Beyond Player Types: Gaming Achievement Goal

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ABSTRACT

Education and psychology studies have used motivational constructs called achievement goals to predict learning success and response to failure. In this article we adapted classroom achievement goal scales to instead measure gaming achievement goals. We collected survey data from 432 university students to empirically examine the applicability and utility of achievement goal constructs from education research to gaming. We introduced a new approach to player types based on mastery and performance gaming achievement goals. Four types are studied: super-achievers, mastery-only, performance-only, and non-achievers. We also examined the relationship between our four achievement goal player types to the traditional achiever, explorer player types. We found that Interest in exploration in games can exist in any of the four types, but those with strong mastery goals have the lowest interest in exploration. Gender and gaming frequency were significantly related to gaming achievement goals. The implications and suggestions for designing games for learning and entertainment are discussed.

Categories and Subject Descriptors

Player experience, Game design,

Keywords

achievement goal, exploration, motivation, player type, serious game,

1. INTRODUCTION

Digital games are increasingly used in school curriculums, corporations or military training, and some games are even prescribed by health professionals as treatments. Unlike entertainment games that are played voluntarily, these serious games are often assigned to users. Most previous research on digital game motivations has focused on voluntary play, little is known about how people are motivated in assigned gaming situations, which could affect how well these games achieve their intended outcomes. Our recent research [11] found important differences in forced play behaviors and gaming predilections of three potentially vulnerable subgroups reluctant gamers, non-gamers, and female gamers identified in the author's previous work [14]. The current research explores theoretical underpinnings to predict different impacts.

Education and psychology studies have used motivational constructs called *achievement goals* to predict learning success and response to failure. One kind of achievement goals called *mastery goals* (e.g. striving to do well) have been linked to more learning. Another achievement goal called *performance goals* (i.e., striving to do better than others) can sometimes lead to more learning, but sometimes interfere with learning. Education achievement goal constructs seem to have strong parallels to digital gaming achievement goals because achievement goals and reward systems are integral to game design. Achievements in school are rewarded by sense of mastery of subject matter, progression through grade levels, honor roll lists, and praise from teachers and peers. Achievements in games are rewarded by a sense of mastery of the game, progression through levels, by points, prizes, inclusion on leader boards, and admiration by other players. Within a game, a player may opt to pursue mastery goals (try to do well at the game) or performance goals (try to outperform other players). A player may also be unmotivated by either form of achievement goal, particularly if play is assigned rather than voluntary.

We used survey questions to explore whether gaming achievement goals influence game play in similar ways to how educational achievement goals influence learning. Gaming achievement goals could help to determine whether and how people play games and, in the case of games for learning, which players are more likely to learn from those games.

2. ACHIEVEMENT GOALS

Achievement goals can be defined as motivation for taking on challenging behaviors or how individuals perceive and respond to achievement situations [4, 5]. Achievement goals focus on motivation to behave competently or the desire to do well (or to avoid doing poorly) on a task or activity (Elliot, 2005). Achievement goals relate to the extrinsic reward of "being" competent, not to the intrinsic rewards of "doing" something competently. Two achievement goal constructs were identified as key predictors of behavior: *performance goals* and *mastery goals* [3, 10]. A person with performance goals seeks to demonstrate their ability and avoid demonstrating inability *in comparison to others*. But a person with mastery goals is motivated by developing competence and task mastery *regardless of others*. Performance goals is predicted to lead to debilitating response to

failure, while mastery goals were expected to be more likely to contribute to successful learning from failure [6].

Elliot and McGregor [7] later introduced a 2x2 achievement goal framework, in which definition (absolute versus normative) and valence (approach versus avoidance) are the two dimensions of competence. This framework yields four achievement goal constructs that our study adopts (see Figure 1). The mastery-approach goal focuses on attaining absolute competence or mastering a task. The performance-approach goal focuses on attaining normative competence (e.g. outperforming others). On the avoidance side, mastery-avoidance goal focuses on avoiding absolute self-referential or task referential incompetence, and performance-avoidance goal focuses on avoiding normative incompetence (not performing worse than others) [7].

	DEFINITION	
VALENCE	absolute	relative
approach	Mastery Approach	Performance Approach
avoidance	Mastery Avoidance	Performance Avoidance

Figure 1. McGregor and Elliot's 2x2 Achievement Goal Framework

The mastery-approach goal is the most preferred achievement goal in a learning context, followed by performance-approach goals. Third most preferable is the mastery-avoidance goals, which may lead to less optimal consequences, but are still less harmful to learning than performance-avoidance goals [7, 8].

In the context of games for learning, players who are motivated by avoidance goals want to avoid failing, and for that reason probably will avoid difficult or complex games where the risk of failure is high. There is nothing inherently wrong with enjoying easy success and avoiding challenges in games for entertainment. However, when it comes to games for classroom learning or corporate training, players whose play is driven by avoidance goals would be dysfunctional learners because their attention would focus on avoiding failure instead of on learning. They are also less likely to learn from mistakes. Avoidance goals are also a dysfunctional for physical and cognitive exercise games because in order to receive cognitive benefits, players need to stretch a little beyond what is comfortable and easy, taking on challenges at the edge of their ability [15]. Limiting play to easy brain game challenges minimizes the cognitive exercise benefits from the games.

Performance goals may also be dysfunctional for learning games, because they focus attention on extrinsic rewards rather than intrinsic goals such as mastery (of the game or subject matter). Research showed that performance-avoidance goals particularly interfere with classroom learning [12, 13].

3. RESEARCH QUESTIONS

In order to investigate the empirical utility of gaming achievement goal constructs, our first research question validates the gaming achievement goal constructs and compares those constructs to classroom achievement goals:

RQ1: What is the distribution of players with mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance gaming achievement goals? How do gaming achievement goals compare to classroom achievement goals? Can gaming achievement goal constructs be used to construct a single player type variable? How does gaming achievement player type relate to gender and gaming frequency?

Next, we examine the relationships between gaming achievement motivations and player characteristics.

RQ2: How do gaming achievement motivations relate to enjoying accomplishment in games? How does enjoyment of accomplishment relate to gaming achievement goals, gender and gaming frequency?

Prior research on player motivation in online games has identified exploration and achievement as important motivations [1, 16, 17]. However, exploration and achievement have been presented as mutually exclusive player motivations. Anecdotal evidence and pretests of our survey instruments suggest this is probably not the case.

RQ3: How do gaming achievement goals relate to enjoying exploration in games? How does enjoyment of exploration relate to gaming achievement goals, gender and gaming frequency?

4. RESEARCH METHOD

An online survey was administered to 432 undergraduates interested in obtaining extra credit in six large telecommunication, communication, history, and culture classes at two large universities. Since a main goal of this study was to explore the idea of gaming achievement goals and to examine the relation of gaming achievement goals to gaming preference and enjoyment, for the achievement measures we used Elliot and McGregor's [7] scale and also asked those same questions adapted to gaming rather than classroom achievement. Both scales consisted of 12 item seven-point Likert-type questions (1 = not at all true of me to 7 = very true of me) such as "My goal is to ...do better in my classes than other students," and "My goal is to ...avoid doing worse in my classes than other students." The original achievement scale has been used in many previous studies to measure classroom achievement goals [2, 9]. We created parallel questions to measure gaming achievement goals such as "My goal is to ... play better than other players," and "My goal is to ...avoid playing worse than other players." Our gaming achievement measures showed high reliability. Cronbach's alpha for mastery-approach gaming achievement goals (.90), mastery-avoidance (.84), performance-approach (.82), and performance-avoidance (.85).

Enjoyment of accomplishment (related to Bartle and Yee's achiever player motivation from prior research) and exploration (related to Bartle and Yee's explorer player motivation) were measured by a series of gaming predilection questions tapping common gaming experiences. We also asked participants demographic questions such as gender, age, GPA and how recently they had played a digital game. Of the participants in the study: 26.2 percent were classified as Non-Gamers who played games for two hour or less per week, 58.4 percent were Moderate Gamers who played more than two hours but less than five hours per week, and 15.4 percent were Avid Gamers who played for five or more hours per week. One third of the study participants were female.

5. DISCUSSIONS

5.1 Distribution and Relation of Gaming and Classroom Achievement Goals

In order to investigate gaming achievement goals, we begin by examining the relation between gaming achievement goals and classroom achievement goals. All four measures of gaming achievement goals were significantly correlated with their classroom counterpart (Mastery approach r=.93, p<.001; Mastery avoidance r=.20, p<.001; Performance approach r=.32, p<.001; Performance avoidance r=.41, p<.001). A student's tendency to be motivated to earn good grades in the classroom was significantly correlated with their desire to earn high scores and to avoid failure in games.

Despite the correlation between classroom and gaming achievement goals, paired t-tests showed significant differences in the respondents' degree of gaming achievements goals compared to classroom achievement goals for all four indices. Gaming mastery approach (t[431]=8.35, p<.001) and mastery avoidance (t[426]=5.70, p<.001) goals were both significantly lower than for classroom achievement. But gaming performance approach (t[427]=5.53, p<.001) and performance avoidance (t[426]=2.38, p<.05) goals were both significantly higher than classroom achievement. In other words, performance is a more important achievement goal for gaming, while mastery is a more important achievement goal for school. Even so, those who had strong achievement goals for school also tended to have strong achievement goals for gaming, and this trend was strongest in regard to performance goals. Gamers who were motivated to play better than others also tend to be motivated to do better than others in school.

	Game mean (s.d.)	Classroom mean (s.d.)	Pearson's correlation	Paired t-test
Mastery Approach	5.27 (1.48)	5.05 (1.40)	.93***	t(431)=8.35***
Mastery Avoidance	5.31 (1.32)	5.75 (1.15)	.20***	t(426)=5.70***
Performance Approach	5.48 (1.26)	5.05 (1.43)	.32***	t(427)=5.53***
Performance Avoidance	5.24 (1.39)	5.06 (1.15)	.41***	t(426)=2.38*

*=p<.05, **=p<.01, ***=p<.001

Table 1. Gaming and Classroom Achievement Goal Comparison and Correlations

In order to better understand the gaming achievement constructs, we conducted a factor analysis using principal components extraction and Varimax rotation on the 12 items representing the four achievement goals. The result yielded a two-factor result instead of the expected four-factor result. Based on the two factor solution, we created a single performance goals measure and a single mastery goals measure. The approach-avoidance distinction was important in context of classroom achievement motivation, but they were too highly correlated for gaming achievement motivations. The factor analysis yielded a performance scale which combines approach and avoidance and a mastery scale based only on mastery-approach. These were used to classify respondents into four gaming achievement goal player types (see Figure 2). Non-achievers (29% of study participants) were below median motivation on both mastery and performance; mastery-only achievers (16%) were above median on mastery and below the median on performance; performance-only achievers (17%) were above median on performance and below median on mastery; and super-achievers (38%) were above median on both mastery and performance gaming achievement motivations.

Figure 2. Distribution of Achievement Goal Player Types

Gender and gaming frequency were significantly related to gaming achievement goal player types. Males were much more motivated to outdo other players than were females. Males were significantly more likely than females to be super-achievers (40% of male, 34% of female) and males were more likely to be performance-only players (21% of male, 7% of female). A plurality of females (40.9%) was non-achievers. Similarly, almost half (48.5 percent) of avid gamers were super-achievers, while only 29.5 percent of non-gamers were super-achievers. In contrast, only 15.2 of avid gamers were non-achievers, while 38.4 percent of non-gamers were non-achievers. Gender is deeply conflated with gaming frequency. Very few females were avid gamers (1.5%). Few males were non-gamers (15.9%), but nearly half of females were non-gamers (48.2%). Thus, gender and gaming frequency were strongly related to gaming achievement goals.

5.2 Gaming Achievement Goals and Accomplishment

Achievement and *exploration* are well known player motivations [1, 16, 17]. Players who were motivated by achievement included the motivations for advancement (progress, power accumulation, and status), mechanics (numbers optimization, modding, and analysis), and competition (challenging others, provocation, and domination). Players motivated by exploration included motivations for discovery (exploration, lore, finding hidden things), role-playing (story line, character history, roles, fantasy), customization (appearances, accessories, style, color scheme), and escapism (relax, escape from real life, avoiding real-life problems). In order to distinguish achievement goals with achievement player motivation, we will refer to achievement player motivation as *accomplishment* motivation.

We examined the relationship of gaming achievement goals with four accomplishment-related gaming preferences: Players motivated by accomplishment would be expected to prefer preferred hard over easy games, compete to earn the best score rather than just play for fun at parties, enjoy time limits rather than say time limits interfere, and prefer to play with others rather than alone.

One way analysis of variance (ANOVA) with post-hoc Tukey HSD analysis was used to compare different preference between gaming achievement goal types. As predicted, super-achievers and performance-only had stronger preference for hard games and competing than mastery-only and non-achievers. Super-achievers and mastery-only players also enjoyed time limit more, interestingly performance-only players did not enjoy time limit. There was no significant difference in preference for playing with others or along, more than half of respondents in all gaming achievement goal types preferred to play with others than alone.

We used hierarchical multiple regression analysis to drill down and see whether gaming achievement goals have explanatory power beyond what can be predicted by gender and gaming. Independent variables gender and gaming frequency were entered into the first block, and mastery and performance goals were entered into the second block to predict each of the accomplishment -related gaming preferences. When controlling for gender and gaming frequency, mastery goals predicted two accomplishment preferences (preferring hard over easy games [ß=.21, p<.001, adjusted R square=.16], enjoying time limits [ß=.19, p<.001, adjusted R square=.04]). And performance goals predicted the fourth (competing at a party rather than playing just for fun [ß=.20, p<.001, adjusted R square=.09]). Gender and gaming were significant predictors for three of the four accomplishment-related gaming preferences. However, achievement goal orientation increased variance explained over and above gender and gaming frequency. Furthermore, in every case either mastery or else performance goals emerged as significant, but never both. This finding supports the importance of distinguishing between these two kinds of achievement goal orientations.

5.3 Gaming Achievement Goals and Exploration

Our four gaming achievement player types are conceptually independent of exploration motivations. In other words, players can have both achievement goals and exploration motivations. We asked four forced choice questions that relate to exploration in games. Our questions included whether they might enjoy a game that emphasize exploration without competition, like to explore the game world beyond what is necessary to win the game, enjoy realistic details about people and places or prefer no "extraneous details," and enjoy playing the latest game rather than sticking with familiar games.

These exploration preferences were summed to form an exploration variable whose value could range from zero to four. Exploration was significantly different by gaming achievement goal player type. Non-achievers averaged 2.86 ($s.d.$=1.03) exploration points, performance-only types averaged 2.82 ($s.d.$=.81), mastery-only averaged 2.35 ($s.d.$=1.16), and super-achievers averaged 2.61 ($s.d.$=1.14) exploration points. One-way ANOVA showed that the differences were highly significant (F[3, 420]=4.05, p=.007). Players who had high mastery gaming achievement goals (super-achievers and mastery-only) were the ones who were least likely to expect to enjoy exploration in games.

Hierarchical multiple regression analysis confirmed that mastery gaming achievement goals negate exploration in games. Mastery goals significantly predicted exploration, ß=-.14, p=.009, adjusted R square=.05, indicating that high mastery was associated with lower exploration. Performance achievement and gender did not predicting exploration. But interestingly, gaming frequency did predict exploration, ß=.17, p=007, suggesting that people who play more games prefer exploration more.

Prior research on player types had assumed that achievers and explorers were mutually exclusive player types. What we find here is that all four gaming achievement player types engage in exploration. But those with mastery goals engage in significantly less exploration than those who lack mastery goals. On the other hand, performance goals do not appear to be at odds with exploration. Performance achievement player types were almost as high on exploration as were non-achievers.

6. CONCLUSIONS

Our findings provide strong support for further investigation into the construct of gaming achievement goals. Performance goals (the desire to play better than other players) were the predominant motivation for most avid gamers and more important than the desire to play well. Mastery approach and performance goals were correlated but appear to tap distinct and important dimensions of gaming goal orientation. Mastery approach goals positively predicted players' interest in accomplishment (prefer hard games and time limit), and negatively predicted interest in exploration. Performance goals predicted enjoyment of competing with others, but also playing easy games. Such preference may lead to dysfunctional learning because rather than challenging their ability, these players prefer to play casually to prevent losing. Non-achievers are also a key component of the gaming audience, particularly in the context of games for learning or cognitive exercise which are not voluntarily played. The nature of forced play experience, as experienced when games are used in structured learning or training environments, is that the gaming experience may be tailored towards specific kinds of players and not others who are also forced to play the game. The next step in our research program will be to try to link gaming behaviors and outcomes with gaming achievement orientation. The findings in this work speak to the following revelations for the process of designing forced play experiences:

Know the gender and gaming experience of your audience. Game design for male-only audiences can safely emphasize performance and super-achievement. But design for mixed gender audiences and female only populations should strongly consider the needs of non-achievers and players with mastery-only goals. Our findings should definitely help focus design emphasis accordingly on performance, mastery, or exploration. On average, females are more likely to be classified as non-achievers, with low performance and mastery gaming achievement goals. They are also less motivated by exploration or achievement. Female are more likely to prefer to play alone, and dislike competing to outplay other players. Non-gamers are the most difficult audience to design for since they are less motivated by achievement or exploration. Super-achievers tend to enjoy both achievement and exploration. A single game design is unlikely to appeal equally to these different audiences.

Interest in achievement rarely co-occurs with an absence of interest in exploration.

Achievers have typically been thought of as opposite to explorers. Our findings showed that most players are interested in both achievement and exploration. A small minority of players (those interested in mastery goals but not performance goals) are the ones most likely to only achievement without exploration, however only 16% of our samples were mastery-only achievers while performance-only achievers also tend to enjoy exploration.

The canonical "achiever" gamer type who eschews exploration is extremely rare compared to the existence of gamers who enjoy exploration either as part of pursuing achievement goals or in the absence of achievement goals. Achievement-oriented game elements (e.g. timers, scoring, leaderboards, etc.) have been common in digital games since their rise to popularity in the 1980's. However based on our findings, their use in forced play experiences should be done much more deliberately. This begs the question of "how do we design for non-achievers?" which is beyond the scope of our current results. The construct of exploration goals in gaming is underexplored. Research into underlying dimensions of enjoyment of exploration in games is warranted.

Introduce gameplay by presenting the game as a meaningful task, in which how well players play will influence received benefits (such as learning or cognitive exercise).

It is clear from our results what in hindsight is obvious, that games are played within a motivational context (or lack thereof). Simply forcing people to play a game which is well designed for learning does not mean the game will achieve the desired result. Players need to engage with the game, and how the game is introduced can help or hurt that engagement.

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