Player Communities in Multiplayer Online Games: A Systematic Review of Empirical Research

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ABSTRACT

Numerous researchers have written about the social dynamics of player communities in multiplayer online games. Following a systematic review of refereed empirical research publications from 2000-2010, this article synthesizes the key methods and concepts researchers have used to study and characterize player communities, as well as the aspects and operationalizations they have concentrated on. The analysis shows that qualitative approaches have been more popular than quantitative. The concepts used to characterize player communities were often not clearly defined or overlapped in meaning. Yet they revealed a prevalence of micro (groups or teams), meso (guilds or organizations) and macro (communities and networks) perspectives. Eighteen different aspects and operationalizations of player communities were identified. Six of these were clearly most popular, i.e. social structuring, rationale, culture & social norms, used ICTs, number of members and time of existence. The article concludes with several perspectives and suggestions for future research.

Keywords

massively multiplayer online game, online game, community, organization, social dynamics, literature review

INTRODUCTION

There is a growing body of scientific literature about social organization within (massively) multiplayer online games (or online games for short). It has been growing since the 1990s with the birth of social scientific research into Multi-User Dungeons (MUDs) as the first online games or virtual worlds (see e.g. Bartle 2004, 488-556). Since then there have been quantitative and qualitative scientific studies into the social phenomena within online games and virtual worlds. Researchers have for example looked at the demographics and motivations of players (e.g. Ryan et al 2006; Williams et al

2008), the patterns of their behavior within games (e.g. Griffiths et al 2004), and addiction (e.g. Griffiths and Meredith 2009).

Of the studies concentrating on player communities, many have taken an ethnographic approach, resulting in detailed accounts of life within them (e.g. Jakobsson and Taylor 2003). The research has been conducted within differing scientific disciplines and published in various channels, e.g. in books, theses, edited book chapters, conference proceedings, and scientific journals. So far research has mostly focused on mapping the ever-changing landscape of player communities, gaining insight into their daily social dynamics.

Overall there has been little effort to synthesize the conducted research. A synthesis aims to give an overview of the different research endeavors, describe their results, summarize key conclusions, and further develop the emerging key themes. As such it also aims to find caveats of previous research and raise new questions for future research.

This article offers a synthesis of research into the social dynamics of player communities in online games. To that end we conducted a systematic literature review. Our review focuses on empirical studies published in 2000-2010 in English edited/authored books and peer-reviewed journals. To pursue our aim, we formulated three research questions:

RQ1: What methods have been used to empirically research the social dynamics of player communities?

Varying scientific orientations and approaches underlie research into player communities. The purpose of this first question is to identify the kinds of approaches to data collection researchers have taken and what datasets they led to. With this knowledge future researchers can reapply key methods or develop new ones.

RQ2: What conceptual definitions and characterizations have been developed to describe player communities?

Several concepts or terms have been used to describe player communities, such as guild and clan. The purpose of this second question is to gain insight into the used concepts and how they have been defined or characterized.

RQ3: What aspects or operationalizations, i.e. empirically qualifiable or quantifiable variables, have been used to research player communities?

This question is closely connected to the second. We deem aspects and operationalizations of player communities respectively qualifiable and quantifiable research variables. By identifying these variables we can further contextualize the concepts and theories developed so far.

In the following section we describe our publication selection and review process. In the subsequent section we review the methods and resulting datasets described in the selected publications. We then offer the results of our analysis of conceptual definitions, characterizations, aspects and operationalizations. The article ends with a discussion of the findings and directions for future research.

METHOD

Publication databases

The material analyzed in this study consists of 17 publications that, following empirical research, describe and conceptualize player communities in online games at least as a substantial part of their focus. The publications were collected by systematically searching several multidisciplinary publication databases. In this section we explain which databases we used and the search criteria we applied to collect these publications. We subsequently explain how we analyzed the selected publications.

We chose to direct our search at six databases using four interfaces. Our review had to overstep simple scientific borders because of the multidisciplinary nature of the field of (computer) game studies. Relevant research has been done in social sciences, humanities, and even some in computer science. After consulting a librarian with special focus on conducting database searches, six publication databases covering multiple fields of science relevant for this study were selected for the search:

- EBSCOhost, i.e. Academic Search Elite (EBSCO Industries 2011a), Communication & Mass Media Complete (EBSCO Industries 2011b) databases, covering journal articles within all fields of science, particularly communication and mass media.

- PsycINFO (American Psychological Association 2011), covering journal articles and authored/edited books within the field of psychology.

- CSA, i.e. ASSIA: Applied Social Sciences Index and Abstracts (ProQuest 2011a) & Sociological Abstracts (ProQuest 2011b) databases, covering journal articles within the field of sociology and the social/behavioral sciences.

- Directory of Open Access Journals (Lund University Libraries 2011), covering 'open access' journal articles, provided the journals' editors uploaded them to the database themselves.

During the search, we observed that several scientific journals relevant to the field of game studies were not indexed by any of the aforementioned databases. Their absence from widely used databases is likely due to the fact that many of them have been established only recently. In order to make our search more valid, we conducted a separate and in many cases manual search of the following journals:

- Game Studies, established in 1999

- Eludamos, Journal for Computer Game Culture, established in 2007

- Journal of Virtual Worlds Research, established in 2008

- The International Journal of Gaming and Computer-Mediated Simulations, established in 2009

- Journal of Gaming and Virtual Worlds, established in 2009

- International Journal of Role-Playing, established in 2009

- Entertainment Computing, established in 2009

Search criteria

To conduct our search we developed several search criteria. We needed to define the period of analysis, the types of publications, and the search terms with which relevant publications could be found.

All the chosen publications were published between 2000–2010. There were two reasons for this decision:

- Maturity of the research field. Most publications discussing player communities in online games date from the beginning of the 21st century. Since then there has been a significant increase in research into online games, manifested for example in the birth of scientific associations such as the Digital Games Research Association (DiGRA, founded in 2003), and academic journals such as Games & Culture (first published in 2006) and Game Studies (first published in 1999).

- Maturity of the game genre. Most publications from the 1990s concern virtual world communities that are much less pervasive (in terms of economic and societal impact) than the player communities of contemporary online games. In the 1990s several studies concerned text-based and small-scaled MUDs (Bartle 2004; Bruckman 1992; Clodius 1997; Curtis 1992; Reid 1994; 1999). We argue that the success of commercial and graphical online games towards the end of the 1990s considerably changed the research arena. The successes of particularly Ultima Online (Electronic Arts, 1997) and EverQuest (Sony Online Entertainment, 1999) fueled a vibrant and profitable market of online games (Van Geel 2010), different from the previous 'ages' of virtual worlds dominated by MUDs (Bartle 2004, 17-28).

We upheld high quality and overall completeness as two simple search criteria. The systematic nature of our literature review meant trying to include all relevant high-quality publications. We limited our search to journal articles and authored/edited books, as these types of publications have been rigorously indexed by the six selected publication databases and we assume that they have all been peer-reviewed to some extent. We excluded purely theoretical publications or 'think pieces' in which the authors do not offer results of an empirical study. We also excluded conference proceedings, papers and presentations, as it was often unclear whether they had gone through a peer review process. Moreover, as they were often not published publically or indexed by scientific search engines, we were not convinced that all relevant pieces could be found and included.

Search terms

Multiplayer online games and the communities within them have been referred to with many names. Authors have used terms such as online game, online multiplayer game, and massively multiplayer online (MMO) game. Sometimes they are also referred to as virtual worlds, virtual environments, or multi-user virtual environments. The latter terms were not the focus of this study. The social organizations of players within and around online games have similarly many names. The more general terms, such as community and organization, are supplemented by use of terms coined by developers and the players themselves, such as guilds and clans. The terms group and team have also been used, especially with regard to games with smaller player groups (such as many first person shooter games). We used the term *community* as it is an umbrella term that seems to be applied generally, including in a publication's keywords.

All in all, it was necessary to include several terms in our search. We used the search phrase 'online game' OR 'multiplayer game' AND communit*. The quotation marks were used to search for entire phrases. In those cases where the search engine did not support the use of an asterisk, we used both community and communities. The search was limited to authored/edited books and articles in peer reviewed scientific journals published in 2000-2010. The search was conducted several times and was finally checked completely on April 1, 2011.

Publication selection

Table 1 shows the number of hits each database returned when we did the search using the aforementioned search criteria. It is important to note that many databases returned the same publications. Thus the total number of unique publications derived from all databases does not equal the total number of hits they all returned. As to the separately searched game studies journals, we only found relevant publications in the journal Game Studies.

Database	Number of hits
EBSCOhost (both databases)	70
PsycINFO	122
CSA (both databases)	38
DOAJ	4

Table 1: Number of hits our search returned per database.

The results of the database and separate journal searches were first subjected to a preliminary analysis. We firstly examined each publication's title and abstract. We only selected publications dealing specifically with the social dynamics of player communities in online games, as opposed to using it as a context to some other phenomena. This primary criterion led us to discard most of the publications returned by the databases, in particular PsycINFO. As can be expected from a database of psychological research, most of the PsycINFO publications focused on addiction or other forms of problematic usage, therapeutic or other health opportunities, and marketing or other economic issues. Roughly the same applied to the EBSCOhost databases. We also only included publications based on empirical research, as explained earlier. The preliminary analysis was conducted separately by both authors, after which results were compared and discussed.

After this selection process we deemed it necessary to confirm the results of the database queries by comparing them to the lists of references in the articles themselves. We needed to ascertain whether differences in the use of terms (i.e. using the words 'guild' or 'clan' instead of community throughout a publication) and limitations of the databases had led to omissions of relevant publications. Looking at the lists of references produced a number of possible inclusions to the selection, all of which were subjected to the same criteria as the results of the preliminary searches (published between 2000-2010, academic journals or books, empirical research). In the end, 31 publications were chosen for a thorough analysis.

Analysis

Per publication we determined and noted the methods of the empirical study and the resulting datasets. The descriptions of methodology were abstracted into more generic concepts of qualitative and quantitative methods, e.g. ethnography, interviews, or questionnaires. Each type of method comes with a different type of dataset explanation (if any). For example, ethnographic research tends to be more specific about the period of research, while often omitting certain specifics like number of interviewees. We noted this information in a spreadsheet, which has been added to this article as an appendix.

We subsequently searched for and noted any conceptual definitions and characterizations of player communities the authors offered in their publications. We did not scrutinize conceptual definitions and characterizations. Any definition or characterization, whether simple or comprehensive, was noted. We also searched for and noted any and all aspects (qualifiable variables) or operationalizations (quantifiable variables) of player community the authors focused on. This meant noting the authors' focus on e.g. the rationale, number of members or time of existence of the researched player communities.

We analyzed each of the conceptual definitions and characterizations we found to see whether they could be related to a higher-order sociological concept. We found that many authors used sociological concepts to describe the player communities they had analyzed, e.g. group, community, network or organization. We also found that some authors used only the term guild consistently throughout the publication, being a game-specific social concept.

In the end we had developed extensive spreadsheets containing each publication's methods, datasets, conceptual definitions, characterizations, aspects and operationalizations. From these spreadsheets we were able to generate several descriptive statistics, i.e. most common methods, conceptual definitions, aspects and operationalizations.

Purposefully omitted publications

After the final thorough analysis 14 publications were discarded as they had a too narrow or too broad focus for inclusion into our analysis. When too narrow, these publications concentrated on behavior of individual players (Barnett and Coulson 2010), technological bases of social interaction (Sotamaa 2010; Yee 2009) or mathematical modeling of the networks that players form between them (Shin 2010; Szell et al 2010; Szell and Thurner 2010). When too broad, these publications concentrated on behavioral norms within a player community or the entire player base of a game (Boellstorff 2008; Chan and Vorderer 2006; Chee 2006; Cole and Griffiths 2007; Consalvo 2007; Johnson et al 2010; Martey and Stromer-Galley 2007; Sherlock 2009). For example, Consalvo's primary focus was cheating as a cultural phenomenon across MMO gaming communities, and the Final Fantasy XI (Square Enix, 2002) community in particular (2007). As a result she provided only very limited insights into the actual makeup of player communities.

RESULTS

Following the selection and analysis procedure, a total of 17 publications had been thoroughly analyzed. In this section the results of the analysis are presented in the order of the research questions posed in the introduction.

Methodologies and resulting datasets

The first research question concerned the methods that have been used to research player communities and their social dynamics. The appendix completely lists the methods of data collection, details about the collected data and the online game(s) concerned. Table 2 summarizes the appendix, specifically the methods generally used across the selected publications.

Methods used	Publications
Various forms of **ethnography or participant observation**, where ethnography entailed not only participation/observation, but also interviewing (formal, informal, of a single respondent, of a group of respondents, online via text or voice chat, face-to-face) or other ways of gathering qualitative data (field notes, voice/text chat logs, discussion forum postings, screenshots, session videos, manuals), followed by qualitative analysis.	Chen 2009; Ducheneaut and Moore 2005; Humphreys 2005; Jakobsson and Taylor 2003; Kolo and Baur 2004; Malone 2009; Pearce and Artemesia 2009; Steinkuehler and Williams 2006; Taylor 2006a, 2006b; Voulgari and Komis 2010; Williams et al 2006; Williams 2009
Data mining, i.e. systematic and (semi-) automatic quantitative data gathering within one or more online games, followed by statistical analysis.	Chen et al 2008; Ducheneaut et al 2006b; Ratan et al 2010; Williams et al 2006
Survey, i.e. setting out one or more questionnaires amongst either unselected or selected respondents, followed by mostly statistical analysis.	Steinkuehler and Williams 2006 Kobayashi 2010 Kolo and Baur 2004 Ratan et al 2010
Social network analysis, i.e. systematic quantitative data gathering concerning relationships between players (through surveys and/or data mining), followed by analysis through network visualization.	Kolo and Baur 2004 Williams et al 2006

Table 2: Data collection and analysis methods used in the selected publications. See also the appendix.

As displayed in table 2, four main approaches could be discerned from the selected publications. The most applied approach was participation and/or observation, or more broadly, ethnography. We consider ethnography to be a methodology that ideally encompasses participation/observation and several other qualitative or quantitative data collection techniques. Ten publications resulted completely from ethnographic research

or participation/observation, while three publications resulted partly from them. Quantitative methodologies were less applied among the selected publications. Four publications utilized data mining techniques, four utilized surveys and two utilized network analysis.

Researchers who applied ethnography or participation/observation used varying terminology to explain their methodology and diverse methods to gather and analyze their data. Although the single term 'ethnography' was most common, the terms 'virtual' (Ducheneaut and Moore 2005), 'multi-sited cyber-' (Pearce and Artemesia 2009) and 'cognitive' (Steinkuehler and Williams 2006) ethnography were also used. These researchers applied a wide range of data collection and analysis methods. In four of the 13 publications resulting from ethnographic methodology, the data and subsequent analysis on which the publication was based was either missing or remained unclear (Humphreys 2005; Malone 2009; Taylor 2006a; Williams 2009). In the remaining publications authors explained how they used differing data gathering techniques. Besides logging their own experiences and thoughts in one or more journals, these authors had informally or formally interviewed other players (Jakobsson and Taylor 2003; Kolo and Baur 2004; Pearce and Artemesia 2009; Steinkuehler and Williams 2006; Taylor 2006b; Voulgari and Komis 2010), logged chat sessions (Chen 2009; Pearce and Artemesia 2009), made and logged screenshots and videos (Ducheneaut and Moore 2005; Pearce and Artemesia 2009) or analyzed documents like forum discussions, websites or manuals (Jakobsson and Taylor 2003; Kolo and Baur 2004; Steinkuehler and Williams 2006, Taylor 2006b). Following qualitative analysis of the data, the authors offered mostly descriptive theories, i.e. theories as to how to describe and interpret the social dynamics of the player communities they had researched.

Slightly less diverse were the data collection and analysis methods of the quantitative researchers. The seven publications based on quantitative methodologies offered precise numbers of respondents (in the case of surveys; Kobayashi 2010; Kolo and Baur 2004; Ratan et al 2010; Steinkuehler and Williams 2006) or avatars (i.e. in-game played characters, in the case of data mining; Chen et al 2008; Ducheneaut et al 2006b; Ratan et al 2010; Williams et al 2006), as well as what data was specifically gathered per respondent. Many of these researchers assembled large databases containing all sorts of data, i.e. demographics, player relations, community associations and community dynamics. The authors subsequentely performed statistical and social networking analyses. Statistical analyses entailed descriptive and correlation analyses, whose results were often presented through tables, figures and graphs. These authors then offered theories with a slightly more explanatory characteristic, i.e. theories as to how to describe as well as explain the social dynamics of the player communities they had researched.

Conceptual definitions and characterizations

The second research question concerned the conceptual definitions and characterizations authors have used to describe player communities and their social dynamics. Our analysis revealed a plethora of concepts used to define and characterize player communities. These were abstracted to 10 main sociological concepts presented in Table 3.

Of all sociological concepts , the three most popular ones were community, guild and group. These three concepts suggest three possible perspectives on player communities, i.e. macro, meso and micro perspectives respectively, as illustrated in Figure 1. The other concepts can also be connected to these three perspectives. Specifically, the concepts team, raid and party fit the micro perspective well as they all focus on small groups. The

concepts organization, clan and social formation/unit generally fit the meso perspective, although the latter can also fit the macro perspective. These concepts relate to larger social entities than the micro perspective does. The concept of network fits a macro perspective, although it can also fit a meso perspective. The macro perspective relates to the relatively largest social entities.

Key concept	Publications
Guild	Chen et al 2008; Ducheneaut and Moore 2005; Ducheneaut et al 2006b; Humphreys 2005; Jakobsson and Taylor 2003; Kolo and Baur, 2004; Malone 2009; Ratan et al 2010; Steinkuehler and Williams 2006; Taylor 2006a, 2006b; Williams et al 2006
Community	Ducheneaut and Moore 2005; Humphreys 2005; Jakobsson and Taylor 2003; Kobayashi 2010; Kolo and Baur 2004; Malone 2009; Pearce and Artemesia 2009; Steinkuehler and Williams 2006; Taylor 2006a, 2006b; Williams et al 2006; Williams 2009
Group	Chen 2009; Ducheneaut and Moore 2005; Ducheneaut et al 2006b; Humphreys 2005; Jakobsson and Taylor 2003; Ratan et al 2010; Steinkuehler and Williams 2006; Taylor 2006a, 2006b; Voulgari and Komis 2010; Williams et al 2006; Williams 2009
Network	Jakobsson and Taylor 2003; Steinkuehler and Williams 2006; Taylor 2006b; Williams et al 2006
Organization	Jakobsson and Taylor 2003; Steinkuehler and Williams 2006; Taylor 2006b; Williams et al 2006
Team	Ducheneaut and Moore 2005; Taylor 2006b; Williams et al 2006
Raid	Chen 2009; Malone 2009; Taylor 2006b
Party	Ducheneaut et al 2006b; Williams et al 2006
Clan	Ducheneaut & Moore 2005; Kobayashi 2010
Social formation or unit	Kolo and Baur 2004

Table 3: Key sociological concepts in the selected publications
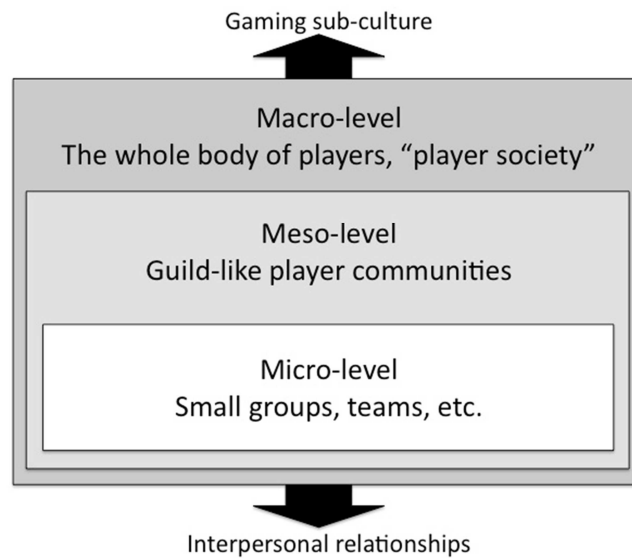
Figure 1: The three-level ecosystem of player communities

Many authors apply multiple perspectives interchangeably or in an overlapping fashion, as well as multiple concepts within each perspective. For example, Chen (2009) analyzed raid groups that for each raid attempt had different compositions of roughly 40 members, thus rendering each raid group more of a 'multigroup formation' (Taylor 2006b, 37) or an organization. Williams (2009, 5) considered (though critically) a group as a 'temporary intentional community', while Pearce and Artemesia (2009, 138) considered guilds as 'communities of play'. Some of these instances could arguably be attributed to differences in interpretation, theoretical confusion or a simple attempt to make the text livelier by the use of (near) synonyms.

In addition to using key concepts in an overlapping fashion, most authors offered no clear definitions for their chosen concepts. This is understandable from an interpretive and inductive scientific paradigm under which most of the publications clearly fall. Having interpreted the results of their empirical research, authors often use commonplace concepts like group and community to portray their understanding to the reader. However, this can be confusing, especially in those cases where the focus of the study seemed to fit several of the perspectives presented in Figure 1.

The seemingly interchangeable use of perspectives and general lack of definitions makes it very difficult to generalize the findings and to form a 'bigger picture'. We can only summarize the concepts and characterizations that were used in several publications:

- Adopting a macro perspective, several researchers characterized communities as having an identity that is implicitly upheld by its members (see also Williams 2009), e.g. the shared value of belonging to a 'play community' that plays all sorts of games together (Pearce and Artemesia 2009, 129), or of offering technological and informational support to tackle complex game mechanics (Humphreys 2005; Pearce and Artemesia 2009; Taylor 2006a).

- Adopting a meso perspective, several researchers characterized guilds as being institutionalized social entities (Jakobsson and Taylor 2003; Kolo and Baur 2004;

Malone 2009; Taylor 2006b; Williams et al 2006). The described institutions point to two types of guilds:

1. A 'casual' (Malone 2009; Taylor 2006a, 331; Williams et al 2006, 350), 'social' (Jakobsson and Taylor 2003; Malone 2009; Ratan et al 2010, 96; Taylor 2006b, 43; Williams et al 2006, 350), 'family' (Taylor 2006b, 43) or simply 'non-raiding' (Humphreys 2005) guild.

2. A 'well-articulated' (Jakobsson and Taylor 2003; Taylor 2006b, 43), 'hierarchical' (Jakobsson and Taylor 2003; Malone 2009; Taylor 2006b, 43) 'uber' (Chen et al 2008, 294; Jakobsson and Taylor 2003; Taylor 2006b, 43), 'strategically oriented' (Ratan et al 2010, 96) or even 'militaristic' (Steinkuehler and Williams 2006, 903) guild.

- Adopting a micro perspective, several researchers characterized groups as being relatively small, temporary and goal-oriented (Chen 2009; Ducheneaut et al 2006b; Humphreys 2005; Jakobsson and Taylor 2003; Ratan et al 2010; Taylor 2006b; Voulgari and Komis 2010; Williams et al 2006; Williams 2009).

Aspects and operationalizations

The third and final question concerned what aspects or operationalizations of player communities the authors used in the selected publications. We consider aspects and operationalizations as variables with which player communities can be researched empirically. An operationalization denotes a quantifiable variable, i.e. a variable that can be used in quantitative research. In qualitative research quantifiable variables can of course also be used, but they can be accompanied by many more variables that cannot be quantified. In our analysis of the selected publications we noted both operationalizations as quantifiable variables and other aspects the authors studied as qualifiable variables.

Like in our analysis of conceptual definitions, a plethora of aspects and operationalizations emerged from our analysis. Intriguingly, they could not be easily mapped to each of the previously defined main perspectives. This means that although one can deduce three main perspectives on player communities from the selected publications, this does not mean that the authors used only specific aspects and operationalizations for a certain perspective. Overall we noted 18 general aspects and operationalizations. Six of these 18 were clearly most common as they were mentioned in seven publications or more, while the other 12 were less common as they were mentioned in up to four publications.

The six most common aspects and operationalizations were:

- **Social structuring (including all forms of management).** Many authors discussed social structuring as an aspect of player communities in two ways. Firstly, they discussed social structuring game-substantively, i.e. how players define roles like 'healers' or 'tanks' that the game's mechanics seem to demand (Chen 2009; Ducheneaut and Moore 2005; Humphreys 2005; Jakobsson and Taylor 2003; Kolo and Baur 2004; Taylor 2006b). Secondly, they discussed social structuring in terms of management, i.e. how players define roles specific to the player community. In this case authors discussed recruitment, activity measurement and reward allocation, conflict management or leadership (Chen 2009; Ducheneaut and Moore 2005; Humphreys 2005; Jakobsson and Taylor 2003; Kolo and Baur 2004; Malone 2009; Pearce and Artemesia 2009; Ratan et al

2010; Steinkuehler and Williams 2006; Taylor 2006a, 2006b; Voulgari and Komis 2010; Williams et al 2006).

- **Rationale.** Many authors discussed the reasons for player communities to exist. A player community's rationale can be a clearly defined goal, e.g. finishing one, several or all game mechanics, which once reached might lead to the end of the player community altogether (Chen 2009; Ducheneaut and Moore 2005; Ducheneaut et al 2006b; Humphreys 2005; Jakobsson and Taylor 2003; Malone 2009; Taylor 2006b; Williams et al 2006; Williams 2009). It can also be a much less clearer pursuit that might never end or be voiced but only interpreted by the researcher, e.g. the continuous pursuit of friendship or opportunities for all sorts of social play (Ducheneaut et al 2006b; Humphreys 2005; Jakobsson and Taylor 2003; Kolo and Baur 2004; Pearce and Artemesia 2009; Ratan et al 2010; Taylor 2006b; Voulgari and Komis 2010; Williams et al 2006; Williams 2009).

- **Culture & social norms.** Many authors discussed how player communities seem to have a set of unwritten rules, norms or conventions, as well as clearer written norms or rules. Culture and social norms are exhibited in patterns in communication and collaboration that the members of a player community develop and uphold, e.g. a militaristic culture encompassing a sense of competition, absolute rules and/or hierarchical structures of power (Jakobsson and Taylor 2003; Malone 2009; Ratan et al 2010; Steinkuehler and Williams 2006; Taylor 2006a, 2006b; Williams et al 2006), or a casual culture encompassing a sense of fun, closeness and/or equal distributions of power (Chen 2009; Ducheneaut and Moore 2005; Jakobsson and Taylor 2003; Kolo and Baur 2004; Malone 2009; Pearce and Artemesia 2009; Ratan et al 2010; Steinkuehler and Williams 2006; Taylor 2006b; Williams et al 2006; Williams 2009).

- **Used ICTs.** Many authors discussed player communities' information and communication technologies and their purposes. They discussed technologies used for communication, i.e. direct/indirect text chat and direct voice chat applications, as well as for knowledge management, i.e. forums, wikis and other applications with which game-substantive knowledge (how-tos, walkthroughs) or organization-specific knowledge (social norms, social structuring) can be developed, stored, shared and reviewed (Chen 2009; Ducheneaut and Moore 2005; Humphreys 2005; Jakobsson and Taylor 2003; Kolo and Baur 2004; Pearce and Artemesia 2009; Ratan et al 2010; Steinkuehler and Williams 2006; Taylor 2006a; 2006b; Williams et al 2006).

- **Number of members.** Many authors stated the specific number of members player communities have, mostly dynamically by specifying a range, noting relative differences ('fewer', 'more') or reviewing its development over a certain period of time (Chen et al 2008; Chen 2009; Ducheneaut and Moore 2005; Ducheneaut et al 2006b; Humphreys 2005; Jakobsson and Taylor 2003; Pearce and Artemesia 2009; Ratan et al 2010; Taylor 2006b; Voulgari and Komis 2010; Williams et al 2006).

- **Time of existence.** Finally, several authors stated the specific or relative amount of time player communities exist, i.e. the amount of hours, weeks, months or years, if they ever seemed to disband at all (Chen et al 2008; Jakobsson and Taylor 2003; Pearce and Artemesia 2009; Steinkuehler and Williams 2006; Taylor 2006b; Voulgari and Komis 2010; Williams et al 2006; Williams 2009).

Of the 12 other aspects and operationalizations of player communities, nine were quantifiable operationalizations, two were qualifiable aspects and one was both used qualitatively and quantitatively. The nine quantifiable operationalizations were:

- The members' avatar/character levels and abilities (Chen et al 2008; Ducheneaut and Moore 2005; Taylor 2006b; Voulgari and Komis 2010).

- The members' commitment (also given the player turnover rate and time spent online) (Voulgari and Komis 2010; Williams 2009).

- The members' centrality (number of other members played with) (Ducheneaut et al 2006b; Williams et al 2006).

- The members' interdependency and overall heterogeneity (Kobayashi 2010; Ratan et al 2010).

- The amount of time members spend grouped within a community to accomplish sub-goals (Ducheneaut et al 2006b).

- The members' ages (Taylor 2006a).

- The members' intensity of play (number of times logged in) (Kolo and Baur 2004).

- The members' spoken languages or national cultures/identities (Taylor 2006a).

- The members' level of trust with one another (Ratan et al 2010).

Two qualifiable aspects of player communities concerned their boundaries (either based on clear criteria or none whatsoever, rendering the boundary symbolic; Williams 2009), and their identity, which effectively encompasses a sense of shared history (Pearce and Artemesia 2009). A final aspect was both qualified in numerous publications (Jakobsson and Taylor 2003; Steinkuehler and Williams 2006; Taylor 2006b; Williams et al 2006), and quantified in another (Kobayashi 2010), though in both cases it concerned the members' 'bonding' and 'bridging' social capital. Put most simply, the former concerned members' close ties, while the latter concerned members' weak ties.

The plethora of aspects and operationalizations again leads to some difficulties in comparing or generalizing the findings from the selected publications. One can argue that there seems to be some consensus that at least the six most common aspects and operationalizations we found are relevant for studying player communities. Then again, there are clearly many other variables that can be studied. The plethora of aspects and operationalizations makes it difficult to compare conceptual definitions and characterizations. The authors of the selected publications developed the conceptual definitions and characterizations after analyses of many highly different variables, in turn obtained using differing research methods.

CONCLUSION

In this article we reviewed studies into social dynamics of player communities in online games published in 2000–2010. Following a systematic search and selection process, we analyzed 17 publications on the conceptual definitions, characterizations, operationalizations and aspects of player communities they offered. The researchers behind the selected publications applied numerous methods within several online games. There was a tendency towards favoring open-ended qualitative approaches. In general the plethora of concepts, aspects and operationalizations used made it difficult to compare or

generalize the findings. Moreover, there was often overlap in meanings of different terms, even though authors only rarely offered clear definitions of the used terms in the first place.

Regardless of overlapping meanings and lack of definitions, three perspectives on player communities emerged from the selected publications. We labeled these micro, meso and macro perspectives. Research from a micro perspective focused on the smaller, temporary and often more short-term goal-oriented groups, teams, raids or parties. From a meso perspective the research focused on larger, longer-lasting and institutionalized organizations, guilds, clans or (sub)communities. Finally, from a macro perspective the research focused on the largest communities or networks that are often symbolic in the sense that they are only bound by a common identity (Williams 2009). Looking at what the empirical research actually concentrated on, we found six common and 12 less common operationalizations and aspects. Most common were social structuring (including all forms of management), rationale, culture & social norms, used ICTs, number of members and time of existence.

The analysis revealed several issues that could and should be addressed in future research into social dynamics of player communities. We discuss several recommendations for future researchers below.

Firstly, in publications resulting from ethnographic research there was often a lack of rigor when describing data collection procedures, the resulting data and its analysis. To the reader it might not be clear what has been observed, how the data has been collected or what the units of analysis are. In the end, the reader of these works is left largely in the dark concerning the origins of the knowledge that is being presented as scientific or academic. If a researcher cannot clearly describe to the reader the processes he or she has utilized, any results and conclusions presented in the research report will be undermined (Silverman 2005, 209). Of course we must note here that such omissions are often the result of cultural analysis being interpretive in nature. Still we claim that a rigorous approach to describing the research procedure (whether it was or was not based on an interpretive science philosophy) has merit as it shows responsibility.

Secondly, although the 17 publications are based on analyses into numerous different online games, there are many other online games that could be researched. As the appendix shows, World of Warcraft (Blizzard Entertainment, 2004) and EverQuest have been researched extensively. The former is at the time of writing still one of the most popular online games, while the latter has arguably lost most of its popularity (especially EverQuest I, see Van Geel 2010). With hundreds of online games in existence, there are also many more opportunities for further research. Moreover, most of the selected publications were focused on Western gaming populations (possibly reflecting our preference for English publications). Thus there are also many more opportunities for further research into non-Western gamers and the online games they are playing.

Thirdly, we argue that future researchers aiming to describe and understand social dynamics in online games could be more careful when positioning their research. For example, the focus of research projects could be clearer by positioning the study on a micro, meso or macro perspective. Some researchers might still want to explicitly adopt a broad, holistic perspective. As noted by Williams et al (2006, 345), it seems that many if not most player communities consider themselves 'hybrids'. This means that a guild, for example, can have various guiding motives behind its operation, making it difficult to

categorize it neatly to deem only one of the three perspectives applicable. Indeed, we do not want to suggest future researchers to only apply common sociological concepts following a choice of either micro, meso or macro perspective. We simply argue that analyses could be improved and more comparable if future researchers explicitly discuss the applicability and usefulness of these perspectives within the context of the chosen online game(s).

Having summarized and discussed the results of our review, we note three main limitations of our approach. Firstly, it should be noted that our analysis and conclusions are based on English publications only, for obvious practical reasons. Secondly, our analysis and conclusions are not based on conference papers or any publications other than journal articles and authored/edited books. Our choice led to the exclusion of at least four arguably relevant conference papers (Ducheneaut and Moore 2004; Ducheneaut et al 2006a; Seay et al 2004; Tosca 2002) and presumably some PhD theses. This was not an easy decision, and can indeed be debated. Generally, being a young field of research, many interesting and insightful publications have been written on the subject other than those selected. Many discussions about social dynamics in online games also take place in popular media, i.e. wikis (e.g. WoWWiki.com), blogs (e.g. Terranova.blogs.com) and news/fan sites (e.g. Gamasutra.com). Overall we have presumably excluded quite a lot of material from our analysis. Again, our preference for a systematic review prohibited us from including only some of these works. Finally, at times we opted to exclude a publication if its main focus was obviously not the social dynamics of player communities, even though it contained a couple of sentences providing insights into them. All three limitations point to the realization that other reviewers might have chosen to include different publications than we did.

We also note that our results depend heavily on when the authors of the selected publications had collected their data. Not many of the selected publications were based on research into an online game that had just been published. The social dynamics that a researcher can observe when conducting research into a relatively old online game could be very different from those observed in a young online game (Chen et al 2008, 298-299).

Overall we feel that despite its infancy this field of study is already quite large in terms of the number of researchers and resulting works. Although the topic of social dynamics in online games might seem under-researched, we argue that the issue is more complicated. The problem is that the vast variety of publication formats renders it difficult to oversee as well as value all the research that has already been carried out.

Regardless of the limitations of our analysis and conclusions, we feel that this article offers future researchers of player communities in online games a useful synthesis of previous approaches and findings. Our recommendations are arguably also very relevant to future researchers. The question finally remains why further research into the topic is actually warranted. An answer to this question firstly depends on one's research field. However, from a general social scientific perspective, the continued and arguably still increasing popularity of online gaming (Van Geel 2010) warrants further research in and of itself. Since online games play an important part in the daily lives of tens of millions of people worldwide, we are as social scientists practically obligated to the general public and policy makers to offer an understanding of what social dynamics actually occur in online games. From a scientific perspective, online gaming's popularity warrants continued research into what structures and cultures players actually form, with which both global and region-specific sociological theories could be further developed. We thus

argue that a more generalizable theory of social dynamics of player communities in online games is worth pursuing. For that to occur, future researchers would need to build upon existing work more explicitly than has been done over the past decade.

ACKNOWLEDGMENTS

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APPENDIX

Overview of methods and resulting sample/datasets per selected publication.

Publication	Methods	Resulting sample/dataset	Online game(s) concerned
Chen et al 2008	data mining	641805 avatars from 62 servers	World of Warcraft
Chen 2009	ethnography	36+ months	World of Warcraft
	participant observation	8 months in community of 70-80+ people	
	chat log capture	1 month (community voice/text chat)	
Ducheneaut and Moore 2005	ethnography	3 months	EverQuest Online Adventures
	game-play video recordings	< 100 hours	
Ducheneaut et al 2006b	data mining	8+ months	World of Warcraft
Humphreys 2005	ethnography	1 year	EverQuest
	interviews		
Jakobsson and Taylor 2003	ethnography		EverQuest
	participant observation		
	interviews		
	document analysis	discussion forums and websites	
Kobayashi 2010	three-wave panel survey	523 respondents in 3 surveys over 2 years	Lineage
Kolo and Baur 2004	document analysis	publisher's manuals/introductions	Ultima Online
	interviews		
	observation	approximately 3 months, of 2 players	
	participation	approximately 3 months	
	questionnaire	104 respondents	
	network analysis	2 communities	
Malone 2009	participant observation (unclear)		World of Warcraft
Pearce and Artemesia 2009	ethnography	18 months	Uru: Ages beyond Myst, There.com, Second Life, community-developed virtual world, Until Uru
	participant observation	160-450 players	
	informal / formal interviews		
	group interviews		
	chat log capture		
	screenshot capture	approximately 4000	
Ratan et al 2010	data mining	several hundred thousand players	EverQuest II
	survey	approximately 3,500 players	

Publication	Methods	Resulting sample/dataset	Online game(s) concerned
Steinkuehler and Williams 2006	ethnography	2 years (first author)	Lineage (I & II)
	interviews	16 players (first author)	
	other unspecified qualitative data	(first author)	
	survey & experimental research	750 players in 2 groups (second author)	Asheron's Call (I & II)
	participant observation	1 year (second author)	
	interviews	30 players (second author)	
Taylor 2006a	ethnography	at least 1 year	World of Warcraft
	ethnography	(details in another publication)	EverQuest
Taylor 2006b	ethnography	4+ years	EverQuest
	participant observation	online (in-game / discussion forums) offline (community meetings)	
	(in)formal on-/offline interviews		
	document analysis	map sites, databases, comics	
Voulgari and Komis 2010	ethnography	18 months, approx. 14 hours/week	Lineage II
	ethnography	7 months, approx. 1-2 hours/week	Tribal Wars
	interviews	15 players	World of Warcraft, Lineage II, Left4Dead, Tribal Wars, The West, EVE Online, Defense of the Ancients, Age of Conan
	focus group		
Williams et al 2006	participant observation	several months by several researchers	World of Warcraft
	data mining	unspecified amount of players (details in another publication)	
	interviews	48 players	
Williams 2009	ethnography	3 years	World of Warcraft
	ethnography	3 years	Other discussion forum community
	interviews		