found to be statistically insignificant in influencing leadership development. The conclusions presented impacts the current available literature, which tends to present a comparatively negative view relevant to online games and individual behavior. Potential game development based on research findings may aid in the improvement of individuals' leadership capabilities.

**Keywords:** *leadership style; behavior; link; online game; multiplayer online battle arena; MOBA; action real-time strategy; ARTS*

## INTRODUCTION

Computer games' influence is growing continually as research shows that the age of children playing games continue to be younger and Internet usage among children becomes more prevalent (Gentile, Saleem, & Anderson, 2007). Despite the mainstream research on gameplay that primarily focused on negative influences of computer games on individuals, this research have explored the positive aspects of gameplay where it focused upon the potential benefits which can be gained from computer games, thereby allowing these positive aspects to be improved within newly developing games and maximize games' potential benefits.

Online games have allowed game players around the world to interact with each other in one single platform, enjoying the games together without boundaries. Subsequently, online games began to gain immense momentum as an important aspect of our social culture, as well as becoming more advanced and sophisticated to the point of creating a simulated reality for the game players today. How does the two worlds of computer games and reality bridge together to impact human lives? How does having two parallel worlds effect the development of an individual's

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characteristics? The urge to discover such profound relationships changing our society today is the motivation behind this research.

This research aims to examine the correlation that exists between character roles in games and leadership in everyday life. The research will explain how these roles in the game and leadership styles are linked and how they influence each other. The games that are part of this research are known as Defense of the Ancients (DOTA) and Heroes of Newerth (HON). These games are suitable for leadership testing due to its unique situational control which aptly allows Fred E. Fiedler's contingency leadership theory.

In order to examine the correlation of gamers' leadership styles and their roles in game, close-ended surveys were distributed in Thailand via written and online formats. The collected data were quantitatively analyzed using statistical analysis tools with methods of factor analysis and multinomial logistic regression analysis.

The purpose of this research is to explore whether or not behaviors in games are correlated with leadership behaviors in real life. The findings of this research will further provide a better understanding of how leadership is developed within an individual and how gameplay contributes to this development. This study has constructed a better understanding of the importance of game content—how it influences our characteristics—and potentially derives games' positive merits for social advancement. Most importantly, findings of this research have significance in future game designs. Game developers can use these findings as a way to improve game content to maximize benefits to be derived from gameplay. This research's purpose and conclusion implies that online games will not simply be an unproductive entertainment, but a significant tool for the development of individual characteristics—allowing online games to be an enhancement to people's lives.

## **LITERATURE REVIEW**

### *IBM's Leadership in Games and at Work*

In 2007, a pioneering study on leadership in games by The International Business Machines Corporation (IBM) concluded that game environments make leadership development easier in society. IBM stated that leadership in games help encourage risk taking, promotes leadership roles and provide opportunities for leadership to be presented. The research further explains that virtual economies, transparency of metrics and connection methods for inter-group communication are present in game environments as factors critical to leadership development in individuals (Reeves, et al., 2007).

This research is of utmost importance in the study of games and leadership. It is a piece of landmark literature firmly establishing the positive linkage of games and leadership development. The adoption of various parts of the IBM research and how it has been incorporated into this research will be discussed later.

### *Fred E. Fiedler's Contingency Model*

In 1967, Fred E. Fielder (1922-present) published his famous contingency model of leadership in his book, "A Theory of Leadership Effectiveness". The contingency model argues that the personality of the leader (known as the leadership style) and the degree to which a situation gives the leader control and influence (known as situation control), are the two fundamental factors which define the effectiveness of an organization (Fiedler, 1978). Fielder writes that the effectiveness of a leader varies depending on whether or not his leadership style is appropriate for use under given circumstances. The concept of situational control within Fielder's model was used to select the appropriate games to be used as particular situational controls in this research.

On top of his famous contingency model, Fiedler also developed how to measure two different leadership styles, known as the Least-Preferred Coworker (LPC) Scale (Fiedler, A Theory of Leadership Effectiveness, 1967). The LPC scale

identifies whether the subject have people-oriented leadership style or task-oriented leadership style. In this research, Fiedler's LPC scale was incorporated into the survey distributed and used as answers choices for the respondents.

#### *Kurt Lewin's Three Major Leadership Styles*

Kurt Lewin (1890-1947) most notably performed leadership decision experiments on young children in 1938 (Lewin & Lippitt, An Experimental Approach to the Study of Autocracy and Democracy: A Preliminary Note, 1938). Lewin described two different styles of leadership based on his analysis of these children's group interaction behaviors. The two leadership styles he derived are authoritarian and democratic leadership styles. In 1939, however, another experiment regarding the pattern of aggressive behaviors in children was conducted (Lewin, Lippitt, & White, Patterns of aggressive behavior in experimentally created social climates, 1939). Through this experiment, Lewin identified a new and third type of leadership style, known as the laissez-faire leadership style. Together, Lewin's three types of leadership styles are adopted as part of this research's framework.

### **THE GAMES: DEFENSE OF THE ANCIENTS (DOTA) AND HEROES OF NEWERTH (HON)**

This research focuses on two games under Multiplayer Online Battle Arena (MOBA)<sup>1</sup> genre, Defense of the Ancients (DOTA) and Heroes of Newerth (HON). DOTA is a custom scenario for the game Warcraft III: Reign of Chaos and its expansion, Warcraft III: The Frozen Throne. The scenario was developed via the "Warcraft III World Editor" known as the Reign of Chaos. Warcraft III World Editor is a tool which allows game players to create and customize their own maps with a high degree of detail and flexibility (Boxer, Anderiesz, & Howson, 2002; Cottee, 2003).

The popularity of DOTA has increased over time, spreading to many parts of the world. Today, many important gaming competitions include DOTA, and these competitions are often sponsored by worldwide leading corporations. The growing popularity of DOTA led to the development of further custom maps as well as full stand-alone games (Sharkey, 2010) including Heroes of Newerth (HON). HON is a MOBA game heavily inspired by DOTA (Nguyen, 2009).

#### *Gameplay Overview and Objective*

DOTA and HON share almost identical game structures, content and gameplay style. The playing method and the game strategies employed in both games are exactly identical. These types of MOBA games are often described as "easy to learn, difficult to master" (AznMichael, 2012).

In DOTA, HON and other MOBA games, there are two opposing teams of up to ten players (Marie, 2010)—ideally with a five-versus-five format. Fewer players on each team are also possible, but often, there are an equal number of players on each side. The game scenario is highly team-oriented, and it is difficult for one single player to lead the team to victory (Nair, 2007).

The ultimate collective goal of the team is to destroy the opposing team's "base". This base is the main structure that is heavily guarded at the opposing sides (IceFrog, Basic Survival, 2010), one base is located at the southwest corner and another is located at the northeast corner of the map. Victory in the game is achieved if one team succeeds in pushing into the base of the opposing team and subsequently destroys the base. With this victory, the game also ends. The average game length ranges anywhere from 30 to 60 minutes.

The gameplay revolves around strengthening individual heroes directly controlled by the game player. Computer-controlled towers<sup>2</sup> and creeps<sup>3</sup> earn the hero experience points; when enough experience has been accumulated, the hero increases by one level. Leveling up improves the hero's strength and also increases the damage they can inflict. This allows players to upgrade the abilities that they possess. In addition to accumulating experience points, players also manage a single

resource—gold. Income is generated periodically at a small amount through the team's bases, or by killing hostile units, base structures, and enemy heroes (Lodaya, 2006). Using gold, players can buy items to strengthen their hero or gain more abilities. Additionally, there are certain items which can be combined using recipes to create even more powerful items. Buying items that suit a hero's particular abilities is an important tactical aspect of the game's strategy (IceFrog, Items, 2010), and the choice of items made by the game player highly reflects their game behaviors.

## **DEFINING ROLES**

The teams in DOTA and HON have roles for each player and the roles define the way a hero can be played given their attributes, skills, and items. A team that wishes to be successful requires a balanced and diverse combination of roles at their disposal. This is because all roles are equally important due to the different responsibilities they have within a team.

Different game related sources, such as the games' official websites or other game related websites and blogs, categorize game roles differently. Some sources claim there are two main categories of game roles and also several sub categories (Rodriguez, Dota Roles| Explanations and Examples, 2011; Role, 2012), other sources suggests there are three main categories (AznMichael, 2012), or even more (Drakthul, 2012). However, the common game role categories, which occur among all sources, are carry, support, and ganker. Moreover, most of the professional game teams that are engaged in DOTA and HON competitions worldwide include these three roles only.

With regards to this research, the three aforementioned game roles will henceforth be the research focus. An additional category known as the non-assigned role will also be introduced due to research methods, all of which will be described in later sections.

### *Carry Game Role*

Heroes with the carry game role are those which typically lack in strength during earlier stages of a game. This is also why carry roles usually require protection from other members in the beginning of the game. Carry heroes are highly dependent on items in order to gain more strength. Therefore, it is usually a strategy for teams to allow carry heroes to earn more shares of the gold and experience by allowing them to administer the "last hit" (DaemonLasher, 2009). Carry heroes cannot be killed too often throughout the game, since they will lose gold necessary for purchasing items which are needed to boost their strength (Drakthul, 2012; FortyniN, 2011; Jia, 2012).

Despite their weak abilities in the early stages of the game, carry roles are often expected to be the strongest role in the team by the end. This is because they have better attribute statuses that will be advantageous as it gains momentum later in the game (Hero Classifications, 2010). Moreover, unlike heroes used through other roles, the amount of damage caused using their abilities are not fixed nor limited by waiting time<sup>4</sup>.

As a result, the carry game role is most relied upon by the team during the later stages of the game. Those who utilize a carry role in the team are expected to inflict the highest amount of damage they could obtain during gameplay. The reason why the role is called "carry" hints at its main responsibility to carry the team towards victory (Rodriguez, Dota Roles| Explanations and Examples, 2011). A well-balanced team should therefore comprise of at least one carry hero, but should never be comprised of more than two carry heroes, in fear of becoming ill-balanced team (Leech, 2011; Role, 2012).

### *Support Game Role*

Support roles ensure that all of their actions are made for the collective benefit of the team instead of individual advancement. Support heroes are not dependent upon items as carry roles are. Therefore, they focus less on the act of farming<sup>5</sup> and use their abilities almost exclusively for the team's success (Leech, 2011). Accordingly, most of the support roles' gold will be spent on items that yield collective benefits to the team (tech-ladan, 2010). The support roles are mostly paired with the team's carry roles in the early stages of the game so as to ensure the safety of the carry role. Support roles' advantage lies in the fact that they make damage infliction easier for their teammates by disrupting opponents and providing better opportunities for teammates to farm. Support roles are therefore crucial in ensuring that the carry heroes can achieve their full potential in the latter part of the game.

The responsibilities of a support role are to provide the teammates with necessary support and protection from the opponents. The concept of supporting can be achieved through any actions giving the team advantage over the opponents—such as actions allowing teammates to earn extra gold or experience points. The concept of protection is simply any action keeping teammates alive (Mayer, 2012)—such as employing a hero's healing ability on a teammate (Hero Classifications, 2010). In some instances, support roles also perform self-sacrifice in order to protect teammates (IceFrog, Basic Survival, 2010). Another crucial job of the support role is to gain control over the opponent's territory and create space for the act of farming.

### *Ganker Game Role*

Ganking is the act through which players attempt to eliminate opponents as much as possible. This action is named after the process of a group of players "ganging" up upon opponent players who have relatively low chances of defending themselves, or when a stronger player "gangs" up on weaker opponents (Ganking, 2012). There are a variety of ganking strategies often used in the game, such as backstabbing, trapping, teleportation, and invisibility (Rodriguez, DOTA Ganking Styles, 2010; Role, 2012). In using all of these strategies, however, the ultimate purpose is to unpredictably initiate an offensive attack on the targeted opponent (Rodriguez, 10 Ganking and Supporting Defense of the Ancients Guide, 2011).

Ganker roles are considered to have features in between carry and support roles. Ganker role game players can act as either a carry or support role, although they may not be as effective as the real carry or support roles. Ganker roles are most responsible for giving the team an early advantage during gameplay by inflicting damage upon as many heroes as possible (Ganking, 2012), since this is the greatest obstacle towards victory. Their action helps the team to earn overall experience points and gold. A successful ganker role game player can significantly decrease an enemy's farming and level accretion process, as well as help teammates gain territory and assist in tower destruction. In this sense, ganker roles are those who eliminate obstacles which lay in the path of victory.

### *Non-assigned Players*

The non-assigned game role is a game role created specifically for the purpose of this research. This game role is used in describing game players who are not characterized as neither carry, support nor ganker role game players. In other words, the non-assigned players are those who do not have display any specific game role characteristics described in the earlier game roles (carry, support, and ganker).

Those who are categorized under the non-assigned game role are simply those who play the game without full conscious awareness of the game's main concepts during gameplay. They may also be game players who play the game solely for entertainment with no expectations of the games' process or outcomes—

thereby lacking consideration for the team's collective purpose, as well as consideration for team cooperation and objective.

## **DEFINING LEADERSHIP STYLES**

Leadership is the exercise of authority and the making of decisions (Dubin, 1951). Leadership style is, therefore, the means through which the authority is exercised and the process through which decisions are made. Leadership style is the manner and approach of providing team direction, implementing plans, and motivating people. The leadership styles adopted for this research are developed under Kurt Lewin's leadership model. The three major leadership styles described under Lewin's model are authoritarian, democratic, and laissez-faire leadership style.

### *Authoritarian Leadership Style*

Authoritarian leadership style<sup>6</sup>—sometimes referred to as autocratic leadership style—is a leadership style that is described to have exclusive control over decision-making processes based on their own beliefs, rarely receiving suggestions or input from others. Although often viewed as too harsh and absolute, authoritarian leaders prove to be a positive force when a situation requires speedy resolutions. Moreover, in complicated matters, authoritarian leaders are able to lead the team through hardships and accomplish the task successfully (Goodnight, 2004; Lewin, Lippitt, & White, Patterns of aggressive behavior in experimentally created social climates, 1939).

### *Democratic Leadership Style*

Democratic leaders<sup>7</sup> are sometimes referred to as participative leaders. It is a leadership style highly emphasizing participation within groups during the decision-making process. Research has shown that democratic leaders are one of the most effective in terms of greater productivity, higher quality of contributions from group members as well as general increased morale within the group. (Goodnight, 2004; Lewin, Lippitt, & White, Patterns of aggressive behavior in experimentally created social climates, 1939).

### *Laissez-faire Leadership Style*

The laissez-faire leadership style<sup>8</sup>, also known as a delegative or free reign leadership style, is characterized as those who delegate tasks with minimal supervision. These leaders' behavior rationale is that group members have their own ways of working efficiently and should thus be left individually with their delegated tasks. Members under the direction of laissez-faire leaders feel a sense of autonomy in terms of their working process and decision-making. However, laissez-faire leaders may also provide suggestions or assistance as requested by his group members (Goodnight, 2004; Lewin, Lippitt, & White, Patterns of aggressive behavior in experimentally created social climates, 1939).

## **TOWARDS A THEORY FOR GAMES AND LEADERSHIP**

This research aims at the question of how leadership styles can be developed using games. Firstly, the research will explain the relationship between real life leadership styles and game roles in the MOBA game genre. The basic rationale behind the explanation is that, just as leaders each have a specific style, game roles each have specific abilities as well. Leaders are restricted by the given problem or situation to be resolved, and game roles are also restricted by the game rules and game environment they were placed in. Both leaders and game roles, therefore, share very similar situational control scenarios. Within these scenarios, leadership styles and game roles also share overlapping traits and behaviors. Through these links between the scenario and behaviors, the correlation of leadership and game roles are established.



## THEORY ADOPTION

Although IBM's research project on online games and leadership has previously concluded that online games do generate great leaders in society, this research focuses solely on leadership in the generic sense. Additionally, the majority of individuals selected for research by IBM are already employed in various leadership positions in their professional careers. Therefore, IBM's findings only sought to explain how these leaders employed game experiences as a reference in their professional decision-making processes.

What this current research adopts from the IBM research is its basic research structure of utilizing surveys and interviews as reference for exploring the relationship between gameplay and leadership development. Moreover, the use of gameplay as an independent variable and leadership as a dependent variable remains the same. However, this research will aim at using a different leadership style model from the IBM research, which will later be further discussed. Departing from the IBM research project, this current research will utilize the MOBA game genre as its research model, instead of IBM's use of the massively multiplayer online role-playing game (MMORPG) game genre. The choice of using the MOBA game genre is used because these games maximize the opportunities giving rise to leadership in gameplay.

### *The Relevance of the Games DOTA and HON to this Study*

In reference to Fiedler's contingency model of leadership, the effectiveness of a leader can be maximized if he is placed under situations which suit his particular leadership style. The main concept behind Fiedler's leadership model relies upon the variable of situation control of certain environments in order to generate various leadership styles. This research will adopt Fiedler's contingency model by applying situational control under online gameplay situations.

Accordingly, the games that most fittingly correspond to the contingency model are DOTA and HON which are both MOBA games. Instead of one specific game, both DOTA and HON were used throughout this research because they are highly identical in every aspect, especially in in-game strategies. This allows the number of respondents to be broadened to two games. Although there are some major differences in regards to gameplay and software features, it does not affect the overall gameplay, game content or game strategies which are crucial to this research. The results of this research are also uninfluenced by these distinctions. Instead, the content of both games provide the situation control as described by Fiedler which brings out leadership behaviors within game players.

The contingency model's situational control theory is highly applicable to DOTA and HON's environments. One should consider the heroes to be equivalent to a leader's characteristics and the game roles to be equivalent to a leader's tasks. The only way to maximize the effectiveness of a game role is to choose a hero that is suited to the role, and construct the hero in a way that fits the role. Most importantly, the hero must be utilized with manners that favor the game roles in order to reach its maximum effectiveness. Similarly, a leader must behave in a style that fits the behaviors of the team members and also the tasks at hand for maximum effectiveness to be reached.

The games DOTA and HON highly emphasize the concept of cooperative team play. Players are forced to choose their heroes thoughtfully at the beginning of a game. They should consider not only the opponent's choices, but also the their teammates choices as well. Each individual player's choice will determine the overall strategies which can be applied throughout the gameplay. In this specific situation, if the leader of the team retains strong control over the team, he can strategically assign hero choices to each team member. The question as to *how* these heroes would be delegated is determined by the leadership styles of the team leader. Moreover, the virtual economies, transparency of metrics and connection methods

for inter-group communication are also present in DOTA and HON environments, in which IBM described as the critical factors to leadership development.

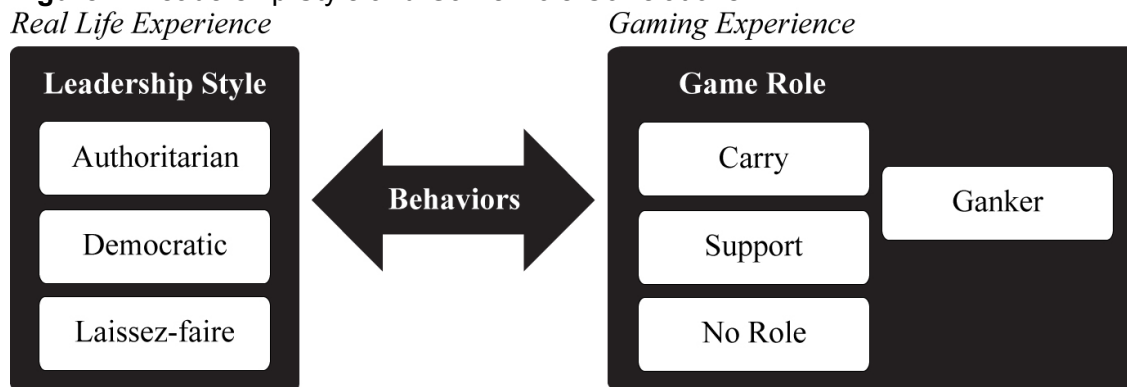
*The Relevance of Lewin’s Leadership Styles to this Study*

Upon examining various types of leadership models in academic literatures, it is deemed that the aforementioned three leadership styles as defined by Kurt Lewin are the most suitable for study in the selected MOBA games. Out of all current academic models, the authoritarian, democratic and laissez-faire leadership styles consists of fundamental behaviors which share behaviors with game roles DOTA and HON. Leadership behaviors described in Lewin’s leadership model can most accurately correlate with principle game roles made available to game players, therefore it can be integrated into the game roles.

Furthermore, many other leadership theories were primarily focused on adult samples and those who are already in a professional working environment. Conversely, this research is based on samples which are much younger—ranging from adolescent to young adults. Lewin happens to be notable for his accomplishment in identifying leadership styles in young adults, legitimizing his model’s application to this research. Lewin’s leadership characteristic descriptions—departing from the many work-related descriptions of other leadership models—most identifies with unemployed young adults, who are the targeted respondents for this survey.

**THE CORRELATION BETWEEN GAME ROLES AND LEADERSHIP STYLES**

**Figure 1: Leadership Style and Game Role Correlations**



Source: Made by the author

The model above (Figure 1) is conceptually derived from Fiedler’s contingency model—that the environment plays a decisive role in determining a leadership style’s effectiveness. Lewin’s three leadership styles are applied within MOBA games using the basis of Fiedler’s contingency model to explore the link between gameplay and leadership styles.

Real life leadership styles and game roles correspond to each other through the similarities of general behaviors which are exhibited both in leadership style characteristics and game roles. In this research, the correlation between authoritarian leadership styles and carry game role, the correlation between authoritarian and democratic leadership styles with ganker game role, as well as the correlation between laissez-faire leadership styles and the non-assigned game role are examined.

### *Carry Game Role Correlates with Authoritarian Leadership Style*

Authoritarian leadership styles and the carry game role share similar behaviors which are reflected through their behaviors towards decision-making, trust given to team members, task-related orientation and the level of responsibility they feel.

In decision-making, both authoritarian leaders and carry role game players dictate the overall group decisions. They require that other members provide them support through strict obedience to the commands given out by them. Authoritarian leaders are those who keep all group-decision making to themselves, and they rarely discuss with other group members nor allow others into the decision-making process. Similar to carry role game players, the situations in games require that they be very decisive in the overall game strategy. For example, after choosing heroes which are suited for the carry game role, the game player using the carry role would require other players to choose heroes which would benefit them the most. The overall game strategy is highly influenced by the carry role game player due to its abilities, items and strength.

In terms of entrusting other team members, both authoritarian leaders and carry role game players do not give complete trust to others. Authoritarian leaders assume that all group members are inherently unproductive, therefore, the group members are constantly subjected to strict supervision. Similarly, carry game roles require that the game player must succeed in strengthening their heroes for the team's success. This pressure forces the carry role game players to be extra careful of any situations which may lead them to death. Although these game players may have other team members supporting and protecting them, those who play the carry role are cautious of depending on the protection provided by other members since any slight mistake would cause their death—and thereby jeopardize the team's success. They are, therefore, more prone to being self-reliant.

In relation to group productivity, authoritarian leaders and carry role game players are highly task-oriented as they heavily emphasize on the group's collective productivity over group members' fair treatment or well-being. Authoritarian leaders base their final decisions on the maximum productivity of their group. They interfere with the individual working process of members in an effort to make sure all processes are executed according to their plan. Authoritarian leaders would enforce their suggestions upon group members—whether or not members agree or are satisfied with such suggestions. Likewise, in DOTA and HON, a victory of a team highly depends on the strength of the team's carry role game players. This situation makes the carry role game players appear to be selfish during gameplay, since they take as much of the resources available to them for the purpose of building their strength. For instance, they will engage in stealing of the last-hitting of opponent heroes, or destroy an opponent's tower in order to obtain extra gold for themselves. Although these actions may cause other team members to harbor a feeling of unfairness, they are done for the team's collective victory.

In terms of retaining responsibility, both authoritarian leaders and carry role game players believe that they are the most significant member of the group, and thereby retain a high level of responsibility. Authoritarian leaders are self-conceited, believing that their own performance is more reliable than others as a result of a lack of trust upon other members. Thus, the demand to make all decisions and monitor all tasks automatically shifts great responsibilities upon themselves. This high responsibility correspondingly leads them to prioritize themselves above all other members. Analogously, carry role game players believe that the heroes they play are of utmost importance to the team—therefore, it must be the strongest amongst all team members. The situation in gameplay also induces them to highly prioritize themselves, since they are the key in determining in a team's victory. Other members of the team must protect their carry role game players to the point where self-sacrifice may be taken to keep carry roles alive. Under such circumstances, the high

responsibility as well as priority taken on by carry role game players corresponds to that of authoritarian leaders.

Such key behaviors mentioned above, with analogous aspects in both authoritarian leadership style characteristics and the carry role's characteristics, create an association between the authoritarian leadership style and the carry game role.

#### *Support Game Role Correlates with Democratic Leadership Style*

Democratic leadership styles and the support game role share similar behaviors which are reflected through their behaviors towards decision-making, trust given to team members, people-related orientation and the sense of responsibility they feel. Interestingly, these aspects are also in sharp contrast with the authoritarian leadership style and the carry game role.

Democratic leaders and the support role game players both emphasize discussion, the sharing of ideas and teamwork. The decisions they make solely depend upon a unanimous agreement amongst group members. Democratic leaders, therefore, ask for opinions before making decisions or insist that decisions are made collective. Likewise, the sharing of ideas or group discussion within games can be accomplished by observing the actions and behaviors of others. For support role game players, the game situations cause them to put their teammates' heroes and their abilities into consideration before they decide their own heroes. The heroes that they pick must be able to effectively support other members.

Having confidence in their actions, democratic leaders and support role game players endow trust to their group members. Once decisions are made and tasks are delegated amongst the members, the democratic leader believes that each member is capable of keeping their responsibilities in check without strict supervision. These leaders are more confident that group members will not fail to deliver accomplishments. Similar, the key to any support role game player is in highly entrusting their team members for the tasks each of them are responsible for. Subsequently, the support role game player's responsibility is to provide the members with necessary support and protection, which allows the team members to accomplish their tasks with fewer difficulties.

In this sense, both democratic leaders and the support role game players are very supportive and people-oriented. They put importance not only to promote the capability of their group members, but also to the fair and nice treatment of the members themselves. Democratic leaders give important to the group results as well, however, they believe that this result can only be achieved after the members feel fairly treated. Democratic leaders would thus provide their group members with support, and they would also put effort in assisting members' tasks. Also, they would show appreciation to the works of group members through praise or admiration of members' skills. On the other hand, if the members were to fail in their delegated tasks, democratic leaders would provide suggestions for motivation instead of punishment.

Support role game players, along the similar lines as democratic leaders, are able to sacrifice their own gold to purchase items to support the overall team performance, instead of spending for their own benefits. The situation in the game causes them to try and not earn extra gold themselves, but let the team earn gold by giving them the chance to engage in last-kill over opponent towers while they assist on the side. Such actions of assisting group members, giving importance to collaborative action and other members' fair treatment make support game roles akin to democratic leaders.

As both democratic leaders and support role game players value teamwork, they often prioritize other members in the group—or have the entire group agree on who should be prioritized with the team. The willingness to sacrifice their own desire as a leader for the entire group emphasizes selflessness of democratic leaders. Throughout the working process, democratic leaders would also give support for

members while each member pursued their working processes individually. The democratic leaders' own needs in the team usually come later, after the needs of other group members are resolved. Similarly, the support role game players push their teammates up front for any opportunities. They may die in a game so that their team members can have extra attacks and gain experience points. It is also under this premise that support-suited heroes in the game are created to be strong initially—so game players do not have to worry about their strength while supporting their teammates. In later stages of the game, however, they will most likely become weaker due to the assistance they give others, while other teammates become stronger and lead the team towards victory.

#### *Ganker Game Role Correlates with Authoritarian and/or Democratic Leadership Style*

Since the ganker game role characteristics are the combination of carry and support game role characteristics, the ganker game role correlates either with authoritarian or democratic leadership styles—or both. The behaviors of ganker role game players share resemblance to the main features of behaviors which describe authoritarian and/or democratic leadership styles. Therefore, the correlations between game roles and leadership styles are similar to the description in the previous sections (Carry Game Role Correlates with Authoritarian Leadership Style and Support Game Role Correlates with Democratic Leadership Style).

Differences and similarities of the ganker game role in comparison to the carry or support game roles lie in the responsibility they hold in the team. Carry role game players are responsible for increasing their power so as to overcome the opponents in the later stages of the game and the support role game players are to provide overall team assistance. Ganker role game players' responsibility, on the other hand, is to eliminate obstacles throughout the game—especially those created by opponents. Both roles have similarities in that heroes well suited for ganker game roles are also well suited for carry game roles, this is because these heroes have high destructive powers from their given abilities.

Since the ganker game role share overlapping similarities with the carry game role and the carry game role is associated with the authoritarian leadership style, it follows that the ganker role game players' behavior consists of the authoritarian leadership style's behaviors as well. These behaviors are in terms of being task-oriented (instead of people-oriented) as well as the amount of responsibility they hold. Both ganker role game players and authoritarian leaders face situations which makes them give less significance to a member's fair treatment and instead focus on the end result of the task to be completed. At the same time, ganker role game players also include democratic leadership style behaviors in the aspects of decision-making and high trust endowed to team members.

However, the ganker role game players may lean towards democratic leadership style in term of decision making and trust—this is because, as aforementioned, ganker game roles overlap with support game roles as well. To exercise successful ganking in a game, the player cannot be alone. It is usually required that all members of the team with a ganking role work collaboratively. Strategies have to be devised beforehand in agreement with all members of the team. Thus, they do not have the power to dictate exclusive commands in gameplay. The game's framework and the inherent nature of ganker roles have forced ganker role game players to prioritize teamwork.

Since ganker game roles share overlapping similarities with the support game role and the support game role is associated with democratic leadership style, it follows that the ganker role game players' behavior consists of democratic leadership style's behaviors as well. Ganker game roles share with the democratic leadership style their amount of trust given to teammates. Although ganker game roles are powerful, they also depend highly on team members. Since any successful ganking strategy depends on collaboration, it is required that trust is endowed to members to accomplish the tasks of their role in the game.

### *Non-assigned Game Role Correlates with Laissez-faire Leadership Style*

Laissez-faire leadership style and non-assigned role in the games share similar behaviors since freedom of each individual and their autonomous decision-making process are prioritized. They remain neutral in terms of task or people-oriented matters, they are susceptible to trusting others only to a certain extent, and they have a low sense of responsibility. As the non-assigned players would not expect other team members to obey to their decisions or actions during gameplay, they likewise do not comply with other members' decisions as well.

The laissez-faire leaders and non-assigned game players lack the motivation to participate in the group decision-making processes. Also, they do not pass on commands nor do they criticize or praise other members' achievements. Laissez-faire leaders are unlikely to interrupt any group collaboration—instead, they stay away from it. They believe that other group members know what is best for their tasks, thus there is no need to neither supervise nor comment on any actions.

Laissez-faire leaders and non-assigned players are both neutral in terms of task or people oriented behaviors. They do not emphasize the importance of accomplishing tasks nor do they put emphasis on the fair and good treatment of their group members. Although laissez-faire leaders will focus on completing the tasks at hand, they do not plan the tasks they do, nor do they consider the outcome or effects of their accomplishments. Non-assigned role game players resonate with laissez-faire leaders in the same way—they engage in gameplay without selecting game roles in consideration of the entire team, nor do they engage in gameplay with any intended outcome (such as victory) in mind.

In terms of the susceptibility in trusting others, laissez-faire leaders and non-assigned players trust their group members only to a certain extent. This trust they give to members is based on their rationale that members are committed to the group and would accomplish the tasks they are given. Due to such a mentality, laissez-faire leaders allow group members to make autonomous decisions during the working process. Laissez-faire leaders believe there is not much more which can be done in assisting the team other than giving the resources they need. Corresponding to behaviors of this leadership style, the non-assigned players have a certain extent of trust in their teammates as well. These game players allow their team members to behave freely in the game since they are trusted with enough skill to lead the team to victory. Non-assigned players are confident that the team performance will function efficiently without their complete commitment to the team. Hence, they often allow themselves to play the game without any specific role, thereby lacking in contribution or responsibility to the team.

It is evident that the laissez-faire leaders and non-assigned game players both avoid taking heavy responsibilities in their groups. They have a low sense of responsibility when compared to other leadership styles and other game roles respectively. Their low sense of responsibility stems from their belief that they are not a fundamental part of the group. For instance, laissez-faire leaders avoid being an indispensable part of the team—they make few to no contributive comments and minimize participation in collaborative decision-making processes. This concept is analogous to the non-assigned game players who do not maintain any specific role within a team. This implies that they do not have seen any specific task as their responsibility. Non-assigned players also do not follow the team's overall plan, nor do they behave in a certain way for the purpose of benefiting the team. Thus, these non-assigned players are not considered a significant team member when compared to others—and corresponding to laissez-faire leaders, non-assigned players do not place high value of their presence in the team.

## **ASSUMPTIONS**

The hypothesis and model framework in this research are created under two assumptions. First, it is assumed that game players are making rational decisions when choosing game characters and when playing the games. Second, it is assumed that game players always attempt to maximize their game roles' ability to the fullest extent when playing the games.

The research survey's targeted demographic were unemployed individuals, because they have not yet been in full contact with work-related group collaborations. Therefore, it is assumed that work experience has not yet shaped the leadership style of these unemployed individuals. Those survey respondents who are more experienced in gameplay (based on total gameplay hours) are assumed to be more precise in identifying their gameplay behaviors—this assumption was subsequently used to eliminate game players who are less experienced and thus have less accurate survey answers.

Additionally, it is assumed in the survey that male and female game players are identical in their gameplay and behaviors, and therefore do not require separate methods in identifying their leadership style or game role.

## **RESEARCH HYPOTHESIS**

The hypothesis of this research is derived from the idea that both leadership styles and game roles share similar behavior and decision-making rationale. To be specific, game players who are characterized as the carry role within the game would display authoritarian leadership style in real life. Game players who are characterized as the support role within the game would display democratic leadership style in real life. Those who are characterized as the ganker role within the game would have either authoritarian or democratic leadership style in real life. Lastly, game players who are characterized as playing the games without any specific game roles—known as non-assigned players—would display laissez-faire leadership styles in real life.

In reference to the discussion above, the main hypotheses could be summed up as the following:

- Hypothesis 1: If a game player displays carry game role behaviors more frequently, he is more likely an authoritarian leader.
- Hypothesis 2: If a game player displays support game role behaviors more frequently, he is more likely a democratic leader.
- Hypothesis 3: If a game player displays ganker game role behaviors more frequently, he is less likely a laissez-faire leader.

## **METHODOLOGY**

### *Survey*

A close-ended survey was utilized as a method to examine the daily life behaviors and the gameplay behaviors of the game players. The structure of the survey designed for this research is divided into three sections—the demographic information section, game roles section and the leadership style section. The game roles and leadership style section of this survey are created through the combination of two models. The first model is taken from Fiedler's well-known book published in 1967, "A Theory of Leadership Effectiveness". Fiedler's model, known as the least preferred co-worker (LPC) scale<sup>9</sup>, was used to measure an individual's leadership orientation.

However, Fiedler's LPC scale only measures the leadership styles of task or people-oriented relations. Thus, in order to suit the research and survey model more fittingly, Fiedler's LPC scale will be combined with Lewin's model as described in his research published in 1939, "Patterns of Aggressive Behavior in Experimentally

Created Social Climates”. In Lewin’s research, he separated test subjects into groups and assigned leaders with different leadership styles to these groups. Lewin observed the reaction and behaviors of the young adults in the group, thereby deriving three leadership styles known as authoritarian, democratic and laissez-faire leadership styles.

The incorporation of Fiedler and Lewin’s models into this research results in three sets of bipolar scales of one to six to be used in the game roles section and leadership style section, instead of Fielder’s one to eight scale. It must also be noted that questions created in the game roles section were based on the descriptions of DOTA and HON game roles taken from the games’ manuals, instructions, game replay videos, game players’ blogs, game forums and other communities widely discussing these two games on the web. The questions in the section examining leadership styles were based on descriptions of leadership behaviors as described in Lewin’s research findings.

The function of this survey is not to identify the most frequently utilized game roles as chosen by the game players, but to detect the players’ key behaviors displayed during gameplay. These key behaviors are analyzed and used to indicate the most appropriate game role that each individual game player should be adopting. This technique is derived from the contingency model’s situational control theory that the most effective game role is the one that best suits the player’s behaviors. The result achieved from utilizing this technique can provide the game player with suggestions of the game roles that will maximize their effectiveness in the games. The technique is applied because amateur game players most likely do not recognize the game role they should be operating based on their behavior. The same concept also lies behind how leadership styles are identified.

#### *Survey Target Sample*

The survey targets unemployed Thai individuals who range from 12 to 30 years of age. Unemployed individuals are the target sample because this research aims to explore those populations whose leadership styles have yet to be shaped by group collaborations in work. In addition, the qualified respondents must have accumulated at least 400 games played in total so as to eliminate inexperienced game players who might miscomprehend the survey questions’ meanings. Thailand is used as the location to choose the targeted sample because there is a mass population of Thai individuals playing the two games studied.

#### *Quantitative Analysis of the Collected Data*

As previously mentioned, six sets of questions using bipolar scales of one to six were introduced for the respondents to score their answers. The six sets of questions were divided into two main categories—game roles and leadership styles. The three sets of questions in the game roles section measure three different game roles. The collected data were first analyzed using factor analysis to confirm the correct categorization of the questions into each game role. Then the scores in each set are summed up and compared with other question sets of the section. The question set with the highest score in the section shows the game role which the respondent should be categorized in. The total scores in each set of questions are also applied as independent variables for multinomial logistic regression analysis.

The three sets of questions in the leadership style section of the survey measures the three different types of leadership styles a respondent should be categorized in. Similar to the game roles, factor analysis was first utilized to confirm that the questions are correctly categorized measuring each leadership styles. Then the score in each set of questions are summed up and compared with other sets of questions in the leadership style section. The set of questions with the highest score is used to categorize an individual’s leadership style. The total scores of each set of questions will be used as the dependent variables for multinomial logistic regression analysis.



## DATA ANALYSIS

### Quantitative Data Summary

The data was collected via online and paper based forms in Thailand from April to May of 2012. The survey reached the targeted demographic of unemployed Thai citizens who play the games DOTA and/or HON, aged between 12 to 30 years old. Survey answers which might have been tampered by ill-willed respondents, such as data which are believed to have been falsified or those with inconsistent demographic information are eliminated in the data set. Samples that have not completed approximately 400 games in total are also excluded. After eliminating the disqualified data samples, the total amount of eligible data used in this analysis is 3197 survey samples (refer to Table 1).

**Table 1: Survey Respondent Demographics**

Survey Respondent Demographics									
		Gender	Age	Education	Income	Years playing the games	Games play per week	Total games played	Playing location
N	Valid	3197	3197	3197	3197	3197	3197	3197	3197
	Missing	0	0	0	0	0	0	0	0
Mean			17.78			3.41		3425.84	
Std. Error of Mean			.054			.037		53.987	
Mode		Male	15	High school	Up to 5,000 Baht	1	More than 30 games	1721	Private places
Std. Deviation		.131	3.077	1.371	.915	2.099	1.998	3052.507	.884
Variance		.017	9.466	1.879	.838	4.406	3.992	9317796.606	.782
Range		1	18	8	6	9	6	16790	2
Minimum		0	12	1	1	1	1	417	1
Maximum		1	30	9	7	10	7	17207	3
Sum		56	56831	14921	4667	10910	13718	10952395	5650

Source: Made by the author

Note. The mean and standard error of mean values are blank in items with nominal or categorical answers as the middle value of these data sets do not exist.

### Factor Analysis

The SPSS statistical analysis program was used to perform factory analysis on the data set. Exploratory factor analysis was used to test whether the grouping of questions as written in the survey are categorized correctly and accurately for the question's purposes, thereby reducing bias in the collected data. Principal component analysis (PCA) was applied within the factor analysis to identify the patterns in the data. After accomplishing PCA, varimax rotation was utilized to simplify the interpretation of factor analysis results. Varimax rotation is part of factor analysis, but varimax rotation shows an additional grouping of the factors from factor analysis. In this research, varimax rotation confirmed the results of the factor analysis as well.

### Marginal Effect After Multinomial Logistic Regression

Multinomial logistic regression (Mlogit) model was applied to the overall analysis of the data set. However, the Mlogit model can only provide estimated coefficients, thus marginal effects model was also performed after completing the Mlogit analysis. This was used to provide an informative conclusion from the results derived out of the Mlogit analysis. Table 2 shows the result of the Mlogit analysis. In this analysis, leadership style is used as a dependent variable and game role behaviors and demographic information are used as independent variables. Variables such as gender, age, academic degree, income, total amount of years played, amount of games played per week, total amount of games played throughout entire life, and location where games are played are all part of the demographic information. The outcome of the marginal effects have revealed the probability that leadership style is influenced by the change in frequency of exercising a given game role behavior.

**Table 2: The Result of Multinomial Logistic Regression**

Multinomial logistic regression      Number of obs = 3197  
 LR chi2(24) = 222.56  
 Prob > chi2 = 0.0000  
 Log likelihood = -2596.3232      Pseudo R2 = 0.0411

Leadership S.	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
<b>Authoritarian</b>						
Carry	.0267004	.0106507	2.51	0.012**	.0058254	.0475753
Support	-.0494833	.0111179	-4.45	0.000***	-.071274	-.0276927
Ganker	.0499802	.0121784	4.10	0.000***	.0261109	.0738494
Female	-1.099511	.4401741	-2.50	0.012**	-1.962237	-.2367861
Age	.0208899	.0190488	1.10	0.273	-.0164451	.0582249
Education	.0117495	.0394804	0.30	0.766	-.0656308	.0891298
Income	.1290329	.0472568	2.73	0.006***	.0364112	.2216546
YearsPlayed	-.0287326	.0503405	-0.57	0.568	-.1273982	.0699331
HoursPlay	-.011955	.0426672	-0.28	0.779	-.0955812	.0716712
TimesPlayed	.0086757	.0100031	0.87	0.386	-.0109301	.0282815
Private	-.2321086	.1307088	-1.78	0.076*	-.4882931	.024076
Public	.0096972	.0985207	0.10	0.922	-.1833999	.2027943
_cons	-1.849006	.537431	-3.44	0.001***	-2.902352	-.7956607
<b>Democratic (base outcome)</b>						
<b>Laissez-faire</b>						
Carry	-.0401847	.0146762	-2.74	0.006	-.0689496	-.0114199
Support	-.1356573	.0154078	-8.80	0.000	-.165856	-.1054587
Ganker	-.0690317	.0166449	-4.15	0.000	-.1016551	-.0364083
Female	-.6909772	.6084701	-1.14	0.256	-1.883557	.5016023
Age	-.0526915	.0282444	-1.87	0.062	-.1080496	.0026665
Education	.0420346	.0574626	0.73	0.464	-.07059	.1546592
Income	-.0030996	.0815439	-0.04	0.970	-.1629226	.1567235
YearsPlayed	-.011094	.0696174	-0.16	0.873	-.1475416	.1253536
HoursPlay	-.0001167	.0585716	-0.00	0.998	-.1149148	.1146815
TimesPlayed	.0082995	.0142138	0.58	0.559	-.0195591	.036158
Private	-.5927707	.1786748	-3.32	0.001	-.9429669	-.2425745
Public	-.0725185	.1447481	-0.50	0.616	-.3562195	.2111825
_cons	4.004579	.7058148	5.67	0.000	2.621207	5.387951

Source: Made by the Author

Note. \* p < 0.1. \*\* p < 0.05. \*\*\* p < 0.01.

**Table 3: Marginal Effects After Mlogit—Authoritarian Leadership Style**

Marginal effects after mlogit  
 $y = \text{Pr}(\text{LeadershipStyle} = \text{Authoritarian}) (\text{predict}, \text{outcome}(1))$   
 = .23367287

variable	dy/dx	Std. Err.	z	P> z	[ 95% C.I. ]		X
Carry	.0056037	.00187	3.00	0.003***	.001946	.009262	15.7954
Support	-.0060845	.00194	-3.13	0.002***	-.009896	-.002273	20.797
Ganker	.0103628	.00213	4.87	0.000***	.006194	.014532	20.163
Female	-.1380285	.03962	-3.48	0.000***	-.215686	-.060371	.017516
Age	.0048192	.00334	1.44	0.150	-.001735	.011373	17.7764
Education	.0012437	.00694	0.18	0.858	-.012357	.014844	4.66719
Income	.0231693	.00827	2.80	0.005***	.006968	.03937	1.45981
YearsPlayed	-.0049181	.00885	-0.56	0.578	-.022264	.012428	3.41257
HoursPlay	-.0021384	.0075	-0.29	0.776	-.01684	.012563	4.2909
TimesPlayed	.0013837	.00176	0.79	0.431	-.002059	.004827	14.5052
Private	-.0276737	.02402	-1.15	0.249	-.074747	.0194	.835784
Public	.0032186	.01737	0.19	0.853	-.030834	.037271	.465749

(“) dy/dx is for discrete change of dummy variable from 0 to 1

Source: Made by the author

Note. \*\* p < 0.05. \*\*\* p < 0.01.

**Table 4: Marginal Effects After Mlogit—Democratic Leadership Style**

Marginal effects after mlogit

$$y = \text{Pr}(\text{LeadershipStyle}==\text{Democratic}) (\text{predict}, \text{outcome}(2))$$

$$= .67873902$$

variable	dy/dx	Std. Err.	z	P> z	[ 95% C.I. ]	X
Carry	-.0018458	.00204	-0.90	0.366	-.005849 .002158	15.7954
Support	.015913	.00214	7.45	0.000***	.011725 .020101	20.797
Ganker	-.0038231	.00231	-1.65	0.098*	-.008351 .000705	20.163
Female"	.1708318	.04894	3.49	0.000***	.074908 .266756	.017516
Age	-.0001807	.00373	-0.05	0.961	-.007488 .007127	17.7764
Education	-.0043624	.00769	-0.57	0.570	-.019433 .010708	4.66719
Income	-.0202807	.00974	-2.08	0.037**	-.039377 -.001185	1.45981
YearsPlayed	.0052166	.00968	0.54	0.590	-.013748 .024181	3.41257
HoursPlay	.001903	.00819	0.23	0.816	-.014146 .017952	4.2909
TimesPlayed	-.0018694	.00194	-0.96	0.335	-.005671 .001933	14.5052
Private"	.0767973	.02695	2.85	0.004***	.023979 .129615	.835784
Public"	.0027634	.01912	0.14	0.885	-.034716 .040243	.465749

(") dy/dx is for discrete change of dummy variable from 0 to 1

Source: Made by the author

Note. \* p &lt; 0.1. \*\* p &lt; 0.05. \*\*\* p &lt; 0.01.

**Table 5: Marginal Effects After Mlogit—Laissez-faire Leadership Style**

Marginal effects after mlogit

$$y = \text{Pr}(\text{LeadershipStyle}==\text{Laissez-faire}) (\text{predict}, \text{outcome}(3))$$

$$= .08758812$$

variable	dy/dx	Std. Err.	z	P> z	[ 95% C.I. ]	X
Carry	-.0037579	.00115	-3.28	0.001***	-.006006 -.00151	15.7954
Support	-.0098285	.00115	-8.53	0.000***	-.012086 -.007571	20.797
Ganker	-.0065397	.00129	-5.09	0.000***	-.009058 -.004021	20.163
Female"	-.0328033	.03195	-1.03	0.305	-.095424 .029818	.017516
Age	-.0046385	.00221	-2.10	0.036**	-.008963 -.000314	17.7764
Education	.0031188	.0045	0.69	0.489	-.00571 .011948	4.66719
Income	-.0028886	.00638	-0.45	0.651	-.01539 .009613	1.45981
YearsPlayed	-.0002985	.00546	-0.05	0.956	-.010998 .010401	3.41257
HoursPlay	.0002354	.00459	0.05	0.959	-.008766 .009236	4.2909
TimesPlayed	.0004857	.00111	0.44	0.663	-.001696 .002667	14.5052
Private"	-.0491236	.01851	-2.65	0.008***	-.085396 -.012851	.835784
Public"	-.005982	.01134	-0.53	0.598	-.028205 .016241	.465749

(") dy/dx is for discrete change of dummy variable from 0 to 1

Source: Made by the author

Note. \*\* p &lt; 0.05. \*\*\* p &lt; 0.01.

**IMPLICATIONS AND FINDINGS***Factor Analysis of Leadership Behaviors and Gameplay Behaviors*

By applying factor analysis to the section of questions categorizing leadership behaviors between authoritarian, democratic and laissez-faire styles, it is revealed that the question groupings were correct. This means that the survey respondents were correctly categorized into the leadership style that they belong to, based on the behavioral questions they answered in the leadership style section of the survey.

Similarly, the result of factor analysis has also shown that the section of questions categorizing game roles between carry, support and ganker roles are accurate. This means that survey respondents who answered questions in the game roles section of the survey were correctly grouped into one of the three game roles.

*Carry Game Role*

According to the result of the survey's marginal effect after Mlogit analyses (refer to Table 3 to 5), carry role game players display tendencies to have authoritarian leadership style. As previously explained, this is because both the carry game role and authoritarian style share behaviors such as dictating the decision-

making process or displaying excessive control, self-centered tendencies, or distrust in other members.

On the contrary, the carry role game players are less likely to have laissez-faire leadership style due to contrasting reasons. Carry role game players do not display laissez-faire leadership style as much since their behaviors do not correspond with each other. Carry role game players put high emphasis on themselves and overall control of the team while laissez-faire leaders have no concern over controlling the team, nor do they consider themselves to be a significant part of the team. Therefore, the analysis also found that they show minimal correlation with each other.

#### *Support Game Role*

According to the result of the survey's quantitative analyses (refer to Table 3 to 5), support role game players are more likely to possess democratic leadership styles and less likely to have authoritarian or laissez-faire leadership styles. This is because behaviors are shared among support role game players and democratic leaders, such as the great amount of trust given to others, the heavy emphasis on group decision-making and group collaboration, as well as selfless enthusiasm in providing members with assistance.

#### *Ganker Game Role*

The result of marginal effect after Mlogit analysis have shown an interesting finding that ganker game roles are more likely to have authoritarian leadership styles when compared with other leadership styles (refer to Table 3 to 5). This can be explained by the fact that the ganker game role partly shares some features of the carry game role, such as their responsibility during the game and being task-oriented. Since the carry game role corresponds to the authoritarian leadership style, it therefore follows that the ganker game role would be associated with the authoritarian style as well.

Some sources have claimed that the carry game role is the most entertaining role to use during gameplay (AzNMichael, 2012), yet the ganker game role is arguably more enjoyable to use, especially in the case of Thailand. It is widely known among Thai DOTA and HON players that during most gameplay where players are not familiar with each other, the game strategies are not efficiently executed. Major issues arise in gameplay as a result of playing on the same team with strangers, such as the imbalance in game roles used and a lack of teamwork. As a result, such teams are usually weaker in the face of teams with players familiar with each other. Subsequently, this imbalance in team strength causes the games to end quickly. The consequence of such issues cause the carry game role to appear less appealing. This is because the carry game roles only become strong towards the later stages of the game. On the other hand, the flexibility of ganker game roles allows players to use it in place of both carry and support game roles. Hence, it is common to observe many carry role game players to abandon the carry game role and utilize the ganker game role instead. The objectives of the ganker game role have therefore been distorted in response to this phenomenon—it has come to replace the carry role's purpose in face of shorter game time. This phenomenon also corresponds with other findings that actually categorize the ganker game role as a sub-category of the carry game role (Rodriguez, Dota Roles| Explanations and Examples, 2011). Therefore, the quantitative results for the ganker game role's correlation with the authoritarian leadership style do find rationale behind this emerging change in the utilization of ganker roles in Thai game players, as well as confirmation from other research.

The aforementioned phenomena where ganker game role are used in place of carry game roles provides an explanation of the ganker game role's negative correlation with democratic leadership style. The ganker game role—which was intended to be used as a mixture of the support game role and carry game role—was utilized in actual game play as more of a carry game role instead. The ganker game

role was no longer used to share responsibilities with the support game role. The ganker role game players therefore display behaviors much more similar to carry role players as opposed to support role players. Since carry game roles correlate with the authoritarian style, it means that the ganker game roles correlate with the authoritarian style as well. Also, since ganker role players do not display characteristics similar to support role players because of the way it used, this means that ganker role players do not correlate with the democratic leadership style.

On a side note, ganker role game players show less likelihood to possess laissez-faire leadership style, because ganker role players emphasize contribution to the team and show dependence towards group members, both traits are contradictory to laissez-faire leader characteristics. This contradiction explains the rationale behind the quantitative analysis which showed no correlation between ganker role game players and the laissez-faire leadership style.

#### *Non-assigned Role*

According to the quantitative analysis conducted on the survey (refer to Table 3 to 5), game players who play the games without any specific role have the tendency to show laissez-faire leadership style. Laissez-faire leaders exercise their “hands-off” habits and minimize their group participation. As aforementioned, each game role within the games has particular features and responsibilities which requires them to engage in group participation and behave in specific ways. However, non-assigned players are in contrast with such a concept—they do not possess any objectives or responsibilities in the games. Game players who were not categorized with any specific roles mainly play the game purely for personal enjoyment above all else. This type of gameplay habit falls into the style of laissez-faire leaders, therefore resulting in its correlation with this particular leadership style.

#### *Gender*

The gender of game players proved to be an important factor which determined ones leadership style. The result of the quantitative analysis revealed that male game players are more likely to have authoritarian leadership styles and less likely to have democratic leadership styles. Oppositely, female game players are more likely to have democratic leadership styles than authoritarian leadership styles.

#### *Age*

The age of game players have significance only in relevance with laissez-faire leaders. According to the result of the quantitative analysis, game players have a lower tendency to be a laissez-faire leader as they become older.

#### *Income*

this concept associates with findings which reveal that players who have higher income (or allowance) have a higher tendency to be authoritarian leaders. Interestingly, the game players who have lower income have relatively higher tendencies to be democratic leaders.

#### *Times Spent on Games*

According to professional game players, the amount of time spent practicing gameplay is highly influences the overall team performance. While this may be true in the case of professional game players, it is quite different for game players in general. Professional game players play games as a career with monetary payment, while amateur game players play games seeking entertainment. Professional game players pay extra attention to their gameplay, analyzing and critiquing gameplay strategies to be employed. All in all, professional game players put in a significant amount of effort during their gameplay and are eager to improve. This does not apply to amateur game players who have less pressure for improvement. Amateur game players therefore are less likely to analyze, critique or pay attention to their gameplay

as much as the professional game players do. As the survey for this research was targeted for game players in general, it was not surprising that the findings show the amount of time spent on gameplay is insignificant towards influencing the adoption of any specific leadership styles. The implication of this is that extra time spent on playing the game may improve one's skills needed during gameplay, but it does not influence leadership development.

#### *Location of Gameplay*

The findings show an intriguing result in regards to the location where the game players played the games. Those who play games in more private settings—such as in their own home or at a friend's house—show tendency towards a democratic leadership style and less tendency towards laissez-faire leadership style. This can be explained by the level of control players have towards the environment they played the games. Gameplay at home or in other private locations are likely to be interfered by various events, such as family members' intrusion, lunch or dinnertime or pressure over homework or house chores. These normal interferences force game players to become more aware of events happening in their surroundings. Playing the games under such circumstances causes game players to become a better participant of the family, respecting the opinion and actions of others—and these are all fundamental traits for a democratic leader. Moreover, such behaviors are in contrast with traits possessed by a laissez-faire leader, which explains why private settings triggering the traits for democratic leader would less likely cause the laissez-faire leadership style to emerge. However, the evidence and explanation that could provide a clear understanding of gameplay location and its effects on leadership style remains limited. It is suggested that aspects related to this linkage be researched and studied further.

### **NOTES TO GAME PLAYERS AND DEVELOPERS**

#### *How Games Should Be Played*

Although findings of this research have successfully provided the evidence that prove a positive correlation between game roles and leadership style, there are imperative points which must be stated in regards to how games should be played properly to enhance one's leadership development without deleterious effects. The findings of this research do not conclude that any individual will become great leaders in society merely by playing games. The findings simply reveals a linkage between gameplay and leadership, which means that playing games can be one of the many sources or first steps for leadership skills to emerge and be developed with. This paper advises that game players play games with a conscious knowledge of the feasible benefits of gameplay as well as possible harms gameplay can cause. By playing games with a conscious mind, game players shall be able to learn more about themselves from their gameplay habits. It must be noted that the advantages of gameplay are not limited solely to game players. By observing and studying how young adults play games, it is possible for parents to better comprehend the characteristics of their children.

Just like other types of media such as books, music or movies, games come in a variety of quality ranging from good to bad. Choosing the appropriate game to play is also one of the most imperative steps of benefiting from gameplay. The two games used in this research, DOTA and HON, are examples of good games which provide great benefits in terms of developing critical thinking skills and respect for teamwork.

#### *How Games Should Be Developed*

It is fundamental for game developers to be conscious about the fact that those playing their games today are younger than ever before. Although some games are rated for adults, these games, unfortunately, fall into the hands of children through particular illegal means. Therefore, games that only offer extreme violence or

educate deleterious social values must be avoided. To achieve this, game developers should be alerted about the significant impact their games have on child development so that they create games with a stronger sense of responsibility.

Game developers should also keep in mind that gameplay are correlated with many aspects of real life. Games not only benefit leadership development, but also creativity (Jackson, Witt, Games, Fitzgerald, Eye, & Zhao, 2012) and decision-making (Blank, 2010). Therefore, in combining such benefits and the concept of choosing appropriate games, game developers should consider creating games which are intellectually challenging in terms of its leadership opportunities, creativity and decision-making. Accordingly, game developers should instill more effort in research and development of games, emphasizing on maximizing possible benefits in the games developed instead of purely seeking profit.

## **CONCLUSION**

This research has revealed that there are correlations as to how games are played and the leadership style which the game players possess. This relationship was proven using three different roles recognized in the games DOTA and HON—carry, support and ganker game roles—with the addition of a non-assigned role. Three major leadership styles as defined by Kurt Lewin—authoritarian, democratic and laissez-faire leadership styles—were tested for correlation in conjunction with the game roles.

A survey regarding gameplay behaviors and leadership behaviors was distributed in Thailand to identify the game roles which should be taken by the game players and also to identify their leadership styles. By utilizing factor analysis in survey data, the results have concluded that questions used in the survey have effectively and accurately served its intent in distinguishing the game roles and leadership styles belonging to each respondent. Interestingly, the result of factor analysis have led to the finding that leadership style behaviors are universal.

Using the multinomial logistic regression analysis, this paper has also successfully established correlation between game roles in DOTA and HON and leadership styles. It is concluded that carry game roles positively correlate with authoritarian leadership style, support game roles positively correlate with democratic leadership style, ganker game roles positively correlate with authoritarian leadership style and non-assigned game roles positively correlate with the laissez-faire leadership style. This implies that game players who belong to these specific game roles may potentially have the specific leadership styles in everyday life as well. These correlations are explained by common behaviors that describe the decision-making process, the prioritization of task or people-oriented issues, the susceptibility to trusting others, and the sense of responsibility that is share amongst the game role and its correlated leadership style.

In summary of the findings and its theoretical grounds, it can be said that just as leaders each have a specific style, game roles each have specific abilities as well. Leaders are restricted by the given problem or situation to be resolved, and game roles are also restricted by the game rules and game environment they were placed in. Both leaders and game roles, therefore, share very similar situational control scenarios. Within these scenarios, leadership styles and game roles also share overlapping traits and behaviors. Through these links between the shared scenarios and behaviors, the correlation of leadership and game roles were established. This research concludes that game roles are positively correlated with leadership styles and can also potentially be used to identify leadership styles.

## NOTES

1. The term Multiplayer Online Battle Arena or MOBA are used in reference to the aforementioned games genre within this research because it accurately describes features of the genre (Perez, 2009). Although originally, the games were previously known as action real-time strategy (ARTS) genre, using the term MOBA can clearly differentiate with the RTS genre, since these two genres are often confused with each other. The term MOBA is synonymous to the ARTS genre, DOTA-style, DOTA-esque, DOTA-based, and DOTA-inspired (Dean, 2011; Nguyen, 2009; Welsh, 2011).
2. Defensive structures in the games DOTA and HON are referred to as "towers". See (uildings, 2012).
3. "Creeps" are weak and computer-automated units periodically placed at each base. They are designated to defend the main paths referred to as "lanes" leading to the team's base, and these creeps also attack the opposing team's base (IceFrog, Basic Survival, 2010; Leahy, 2010; Lodaya, 2006). See Creeps, 2012.
4. Waiting time is the amount of time that a player needs to wait after using an ability before it can be used again.
5. "Farm" or farming up gold refers to the act of killing hostile creeps in order to earn gold and experience (Glossary, 2012; IceFrog, 2010). See Rodriguez, Dota Farming Guide, 2011 for more information on farming strategies.
6. See Goodnight, 2004; Lewin & Lippitt, An Experimental Approach to the Study of Autocracy and Democracy: A Preliminary Note, 1938; Lewin, Lippitt, & White, Patterns of aggressive behavior in experimentally created social climates, 1939 for detailed characteristics of an authoritarian leader.
7. See Goodnight, 2004; Lewin & Lippitt, An Experimental Approach to the Study of Autocracy and Democracy: A Preliminary Note, 1938; Lewin, Lippitt, & White, Patterns of aggressive behavior in experimentally created social climates, 1939; Woods, 2004 for detailed characteristics of a democratic leader.
8. See Eagly, Johannesen-Schmidt, & van Engen, 2003; Goodnight, 2004; Lewin, Lippitt, & White, Patterns of aggressive behavior in experimentally created social climates, 1939 for detailed characteristics of a laissez-faire leader.
9. The theory of the LPC scale is based on a scenario where respondents are asked to describe the person the respondent is least preferred to work with given a pair of keyword description, such as friendly versus unfriendly, to be rated on a scale of one to eight. See Fiedler, A Theory of Leadership Effectiveness, 1967.

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