The Psychology of Massively Multi-User Online Role-Playing Games:

Motivations, Emotional Investment, Relationships and Problematic Usage

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Introduction

Every day, millions of users [1, 2] interact, collaborate, and form relationships with each other through avatars in online environments known as Massively Multi-User Online Role-Playing Games (MMORPGs). For example, in a planetary system known as Corbantis, geological surveyors are busy inspecting their chemical harvesting installations to maintain their daily quota for a cartel of pharmaceutical manufacturers. These manufacturers, allied with a rebel faction, are struggling to research and supply key medical supplies to the front lines of the conflict. Corbantis is an incredibly sophisticated online environment capable of supporting thousands of users at a time. Users log on to the server from remote locations independent of each other, and interact with each other through graphical avatars to accomplish complex goals. But Corbantis is merely one planetary system out of many other equally complex worlds. These online environments offer tantalizing glimpses of how millions of avatars interact on a daily basis outside of a laboratory setting and what users derive from that experience.

The study of MMORPGs is highly relevant to research on social interaction in Shared Virtual Environments (SVE) and avatars at work and play in these environments. Although many of the theoretical implications of social interaction in virtual environments have been explored in the artificial confines of Virtual Reality (VR) research laboratories [3-8], MMORPGs are the only existing naturalistic setting where millions of users voluntarily immerse themselves in a graphical virtual environment and interact with each other through avatars on a daily basis. The opportunity to study what people actually do when they choose to be in a virtual environment with thousands of other people cannot be overstated, and the results and implications of a survey study of 30,000 MMORPG players will be presented in this chapter.

In the following section, the history and structure of MMORPGs will be presented, followed by an overview of the methodology used in the survey study. The demographics, usage patterns and motivations of users will then be presented. A combination of quantitative and qualitative data will guide discussion of relationship formation, role exploration, skill transfer, and problematic usage in these environments. Finally, potential uses of these environments for social science research will be discussed.

History of MMORPGs

MMORPGs are a new class of Multi-User Domains (MUDs) - online environments where multiple users can interact with each other and achieve structured goals. The first MUD - an adventure game in a persistent world that allowed multiple users to log on at the same time - was created in 1979 by Roy Trubshaw and Richard Bartle [9]. While it is commonly thought that MUDs descended from table-top role-playing games (RPGs) such as Dungeons and Dragons, the two genres emerged around the same time and co-evolved beginning in the early 70's [10] and became popular during the 80's. Both games allow users to create characters based on numerical attributes (ie. Strength, dexterity, intelligence) and

templated roles (ie. Warrior, Cleric, Druid) with different strengths and weaknesses. Game-play typically revolved around a combination of interactive story-telling and logistical optimizations under the guise of slaying monsters and attaining higher levels and skills. In RPGs, a designated Game Master controlled the outcome of events based on dice-rolls and references to charts and tables. In MUDs, this is controlled by the server.

As the graphical and processing capabilities of the modern personal computer increased, and as accessibility to the Internet became widely available, it became possible in the early 90's to build MUDs with graphical front-ends. Ultima Online, launched in 1997, is recognized to be the first MMORPG – a persistent, graphical, online environment that allowed thousands of users to be logged on at the same time. The number of active users that Ultima Online could support was what distinguished MMORPGs from existing graphical MUDs. The second MMORPG, EverQuest, launched in 1999, quickly achieved a sustained user base of 400,000 and remains the most popular MMORPG in North America as of 2004 [2] even though at least 10 competing MMORPGs have emerged since then.

Details of MMORPGs

Users must purchase or download the specific MMORPG client and pay a monthly subscription fee (around 10-15 USD) to access the central servers. Users view the world in real-time 3D graphics, and use an avatar (a humanoid graphical representation of the user/player in the game) to interact with the environment and each other through a combination of a mouse-driven user interface and keyboard commands. Communication between users occurs through typed chat and animated gestures and expressions. The worlds of MMORPGs are vast and presented in rich, graphical detail. It typically takes several hours to traverse the entire world of an MMORPG, although different types of transportation are available to teleport users to different locations in the world. Users are given a large degree of control

over the appearance of their avatars. For example, in the recent MMORPG *Star Wars Galaxies*, users are able to manipulate their avatar's gender, race (Wookie, Human, Rodian, etc.), skin tone, age, height, weight, musculature, cheek prominence, jaw prominence, brow prominence, nose shape, eye shape, eye color, hair style, hair color, mouth shape, lip fullness, and the presence of body markings or freckles.

Users choose from a set of professions or roles that the MMORPG provides. The permanence or fluidity of roles varies depending on the design of the environment. Each role has varying strengths and weaknesses, and most MMORPGs are designed such that users must often collaborate to achieve goals within the environment. While early MMORPGs were based on fantasy medieval worlds made popular by RPGs and contained only combat-oriented roles (ie. Warrior, Archer, Healer, etc.), recent MMORPGs have offered more diverse profession alternatives. For example, in *Star Wars Galaxies*, one can become a skilled musician, chef, hair stylist, pharmaceutical manufacturer, or politician.

Goals and rewards in MMORPGs typically use a random-ratio reinforcement schedule based on operant conditioning. Early achievements are quick, almost instantaneous, and gradually take more and more time and effort until progression becomes almost imperceptible. Most forms of advancement in MMORPGs require increasing cooperation or dependency on other users, oftentimes mutually beneficial. In *Star Wars Galaxies*, surveyors locate deposits of chemicals and minerals across different planets. To harvest these resources in bulk, surveyors must purchase mining installations from architects. Alternatively, surveyors can choose to sell the locations of rich deposits (i.e. the information itself) to miners rather than harvesting the resources themselves. Surveyors who choose to harvest resources may then become resource brokers who market those resources to artisans and manufacturers who need those resources to produce goods. Combat, medical or fashion goods then are sold on the open market and bought by mercenaries, doctors and other members of the general public.

Ultimately, each user decides which form of advancement they will pursue, and the richness and complexity of the environment eliminates the need for super-ordinate goals or storylines. Every user is motivated by a different combination of the possible rewards. The result is that adventures, stories, and most importantly, meaningful interactions and relationships between users emerge. Functional constructs within the environment facilitate these social networks – combat groups (temporary collaboration between a few users), guilds (persistent user-created membership organizations), and ideological alliances (agreements between guilds or "racial" groups).

Collaboration in MMORPGs

Combat-oriented collaborations in MMORPGs become incredibly complex once users have advanced beyond beginner levels. In typical battle-oriented scenarios, groups of 4 to 8 users are confronted by multiple enemy agents based on fairly sophisticated AI. These groups of users are typically composed of a balanced combination of roles and must communicate and perform effectively as individuals using a predetermined group strategy. Consider a fairly typical crisis situation. Certain enemy agents will run away and elicit help from allied agents when they are badly wounded. In a dungeon setting, these enemy agents typically run towards deeper, more dangerous locations. If the agent succeeds, he will return with several stronger agents. But if one user chases the agent, while the others decide not to, then that jeopardizes the group as well. This situation typically occurs while the group is still engaged with other half-wounded agents. Also remember that different users have different personalities (risk-taking propensities, assertiveness, and so on) and different stakes at this point of their adventure, and differ in their loyalty to the group and each other. In the span of 5 to 10 seconds, the risk-analysis, opinions and decisions of the group communicated over typed chat, or the solitary actions of a particular user, will determine the life or death of all members of the group. This particular type of crisis is also embedded

into the larger context of existing tensions such as emergent leadership, group polarization, and personality differences.

More recent MMORPGs such as Star Wars Galaxies have also created collaboration scenarios of an entirely entrepreneurial nature. All non-basic goods in the environment (clothing, housing, pharmaceuticals, etc) are produced by users. Unlike earlier MMORPGs, users cannot sell goods back to the server itself. All transactions, and the resulting supply, demand, and pricing of specific goods, are user-driven. The environment has mechanisms allowing users to survey for resources, harvest those resources, research schematics for assembling resources into sub-components, construct factories to mass-produce finished goods, and market those goods to the public. The process is so complex, time-consuming, and distributed over several skill sets that users typically specialize as resource brokers, manufacturers, or retailers, and typically form quasi-business entities with other users to facilitate that process. These entities have to communicate effectively, develop a coherent product strategy, assess market competition, and ensure the production chain is running smoothly. Many users comment that being part of such entities feels like having a second job.

Existing Literature on MMORPGs

More than a decade has passed since Dibbel [11] pondered the significance of a virtual rape in LambdaMOO as it was embroiled in a political reform. The academic interest in MUDs it sparked was almost entirely driven by qualitative scholars. Turkle [12] articulated how these environments revealed the fluid and decentralized nature of identities. Others [13] have challenged the utopian visions of cyberspace, arguing that online communities do not foster racial equality but merely make racial minorities easier to suppress. The behavioral sciences have kept their distance from these online environments. With regards to video gaming in general, the field of psychology seems fixated on whether

video games cause real-life aggression [14-23]. Considering that new forms of social identity and social interaction are emerging from these environments, is aggression the only thing worth our attention?

Academic attention in MMORPGs has largely been driven by economic and legal scholars. Castronova [24] has calculated the Gross National Product of the world of EverQuest by aggregating e-Bay sales of virtual items and currency, and has also shown that male avatars sell for more than female avatars of exactly the same capabilities [25]. Legal scholars [26] have examined the ownership of virtual property and whether avatars have enforceable legal rights. Griffiths [27] has also aggregated online poll data at websites catering to EverQuest players to provide the basic demographics and preferences of EverQuest players.

In essence, there has been very little research available that has explored the social interactions, relationship formation and derived experiences of the users of MMORPGs. Since the spring of 2000, the author has carried out an extensive survey study of over 30,000 MMORPG users that has examined who uses MMORPGs, what motivates their use, and the salience and impact of the experiences that emerge in these environments. While a previous paper [28] focused on presenting statistical findings from the data set, the following chapter summarizes and elaborates on those findings with qualitative data to provide a richer perspective of these online environments.

Methodology of Survey Study

The survey study consisted of a series of online surveys that were publicized in web portals that catered to MMORPG users from the years 2000 to 2003. The approximate number of active subscribers to each existing MMORPG was publicly available [1], and it was usually clear which MMORPGs comprised the bulk of all MMORPG players. Therefore, users of the four most popular environments were targeted for

the study – EverQuest, Dark Age of Camelot, Ultima Online, and Star Wars Galaxies. A survey with new content was usually publicized every two to three months. Each survey took about 5 to 10 minutes to complete, and typically 2000 to 4000 respondents would complete each survey. In each survey, respondents were asked to provide their email if they were interested in participating in future surveys. At the beginning of each survey phase, in addition to the recruitment at websites, respondents already in the database were contacted via email to notify them of the new survey in which they could participate. Over the course of four years, 30,000 unique users participated in the survey study.

Lack of motivation and integrity in web-based surveys are two potential concerns, but studies have shown that web-based respondents are typically highly-motivated due to self-selection and anonymity does not have an adverse affect on data integrity [for review, see 29]. Sampling bias is also a concern. In particular, a skewed representation of dedicated and heavy users is possible. Because of market competition, demographic information about users of these environments is not publicly available; however, informal communication with representatives of some of these companies has corroborated the basic demographic representativeness (average age and average hours per week) of the sample. Also, the sampling bias in using a large, non-random sample of MMORPG users to generalize to other MMORPG users is probably not any riskier than the standard practice in experimental psychology of using small, non-random samples of mostly Caucasian students between the ages of 18 – 22 who are enrolled in introductory psychology courses to generalize to all of humanity (for example, see [30]).

Only For Teenagers?

The stereotype that only teenagers partake in these environments discourages broader interest in studying these environments. Indeed, the Journal of Adolescence recently dedicated an entire special issue to the topic of video game violence (February, 2004), fostering the stereotype that adults don't

engage in these kinds of activities, or that somehow adolescents interact with video games in an entirely different way from how adults interact with them. Data from Griffiths' study [27] as well my survey study [28] challenge that stereotype. The average age of MMORPG respondents was 26.57 ($n = 5509$, $SD = 9.19$); the median was 25, with a range from 11 to 68. The lower and upper quartile boundaries were 19 and 32 respectively. Thus, in fact only 25% of MMORPG users are teenagers.

Many MMORPG users have stable careers and families of their own [28]. 50% of respondents ($n = 2846$) worked full-time, 36% were married, and 22% had children. The data showed that teenagers, college students, early adult professionals, middle-aged homemakers, as well as retirees were part of these environments. Indeed, these seemingly disparate demographic groups would oftentimes be collaborating and working together to achieve the same goals similar to the ones mentioned earlier. This finding is particularly striking given that these disparate demographic groups seldom collaborate in any real life situation.

Time Investment

The demographic reality of these environments is important to establish to frame the significance of the following data on usage patterns. Users spend on average 22.72 hours ($n = 5471$, $SD = 14.98$) each week in their chosen MMORPG. The lower quartile and upper quartile boundaries were 11 and 30 respectively. The distribution showed that about 8% of users spend 40 hours per week or more in these environments – the equivalent of a normal work week. The significant amount of time that users are willing to invest in these environments is further highlighted by the finding that 60.9% of respondents ($n = 3445$) had spent at least 10 hours continuously in an MMORPG. The correlation between age and hours spent per week was not significant, implying that the appeal of these environments is comparable for high-school students, middle-aged professionals and retirees.

Emotional Investment

The appeal and salience of these environments is further demonstrated by the degree that users are emotionally invested in their avatars and the environment. When respondents were asked whether the most positive experience they had experienced over the period of the past 7 days or the past 30 days occurred in an MMORPG or in real-life, 27% of respondents (n = 2170) indicated that the most satisfying experience over the past 7 days occurred in the game, and 18% of respondents indicated the same when the wording was changed to "over the past 30 days". With regards to the most negative event, 33% of respondents indicated that the most negative experience over the past 7 days occurred in the game, and 23% of respondents indicated the same when the wording was changed to "over the past 30 days".

Open-ended questions asking users to elaborate on examples of these experiences drew responses that revolved around interactions with other users [31]. Typical positive experiences involved an unexpected altruistic or courageous action by another user.

> He showed rare courage by staying until everyone was clear, including me, knowing that he would probably not make it out alive. That was the most selfless thing I had seen done before or since. He stayed, knowing the corpse retrieval that awaited him, the experience he would lose, and the wasted time he was about to experience because of it. He could have run and lived, but he didn't for our sakes. When you make sacrifices for people, they will remember, and the best groups are those built on loyalty, self-sacrifice, and courage. [male, 32]

On the other hand, typical negative experiences involved the selfish actions of other users, or actions or behaviors that constituted an attack on the competence or self-worth of a user.

I was playing my enchanter at the time, and his partner turned out to be an enchanter, a level higher than I was. I was medding up after buffing the group and switching my spells back to hunting/guarding spells, when the new enchanter started casting everything I had just cast, overwriting everything I had done, telling the group what to do and commenting on how they obviously hadn't had a chanter with them who knew how to take care of their group and they were lucky he was there, he'd make sure they didn't get into TOO much trouble. I disbanded and headed for the zone, in tears of frustration. To be overwritten, pushed aside, and belittled was unbearable. [female, 36]

What is clear is that these environments encourage both time and emotional investment from the users, and that users derive salient emotional experiences from these environments.

Motivations

The usage patterns of users force us to examine what makes these environments so appealing. What motivates users to become so invested in these environments? User responses expose the varied and multi-faceted reasons for why users engage in these environments.

After many weeks of watching I found myself interested in the interactions between people in the game, it was totally absorbing!!!! The fact that I was able to immerse myself in the game and relate to other people or just listen in to the 'chatter' was appealing. [female, 34]

I play MMORPGs with my husband as a source of entertainment. Overall it can be a cheaper form of entertainment where you can spend quite a bit of time with a significant other. To play well you end up developing more ways of communicating. [female, 31]

I like the whole progression, advancement thing ... gradually getting better and better as a player, being able to handle situations that previously I wouldn't have been able to. [male, 48]

No one complains about jobs or other meaningless things. It's a great stress reducer. I like that I can be someone else for a couple hours. [female, 28]

Currently, I am trying to establish a working corporation within the economic boundaries of the virtual world. Primarily, to learn more about how real world social theories play out in a virtual economy. [male, 30]

Having an empirical framework of articulating motivational differences between users is the foundation to understanding the emergence of more complex behaviors and interactions in these environments. This framework provides the foundation to explore whether different sections of the demographic are motivated differently, and whether certain motivations are more highly correlated with usage patterns or in-game preferences or behaviors.

In an attempt to create an empirical framework for articulating motivations for MMORPG usage, a series of 40 statements covering a broad range of motivations were generated based on open-ended responses as well as Bartle's [32] theoretical framework of "Player Types" based on his experience in MUDs. Examples of the resulting items include: "I like to feel powerful in the game," and "I like to be immersed in a fantasy world." These statements were presented using a 5-point Likert-type scale and then analyzed using an exploratory factor analysis to arrive at a parsimonious representation of the associations among the 40 items [28].

The analysis produced five factors. The "Relationship" factor measures the desire of users to interact with other users, and their willingness to form meaningful relationships that are supportive in nature, and which include a certain degree of disclosure of real-life problems and issues. The "Manipulation" factor measures how inclined a user is to objectify other users and manipulate them for his personal gains and satisfaction. Users who score high on the "Manipulation" factor enjoy deceiving, scamming, taunting and dominating other users. Users who score high on the "Immersion" factor enjoy being in a fantasy world as well as being "someone else". They enjoy the story-telling aspect of these worlds and enjoy creating avatars with histories that extend and tie in with the stories and lore of the world. The "Escapism" factor measures how much a user is using the virtual world to temporarily avoid, forget about and escape from real-life stress and problems. And finally, the "Achievement" factor measures the desire to become powerful in the context of the virtual environment through the achievement of goals and accumulation of items that confer power.

It was found that male users score higher than female users on Achievement and Manipulation, whereas female users scored significantly higher on the Relationship, Immersion and Escapism factors. In other words, male users are more likely to engage in these environments to achieve objective goals, whereas female users are more likely to engage in MMORPGs to form relationships and become immersed in a fantasy environment. These gender differences resonate with findings by Cassell and Jenkins [33] and suggest that MMORPGs do not have one set of factors that appeals to everyone equally well, but instead, have a host of appealing factors each of which draws in users with different motivations. With regard to how these motivations related to usage patterns, among male users, age was inversely correlated with the Manipulation ($r = -.33, p < .001$) and Achievement ($r = -.27, p < .001$) factors, implying that younger male users tend to objectify both the environment and other users for their own personal gains. Among female users, age was inversely correlated with the Manipulation ($r = -.15, p < .001$) and Immersion ($r = -.13, p < .001$) factors.

The articulation of the different reasons why users engage in these environments allow researchers to explore usage preferences and behaviors in relation to the motivations of the user in addition to gender and age differences. It is simply not the case that all users engage in these environments for the same reason.

It's All Pretend?

Because these environments are labeled "role-playing games", it is easy to assume that users treat it as a simplistic game of pretend-play. The emotional investment that these environments derive from users is one way of countering that assumption. Users in fact take these environments very seriously. Other survey data also show that the majority of users indicate that the way they behave and interact with others in these environments is very close to how they behave and interact with others in the material world [31]. In other words, most users are simply being themselves rather than experimenting with new identities or personalities. It is also easy to assume that nothing serious or meaningful happens in or can be derived from these environments because they are merely semi-sophisticated forms of play. The following sections provide multiple lines of evidence to argue that many different kinds of serious social phenomena occur in these environments.

Relationships in MMORPGs

When asked to compare the quality of their MMORPG friendships with their material world relationships, 39.4% of male respondents (n = 2971) and 53.3% of female respondents (n = 420) felt that their MMORPG friends were comparable or better than their material world friends [28]. Furthermore, 15.7% of male respondents (n = 2991) and 5.1% (n = 420) of female respondents had physically dated

someone who they first met in an MMORPG [28]. Thus, both platonic and romantic relationships seem to occur with significant frequency in MMORPG environments. This finding resonates with Walther's [34] notion of the hyperpersonal effects of computer-mediated communication (CMC).

Indeed, the ingredients that Walther proposed for hyperpersonal interactions – interactions that are more intimate, more intense, more salient because of the communication channel – all exist in MMORPGs. First, the communication channel allows the sender to optimize their self-presentation because interactants do not have to respond in real-time. Second, the receiver forms an impression of the sender by inflating the few pieces of information that the sender has optimized. Third, participants can reallocate cognitive resources typically used to maintain socially acceptable non-verbal gestures in face-to-face interactions and focus on the structure and content of the message itself, which comes across as more personal and articulate. Finally, as interactants respond to personal messages with equally personal and intimate messages, the idealized impressions and more personal interactions intensify through reciprocity. The cumulative effect is that the interaction becomes more intimate and positive.

It has also been suggested that there are factors unique to MMORPGs that facilitate relationship formation [35]. The kind of high-stress crisis scenario outlined earlier in the chapter occur with great frequency in these environments under different guises. When paired with the degree of emotional investment users place in these environments, many relationships are in fact triggered by these trust-building scenarios, analogous to boot camps and fraternity initiations in the material world.

> To succeed in EQ you need to form relationships with people you can trust. The game does a wonderful job of forcing people in this situation. Real life rarely offers this opportunity as technological advances mean we have little reliance on others and individuals are rarely thrown into life-or-death situations. [male, 29]

While it may appear that meeting other users with compatible personalities and interests seems like finding a needle in a haystack in these environments, users are in fact pre-selected for compatibility. 36% of employed respondents (*n* = 1099) work in the IT industry, and 68% of respondents (*n* = 3415) have experience with table-top role-playing games. IT workers are typically analytical and rational; RPG players are typically imaginative and idiosyncratic. Both tend to be non-conformist. MMORPG environments are a very specific form of entertainment – gradual advancement via avatars in a fantasy medieval or futuristic world **with other users. Thus, in fact, MMORPG users are probably similar in more ways than not.**

And finally, the fantastical metaphors employed in these environments encourage idealizations that parallel cultural myths of chivalric romance – knights in shining armor, clerics with glowing auras. Thus, these metaphors also encourage idealization in addition to the underlying inflated sense of compatibility due to hyperpersonal interactions. MMORPGs are environments where users are in fact falling in love with knights in shining armor.

> The MMORPG relationship is inexplicably more romantic, more epic, more dramatic … [female, 16]

MMORPG environments allow us to think about how the mechanics and functional constraints of a constructed world could be used to engineer the relationships that form [36]. User dependencies, the mechanics of death, and other structures all play a role in encouraging or discouraging relationships to form in these environments. MMORPGs allow us to ask questions about how the mechanics of a world influence the communities that form instead of focusing on individual interactions.

Romantic Partners and Family Members

There is a very different kind of relationship "formation" that can be explored in MMORPGs. Many MMORPG users participate in the environment with a romantic partner or family members. 15.8% of male respondents ($n = 1589$) and 59.8% of female respondents ($n = 311$) participate in the environment with a romantic partner, while 25.5% of male respondents and 39.5% of female respondents participate in the environment with a family member – a sibling, parent or child [28]. Open-ended responses from these users indicate that their online relationships shape, influence and allow them to explore their material world relationships.

Many romantic couples who participate in the environment together commented on how the environment highlighted their individual differences. For these users, the MMORPG environment reflected and accentuated differences in their personalities and worldviews.

> Our styles are totally different. For instance, I will rather play in a group just for company, even if the exp gain is minimal, whereas my partner tends to literally AVOID other players. I am often a pushy role-player, forcing others to RP or get out of my face. Thus I am unafraid of starting an argument, whether in /say, /tell or even /shout. This seems to make my partner very uncomfortable. For these reasons, if we are playing together we try very hard to compromise. However, I insist on having 'solo' characters that I only play on my own. I tend to find his gaming style restrictive. [female, 23, engaged]

> I would say rather than having learned something new about him, it was more like it emphasized differences between us that I already knew about. He is very patient, I am very impulsive, etc. And these differences are a lot more apparent in a game situation. [female, 27, dating]

For other romantic partners, the MMORPG environment not only reveals individual differences, but it also comes to shape the relationship itself.

> Like children who play dolls to explore social situations and different perspectives, EQ enables us to look at issues of dependence/independence, and gender perceptions. It's increased the equanimity between us, and brought us closer through exercises in trust that transcend in game terms, class, level, and gender. We will discuss game scenarios and learn from each others perception (i.e., when to run). After 3 years of playing together we are a well-oiled machine, and can lead a group, follow or solo together or apart. [female, 34, married]

> Our relationship has definitely been enhanced. We're better now at working together towards goals. And we both really enjoy growing, learning and adventuring together. It's exciting to be involved in each other's triumphs. [female, 29, married]

Parents and their children who participate in these environments provide another perspective on how the MMORPG environment interacts with existing relationships. Many parents commented on how the environment allowed them to observe their children in social interactions that they usually had no access to in the material world. For them, the MMORPG environment became a window into parts of their children's identity that they hadn't known about before.

> I learned that my son is a very good strategist. I knew that to a degree before, but it has been eye opening to watch him lead a group. I did not know he had these skills. [female, 49]

> It added depth and clarity to many traits that I knew they had to see how they presented themselves in a different environment. Since I am pretty much removed from their circle of

friends and can't watch them at school, EQ provides a window into their behavior outside of the house [female, 37]

I found that my son handles himself in a very mature manner. (He's 13 now). I have also been told by many other players that know of our relationship how courteous and well spoken he is. [male, 49]

Other parents commented that the MMORPG environment has allowed them to transcend the strict roles of parent-child relationships in a rewarding way. The MMORPG environment not only shapes these relationships, but in fact restructures them by allowing the participants to redefine the boundaries of their material world roles.

I think it has enhanced our relationship, we both treat each other more like equals and partners in our private life. It is much easier to talk to her now and I have found her talking to me about much more of her life and ideas. [female, 40]

Yes, playing EQ with my daughter has been very enjoyable, and I have learned more about my daughters personality as she treats me as a friend on EQ and not a parent. [female, 40]

Thus, MMORPG environments are not only places where new relationships are engineered, but in fact are windows into existing relationships as well as catalysts for the restructuring of roles in those relationships.

Role Exploration and Skill Transfer

Turkle [12] articulated how MUDs allow users to explore new roles and identities. MMORPG environments are also used for these purposes.

> In reality I'm an Army Officer, very assertive and aggressive. In MMORPGs I'm more like I wish I could be, quiet, introspective and sensitive of other's feelings. Taking on different roles has also taught me to 'walk a mile' in other shoes before judging - not useful as an army officer, perhaps, but very useful in becoming a quality human being. [male, 42]

> When I play my male characters, other male members of the party will listen to me better, take me more seriously. In my male form I could give orders and have them listened to, where as a female, my characters aren't always taken quite as seriously. Also, where my female characters were given many gifts by random players when they were young, I didn't see it happening with my males, which I didn't mind at all. I've enjoyed the higher level of "respect" for my abilities that seems to come with playing in a male body. [female, 22]

But beyond exploring how MMORPGs can shape the identities of individuals, these highly social and structured environments also allow us to explore whether certain valuable skills learned in an MMORPG can transfer to the material world.

Personal advancement in MMORPGs typically involves collaboration among groups of users in an attempt to achieve a challenging task. Thus, a prime candidate for acquired skills is leadership skills. In emergent groups within the MMORPG environment, leaders deal with both administrative as well as higher-level strategy issues, most of which arise and have to be dealt with spontaneously. Administrative

tasks include: role assignment, task delegation, crisis management, logistical planning, and how rewards are to be shared among group members. Higher-level strategy tasks include: motivating group members, dealing with negative attitudes, dealing with group conflicts, as well as encouraging group loyalty and cohesion. These issues are even more salient in long-term social groups, such as guilds, which have formalized membership and rank assignments. In other words, MMORPGs provide many opportunities for short-term and long-term leadership experiences. As one user notes,

> I've never been one who is particularly comfortable with a leadership role in real life. In the game, friends and I left another guild that no longer suited us for various reasons and formed our own. I was approached by several of these friends to assume leadership of the guild and agreed, even though I was uncertain of my suitability. I've grown more accustomed now to directing various aspects of running the guild and providing a vision and leadership to the members. Follow-up and assertiveness now feel more natural to me even in real life. It has been an amazing opportunity to push myself beyond my boundaries and a rewarding experience. [female, 46]

This sentiment is shared by many users. In the survey study [28], 10% of users felt they had learned a lot about mediating group conflicts, motivating team members, persuading others, and becoming a better leader in general, while 40% of users felt that they had learned a little of the mentioned skills. This is striking given that these environments are not structured pedagogically to teach leadership. Acquisition of leadership skills in these environments is in fact an emergent phenomenon. But more importantly, these findings demonstrate that real-life skills can be acquired or improved upon in these environments. Certainly, self-reported assessments are not robust assessments, but these findings lay the foundation for more controlled studies of the acquisition of complex social skills in these environments.

Problematic Usage

As mentioned in the section on time investment, 8% of users spend 40 hours or more in these environments, and 70% have spent at least 10 hours continuously in an MMORPG in one sitting. Both quantitative and qualitative data suggest that a small, but significant, group of users suffer from dependence and withdrawal symptoms [37].

> I am addicted to EQ and I hate it and myself for it. When I play I sit down and play for a minimum of 12 hours at a time, and I inevitably feel guilty about it, thinking there a large number of things I should be doing instead, like reading or furthering my education or pursuing my career. But I can't seem to help myself, it draws me in every time. I have been out of work now for over a month and now find myself in a stressful, depressed state that is only quelled when I am playing EQ, because it's easy to forget about real world troubles and problems, but the problem is when you get back to the real world, problems and troubles have become bigger, and it's a bad, bad cycle. I've tried quitting seriously on several occasions. There are serious withdrawal pangs, anxiety, and a feeling of being lost and not quite knowing what next to do with yourself. [male, 26]

On 5-point Likert scales, 15% of respondents (n = 3989) agreed or strongly agreed that they become angry and irritable if they are unable to participate. 30% agreed or strongly agreed that they continue to participate in the environment even when they are frustrated with it or not enjoying the experience. And 18% of users agreed or strongly agreed that their usage patterns had caused them academic, health, financial or relationship problems. Agreement with the mentioned statements was significantly positively correlated with average weekly use of the environment. Even more striking, 50% of respondents (n = 3166) considered themselves addicted to an MMORPG in a direct "yes"/"no" question.

While it may be difficult to draw a line between healthy and unhealthy usage of these environments, it is clear that certain users are engaged in problematic usage of these environments.

While the design of these environments, such as the sophisticated reward cycles based on operant conditioning paradigms [38], certainly plays a role in engaging users in problematic usage, it would be overly-simplistic to focus entirely on the architecture of the environment itself. After all, that perspective fails to account for why only certain users engage in problematic usage. It also fails to take into account that different users are motivated to participate in the environment for different reasons. One proposed model of problematic usage [37] approaches the environment as a place where many common anxieties can be overcome. For example, users who have low self-esteem can become powerful and competent in these environments and they are driven to achieve in these environments as a way of overcoming anxieties they have in the material world. Or for example, users who feel undervalued in the material world can become needed and valued members of groups or guilds. Users with poor self-image can choose to be as attractive and physically fit as they desire. Users with low internal locus-of-control gain a stronger sense of agency in these environments. Users with stressful problems can use these environments as escape. In short, these environments are seductive for some users because it empowers them in ways specific to their anxieties.

Online Environments as Potential Social Science Research Platforms

The structure and design of these environments make them good candidates for a host of alternative uses for social scientists. For example, traditional personality assessment techniques are typically transparent and reactive. Because actions in massively multi-user online environments can be tracked unobtrusively by the server, every users' attitudes and personalities may be tracked using behavioral measures. And because users are personally invested in their avatars and the environment, every decision they make is

personally revealing. The length and frequency of utterances, as well as the breadth and depth of a user's social network can all be meticulously measured and tracked over long periods of time. This database of measures provides rich longitudinal profiles of individual users as well as how they rank amongst a large sample of other users. One could think of MMO environments as a gold-mine of personality data as well as a platform to develop unobtrusive personality assessment tools.

The arguments that Blascovich et al. [39] make for the use of immersive virtual reality technology as a methodological tool for social psychology can also be applied to MMORPG environments. The movements, interactions and preferences of large numbers of users can all be tracked unobtrusively and recorded. For example, one could implement a transformed social interaction [40, see also Chapter X of this volume], such as non-zero-sum gaze, on one MMORPG server and use another server for control, and track the aggregate changes in mean length of utterances or topology of social networks. The MMORPG environment allows us to answer social psychology questions on a social level rather than an individual level. How does non-zero-sum gaze or other transformed social interactions reshape social networks, alter the flow of information, or affect trust (Fukuyama, 1996) in a social organization? As social organizations proliferate in MMORPG environments, research in transformed social interactions becomes even more important as it will inform us of how designers could engineer these environments to encourage the formation of strong and trusting social networks.

Conclusion

As scholars who studied MUDs [11, 12] pointed out, our virtual identities and experiences are not separate from our identities and experiences in the material world. They co-evolve as they shape each other. MMORPGs are not a new form of play as much as a new communication medium that affords new forms of social identity and social interaction.

While typical VR environments try to replicate human avatars in contemporary physical locations, MMORPGs offer fantastical avatars and worlds. After all, if you could be anyone anywhere, would you choose to be exactly who you were? This tension begs the broader question – Given that we are not constrained to human forms or modes of movement and interaction that are bound by laws of physics, why do we insist on replicating them? If the body is merely the original prosthesis [41], can we not think "outside of the body"? Insisting on visual veridicality also forces us to abandon interesting issues in self-representations. What might decisions in virtual self-representation tell us about users?

The strong appeal of these environments also has interesting implications. MMORPGs do not only appeal only to teenagers. They are online environments where young professional adults, middle-aged home-makers and retirees interact and collaborate on a daily basis. More importantly, the average MMORPG user spends more than half a work week in these environments. As more people engage in online environments instead of watching TV, it raises interesting questions with regard to Gerbner's cultivation theory [42]. Gerbner found that heavy TV viewers have a worldview that overestimates violence and the percentage of legal-enforcement workers in the general population due to their over-representation in TV content. Might certain worldviews be cultivated by heavy exposure to online environments? For example, users are given a high degree of control and agency in MMORPGs, and all events are based on underlying numeric variables. So it might make sense to ask whether heavy users have a stronger internal locus of control, or apply a more closed-system perspective on thinking about events in the material world.

The data presented also explored how virtual environments impact relationship formation in different ways. Not only can these environments facilitate formation of relationships, but they are also windows into and catalysts in existing relationships. More importantly, relationships can be thought of as being engineered by the architecture of the environment. For example, what are the potential effects of

transformed social interaction [40] on social interactions at a community level? It also leads us to wonder how a community in the material world could be shaped by allowing them to interact in an engineered virtual environment.

The excessive usage exhibited by certain MMORPG users might appear problematic at first, but in fact forces us to ask whether the mechanisms of appeal in MMORPGs could be harnessed for pedagogical purposes. Story-path curriculums, used in certain schools, embed the syllabus of each term in an ongoing hypothetical setting, such as an iron-forging village in 19th century England. Every student takes on the role of a member of the village, such as blacksmith, pastor or farmer, and the syllabus material is woven into relevant tasks that the villagers encounter. For example, basic algebra may be embedded into a task that tried to optimize ratios of profitable crops, while social policy material may be embedded into a town meeting over a local epidemic of scarlet fever. The goal is to increase interest in learning by making the material personally relevant to students. The structure of MMORPGs are well-suited for story-path curriculums, and in fact, would also allow classes from different schools to inhabit different villages and create a larger social community that worked together to resolve conflicts or achieve common goals.

Finally, MMORPGs also blur the distinction between work and play in intriguing ways. Case studies of virtual real-estate brokers [43] are one of many compelling examples of how digital media blur the distinction between work and play. These users sell virtual real-estate (as well as virtual weaponry and currency) for real-life currency on auction sites such as eBay. More compelling are the "sweatshops" in developing nations that hire youths to generate profit by accumulating these virtual goods and currency and then selling them for real-life currency [44]. In this case, work and play are indistinguishable. As Andrejevic [45] has pointed out, interactive media creates digital enclosures that allow work to be performed under the guise of entertainment. For example, in There.com, brand-name fashion designers use the environment as a marketing test-bed for new clothing designs. Sales of the test products and whether users who have large social networks buy them are aggregated automatically. The irony is that

not only do these users have to pay a monthly fee to subscribe to the environment, but they are performing free labor for a third-party corporation. As these environments become more sophisticated, we can imagine them transforming into predominantly sites of economic activity under the guise of interactive entertainment.

We have seen that MMORPG users become highly invested in these environments, and that serious social phenomena occur in these environments that can create, shape and restructure relationships in the material world. Everyday, millions of users log on to worlds like Corbantis, performing highly-specialized and complex tasks, interacting and collaborating with each other through avatars. Some of them are accumulating virtual real estate to trade for US dollars. Some are married to people they have never met. Some are collaborating with their children to produce advanced pharmaceuticals, while others are planning a mayoral campaign. Indeed, if we are interested in the social lives of avatars, the citizens of worlds like Corbantis have a great deal they can tell us.

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