

# Building an MMO With Mass Appeal

## A Look at Gameplay in World of Warcraft

Nicolas Ducheneaut

Nick Yee

Eric Nickell

Robert J. Moore

*Palo Alto Research Center*

World of Warcraft (WoW) is one of the most popular massively multiplayer games (MMOs) to date, with more than 6 million subscribers worldwide. This article uses data collected over 8 months with automated “bots” to explore how WoW functions as a game. The focus is on metrics reflecting a player’s gaming experience: how long they play, the classes and races they prefer, and so on. The authors then discuss why and how players remain committed to this game, how WoW’s design partitions players into groups with varying backgrounds and aspirations, and finally how players “consume” the game’s content, with a particular focus on the endgame at Level 60 and the impact of player-versus-player-combat. The data illustrate how WoW refined a formula inherited from preceding MMOs. In several places, it also raises questions about WoW’s future growth and more generally about the ability of MMOs to evolve beyond their familiar template.

**Keywords:** multiplayer online games; player behavior; automated data collection; game design

### Introduction

World of Warcraft (WoW) recently took the world of online gaming by storm, achieving levels of success previously unheard-of for U.S.-based massively multiplayer online games (MMOs). Whereas MMOs in Southeast Asia (and in particular Korea) have routinely reported subscribers numbering in the millions (Woodcock, 2005), WoW far surpassed the pioneering EverQuest to place itself at the top of U.S. charts, claiming more than 6 million subscribers worldwide (Blizzard, 2006).

Multiplayer game designers have long been in search of the “magic bullet” that would help them break the coveted million subscribers mark. Numerous books (e.g., Bartle, 2004; Mulligan & Patrovsky, 2003) and research articles have been written

to either report on the workings of current MMOs or to offer suggestions about the design of future games in the genre. Most of this past work however suffers from one major limitation: a lack of large-scale, longitudinal data about the players' behaviors and their interaction with each game environment. Indeed, most of the current online gaming research tends to be based on self-reports obtained from the players using interviews (Yee, 2001), surveys (Seay, Jerome, Lee, & Kraut, 2004), or ethnographic observations (Brown & Bell, 2004; Taylor, 2003). Except for Ducheneaut and Moore (2004) and Ducheneaut, Yee, Nickell, and Moore (2006), no studies are based on data obtained from the games themselves. Yet, game designers recognize the need for a more systematic analysis of online games. At the recent Austin Game Developers Conference for instance, Ubisoft's Damion Schubert (2005) commented that "[Game designers] don't do enough data mining . . . we should let data analysis lead design."

In this article, we would like to answer Schubert's call by reporting on our observations of more than 220,000 World of Warcraft characters we studied over 8 months. To address the lack of large-scale longitudinal data about MMOs, we developed a data collection infrastructure based on automated bots placed in the game world to record information about each player's whereabouts and activities over time. We initially mined this data to better understand the social dimensions of playing WoW: how often players interact with each other, the size and prevalence of groups, and so on. These results are reported elsewhere (Ducheneaut et al., 2006). In another contribution to this issue we also use our data to take a closer look at guilds—persistent player associations that play an important role in multiplayer games (Williams et al., 2006 [this issue]). For the purpose of this article, we will use our data to describe instead how WoW functions as a game. In other words, we will focus on metrics that reflect the players' gaming experience: the time they spend at each level, the classes and races they choose and their impact on their progression in the game, and so on.

Surprisingly, this simple information has not been available from any MMO so far. To bridge this gap we therefore decided to present a descriptive account of gameplay in WoW that would frame the other contributions to this special issue, providing important background information about the basic mechanics of the game. As we will see, analyzing simple gameplay metrics also raises interesting questions about the potential and inherent limits of the current "MMO formula." Our contribution is structured as a detailed case study, highlighting the tough balancing act of designing a MMO with wide appeal and longevity.

We begin with a description of World of Warcraft for readers who might not be familiar with the game. Immediately thereafter, we describe our research methods in detail. We then describe the player's gaming experience in WoW, breaking down our analyses into three main areas: general play patterns (e.g., playing and leveling time), in-game demographics (e.g., character classes, races, and gender), and activities (e.g., raids in instances, travel). Each section ends with a summary where we

take a critical look at the data and discuss what WoW can teach us about designing current and future MMOs.

## World of Warcraft

World of Warcraft is based on a classic formula inherited from massively multi-player online role-playing games (MMORPGs) that has been available for many years. This game genre itself descends from earlier pen-and-paper role-playing games such as *Dungeons and Dragons* (Fine, 1983). But whereas the game genre is clearly not novel, WoW managed to expand its appeal significantly. After its launch by Blizzard Entertainment in November 2004, it became rapidly clear that WoW was going to surpass its predecessors' size and success: The game sold out during its first store appearance, attracting more than 240,000 subscribers in less than 24 hours (more than any other PC game in history), and its subscriber base progressively expanded to 1.5 million in March 2005, eventually reaching 6 million.

As in previous MMORPGs, WoW players first create an alter ego by choosing from eight races and nine character classes. The character classes can be roughly divided into types using familiar MMORPG archetypes (Ducheneaut & Moore, 2005): "melee"<sup>1</sup> classes that have to "tank" (take damage from) monsters (e.g., Warriors), "ranged" classes attacking from a distance with a bow or a gun (e.g., Hunters), and "casters" using various forms of magic, be it for "dps" (high damage per second, such as a Mage) or for healing other party members (e.g., Priests). WoW also has several "hybrid" classes combining two or more of these general abilities, at the cost of being less proficient in each than a specialist of the same type (e.g., Paladins are a combination tank/healer but neither as good in melee as a Warrior nor as proficient at healing as a Priest).

Players must also pick a "faction" to fight for: either the Alliance or the Horde. The Alliance is comprised of the Night Elves, Humans, Dwarves, and Gnomes; the Horde is comprised of the Orcs, Trolls, Taurens, and Undeads. Two of the nine classes are faction specific: Paladins can only be played with the Alliance, and Shamans are restricted to the Horde. Choosing a faction affects a player's experience significantly. On all servers, characters cannot communicate across factions: The text typed by a Night Elf for instance is automatically translated into gibberish by the system such that an Orc nearby will not be able to understand it. The only way to communicate across factions is through gestures (e.g., "/smile," "/wave"). On player-versus-player (PvP) servers, the impact of factions is even more important: In most of the game world, players can attack members of the opposing faction at will. On player-versus-environment (PvE) servers, player-versus-player combat is consensual, and players must turn on a "PvP flag" to signal their intentions and enable other players to attack them.

Once their character is created, players can begin questing in Azeroth, a medieval fantasy world broadly inspired from the works of authors such as J. R. R. Tolkien.

Azeroth is an extremely vast and richly detailed 3-D environment. Players can fight dangerous creatures (which as mentioned earlier may include other players) and explore the game's two continents alone or in the company of others while undertaking quests. The game allows players to form temporary parties of up to 5 people to tackle the most difficult quests and "raid groups" of up to 40 people for high-end "instances" (dungeons). Completing quests and killing "mobs" (monsters) allows them to earn "experience points" and reach progressively higher levels (60 is the current maximum), improving the abilities of their character and acquiring powerful items along the way.

The players also often join "guilds," a more permanent form of association than the temporary quest groups. A guild allows its members to differentiate themselves from others with a "guild tag" below their name and by wearing a custom "tabard" (a shirt with a color and icon selected by the guild officers). Guilds also have access to a private group chat channel shared between the members. They are usually described as the place where most of a player's important relationships are formed and frame a player's social experience in the game (Seay et al., 2004; Taylor & Jakobsson, in press; Yee, 2001)—a hypothesis tested in another contribution to this special issue (Williams et al., 2006).

## Interface

Players interact with the game and other players through an interface that closely resembles those of previous online games (see Figure 1). At the bottom, several rows of buttons allow players to perform game-related actions such as casting spells or turning on special abilities. Players communicate with each other by typing text in the "chat box" at the lower left of the screen. Several communication channels are available: private, one-to-one "tells," group chat, guild chat, "spatial" chat (heard by all players within a certain radius), and finally "zone chat," which reaches all the players in a given zone of the game (zone chat is further subdivided into four channels: general, trade, local defense, and "looking for group").

## Servers and World Geography

To break down the game's large subscriber base into more manageable units, players must choose a specific server to play on. Each server can host a community of about 20,000 players (there were 107 servers available in the United States at the time of our writing). Three server types are available. The most common is PvE where players cannot kill other players by default, unlike PvP servers. The third server type is role-playing (RP) for players who prefer to "stay in character" during the game.

On each server, the world of Azeroth is divided into two continents, each further subdivided into zones. Players can freely travel across these zones, either on foot or

**Figure 1**  
**World of Warcraft's Interface**



Source: World of Warcraft® provided courtesy of Blizzard Entertainment, Inc.

by using various forms of public transportation (e.g., boats). However, each zone is home to creatures of a particular level range (e.g., Tanaris is a 40 to 50 zone) and could prove deadly to lower-level players. Each race has a capital city (e.g., Ironforge for the dwarves) that plays an important role as transportation hub and place of commerce. Capitals also host an auction house where players can trade objects on an open market. As such, they tend to be densely populated and frequently visited.

## Method

We began our study of WoW by observing the game world from the inside and started playing right after its launch in November 2004. All authors created a main character and several “alts” (secondary characters) on different servers. We picked different character classes to get as broad an overview of the game as possible. We joined guilds and participated in the community’s regular activities (quests—alone or in groups, guild raids, PvP combat, etc.). This provided us with a rich qualitative background to frame our analyses.

We later moved to a complementary, more quantitative research approach. WoW has been designed such that its client-side user interface is open to extension and modification by the user community. In addition, the game offers by default a “/who” command listing the characters currently being played on a given server. These two features have allowed us to develop a custom application to take a census of the entire game world every 5 to 15 minutes, depending on server load. Each time a character is observed our software stores an entry of the form:

Alpha,2005/03/24 13:45:30,Crandall,56,Ni,id,y,Felwood,Ant Killers.

The aforementioned represents a Level-56 Night Elf Druid on the server Alpha, currently in the Felwood zone, grouped (“y”), and part of the Ant Killers guild. Using this application we have been collecting data continuously since June 2005 on five different servers: PvE(High) and PvE(Low), respectively, high- and low-load player-versus-environment servers; PvP(High) and PvP(Low), their player-versus-player equivalents; and finally RP, a role-playing server. Overall, we observed 223,043 unique characters. We then used the accumulated data to compute a variety of metrics reflecting the players’ activities, which we present in the following.

## Observations

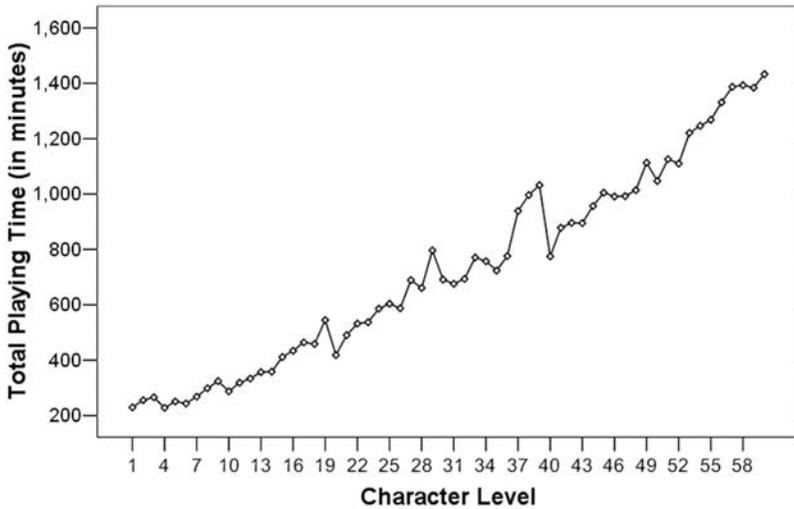
### General Play Patterns

#### *Playing Time*

We began our investigations with a simple question: How much time do players spend in WoW? To calculate every character’s total playing time over a 1-week period, we parsed through the census logs and accumulated each character’s time spent in the game. On average, each character spent 615 minutes ( $N = 76,364$ ,  $SD = 932.24$ ), or about 10 hours, in WoW during that 1-week period. The median was 216 minutes, or about 4 hours. Although these statistics are significantly less than the usage patterns reported elsewhere (Yee, 2006), it must be noted that the sample unit in this data set is each character and not each player. Furthermore, the game mechanics in WoW encourage creating Level 1 characters for storage or auction house trading purposes (i.e., “mules”), and this practice also affects the average playing time of characters. For example, 14% of the sample consisted of Level 1 characters, and of these, 38% did not advance above Level 1 during the 1-week period.

Nevertheless, comparing the average play times of characters of different levels does reveal interesting relative differences. For example, we notice that play time tends to increase by character level (Figure 2). This is probably due to a combination of several factors. First of all, casual players may be discouraged to continue leveling and stop playing. Second, players may increase commitment to playing as they increase in

**Figure 2**  
**Playing Time by Character Level**



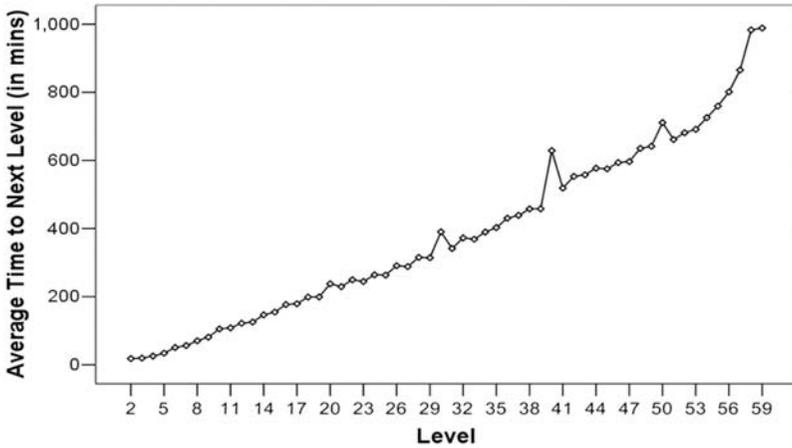
level. And finally, characters at the higher levels are probably those players who are in the habit of playing more hours per week than those characters at the lower levels.

Another trend revealed by the graph is the commitment spike right before every 10th level. This begins with the spike at Level 9, the more prominent spikes at Levels 19 and 29, and the very large spike right before Level 40. For example, Level 39 characters were played on average 1,032.43 minutes ( $N = 510$ ,  $SD = 1,033.55$ ), whereas Level 40 characters were played on average 774.62 minutes ( $N = 952$ ,  $SD = 877.27$ ) over the 1-week period. These commitment spikes are probably due to the distribution of new skills and talents in the game at different levels. There are more new skills learned at every 10th level, and the talent tree is designed to allow access to a new tier of talents at every 10th level. The spike right before Level 40 is more dramatic probably because characters also get access to traveling mounts at Level 40 in addition to the new set of skills and talents. In other words, players spend more time playing when they are just about to reach these high-reward levels. These findings are also congruent with well-known behavioral conditioning principles (Skinner, 1938).

### *Leveling Time*

We also calculated the average amount of time it takes to advance to the next level from any given level. To calculate these averages, we extracted all leveling events.

**Figure 3**  
**Average Leveling Time Across Character Levels**



A leveling event was defined as the time it took for a character to be observed at a new level from their previous level. Because part of the first leveling event may have occurred before the sampling window (i.e., a character was midway to Level 35 before the sampling window), we excluded the first leveling event we observed from all characters.

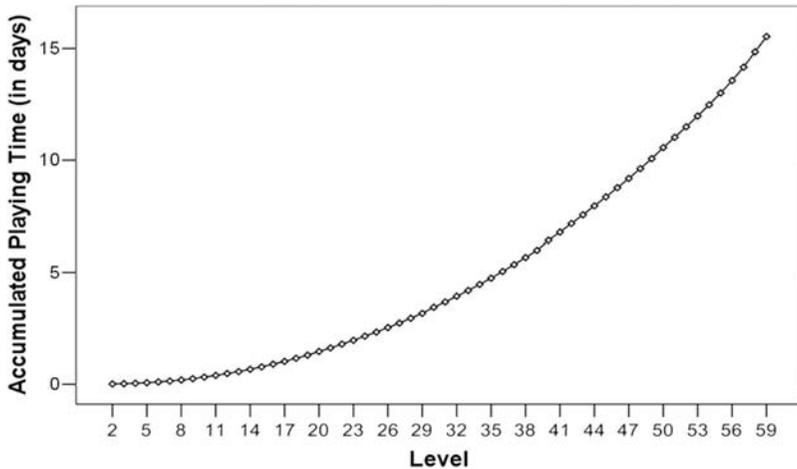
In the plot of average leveling time by character level (Figure 3), we can observe several trends. First, there is a mild step effect throughout. It takes characters less time to reach an even level and more time to reach an odd level. This effect is again more pronounced for Level 39 and Level 40. This step effect is probably due to the distribution of new skills at even levels. Indeed, across all character classes, players can “upgrade” their character with new abilities (more powerful spells, more damaging melee attacks, etc.) only at even levels. As such, players interested in new content have more incentive to reach an even level quickly and less incentive to do so for an odd level. Second, the time it takes to reach the next level increases in a linear fashion.

Overall, our data indicate that a player’s leveling time can be obtained with the following equation:

$$\text{Leveling Time (in minutes)} = (\text{Current Level} \times 14.0) - 44$$

If we assume that current Level 60s spent these amounts of time while reaching Level 60, then the average Level 60 character has an accumulated play time of

**Figure 4**  
**Average Accumulated Playing Time Across Character Levels**



15.5 days—a total of 47 8-hour workdays, or roughly 2 full months of workdays (Figure 4). Given that about 15% of all characters in WoW are Level 60, this means that about 15% of characters have spent roughly 2 full months of workdays in WoW. Again, it is hard to extrapolate this to actual players, but these statistics give a sense of the large amount of time the average player spends in these online environments.

#### *Rate of Advancement*

Another measure of advancement is the number of levels a character advances in a set period of time. This differs from leveling time in several ways. First of all, this measure gives us a rate of advancement for each character. Because our calculation of leveling times was an aggregate of leveling events, characters that leveled often contributed more to the sample than characters who made only one or two levels. Thus, creating a character-level metric would allow us to sidestep this confound. And second, efficient leveling times may not be equivalent to a high rate of advancement. After all, just because a character is efficient at leveling does not imply they want to make 10 levels a week. Thus, characters who are inefficient at leveling may have a higher rate of advancement than characters who are efficient at leveling.

To create this metric, we looked at the first 10 days and the last 10 days of August 2005 and included only those characters that were observed in both periods. This was done so that we did not include new characters that started toward the end of the

month—who presumably would have had less time to advance than those characters that were already there at the beginning of the month. This sampling method yielded 83,020 characters.

We calculated a standardized measure of level advancement as follows. A character's raw advancement is simply the number of levels the character has advanced. In this case, we subtracted the starting level from the ending level (i.e., end of month–beginning of month). The problem is that over a 1-month period, a 10-level advancement by a Level 1 character is much less significant than a 10-level advancement by a Level 50 character. In other words, the advancement needs to be qualified by the starting level. The method we used to standardize character advancement was to calculate the average (and standard deviation) of advancement for every starting level. In other words, compared with other characters who also started at Level 10, did this particular character level faster or slower than the average? We did this by calculating the  $z$  score of advancement for every character based on the average and standard deviation for their starting level.

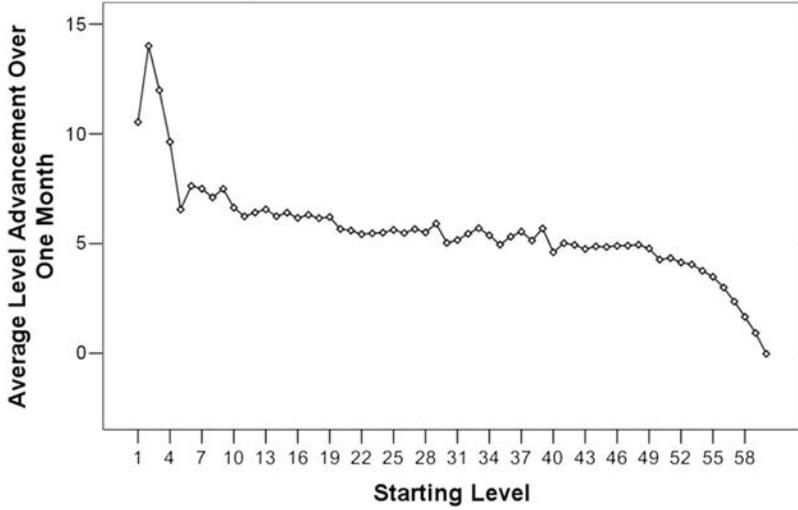
There were two large groups of characters that were excluded from this analysis. First, we excluded all characters who spent more than 90% of their time in a city. We presumed that these were mules of one kind or another and they would simply introduce too much noise. Namely, 6,393 (or 7%) of the original sample were excluded this way. Then we excluded all characters who were already Level 60 because by definition they could not advance anymore. This further excluded 14,408 (or 18.8%) of the remaining sample. Thus, we ended up with a sample of 62,035 characters. The means and standard deviations used to calculate the standardized scores mentioned earlier were actually derived from this sample so we were making consistent comparisons.

The plot of average level advancement over the month of August 2005 by the starting level is presented in Figure 5. It is interesting to note that players move very quickly through the first 10 levels. The game is designed such that the players experience rapid progress and frequent rewards during their first play sessions—an important design strategy to encourage continued play. The rate of progress is then fairly stable up to Level 50, at which points it drops precipitously. As we discuss later, by the time players reach this “endgame,” interest in WoW is not driven by achievement through leveling anymore: Group activities (e.g., high-end raids in instances to collect powerful items) replace basic quests, and gamers turn to reputation as a marker of achievement (Taylor, 2003).

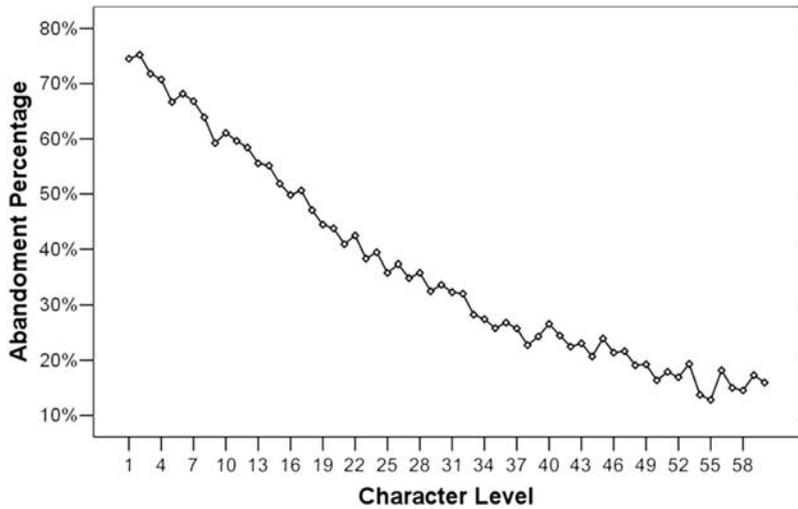
### *Character Abandonment*

Our longitudinal data collection method also allowed us to explore the rates of character abandonment (Figure 6). In a sample of 75,314 characters observed in the first week of June 2005, 46% were not observed in the first week of July 2005. The lower level the character, the less likely they were observed again in July. For characters

**Figure 5**  
**Average Level Advancement by Level**



**Figure 6**  
**Character Abandonment Rate by Character Level**



**Table 1**  
**Standardized Coefficients of Variables Used in Multiple**  
**Regression of Character Abandonment**

Variable	Beta	<i>t</i>	<i>p</i>
Guild size	-.00	-1.0	.31
In guild	-.09	-21.58	< .001
Play time	-.19	-52.17	< .001
Level	-.29	-74.07	< .001
Group ratio	-.04	-9.71	< .001

Level 10 and below, 71% were not observed 1 month later. For characters Level 50 and above, only 16% were not observed 1 month later.

This high level of “churn” is not unheard of in MMOs. Industry veterans for instance mention that only 40% of new subscribers remain in a game for more than 2 months (Mulligan & Patrovsky, 2003). Our numbers seem to corroborate this information, and overall, it does not seem that WoW is necessarily more “sticky” than its predecessors. It is also clear that the design of early levels is crucial because players build up their commitment to the game as the level of their character increases. Interestingly, the rate of character abandonment by level decreases linearly, whereas the design of the game apparently creates three progression stages (Figure 5: initial fast progress, a fairly lengthy period of linear progress, and finally slow progress). It would probably be valuable for game designers to experiment with the interplay between these two curves, with the aim of fine-tuning the reward structure such that the abandonment rate drops more quickly in the early stage of the game.

#### *Predictors of Character Abandonment*

The character abandonment data allowed us to explore which variables were the best predictors of character abandonment. From the first week of June, we derived the following variables: whether the character was in a guild or not, the size of the guild, the character’s play time, the character’s level, and the amount of time the character spent in a group. We then ran a multiple regression with character abandonment as the dependent variables and the mentioned variables as the predictors.

Our model had an adjusted  $R^2$  of .22 (Table 1). The best predictor of character abandonment was the character’s level, followed by the character’s play time. Characters in a guild were significantly less likely to abandon a character than characters not in a guild, but interestingly, as long as a character was in a guild, the size of the guild was not important. The amount of time a character spent in a group, although a significant predictor, plays a trivial role when compared with the character’s level and play time.

### *Summary: A Fine-Tuned Reward Structure*

Although WoW is often portrayed as a more “casual” game than its predecessors (Kasavin, 2004), it is clear players still invest a significant amount of time in the game. It is particularly interesting that play time is apparently greatly influenced by WoW’s rewards structure (alternating levels with and without new skills, “milestone” levels opening up new content such as mounts or talents, and a slow but steady increase in required play time with each level). Part of WoW’s appeal might be due to a carefully crafted path of advancement that is reminiscent of behavioral conditioning principles (Skinner, 1938), where incentives and rewards are distributed to maximize player commitment. Once players are really invested into the game, activities switch to a different endgame (Bartle, 2004) where the focus is less on leveling up and more on accumulating powerful items and accruing reputation (Taylor, 2003).

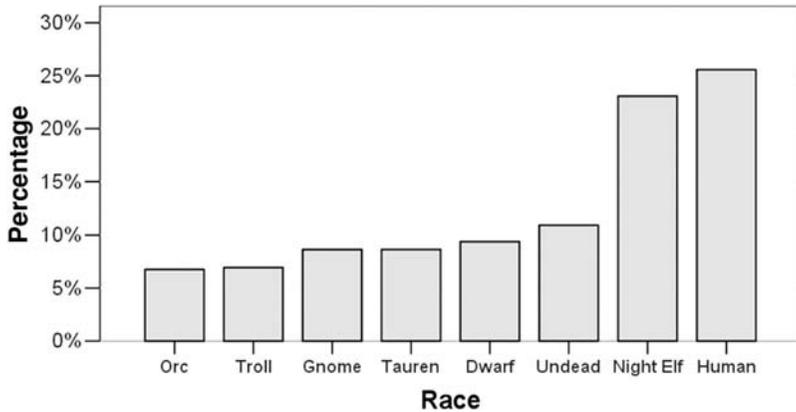
WoW is known to have been one of the longest MMOs to develop. Our numbers show the time that was spent polishing the game’s mechanics might have been a sound investment: Play time and level being the most significant predictors of character abandonment, it makes a lot of sense to optimize the game’s advancement curve to give players the sense of achievement they are looking for and therefore to keep them playing (and paying) as long as possible. But although WoW refined the classic MMO formula to great success, we note that player churn remains high, indicating that overall the game remains unattractive in the long run for a large number of players. An important question then emerges: Has WoW reached an unbreakable threshold and maximized its attractiveness to players? Or could the game (and MMOs in general) be improved such that the 46% who leave after a month (and the end of their free trial) remain longer?

### **In-Game Demographics: Class, Race, and Genre**

As we mentioned earlier, WoW is based on a medieval fantasy universe (elves, orcs, mages, warriors, etc.) that is now a familiar part of popular culture (Fine, 1983). A very large number of MMOs have used a similar template in the past, and yet little is known about how these widespread archetypes are used by the players and how they eventually affect their experience in the game.

To shed more light on this issue we used our census data to explore the popularity of each race and class. In our sample ( $N = 76,364$ ), Humans and Night Elves are the most popular races (25% and 23%), far beyond any other, whereas Orcs are the least popular (7%) (see Figure 7). Moreover the Alliance (the forces of “good” in WoW) outnumbers the Horde (their “evil” counterpart) 2 to 1. These numbers are particularly interesting considering that beyond minor race-specific game advantages (e.g., Taurens have a small bonus in herbalism, Humans are slightly better with swords, etc.), the differences between races are essentially cosmetic (e.g., Night

**Figure 7**  
**Character Race Distribution**



Elves are tall, dark, and mysterious; Orcs are stocky, green, and somewhat intimidating with large fangs; etc.; see Figure 8).

The players' apparent reluctance to play "ugly" and "bad" characters could indicate that despite the anonymity of virtual worlds and their potential for experimenting with different identities (Turkle, 1997), social and cultural norms still shape an individual's choices in virtual worlds powerfully. In particular, the more "politically correct" races and classes are apparently more popular.

The data on class preferences illustrate a different trend (Figure 9). Although the differences are less pronounced than they are with races, a group of three classes (Warrior, Hunter, and Rogue) stands out as the most popular. It is interesting to note that, as we discussed elsewhere (Ducheneaut et al., 2006), these classes tend to be the most "soloable" in the game—that is, they survive fairly well outside of groups compared to "weaker" classes like the Priest who are more dependent on the support of a tank taking hits while they cast spells at a distance.

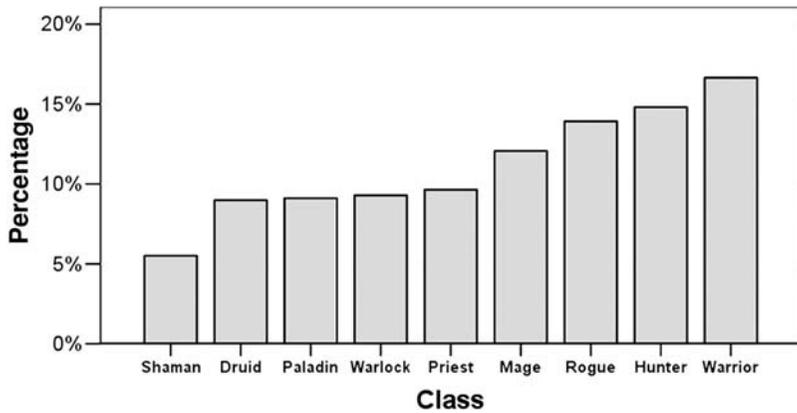
In fact, WoW's four healing classes (Shaman, Druid, Paladin, Priest) are all among the least popular. This lack of popularity is all the more interesting considering that the presence of healers is one important characteristic setting MMOs apart from other online genres (e.g., first-person shooters, FPS, or real-time strategy, RTS, games). Although Blizzard designed these classes such that they can function as well as possible independently (e.g., Priests are not limited to healing, they also have offensive spells), it still looks as if support roles are less in favor than others. This could be a reflection of WoW's success at attracting players from other, more action-oriented

**Figure 8**  
**An Orc and a Night Elf**

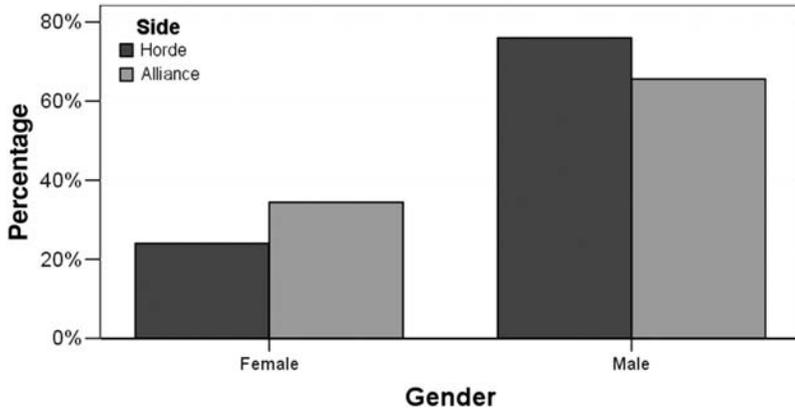


Source: World of Warcraft® provided courtesy of Blizzard Entertainment, Inc.

**Figure 9**  
**Character Class Distribution**



**Figure 10**  
**Gender Distribution by Faction**



genres: Being less familiar with the notion of a healer, these newcomers might pick the more offensive classes by default.

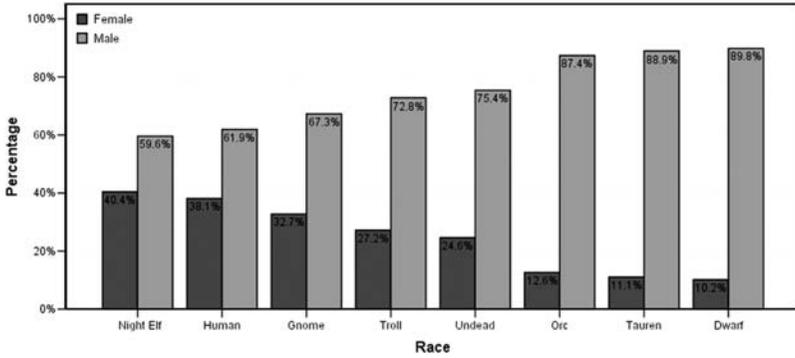
Gender-bending is a much discussed aspect of playing online games (Yee, 2005). Although our bots obviously cannot collect information about each player's real-life gender, our census data still allow us to observe the distribution of character gender across races and classes, revealing interesting divisions.<sup>2</sup> Overall, there is a higher percentage of female characters on Alliance side than on Horde side (34.4% vs. 24.0%), see Figure 10.

A more fine-grained analysis shows the underlying difference. The top three races with the most female avatars are Alliance races—Night Elves, Humans, and Gnomes (Figure 11).

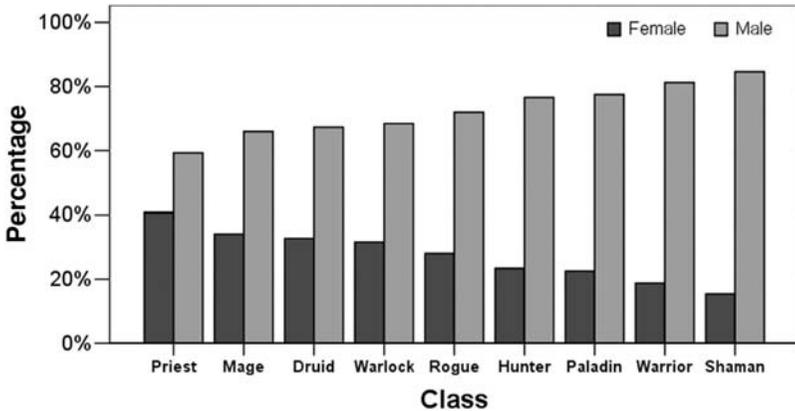
The gender distribution by class is also interesting (Figure 12). Among Priests, there are almost equal numbers of male and female characters (40.4% vs. 59.6%). On the other hand, there is a great gender disparity among Shamans (10.2% vs. 89.8%).

The gender distribution by class is interesting in that it seems to reflect stereotypical assumptions of those classes. For example, the classes with the highest female ratio are all healing or cloth-wearing classes. Given that most of WoW's players are male (Yee, 2005), this suggests that male players gender-bend at different rates depending on the class they choose. In other words, male players who play Priests are more likely to gender-bend than those who play Warriors. Thus, real-world stereotypes come to shape the demographics of fantasy worlds. The aesthetic preferences we mentioned earlier in the context of races also seem to be reinforced when taking in-game gender into account, with players clearly favoring the "sexy"

**Figure 11**  
**Gender Distribution by Race**

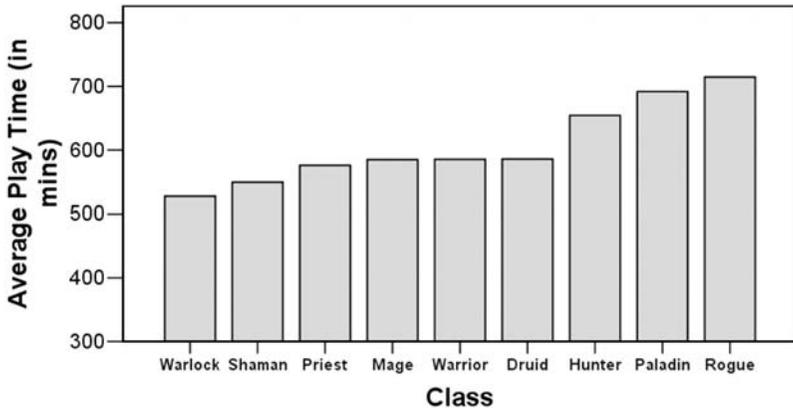


**Figure 12**  
**Gender Distribution by Class**



female Night Elves (source of much derision in the player community, with stories of male teenagers mesmerized by these characters’ “dance” animation) to their perhaps less visually pleasing Dwarven counterparts. As in earlier, text-only environment, WoW can therefore be a place for “identity tourism” that far from projecting a balanced view of gender and race instead perpetuates the domination of certain canons of morale and beauty (Nakamura, 2000).

**Figure 13**  
**Average Play Time by Class**



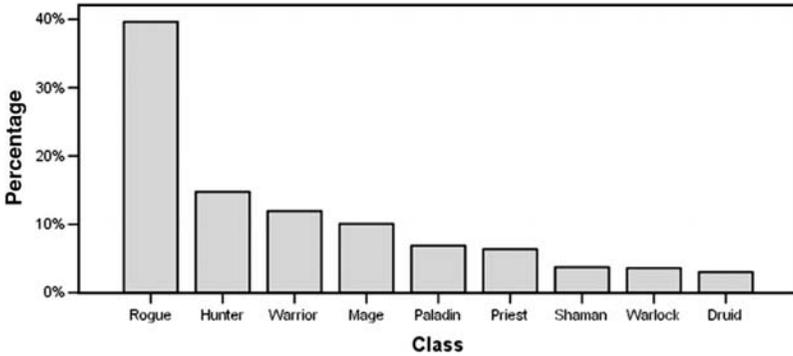
### *Play Time and Class*

We also compared the average weekly play times of different classes (see Figure 13). The range between most and least weekly play times was about 3 hours,  $F(8, 76,363) = 39.41, p < .001$ . Rogues spend about 3 more hours online than Warlocks each week.

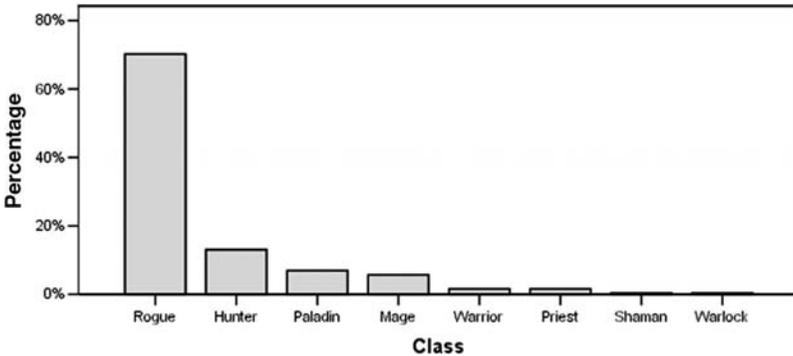
Of course, it is difficult to draw any firm conclusion from these differences due to the lack of data about each player's motivations. It could be that Rogues are easier to play and encourage their players to stay longer in the game, or it could be that "hardcore" players who play longer tend to choose Rogues more than any other class. Still, these data allow us to explore an important phenomenon in more detail: "gold farming" (Lee, 2005). A farmer is "a general term for a person who acquires in-game currency in a MMO through collecting items and money that can be obtained by continually defeating enemies within the game" (Wikipedia, 2006). This currency is then often sold for real-world currency such as the U.S. dollar.

Farming is a controversial practice, and our goal here is not to discuss it in depth. Our data however can help measure the prevalence of the phenomenon. Indeed, our experience in the game and discussions on Blizzard's forums indicate that farmers predominantly choose Rogues. This makes practical sense: Rogues have a "stealth" ability allowing them to sneak past low-value mobs and go directly for the most profitable items; they also generate high damage and can run through many mobs quickly, increasing the player's chances of getting a valuable "drop." In parallel, investigations into the farming business indicate that professional farmers spend a lot of time in the game, sometime to the extent that a character might be constantly online and played in shifts by two or more individuals (Lee, 2005).

**Figure 14**  
**Distribution of Classes at the 99th Percentile of Play Time**



**Figure 15**  
**Distribution of Classes at the 99.9th Percentile of Play Time**

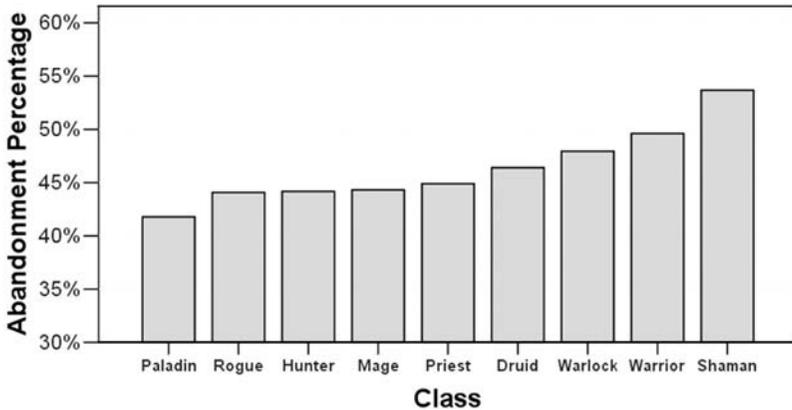


In an attempt to identify farmers we isolated characters with the highest play time. If we focus on the top 99% percentile, we obtain 2,413 characters with the following class distribution (Figure 14). The time cut-off at the 99% mark was 5,532 minutes over a 2-week sample, which amounts to 7 hours online per day.

The trend is even sharper if we only take the top 99.9% percentile of play time ( $n = 245$ ). Here the cut-off is 12,637 minutes—that is, a considerable 15 hours per day. Rogues and Hunters together account for 85% of characters in that range (Figure 15).

The large asymmetries we see here cannot be due entirely to chance and tend to corroborate the hypothesis that Rogues (and Hunters to a lesser extent) are used

**Figure 16**  
**Character Abandonment Rate by Class**



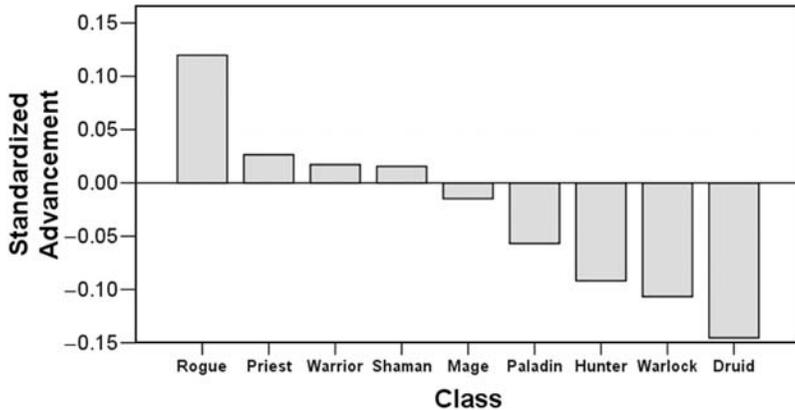
beyond what even the most hardcore players would do. Focusing on the most extreme pattern, we find 245 potential farmers across five servers in a 2-week period. Although the numbers are large, they certainly do not represent the “farmer invasion” that many players fear. Still, there is little doubt a significant farming industry already exists. If we extrapolate our information to the 107 U.S. servers in operation, there could be potentially  $107 / 5 \times 245 = 5,200$  farming characters in operation in the United States alone.

### *Class Abandonment*

Using the measure of character abandonment described earlier, we tabulated abandonment rates by class (Figure 16). There were significant differences,  $F(8, 75,313) = 33.51, p < .001$ . The analysis showed that Shamans are the class most likely to be abandoned (54%), whereas Paladins are least likely to be abandoned (42%).

There are two ways of interpreting these data. One is to focus on the game mechanics themselves, which might lead us to think that Shamans are abandoned because the class is not enjoyable to play, whereas Paladins have a low abandonment rate because the class is very enjoyable. Another way is to focus on the personality and motivational differences between players who choose different classes in a game. This might lead us to wonder whether players who choose Shamans are very different from those players who choose Paladins. Data from the Daedalus Project show some of these potential motivational differences (Yee, 2005). For example, players who choose to play Shamans tend to be significantly more competitive than

**Figure 17**  
**Standardized Advancement Rate by Class**



players who choose to play Paladins. These two sets of data do not make clear the individual contribution of these two factors, but it must be kept in mind that the census data we are exploring is produced by the interaction between game mechanics and player preferences.

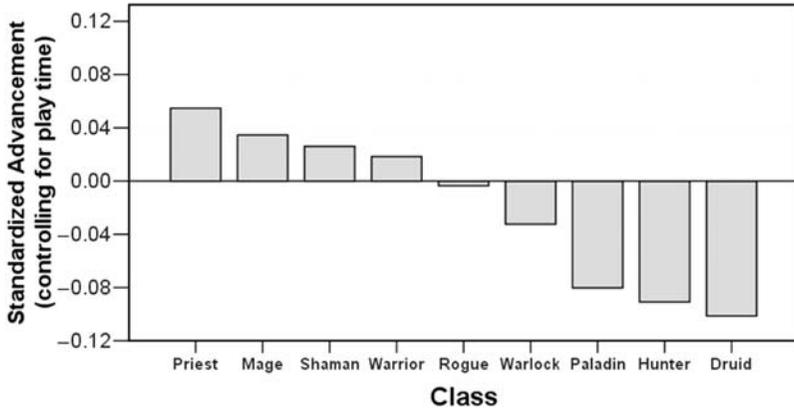
#### *Rate of Advancement by Class*

There were also significant differences between rate of advancement among the different classes,  $F(8, 62,034) = 42.61, p < .001$  (see Figure 17). In particular, Rogues leveled significantly faster than all other classes (Tukey post hoc test,  $ps < .001$ ).

But to a certain extent, this conflates level advancement by playing time. For example, Rogues actually also spend more time playing than most other classes. If we control for playing time, we get a more precise sense of actual “rate” of leveling (Figure 18). The huge drop for the Rogue means that most Rogues play more than other characters and that this is what leads to their higher level advancement, but once we take their higher playing time into account, they are not the fastest levelers overall. The actual fastest levelers are Priests, but because they spend less time playing, their actual level gain is less than Rogues.

Again, it is hard to tease out the relative contributions of game mechanics and player motivations. Note however that two of the fastest leveling classes, Priest and Shaman, are among the least popular healing category we discussed earlier. If we hypothesize, as we did earlier, that healing classes are not popular among MMO newcomers, we would expect these classes to be played by more experienced players and

**Figure 18**  
**Standardized Advancement Rate by Class Controlling for Play Time**



therefore to level faster. Our numbers are far from conclusive but tend to support this possibility.

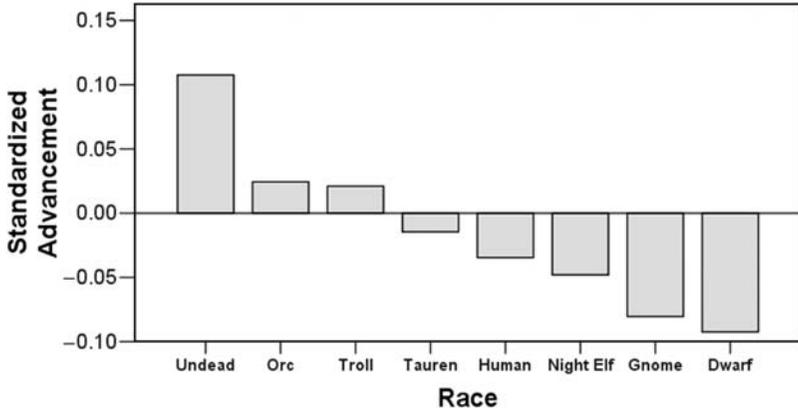
#### *Rate of Advancement by Race*

The race differences were a little more interesting in that the top four races were the Horde races and the bottom four races were the Alliance races (Figure 19). The split was surprisingly clean. The split also closely matches data from the Daedalus Project (Yee, 2005) on motivational differences between players who choose Horde versus Alliance.

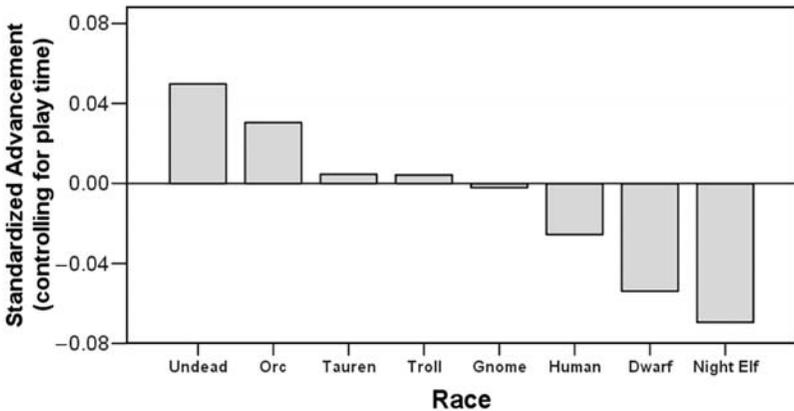
Again, there are differences in playing time among characters of different races. Notably, Night Elves play just as much as Undead, which is surprising given the advancement difference. If we plot out the average level advancement controlling for playing time, we see this difference more clearly (Figure 20).

So the Undead level the most over a month, spend the most time playing, and are actually also the fastest levelers. Night Elves on the other hand spend almost as much time playing but are the slowest levelers of all the races. This matches our experience in the game and conversations we have seen on player forums. New and less experimented players tend to pick “friendly” races initially: The forces of “good” portrayed in popular movies like *Lord of the Rings*, for instance. The Alliance races “look good” and can be more attractive at first. Conversely, achievement-oriented MMO players tend to pick the “bad guys,” either because they already tried the other side and want to experience something new or quite often, explicitly to avoid playing

**Figure 19**  
**Standardized Advancement Rate by Race**



**Figure 20**  
**Standardized Advancement Rate by Race Controlling for Play Time**



with *noobs*<sup>3</sup> (a derogatory term for inexperienced players). Our numbers clearly show this Horde bias toward achievement.

Coupled with our previous data on class popularity and leveling rates, a picture emerges reflecting a fairly clean fracture between two player populations in WoW.

On one hand, a group of newcomers to the genre picks “action-oriented,” solo classes from the better-looking races of the Alliance (Night Elves, Humans). On the other hand, a group of more experienced and achievement-oriented players selects more group-oriented “support” classes from the most “evil” races of the Horde (Undeads, Orcs). Of course this is clearly an oversimplification: We simply want to point out two broad trends reflecting the diverse ways in which players relate to their race and class. The fairly wide number of options available in WoW supports this differentiation and probably helps attract a broad range of players. We wonder however if Blizzard intended such a clean cut between the two factions. Indeed, it can have some negative consequences in terms of game balance. On many servers, for instance, the Horde/Alliance imbalance seriously limits the number and quality of matches in the Battlegrounds (arenas where groups of players from each faction collectively battle against each other, leading to valuable rewards; battlegrounds open up only when a large enough and balanced number of players from each side sign up for them).

*Summary: Redefining the Meaning of Classes, Races, and Gender*

The data presented in this section highlight the importance of taking into account factors that exist outside of the game—player gender, personality, and motivations—when making sense of data within the game. For example, the differing leveling rates of classes are not solely based on their effectiveness inside the game. Players select classes on the basis of their own motivations of play, and the leveling rates we see closely match how achievement oriented the players are for different classes (Yee, 2005).

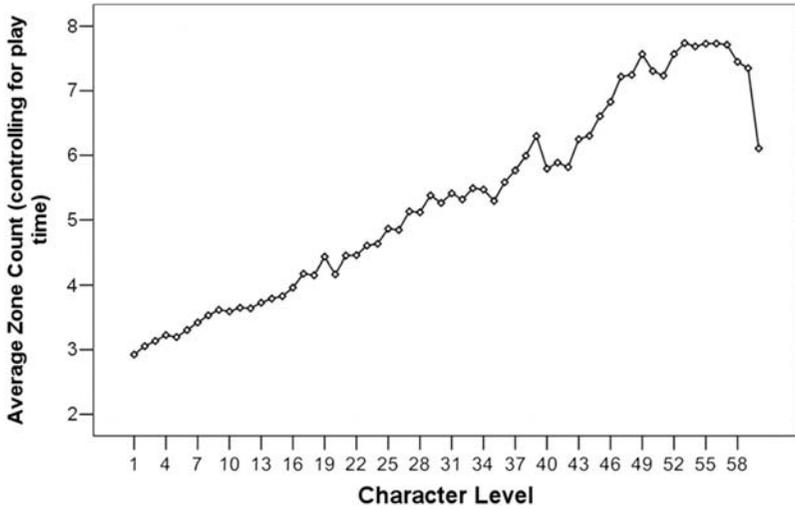
Still, it remains possible to use in-game demographic data exclusively to identify interesting trends. The surprisingly large number of Rogues played almost continuously for instance is probably an indicator of gold farming activities. The clean split in leveling rates between Horde and Alliance also illustrates how players can easily self-segregate into groups of fairly homogenous backgrounds and aspirations, potentially leading to game imbalances. And finally, the distribution of races and classes clearly indicates strong preferences for characters fitting stereotypical canons of morale and beauty, perpetuating offline norms in virtual environments.

## Activities

*Traveling in Azeroth*

The log samples also allowed us to explore how players “consume” the game content, that is, which areas of the game world they visit and how often they do so. We began by counting the number of different zones each character had been in over a period of 1 month. One potential confound we tried to deal with was accidental

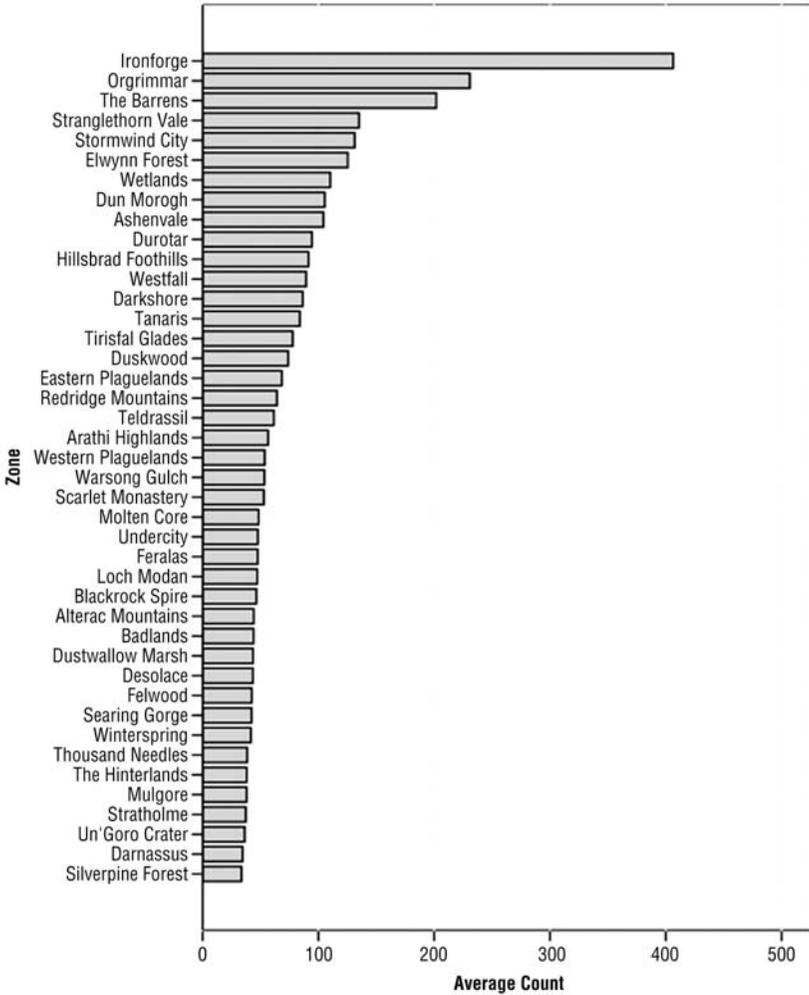
**Figure 21**  
**Average Zone Count by Character Level Controlling for Play Time**



zone logging due to flight paths. We did not want to count a zone if a character was simply flying through that zone when the census was taking place. To resolve this, we only counted a zone as being unique if a character is seen in that zone for at least two consecutive census snapshots.

Our data showed that zone count increased gradually over level with noticeable spikes at Levels 19, 39, and 49. The most noticeable of these spikes occurs at Level 39. This matches the spike in playing time. Thus, it seems reasonable to hypothesize that players play harder at these levels and are more likely to spend more time playing as well as being more willing to move into a larger variety of zones. Because average zone count correlates highly with time played ( $r = .81$ ), we replotted the graph controlling for play time to give a better sense of how widely traveled characters are at different levels (Figure 21). Most of the graph’s features remained the same, with one important exception: The data showed a sharp drop for Level 60 characters. In other words, Level 60 characters spend significantly more time playing than lower-level characters, but if we account for playing times, Level 60 characters actually are less adventuresome than the average Levels 50 to 59 characters. In fact, the travel patterns of Level 60 characters approximate those of Levels 43 to 44 characters. This is probably due to the shift from quests to high-end instances as the latter are located in a limited number of areas.

**Figure 22**  
**Average Zone Count**



We also tabulated zone populations. Unsurprisingly, Ironforge and Orgrimmar (both major trading posts and flight hubs for each faction) were the most populated zones (Figure 22).

It is interesting to note important differences in the popularity of similar zones, however, as it probably reflects the impact of their design on player activities.

Darnassus, for instance, is also a capital city (for the Night Elves), offering services that are entirely similar to Orgrimmar and Ironforge (large number of merchants, trainers, a bank, etc.). Yet it is one of the least visited places in the game, which is all the more surprising considering Night Elves are the most popular race. Its location probably explains this low use: Darnassus is an isolated island in the upper left corner of Azeroth, connected to the mainland by a single flight point or by an even slower boat. As such, Darnassus illustrates how players always try to optimize their play time: A Night Elf faced with a lengthy trip back to Darnassus for training or a much shorter one to Ironforge will most probably choose the latter. No matter how beautifully designed a zone is (and Darnassus is beautiful, with a unique “elvish” aesthetic), players will apparently favor expediency over sightseeing.

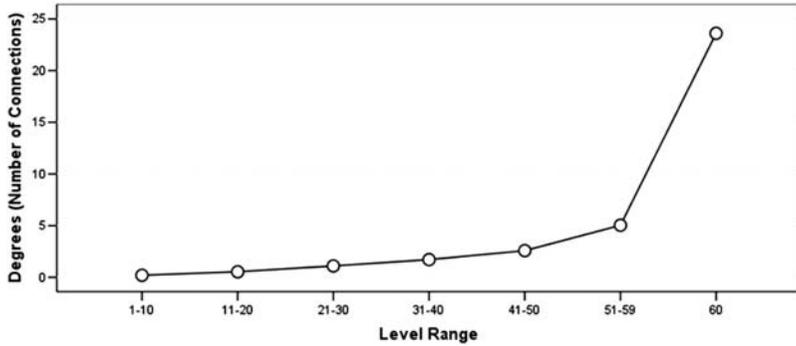
In a similar vein, some zones catering to the same level ranges are visited very unevenly. Stranglethorn Vale or STV (Levels 35 to 45 approximately) is much more popular than Desolace (same range). Location probably plays a role here again: STV is connected to other areas by two major flight points and several maritime routes. The density of game content available is also a probable factor: STV offers a large number of quests, most grouped in tight areas, which facilitates “grinding” experience points at an accelerated rate. Finally the Horde and Alliance flight points and quest areas are tightly packed, which on PvP servers almost guarantees opportunities for player-to-player combat (and leads to STV being called, among other things, “Ganklethorn Vale”—being “ganked” is the act of being attacked by players of the opposing faction, often of higher level, while conducting other activities).

So overall, despite offering a vast world with many opportunities for travel, activities in WoW appear to be concentrated into a surprisingly small number of areas. This should not be particularly surprising considering the players’ tendency to optimize their play time. The fact that some zones are restricted to high-level players and that there are fewer of them than beginners is also an important factor, but it does not explain all the difference. Our data indicate the crucial importance of carefully designing an MMO’s transport network: A tough balancing act must be achieved where players still feel a sense of space and travel yet transportation time is minimized to guarantee maximum accessibility to all areas.

### *The Endgame: Playing WoW at Level 60*

Anecdotally and from some of our earlier data, the game at Level 60 is entirely different from the game pre-60. Above all, level advancement is no longer the goal, and most guilds become raid and instance oriented. We wanted to explore this shift in more depth. To do so, we decided to reuse social network metrics from an earlier study (Ducheneaut et al., 2006). In particular, we calculated the degree (number of guildmates played with), centrality (proportion of guildmates played with), and weight (overall time spent in groups) for each character and found their means according to their level range.

**Figure 23**  
**Average Degree by Level Range**



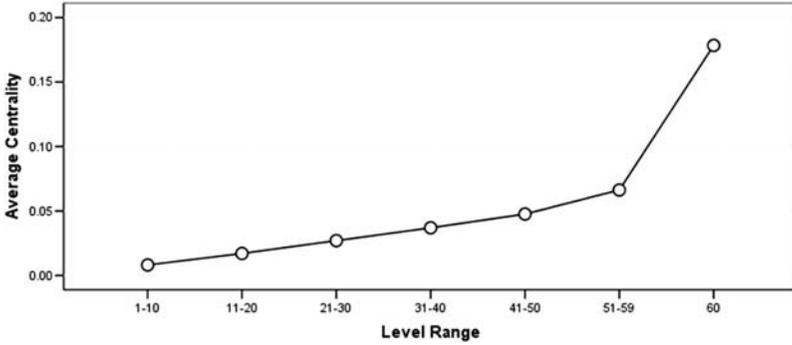
The data suggest a sudden shift at 60 rather than a gradual change,  $F_s(6, 102,242) > 3,700$ ,  $ps < .001$ . Figures 23, 24, and 25 are graphs showing the difference for the three metrics mentioned.

It is quite clear that at Level 60, WoW becomes a much more intensely social game—an interesting contrast to the earlier stages of the game where a large majority of time is spent alone, as our previous analyses revealed (Ducheneaut et al., 2006). At Level 60, characters progress not through experience points but through the acquisition of more and more powerful items (“epic gear”). “Epics” are “dropped” by creatures in instances that to be defeated require groups of at least 5 but more often 20 or even 40 tightly coordinated players. These high-end raids are significant undertakings requiring a lot of planning and in-game communication—the latter being clearly reflected in our social network metrics.

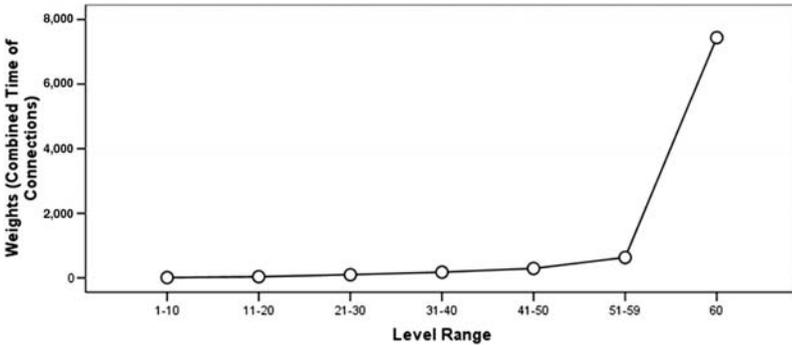
As such, it is clear that WoW is in some sense two games in one. For some players the game does not really begin until they reach the endgame. The leveling necessary to get there is simply something to be endured and minimized, which goes a long way toward explaining why so many players do not group and level up quickly in the early stages of their character’s development (Ducheneaut et al., 2006). Others make a more leisurely progress through the game and enjoy the early stages of the game. They might then find the endgame too hardcore (Taylor, 2003) for their taste and either leave, start a new Level 1 character, or transition to a new play style and join other “raiders” in high-end instances.

We wondered however how many of the Level 60 characters really manage to organize and participate in these complex high-end raids. Indeed, Blizzard has openly focused a great part of their ongoing design efforts on adding more high-end

**Figure 24**  
**Average Centrality by Level Range**



**Figure 25**  
**Average Connection Weights by Level Range**



instances, and some have criticized them for favoring hardcore players over their more casual counterpart. This debate is neither new nor specific to WoW and reflects the difficulty of designing a game appealing to a wide audience. To shed more light on the issue, we tried to assess how many characters participated in high-end content such as Molten Core or Zul’Gurub.

In the month of January, we tracked 223,043 characters. Of these, 11,098 (5%) spent time in high-level raid content. The majority of these were Level 60 (as

expected)—99.4%. The remainder were levels 56 to 59 (0.06%). Of all the Level 60s, 30% have spent time in raid content. On average, characters who spent time in raid content spent 310 minutes (about 5 hours) over the month of January in raid content.

Pushing our analyses further, we also note that of those who spent any time in raid content, 28% spent less than an hour in it. In other words, only 72% of these characters spent more than an hour in raid content. Thus, 3.6% of all observed characters spent more than an hour in raid content over the month of January.

These numbers might appear quite low at first, and they tend to substantiate criticisms we mentioned earlier: namely, that a disproportionate share of design effort is spent on content consumed by a tiny minority of players. However, we have to bear in mind that the 3.6% of the population we identified are most probably among the most “die-hard” players. As in any online community (Kim, 2000), this core player base is probably the most vocal and quite influential: They attract new players through word of mouth and often act as “glue” between their more casual counterparts. From a marketing standpoint, it therefore makes sense to keep them as happy as possible. But on the other hand, it also shows, like some of our earlier analyses in this article, that WoW is less casual than claimed: The game is clearly designed to steer players toward more and more hardcore activities requiring a lot of time and effort. In this, WoW is not different from any of its predecessors in the genre.

### *Server Differences: The Impact of Open PvP*

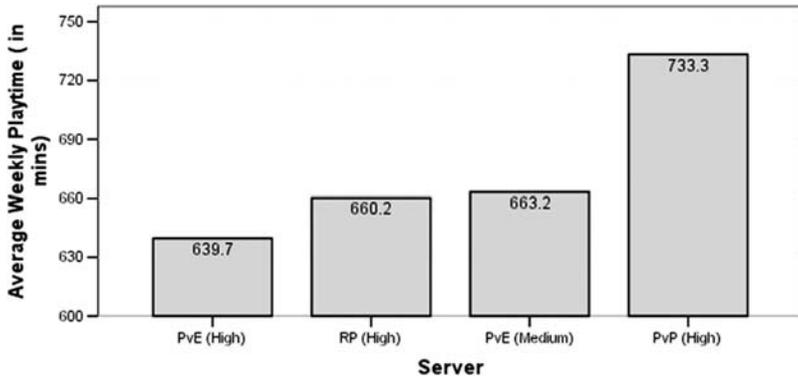
Player-versus-player combat is notoriously hard to design for a MMO (Bartle, 2004), but Blizzard embraced it right from the beginning. A large number of servers are open PvP (players can be attacked almost at will in most of the game’s areas). Even in player-versus-environment or role-playing servers, players have the option to turn on a PvP flag signaling their willingness to fight with other players. All servers also feature Battlegrounds (Warsong Gulch, Arathi Basin, and Alterac Valley) where players can sign up for large-scale faction warfare.

We wanted to explore whether open PvP environments strongly differ from their alternatives. The observed difference was largely driven by the PvP server,  $F(2, 140,843) = 171.69, p < .001$ . Characters on PvP servers played about an hour more (~70 minutes) over a 1-week period than characters from the RP and the two PvE servers we observed,  $ps < .001$ . The average character play time in this sample was 11.2 hours, about a 10% difference of the mean (Figure 26).

Although one might expect that characters on PvP servers could be more inclined to be in a guild (for safety in numbers, etc.), the data did not bear this out. Overall, guild involvement rates were comparable across server types and level ranges (Figure 27).

We might have also expected that guilds on PvP servers would be larger in general given the demands on survival. This also did not bear out with the data. We created a

**Figure 26**  
**Differences in Play Time Across Servers**



Note: PvE = player versus environment; RP = role-playing; PvP = player versus player.

list of every guild that was observed and the total number of unique characters observed to have that guild tag. There were significant differences,  $F(2, 140,842) = 1221.22$ ,  $p < .001$ , but it was between the RP server and the other two server types,  $p < .05$  (Figure 28).

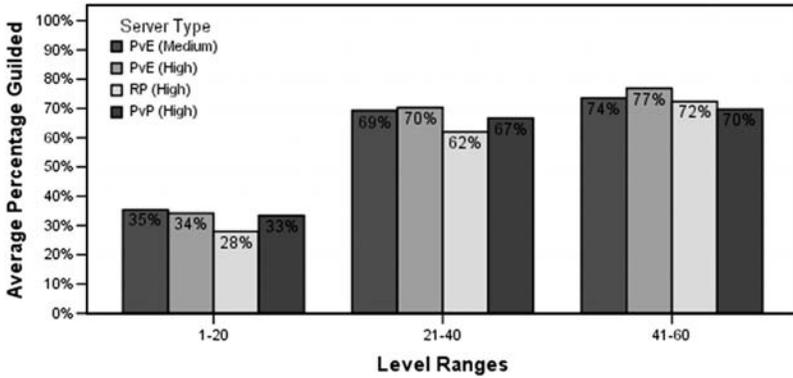
Still, characters on the PvP server were observed to be in a group more often than characters not on PvP servers,  $F(2, 140,842) = 202.49$ ,  $p < .001$ . Overall, the difference was about 30% versus 25%. The increased grouping ratio seems to be reflected across all 60 levels (Figure 29).

Messages on forums seemed to suggest that it was harder and took longer to level on PvP servers than on non-PvP servers. Although we did find a significant difference,  $F(2, 149,231) = 501.31$ ,  $p < .001$ , it was almost in the opposite direction. Controlling for character level, characters on the PvP server leveled faster ( $M = 189.78$ ,  $SE = .63$ ) than characters on PvE ( $M = 219.65$ ,  $SE = .64$ ) or RP servers ( $M = 211.74$ ,  $SE = .84$ ),  $ps < .001$  (Table 2). In fact, perhaps the need to level is more salient on PvP servers than non-PvP servers and outweighs the difficulty of leveling: After all, it is only at Level 60 that the probability of being outmatched by an opponent of higher level is reduced to 0.

#### *Summary: Designing Content for All Player Types*

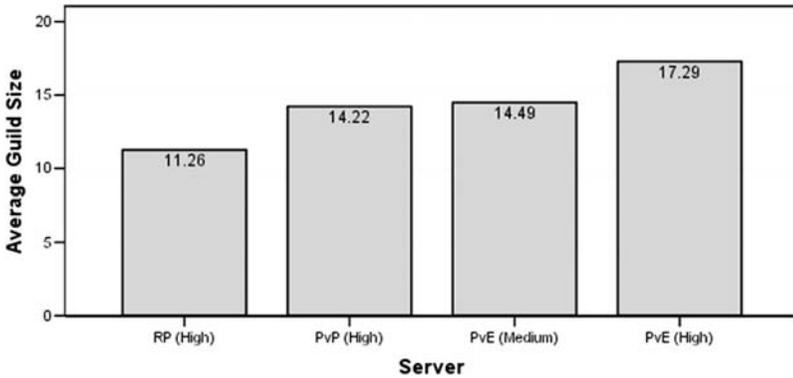
Our data on player activities revealed several interesting trends. First, Azeroth is an unevenly traveled world. The density of content yielding “fast xp” and the game’s transportation network both steer players to a few popular areas. Second, WoW is really two games in one: A player’s experience shifts dramatically once they reach Level 60. Much more coordination and group play are required to tackle the difficult

**Figure 27**  
**Percentage of Guided Characters Across Server Types and Level Ranges**



Note: PvE = player versus environment; RP = role-playing; PvP = player versus player.

**Figure 28**  
**Average Guild Size Across Server Types**

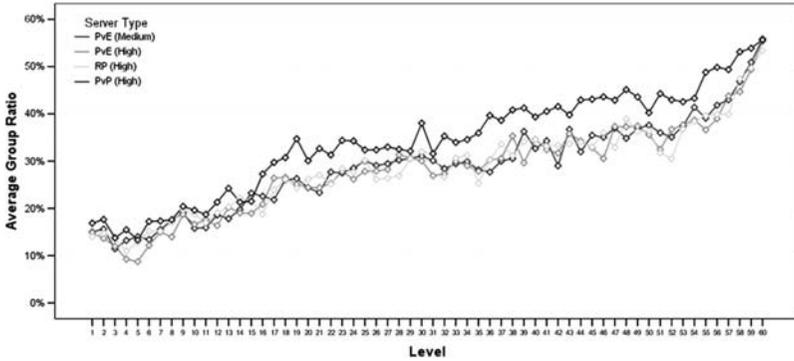


Note: PvE = player versus environment; RP = role-playing; PvP = player versus player.

high-end instances. In fact, it seems only a tiny fraction of players ever get to access this content. Ultimately, WoW is therefore a hardcore game, much like its predecessors in the genre. Its success has probably more to do with the smooth gameplay it offers in the early stages of a character’s life than the inclusion of more casual gamers.

WoW is also one of the first MMOs to embrace PvP on a large scale, and the impacts of this decision are surprisingly limited. Our data indicate players on PvP

**Figure 29**  
Average Group Ratio Across Server Types



Note: PvE = player versus environment; RP = role-playing; PvP = player versus player.

**Table 2**  
Leveling Time Across Server Types (Dependent Variable: Level Time Mean)

Server Type	Level						Total
	1 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	
Player-versus-environment (medium)	64	221	397	585	834	1,073	227
Role-playing (high)	59	218	381	580	853	1,099	225
Player-versus-environment (high)	55	190	327	523	703	945	231
Player-versus player-(high)	53	190	348	550	752	991	240
Total	53	190	348	550	752	991	240

servers might be a bit more achievement oriented than others. Most interestingly, PvP combat apparently encourages players to group more and play more, suggesting that shared adversity might be a positive force in the social life of a MMO if it is correctly implemented.

### Conclusion

The gameplay metrics we analyzed in this article allowed us to paint a broad picture of gaming activities in WoW. Basic in-game demographic information, such as

the population for a class or race, can reveal important forces at work that ultimately affect a player's experience. Our data also reveal some of the potential factors behind WoW's success and others that may threaten the game's appeal in the long run.

Above all, it appears WoW's players are not much more casual than in other MMOs. WoW still requires a significant time commitment, which apparently 6 million subscribers are willing to make. The attractiveness of the game could have a lot to do with its fine-tuned incentives and rewards structure, reminiscent of behavioral conditioning. Although many earlier MMOs were criticized for requiring long, repetitive grinding sessions (often in groups) early in the game to progress, WoW seems instead to have been optimized such that players experience more of a "flow" experience (Csikszentmihalyi, 1990), with challenges increasing gradually and rewards always in sight. As noted virtual worlds designer Raph Koster (2005) proposed, "fun is a process." And indeed, with WoW's mechanics being almost entirely identical to predecessors like EverQuest, it is quite probable that a difference in process is at the root of WoW's spectacular growth.

Our data also point at other potential factors contributing to WoW's wide appeal. In particular, it is quite probable that WoW managed to attract gamers from competing online genres (e.g., first-person shooters and real-time strategy games) and even from offline alternatives (especially medieval fantasy, single-player games). Before launching WoW, Blizzard already had a strong reputation for building high-quality games (e.g., Diablo, a single-player medieval fantasy game, and the Warcraft RTS series), and part of their fan base could easily have migrated to their new MMO on the strength of this reputation alone. Looking at the relative distribution of classes in the game, it is also clear that a very large number of players favor the most action-oriented archetypes. By making these classes accessible and enjoyable to play with or without a group, Blizzard probably managed to break the MMORPG mold and tapped into the FPS, RTS, and single-player gaming populations. Our metrics also indicate that Blizzard managed to integrate PvP into the core mechanics of the game without unbalancing it. The opportunity to compete against other human players instead of computer-controlled monsters probably reinforced WoW's attractiveness to FPS players.

But WoW returns to a well-known MMORPG formula in the late stages of a player's progression. WoW's endgame centers on large-scale raids requiring intense coordination between a large number of players (up to 40). These can be incredibly time-consuming: Beyond the 3- to 4-hour time commitment for the raid itself, countless hours must be spent beforehand to prepare for the run (e.g., to acquire items providing increased protection against each instance's "boss"). Our social network metrics clearly show how this need for increased coordination translates into more frequent social contacts between the players. Although this may sound desirable at first, it is important to keep in mind that most WoW players progress through the game alone (Ducheneaut et al., 2006), and the sudden switch to large-scale groups could be jarring. If, as we hypothesized earlier, many of WoW's players migrated

from other game genres where group experiences are generally “lightweight” (e.g., in an RTS, simply sign in and play against a human opponent right away), the problem would be reinforced. Symptoms of this disconnect could already be visible. As we described, only a small fraction (30%) of all Level 60 characters manage to access high-end content. This coupled with the high churn rate we observed indicate that WoW suffers from the same retention problems as its predecessors (Mulligan & Patrovsky, 2003). Although a steady stream of “newbies” coming from competing game genres is currently sustaining an explosive growth, the situation could devolve dramatically should this supply of newcomers be exhausted. Of course, it could also be that this market is growing fast enough that WoW will never have to face this issue.

Our analyses have also shed some light on basic player preferences in MMOs. In particular, the balance between populations of each class, race, and gender reveals some interesting aesthetic and moral preferences. For instance, a very large majority of players prefer playing races that conform to highly stereotypical canons of beauty (e.g., the tall, lean, and often scantily clad female night elves). They also prefer the “good” side (the Alliance) to their “evil” counterpart (the Horde) 2 to 1—even though these differences are simply cosmetic, and Blizzard explicitly designed each faction such that both could be morally ambiguous, and heroes could be found on each side. Some characters from the Horde, for instance, are far from evil. The Taurens are peaceful nature lovers, and many of their quests involve preserving nature and animals. The Orcs are trying to overcome their past as tools of evil and are consequently concerned about behaving with honor and doing the right thing. In Orgrimmar (the Orcs’ capital), there is an orphanage just like there is in Stormwind (the Humans’ capital). By contrast, some of the Alliance quests involve murder and extortion. But despite these backstories (to which perhaps few players really pay attention), players overwhelmingly prefer siding with the stereotypical “good.”

This imbalance becomes all the more interesting when rates of advancement are compared across factions. Indeed, Horde players apparently progress faster through the game. Coupled with survey data (Yee, 2005) and conversations with WoW players, a common pattern emerges. It seems as if players (and in particular, MMO newcomers) tend to choose the “good” side for their first experience with the game. As they gain more experience however (or as they join with experience from a previous MMO), they migrate to the “bad” side to segregate themselves from newbies. It is interesting to see how experienced gamers consciously use the unattractiveness of the Horde as a barrier to entry into their world. It is also quite probable that Blizzard did not anticipate such segregation, and it highlights the ever-changing and complex interplay between a world’s design and its players’ choices.

There is of course much more to say about WoW. The contributors to this special issue investigate a wide range of topics that we hope will benefit from the background information we provided in this article. In the meantime, we plan to continue our data collection effort to help scholars and practitioners understand MMOs from the inside.

## Notes

1. Because of World of Warcraft's (WoW's) similarities with earlier massively multiplayer online role-playing games (MMORPGs), veteran players have imported many cultural practices that originated in these earlier environments. The most noticeable is the large MMORPG lingo used to describe roles and activities in the game world. We will define the most important notions in this introduction so that we can use the player's terminology unchanged in later parts of this article.

2. The gender of characters is not one of the variables that can be retrieved via the "/who" command. The server does store this information of course, but it is only accessible by client-side interface if the character is within targetable range. In an attempt to gather information about the gender of characters, we placed our census bots in central city locations. The bots cycle through their most recent census data and try to target everyone in that list. Characters who are found then have their gender noted. The gender information thus accumulates over time. Our data set from October had a gender identification rate of 32.1%, and it is these data we are using here.

3. See this thread on Daedalus, for instance: <http://www.nickyee.com/daedalus/archives/001366.php>

## References

- Bartle, R. (2004). *Designing virtual worlds*. Indianapolis, IN: New Riders Publishing.
- Blizzard. (2006). *Customer base reaches 6 million players worldwide as Blizzard Entertainment® prepares its award-winning MMORPG for continued growth in Europe*. Retrieved July 27, 2006, from <http://www.blizzard.com/press/060228.shtml>
- Brown, B., & Bell, M. (2004). CSCW at play: "There" as a collaborative virtual environment. In *Proceedings of CSCW'04* (pp. 350-359). New York: ACM.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: HarperCollins.
- Ducheneaut, N., & Moore, R. J. (2004). The social side of gaming: A study of interaction patterns in a massively multiplayer online game. In *Proceedings of the ACM conference on Computer-Supported Cooperative Work (CSCW2004)* (pp. 360-369). New York: ACM.
- Ducheneaut, N., & Moore, R. J. (2005). More than just "XP": Learning social skills in massively multiplayer online games. *Interactive Technology and Smart Education*, 2, 89-100.
- Ducheneaut, N., Yee, N., Nickell, E., & Moore, R. J. (2006). "Alone together?" Exploring the social dynamics of massively multiplayer online games. In *Proceedings of the ACM conference on Human Factors in Computing Systems (CHI 2006)* (pp. 407-416). New York: ACM.
- Fine, G. A. (1983). *Shared fantasy: Role-playing games as social worlds*. Chicago: University of Chicago Press.
- Kasavin, G. (2004). *World of Warcraft*. Retrieved August 8, 2005, from <http://www.gamespot.com/pc/rpg/worldofwarcraft/review.html>
- Kim, A. J. (2000). *Community building on the Web*. Berkeley, CA: Peachpit Press.
- Koster, R. (2005). *A theory of fun for game design*. Scottsdale, AZ: Paraglyph Press.
- Lee, J. (2005). Wage slaves [Electronic version]. *IUP.com*. Retrieved July 27, 2006, from <http://www.1up.com/do/feature?cid=3141815>
- Mulligan, J., & Patrovsky, B. (2003). *Developing online games: An insider's guide*. Indianapolis, IN: New Riders Publishing.
- Nakamura, L. (2000). Race in/for cyberspace: Identity tourism on the Internet. In D. Bell (Ed.), *The cybercultures reader* (pp. 226-235). New York: Routledge.
- Schubert, D. (2005, October). *What Vegas can teach MMO designers (and how to take a design lesson from almost anywhere)*. Speech presented at Austin Games Conference, Austin, TX.
- Seay, A. F., Jerome, W. J., Lee, K. S., & Kraut, R. E. (2004). Project Massive: A study of online gaming communities. In *Proceedings of CHI 2004* (pp. 1421-1424). New York: ACM.

- Skinner, B. F. (1938). *The behavior of organisms*. Norwalk, CT: Appleton-Century-Crofts.
- Taylor, T. L. (2003). Power gamers just want to have fun? Instrumental play in a MMOG. In *Proceedings of the 1st Digra conference: Level Up* (pp. 300-311). Utrecht, the Netherlands: University of Utrecht, the Netherlands.
- Taylor, T. L., & Jakobsson, M. (in press). The Sopranos meets EverQuest: Socialization processes in massively multiuser games. In E. Hayot & T. Wesp (Eds.), *The EverQuest reader*. London: Wallflower Press.
- Turkle, S. (1997). *Life on the screen: Identity in the age of the Internet*. New York: Touchstone Books.
- Wikipedia. (2006). Gold farming [Electronic version]. Retrieved March 31, 2006, from [http://en.wikipedia.org/wiki/Gold\\_farming](http://en.wikipedia.org/wiki/Gold_farming)
- Williams, D., Ducheneaut, N., Xiong, L., Zhang, Y., Yee, N., & Nickell, E. (2006). From tree house to barracks: The social life of guilds in World of Warcraft. *Games and Culture*, 1 (4), 338-361.
- Woodcock, B. (2005). *An analysis of MMOG subscription growth—Version 18.0*. Retrieved July 12, 2005, from <http://pw1.netcom.com/~sirbruce/Subscriptions.html>
- Yee, N. (2001). *The Norrathian Scrolls: A study of EverQuest (Version 2.5)*. Retrieved October 7, 2003, from <http://www.nickyee.com/eqt/report.html>
- Yee, N. (2005). *The Daedalus Gateway*. Retrieved August 17, 2005, from <http://www.nickyee.com/daedalus>
- Yee, N. (2006). The demographics, motivations and derived experiences of users of massively-multiuser online graphical environments. *PRESENCE: Teleoperators and Virtual Environments*, 15, 309-329.

**Nicolas Ducheneaut** is a research scientist in the Computing Science Laboratory at the Palo Alto Research Center (PARC). His research interests include the sociology of online communities, computer-supported cooperative work, and human-computer interaction. His research is based on a combination of qualitative methods (ethnography) with quantitative data collection and analysis (i.e., data mining and social network analysis).

**Nick Yee** is a PhD student in the Department of Communication at Stanford University. His research focuses on social interaction and self-representation in immersive virtual reality and online games.

**Eric Nickell** is a researcher in PARC's Computing Science Lab, probing how data harvested from multi-player virtual worlds can help us understand their social nature.

**Robert J. Moore** is a sociologist in the Computing Science Laboratory at PARC. He specializes in the microanalysis of social interaction and practice in virtual worlds and in real life. In the area of online game research, he examines the mechanics of avatar-mediated interaction, virtual public spaces, and player practice through screen-capture video analysis and virtual ethnography.