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Massively Multiplayer Online Role-Playing Games (MMORPGs) and Commitment Behavior: An Integrated Model

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Abstract

The Massively Multiplayer Role-Playing Game (MMORPG) phenomena have generated significant interest on the part of consumers and software publishers. While there have been many efforts to improve the quality of the games in terms of technology (e.g. graphics, networking, etc.), little effort or research has been extended towards identifying business applications of MMORPG. The main goal of this study is to identify the factors that influence game players to commit themselves to MMORPGs. Nor has there been any research effort directed at identifying lock-in strategies for MMORPGs. To achieve this goal, we propose two different lock-in strategies for MMORPGs: (1) A control-enhancing strategy, based on both Control Theory and Psychological Ownership Theory, and (2) An interaction-enhancing strategy, based on both Symbolic Interaction Theory and Social Identity Theory. In this paper we report the results of an empirical study that examines the effectiveness of these two strategies. A structural equation model is developed to test the

¹ Corresponding Author
Keywords
MMORPG, Control Theory, Psychological Ownership, Social Identity, Symbolic Interaction

Introduction

The number of people who enjoy online games has increased such that online games are “the trend of the day” (Ye and Chen 2006). It has been estimated that there are approximately 14 million active subscribers to MMORPGs (http://www.mmogchart.com/) Online games have various enthusiasts in different age groups, and they are considered a part of daily life (Yee 2006). According to the International Data Corporation (IDC), industry revenue of the online pc game market will increase from $656.3 million in 2004 to $2 billion in 2008. Due to its popularity, MMORPGs have been expected to make more profits than other types of online computer games (Parks Associates 2005). Ye and Chen (2006) note that, “MMORPGs are called “persistent-state-world (PSW) or persistent-world (PW) since the virtual world is generally hosted by a company and is always available, and various events happen continually in the game world, even while some of the players are not playing their character.” The MMORPG is in many ways similar to the dystopic pseudo-world described in the movie Matrix. In some ways this is an important characteristic of the MMORPG, and the main reason for game addiction. While some MMORPG companies are very successful in locking in game players to their games and generate profits (e.g. Vivendi http://www.gamespot.com/news/6165026.html), many companies are not. According to the result of an investigation conducted by MMOGCHART.COM, 85.6% of MMORPG market is occupied by leading five games (See Table 1). The objective of this study is to identify strategies related to locking-in online players of MMORPG.

Characteristics of MMORPGs

Massively Multiplayer Online Role Playing Games (MMORPG) are defined as a “genre of online computer role-playing games (RPGs) in which a large number of players interact with one another in a virtual world” (Wikipedia 2005). MMORPG is a general term used to describe all kinds of games in which multiple players share one game world and build up their own characters. Table 1 provides typical examples of the MMORPG. These five games are now market leaders in terms of subscriptions market share (June 2006),
There are many different online games in the category of MMORPGs, but all of them share basic characteristics. One of them is the ‘Character’ controlled by game players. Game players must have at least one of their own characters in order to play the game. Another common characteristic of MMORPGs is the “Guild,” which is a community of players of a particular game. Members who make up guilds regularly play together in the game (Nardi et al. 2007; Wikipedia 2005). The guild is also sometimes called ‘clan.’ Many MMORPGs provide game players with both a chatting service but also a guild instant messenger for better communication among guild members (Brignall and Valey 2007). According to Williams (2006), social interactions are increased by enjoying the guild life and game players can form social networks.

Despite the increasing number of MMORPG players, our review of the literature found very few studies examining why players spend their time on online games. Moreover, most of the studies were conducted in psychology. For instance, Yee (2006) found that age, gender, usage patterns, and in-game behaviors were positively related to game player’s motives. Yee (2006) pointed out, “Not only do MMORPGs appeal to a broad age range (Mean = 26.57, range = 11–68), but their appeal is very strong, averaging 22 hours of usage per week across all ages.” This cross-age appeal is a very interesting finding for marketing and game development.

In terms of gender, Ko (2005) found no significant characteristics of females, found that older males with lower self-esteem, and lower satisfaction with their life” commit more of their daily life to online games more than other males.

Lo et al. (2005) also found that two types of players spent more time on online games: 1) players who suffered from the pain of human relations, and 2) players who felt more social anxiety. Sørensen and Holm (2003) supported these findings and found that game players are committed to the game by playing together and chatting with other players.

Chapell (2006) and Steinkuehler and Williams (2006) focused on addiction to the game. They viewed game addiction as similar to alcohol and gambling addictions and that the central factors of such addictions are “salience, mood modification, tolerance, conflict, withdrawal symptoms, cravings, and relapse (Chappell et al. 2006).”

As shown above, only a few studies have demonstrated online game players’ behavior in the area of psychology, but these are not enough to explain the secret to success in the MMORPG market. The main goal of this study is to identify factors influencing game players to commit to the MMORPG. To achieve this goal, strategies facilitating loyalty are developed and presented in the next section.
Strategy Development

The lock-in phenomenon can be explained in terms of the concept of e-loyalty, which starts from brand loyalty. Brand loyalty is defined as “the preferential, attitudinal and behavioral response of consumers toward one or more brands in a product category over a period of time (Engel et al. 1982). Brand loyalty is often regarded as the core driver of brand’s equity (Aaker 1991). According to Gommans et al. (2001), “the drivers of e-loyalty have immediate implications of developing and maintaining brand loyalty in e-space.” That is, e-loyalty is the extended concept of brand loyalty. Based on Gommans et al. (2001)’s view, e-loyalty in this study is defined as development and maintenance of attitudinal and behavioral responses toward a MMORPG by a game player.

We propose two different strategies to facilitate e-loyalty, they are: 1) Control-Enhancing Strategy, based on Control Theory and Psychological Ownership Theory, and 2) Interaction-Enhancing Strategy, based on Symbolic Interaction Theory and Social Identity Theory.

Control-Enhancing Strategy

Since understanding players’ feelings is considered an important factor of an online game’s success, many online game companies have made an effort to identify players’ feelings when they play the game. The present study assumes that there must be psychological connections between the game player and the character that he/she plays. In applying control theory and psychological ownership theory to psychological connections, the present study proposes a Control-Enhancing Strategy as illustrated in Figure 1.

As noted nearly 75 years ago by Baeglehole (1932) the target of ownership is manifested by feelings of protecting and enhanced by feelings of ‘mine.’ Pierce et al. (2001) defined psychological ownership as that state in which an individual feels as if the target object of ownership, or a piece of that object, is theirs, and then identifies the core of psychological ownership as a sense of possession which is the feeling of ‘mine’ or ‘ours.’ Stated differently, it is “the feeling of possessiveness and of being psychologically tied to an object” (Pierce et al. 2003). Dyne and Pierce (2004) described psychological ownership as a psychologically experienced phenomenon which reflects a relationship between the target object and the individual.
Psychological ownership can be promoted by controlling the target, coming to know the target intimately, and investing the self in the target (Pierce et al. 2001). Each player in the MMORPG has his/her own object, called a ‘character’, which is controlled by him/her. When a player has a feeling of control over his/her own character, he/she is more likely to develop strong psychological ownership toward that character. Pierce et al. (2004) empirically supported this view that perceived control over an object leads to psychological ownership towards it. Issac (1933) also agreed that a feeling of ownership is related to sense of control over the object of ownership.

The concept of control is conceptually related to manipulating the target directly (Pierce et al. 2001; Pierce et al. 2003). Rothbaum et al. (1982) suggest a two-process model of perceived control in which the concept of “perceived control” can be divided into primary and secondary control. According to Weisz (1996), primary control refers to the traditional view of control in which people develop a sense of control by manipulating the objective conditions of the environment to fit their needs and wants, whereas secondary control involves the person accommodating to the objective conditions in order to maximize their fit with the existing environment.

The concept of primary control is the same as the ‘feeling of control’ proposed by Pierce et al (2001), and the concept of secondary control is very similar to behaviors that people engage in in order to change their condition or investing in themselves in order to know the target object intimately.

Accordingly, when a player in a certain MMORPG invests themselves in the character to better manipulate it (Secondary control) and has a feeling of control over it, he/she should develop strong psychological ownership towards his/her own character.

The development of a strong psychological ownership bond towards the character will lead the player to stronger levels of e-loyalty towards the game. According to Vandewalle (1995), psychological ownership changes the behavior of members. This means that strong psychological ownership affects and changes the member’s behavior and their feelings. Saeed et al. (2002) explored the relationship between customer psychological ownership and e-loyalty toward websites. It was found that there must be a positive relationship between game players’ psychological ownership towards his/her character in the game and e-loyalty towards the game. In short, strong psychological ownership developed by strong perceived control over characters will create e-loyalty towards MMORPGs, as illustrated in Figure 1.

**Interaction-Enhancing Strategy**

As mentioned earlier, it is one of the distinguishing characteristics of MMORPGs that most game players in the MMORPG join the guild when they play the game. This develops a stronger social bond. Hsu and Lu (2007) posit that the concept of online communities can be used to improve players e-loyalty toward the game. The present study supports Hsu and Lu (2007)’s position of providing theoretical background based on symbolic interaction theory and social identity theory. Finally, Interaction-Enhancing strategy is proposed based on these theories, as illustrated in Figure 2.
Social identity is defined as the individual’s knowledge that he/she belongs to a certain social group, with some emotional and value significance of him/herself to the group membership (Adams and Hogg 1990). A core tenet of social identity theory is that, defining themselves in terms of a particular social identity, individuals act to maintain or enhance the positive distinctiveness of the group with which that identity is associated (Haslam et al. 2003). Mael and Ashforth (1992) pointed out that social identification is basically the perception of belongingness to a group classification. The individual perceives him/herself as an actual or symbolic member of the group.

In the context of organizational behavior, Bergami and Bagozzi (2000) provided a concept for the cognitive component of social identity in terms of a valued group as an instance of self-categorization formed by a member of the organization. Degree of the effects of the valued group may differ based on the characteristics of the group. Bergami and Bagozzi (2000) classified the concept of social identity into three different aspects, pointing out that “social identity in terms of a valued group involves cognitive, affective, and evaluative components, and motivates behavior that is consistent with identity maintenance.” Table 2 presents definitions of these three aspects of social identity.

<table>
<thead>
<tr>
<th>Aspects of Social Identity</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Social Identity (Self-categorization)</td>
<td>“The perceived overlap between one’s own self-concept and the identity of the organization/group” (Bergami and Bagozzi 2000)</td>
</tr>
<tr>
<td>Affective Social Identity (Affective Commitment)</td>
<td>“Identification with, involvement in, and emotional attachment to the organization/group” (Allen and Meyer 1996)</td>
</tr>
<tr>
<td>Evaluative Social Identity (Organization-based Self-esteem)</td>
<td>“Evaluations of self-worth deriving from one’s membership in the organization/group” (Bergami and Bagozzi 2000)</td>
</tr>
</tbody>
</table>

Tajfel and Turner (1987) identified that feelings of social identity emerge through three consecutive processes. The first process of social identity is self-categorization, which refers to groups providing a social identity to their group members, so that members can have positive distinctiveness in terms of ‘we’ rather than ‘I.’ This can be seen in that people tend to classify themselves and others as belonging to various social categories based on favoritism. After making social categories, people may acquire positive attitudes such as self-esteem and social identity gained by comparing their in-group and out-group (Tajfel and Turner 1979).

The second process is social comparison, which is related to social categorization in the previous process. According to Tajfel (1978), social comparison refers to “how positive or negative is his evaluation concerning this group membership.” Ellemers et al. (2004) defined social comparison as “the process by which a social categorization is invested with meaning”.

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**Figure 2. Interaction-Enhancing Strategy based on Symbolic Interaction Theory and Social Identity Theory**

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The last process is social identification, and it is the extent of his/her emotional investment both in his/her membership awareness and evaluations based on the first and second process (Tajfel 1978). Mael and Ashforth (1992) define social identification in that “the individual perceives him or herself as an actual or symbolic member of the group (I am a man’; ‘I am a fan of the local football team’).” Ellemers et al. (2004) defined it as “the process by which information about social groups is related to themselves.”

Moon et al. (2006) identified these processes as a part of socialization. Socialization is defined as a process by which individuals become part of a group, involving processes that progressively confine their behavioral potentialities within an acceptable range and prepare them for the types of roles they will be expected to play later in life (Ryder 1965). Maltas (2004) pointed out that the phenomenon of socialization can be understood through the concept of symbolic interaction theory because the theory explains the gestures, reference group, and significant others that construct meaning for an individual in a specific social situation. According to interaction theory, social interaction helps to create shared meanings among situated actors, and this interaction facilitates coordinated actions that help to define the uses and outcomes of communication technology in informal or formal groups (Fulk et al. 1995). In short, an individual in a particular group/organization can develop three different aspects of social identity through appropriate social interactions with other members following certain processes of socialization.

Findings from studies in the area of e-community support the idea that social identity can be developed in the online environment (Bagozzi and Dholakia 2006; Dholakia et al. 2004). Churchill et al. (2004) and Kollock (1998) suggested that certain types of web features on interfaces facilitate and encourage a successful symbolic interaction between online users. In the MMORPG, players will be able to enhance symbolic interactions with other members in the guild using diverse features such as ‘guild boards’, ‘guild chatting rooms’, ‘guild messengers’ and so forth. Through these features, players become socialized and will start to develop social identity in the guild. As a result, their behaviors in the game will change. Ashforth and Mael (1989) suggest that strong social identity enables the newcomer to reify the organization and feel loyal and committed to it, and facilitates the internalization of organizational values and belief in the context of real organization. In addition, Moon et al. (2006) found that strong social identity among bloggers leads them to develop e-loyalty to the blog service providers to which they subscribe. In this regard, players who have strong social identity through enhanced symbolic interaction will be more likely to be locked in to the MMORPG, as illustrated in Figure 2.

**Research Methodology**

**Research Design**

The main goal of this study is to investigate which factors will lead game players to develop a tendency to have e-loyalty towards MMORPGs. To accomplish this goal, two strategies for building e-loyalty were proposed: Control-Enhancing Strategy, and Interaction-Enhancing Strategy.

It is necessary to validate the proposed strategies empirically to improve service for game players. Hence, as shown in Figure 3, this study establishes a research model to test proposed strategies. Each hypothesis on the path will be estimated through
As suggested by Bergami and Bagozzi (2000), Social Identity has three different sub-constructs: Cognitive Social Identity, Affective Social Identity, and Evaluative Social Identity. Also based on Rothbaum et al. (1982), Perceived Control has two sub-constructs: Primary Control and Secondary Control.

**Instrument Development and Data Collection**

This study implements a survey to verify the proposed research model in Figure 3. We operationalize latent variables from Figure 3 based on a literature review. All measures were taken from previous studies in psychology, sociology, and behavior science, such as Allen and Meyer (1990), Churchill et al. (2004), Dholakia et al. (2004), Dwyer and Ganster (1991), Dyne and Pierce (2004), Ellemers et al. (1999), Kim et al (2003), Kollock, Pierce et al. (2003), Mckinney (2002), Srinivaan et al. (2002), and Zeithaml et al. (1996). Finally, 30 measure items were developed as shown in Appendix A.

Data was collected using both paper and e-mail format. A total of 73 responses were collected, 28 (38.4%) through paper-based surveys, and 45 (61.6%) through e-mail surveys. Respondents were composed of 10 females and 63 males. All
respondents had played at least one or more MMORPG, and they answered about one specific game that they preferred. Most of them (73.97%) answered that they enjoy the game at least 10 hours a week, and the average was 24.13 hours a week.

Data Analysis and Results

Assessment of Measurement Model

The Partial Least Squares (PLS) method was used for data analysis. The measurement model was tested using the composite reliability and Average Variance Extracted (AVE) for internal consistency. A cross-loading matrix, and the correlation matrix with square root of AVE were used to verify convergent and discriminant validity. Composite Reliability and AVE of latent variables are provided in Table 3.

<table>
<thead>
<tr>
<th>Table 3. Composite Reliability and AVE of latent variables</th>
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<tbody>
<tr>
<td>(1) Primary Control over Character</td>
</tr>
<tr>
<td>(2) Secondary Control over Character</td>
</tr>
<tr>
<td>(3) Psychological Ownership towards Character</td>
</tr>
<tr>
<td>(4) Perceived Interaction between Guild Members</td>
</tr>
<tr>
<td>(5) Cognitive Social Identity in the Guild</td>
</tr>
<tr>
<td>(6) Affective Social Identity in the Guild</td>
</tr>
<tr>
<td>(7) Evaluative Social Identity in the Guild</td>
</tr>
<tr>
<td>(8) E-loyalty towards the MMORPG</td>
</tr>
</tbody>
</table>

All composite reliability values are higher than .80 and all AVE values are higher than .60. These results show that the measurement model has strong internal consistency. Next, cross-loadings of each item were explored and compared across all latent variables. In this process, PC1 and AS4 were deleted to improve discriminant validity of the measurement model (See Appendix A). The final cross-loading matrix is provided in Appendix B. All PLS factor loadings on this construct were quite high, greater than 0.70, and all cross-loadings were lower than their related factor loading, which indicates that both strong convergent validity and discriminant validity exist in the measurement model.

In addition, Table 4 examines the ratio of the square root of the AVE of each latent variable over the correlations of this variable with respect to all the other variables.
In Table 4, diagonal elements in parenthesis are correlations of each construct with its measure, which is the square root of AVE. Off-diagonal elements are correlations between constructs. As shown in Appendix B, each construct is more highly correlated with its own measures than with any other constructs. This indicates that strong discriminant validity exists among the constructs.

A marker variable, “Attitude towards the Tax Policy,” was placed between the dependent variable and the independent variables to examine the common method variance artifact. After data collection, we found that there were quiet low correlations between the marker and the other variables, which means that the data collected was not contaminated by common method variance.

**Assessment of Structural Model**

The investigation of the measurement model’s effectiveness for this study confirmed that reasonable internal consistency and construct validity exist in the model. Finally, the structural equation model proposed for this study is assessed as shown in Figure 4.
As shown in Figure 4, all hypotheses in the model are supported. Factor loadings from “Perceived Control over Character” to its sub-constructs “Primary Control Over Character” and “Secondary Control Over Character” are .866 and .941, respectively. Factor loadings from “Social Identity in the Guild” to the three aspects of social identity are .843 (cognitive), .941 (affective), and .890 (evaluative).

The result shows that about 31% of the variance of the game player’s psychological ownership towards their character is accounted for by their perceived control over the character ($R^2 = .307$) and its path coefficient is .554. This finding implies that a game player who has high perceived control over a character tends to develop strong psychological ownership towards their character. It supports the role of perceived control over character as an antecedent of psychological ownership towards the character.

About 28% of the variance of the game player’s social identity in the guild is accounted for by their perceived interaction between guild members ($R^2 = .282$) and its path coefficient is .531. This finding implies that a game player who has better interacted with other guild members through diverse features provided by MMORPG tends to have stronger social identity in the guild. In addition, this supports the role of perceived interaction between guild members as an antecedent of social identity in the guild.

Coefficients from “Psychological Ownership towards Character” and “Social Identity in the Guild” to e-loyalty towards the MMORPG are .272, and .237, respectively. The $R^2$ value is .201 which means that the variance of e-loyalty towards the MMORPG in the sample can be well accounted for by psychological ownership towards characters and social identity in the guild.

Accordingly, it is concluded that e-loyalty towards the MMORPG can be achieved through the two strategies proposed here:
1) through psychological ownership towards character developed through appropriate online perceived control over character, and 2) through social identity in the guild developed through appropriate online perceived interaction between guild members.

In conclusion, both Control-Enhancing Strategy and Interaction-Enhancing Strategy turned out to be effective methods for locking-in online game players.

**Conclusions**

The main goal of this study was to identify factors influencing game players to commit themselves to MMORPGs, and then to develop relevant strategies to lock-in players to such games. We found that strong e-loyalty from game players can be created by the two strategies we proposed.

Control-Enhancing Strategy suggests that game players’ perceived control over their character will develop strong psychological ownership towards it. Generally, players in the MMORPG must manage their own character. Feeling of ownership towards the character emerges when they invest themselves in order to understand how to control the character effectively. When they develop strong psychological ownership towards a character, they will be locked-in to the MMORPG. Therefore, game service providers need to create characters that provide players with more controllability when they develop a new MMORPG. If characters in the game are simple and dull, players will not try to understand or manage the character, and they will become easily bored with it.

Characters in leading MMORPGs can acquire various items and equipments. Characters can use them as resources or as a part of the characters. Also, characters are rewarded when they accomplish quests demanded from the game with money, items, and experience, which in turn allow players to improve their characters in skill and level. Such policies of leading MMORPGs can be explained by control theory and psychological ownership.

The bottom line in terms of the Interaction-Enhancing Strategy is fostering social interaction among game players. In the early stages in leading MMORPGs, most game quests can be accomplished without the help of other players. However, in the higher level stages most game quests are designed to be accomplished only through team play. Players need to work together in order to advance in the game so most of them join guilds. In addition, players are encouraged to take part in battles against other players, and without strong guild membership they will not be able to win the battles. Thus, leading MMORPGs provide diverse interaction tools for effective communication among guild members; that is, they enjoy the game with other players by developing strong social identity. Players share their mutual goal with other guild members or new comers through interaction tools, such as a chatting room, guild board, guild shelter and so forth. All of these policies of leading MMORPGs are well accounted for by symbolic interaction theory and social identity theory.

In conclusion, both Control-Enhancing Strategy and Interaction-Enhancing Strategy provide new understandings of the MMORPG player’s psychology and behavior. The findings of this study are not limited to the MMORPG business, and can be extended to diverse areas of e-business where cooperation and contribution are critical to the success of the business.


Jo et al. Massively Multiplayer Online Role-Playing Games (MMORPGs) and Commitment Behavior: An Integrated Model


Steinkuehler, C., and Williams, D. "Where Everybody Knows Your (Screen) Name: Online Games as "Third Places","
Appendix A.

Primary Control over Character  (Dwyer and Ganster 1991; Pierce et al. 2003)
  1. I can decorate, or personalize my character. (DELETED)
  2. I know how to control my character efficiently.
  3. In general, I have enough control my character.

Secondary Control over Character  (Dwyer and Ganster 1991; Pierce et al. 2003)
  1. I have invested much time in order to control my character.
  2. I spend much time at my character.
  3. I frequently visit the game to control my character.

Psychological Ownership towards Character  (Dyne and Pierce 2004; Pierce et al. 2003)
  1. The character which I controlled in the Game is MINE.
  2. I feel that my character is an extended part of myself.
  3. My character is a kind of self-expression.
  4. My character is extremely important to me.

1. I share ideas with other players efficiently through the features of the game interface provided by this Game Service Provider.
2. I express my feelings or emotions to other players efficiently through the features of the game interface provided by this GSP.
3. Quick communication is possible between myself and other players through the features of the game interface provided by this GSP.
4. Overall I think I am satisfied with interaction with other players through the features of the game interface provided by this GSP.

Cognitive Social Identity (Self-Categorization in the Guild) (Ellemers et al. 1999)

1. I perceived an overlap between my self-identity and guild members in the game.
2. Imagine that one of the circles at the left in each row represents your own self-definition or identity and the other circle at the right represents the identity of your friend group in the Game you play. Please indicate which case (A, B, C, D, E, F, G, or H) best describes the levels of overlap between your own and your guild’s identities.


1. I am emotionally attached to the members of guild on the Game.
2. I feel feelings of belongingness towards the members of guild on the Game.
3. I am happy to spend time with the members of guild on the game.
4. I enjoy discussing the members of guild on the game with people outside it. (DELETED)
5. The members of guild on the game have a great deal of personal meaning for me.

Evaluative Social Identity (Group-based Self-esteem) (Dholakia et al. 2004)

1. I am a valuable member of the guild on the game.
2. I am an important member of the guild on the game.
3. I feel that I am respected by members of guild on the game.

Attitude towards the tax policy (marker variable)

1. I am willing to pay higher taxes for social welfare.
2. Generally, I support high-tax policy rather than low-tax policy.

E-loyalty towards the Game (McKinney et al. 2002; Srinivasan et al. 2002; Zeithaml et al. 1996)

1. I prefer this game to others.
2. I intend to continue playing this game.
3. I will say positive things about this game to other people.
4. Overall the service quality provided from GSP matches my expectation.
5. After playing this game service, I am very satisfied.
### Appendix B. Cross Loading for the Measurement Model

#### Cross Loading for the Measurement Model

<table>
<thead>
<tr>
<th></th>
<th>Primary Control</th>
<th>Secondary Control</th>
<th>Psychological Ownership</th>
<th>Perceived Interaction</th>
<th>Cognitive Social Identity</th>
<th>Affective Social Identity</th>
<th>Evaluative Social Identity</th>
<th>e-loyalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC2</td>
<td>0.936</td>
<td>0.607</td>
<td>0.431</td>
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<td>0.233</td>
<td>0.193</td>
<td>0.338</td>
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</tr>
<tr>
<td>PC3</td>
<td>0.935</td>
<td>0.601</td>
<td>0.500</td>
<td>0.503</td>
<td>0.383</td>
<td>0.369</td>
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<tr>
<td>SC1</td>
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<tr>
<td>SC2</td>
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<td>0.934</td>
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<td>SC3</td>
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<td>OS1</td>
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<td>0.701</td>
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<td>0.155</td>
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<tr>
<td>OS2</td>
<td>0.502</td>
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