

- Draft -

Reference:

Berry V., Boutet M., Coavoux S., « Ways of playing. The differentiation of practices in online video games », *In* : M. Grenfell et F. Lebaron, *Bourdieu and Data Analysis: Methodological Principles and Practice*. (à paraître en 2013)

Playing styles: The differentiation of practices in online video games.

Vincent Berry, Manuel Boutet, Samuel Coavoux

Introduction

Our collaborative work started as a reaction to some of the core assumptions of the newly developed discipline of “Game Studies”. That body of literature, akin to cultural studies, is taking root in academia. It makes the assumption that video games are a new medium that needs to be studied using new ways of investigation. This difference is believed to be best studied by analysing the rules of the games. Most of the time, the study of games as mere formal systems of rules does not document what players actually do while playing. The studies which do so, in precise, thorough ethnographies (Taylor 2006; Pearce 2009), depict a particular way of playing, but rarely the diversity of play styles.

Video games ask for a form of cultural consumption distinct from that of television, books or music. Since they are intrinsically interactive, what matters is *what people do* with games rather than what they think about them. We thus use the expression *play styles* to designate ways players interact with video games. The purpose of our research is to describe those styles (Boutet 2012a), trace them back to their origins (Coavoux 2010b; Berry 2009), and study their relations, i.e. how each takes place in a social space (Bourdieu 1991), where they are linked by ties of power and conflict (Coavoux 2010a). The intention of this chapter is to demonstrate that no one style can by itself characterize what it is “to play the game”. On the contrary, playing should be viewed as choices in the making, hence understood in relation to all the other play styles surrounding it. An inquiry into practices is thus required, since the possibilities are partly created by players – and not inscribed solely in the rules. After establishing a classification of practices, we discuss where those variations come from: to trace them back to indicators of social characteristics, like gender, generation or class, as well as gaming experience. Finally, what we demonstrate that video game practices are modelled like a social field; as such, they are partially determined by a field of social position, and partially moved by their own field-specific dynamic.

We base this article on our various studies of online video games, and more specifically of *World of Warcraft* (*WoW*). *WoW* is a game where players control a character in a vast fantasy world (similar to J. R. R. Tolkien's *Lord of the Rings* universe). The character is partly customizable, and the choice of one of the various possible characters might lead to very different game experiences. A monthly subscription (around 12 USD) is required of the player. The main goal proposed by the game is to improve that character by training it, and acquiring virtual equipment that will increase its power. Players can also fight creatures managed by the program (Artificial Intelligence or A.I.), confront other players connected at the same time, or even sell virtual goods acquired during the game. A social world is therefore simulated. We used both qualitative and quantitative methods, but the empirical aspect of the current chapter is composed of a self-administered online survey of the game players conducted in early 2009.

This paper will first establish the need for such a study by reviewing current Game Studies literature, and showing that it does not account for the diversity of ways of playing. We will then map a social space of the online game, and show that this space is strongly structured by players' preferences and power relations. Finally, we will trace the players' positions in that social space back to their social characteristics, to find that traditional variables are not enough for such a project, and that we must take into account the specific dynamics of playing activities.

Where are the players?

Although a prominent artifact of contemporary mass culture, videogames have not yet attracted much attention from sociologists, and the largest part of the academic literature devoted to this cultural product has arisen in the "Game Studies" discipline. The term refers to a wide variety of works, in fields ranging from cultural studies to psychology, which attempts to make sense of video games as a single new medium. However, a striking feature of this body of literature is that the players are often absent in the analysis, as if videogames were a text with no readers; when they do appear, it is as an archetypal figure of *the* player, and almost never as players. In this landscape, there is little room for a thorough analysis of the diversity of players, not only as a demographically diverse population, but also as a body of cultural consumers with very different relations to the games they play.

Game Studies was born, like cultural studies, in Humanities departments. However, though the Birmingham department started from a will to shift the attention from texts to readers (Hoggart 1957), the first ambition of Game Studies was to have games considered as legitimate texts, hence focusing on their formal features. Reflections on game design – i.e. the craft of making games, and the study of what constitutes a game – are dominant in the field (Bogost 2006), and other formal approaches, such as ideological criticism, also flourish (Kline, Dyer-Witheford, and de Peuter 2003). In this literature, there are no such things as social actors, because the player is reduced to a trigger: there might be someone on the other side of the electronic device to activate the games' feature, eventually endowed with psychological properties, possibly influenced by the militaristic ideology of the games, but nonetheless without past, socialization or individuality. A common point to all these approaches is that the game is like a stage, set in advance, a text, already written. The player walks in after the play has been set up, in order to enact this script: there is no place for individuation or creativity, or for the play as an activity in the making.

Some authors follow the path set up by cultural studies more closely and draw attention to the various receptions of games. Adapting Stuart Hall's model of communication (1980) to videogames (Raessens 2005), Anne Everett studied the different levels of reading of "races" in videogames (2005), and Richard & Zaremba (2003) the ambiguous reception of the feminine yet masculine character Lara Croft. Yet, such analyses seldom push further than the level of representations. A diversity of players is acknowledged, but they are defined as cultural *receptors*, the variation in their practices stays in the shadow. Ultimately, the game is reduced to a text, a device containing representations, and its existence as an interactive medium is negated.

Social Sciences perspectives on players and playing are few, but of great value. A string of rich ethnographic studies have shed light on some of the most "exotic" practices of online gaming, such as "power-gamers" (Taylor 2006; Nardi 2010; Pearce 2009). They show gaming as a situated action, focus on the identity of players and the relationships between them, and tackle issues of power and conflict between the players and the editors. However, to the best of our knowledge, no comparative work has yet been undertaken. Those ethnographies focus on local, well-defined groups of players, who most of the time have a special interest in the game. However, they do not situate those groups among the larger mass of users. Mathieu Triclot's (2011) study of the successive "regimes of

experience” in video game history does provide a valuable theoretical framework, but mainly accounts for diachronic diversity in play styles.

Finally, there have been a few attempts at classifying players among the Game Studies literature (Tuunanen and Hamari 2012, lists the most prominent). They are, however, unsatisfactory from the perspective of sociology of culture and cultural consumption. The many psychological studies of video games classify players based on their “motivations” which can be oriented towards achievement, socialization, or exploration (Yee 2006). However, such studies pay little attention to the fact that games are *played*, and that playing is a process. Instead, they tend to reify activities and players. The activities allowed by the gameplay are taken as the range of possible goals. Similarly, players are reduced to a set of distinct psychological traits traced to the way they engage in games. Therefore, the historical genesis of taste (Bourdieu 1984) as well as the dynamics of situated action are ignored and replaced by a vision of a value-shaped action that has long been convincingly criticized (Swidler 1986). The surveys do not ask *what* people do inside the game, but *why* they do it, whatever *it* is. Unfortunately, this underlying theory of action seems to be dominant even on the “ludologist” side of Game Studies, investigating “mentalities” rather than practices (Kallio, Mäyry, and Kaipainen 2011).

Behavioural typologies mainly use in-game metrics analysis, using the data the games themselves produce (Williams, Yee, and Caplan 2008; Drachen, Canossa, and Yannakakis 2009). While fruitful, this method can only measure what the software itself measures, and ignores important dimensions of practices. Most notably, not all playing happens inside the game universe: it is a shared object that stimulates social interactions among players, in front of the screen as well as via Internet, (e.g. Zabban 2009). Moreover, these analyses often rely on little demographic and cultural variables, with no means to reach players outside of the game, and thus assumes that games can be isolated, and studied in and of themselves. In the end, it classifies game design features rather than players themselves.

The social space of play styles

The study of play styles was conducted through an online survey aimed at French- and English-speaking *World of Warcraft* players. The survey, conducted in February and March 2009 by one of the co-authors, was self-administered. The respondents were recruited on game-related forums, whether specific to this game, or aimed at all MMORPG players, as well as on several prominent social network services. The questions focused on the way people played: what they value in the game, what they do in the virtual world, how and with whom they do it. Given the state of Game Studies at the time, where dozens of mostly psychological surveys were carried out on the same game, our survey was carefully designed not to appear as centred on “addictive” behaviours.

A Multiple Correspondence Analysis (MCA) was then carried out on 15 variables describing game practices. We made sure to include the widest range of survey questions possible in the analysis (cf. description below). However, since some questions were redundant, their presence in the algorithm could have artificially emphasized some dimensions, and we thus removed some variables from the analysis (ex. in the survey there were eight questions on raids, (game trials for large player gatherings), but only one that greatly contributed to the first axis was kept). The first versions of the MCA included other active variables that have since been dropped for lack of contribution to the first axis. The active variables can be found in Table 1.

Variable name	Variable description	Modalities	Modalities description
PrefClus	What players prefer in the game (synthetic variable computed from a seven-item ordered question: In the following list, what are the elements of World of Warcraft you prefer? [Please number each box in order of preference from 1 to 7]) ¹ . Note that some of those items were merged during the construction of the variable, so that only 5 modalities remain.	PvE Hist HL PvP Prog	Cooperative play History of the game universe High-level play Oppositional play Character's progression
EquPve	Best piece of PvE equipment owned before <i>Wrath of the Lich King</i> (WotLK), <i>World of Warcraft's</i> second extension set (ranked lowest to highest).	NE HS T3-T4 T5 T6 T6+	Poor, uncommon, or rare equipment – non epic Epic equipment outside of a set T3.5 or T4 set T5 set T6 set “Sunwell T6” set
RaWoNa	Ever been to the WotLK Naxxramas raid	never part normal hero	Never Have tried it Have completed it Have completed it on the hardest difficulty setting
ReCo	Ever read comics set in the game world	never	Never
ReFF	Ever read fan-fiction set in the game world	rare often	Rarely Often or very often
PrdFF	Ever written fan-fiction set in the game world	no private public	Never Yes, but never published it Yes, and published it
ReHist	Ever read a history of the game world	yes	At least rarely
ReFic	Ever seen a movie set in the game world (machinima)	no	No
PrdVif	Ever produced a movie set in the game world		
AcSolo	How often does respondent (R) play on their own	yes	Often or very often
AcExpl	How often does R explore the game world	no	Never or rarely
AcBG	How often does R participate in battlegrounds		
AcAr	How often does R participate in arena fights		
AcPvP	How often does R engage in fights against other characters		
AcFreqCl	How long does R play a week (computed from three questions about the amount of time played the week before the survey, the day before the survey, and the average amount of time played a week for players who had quit the game)	1-10h 11-16h 17-25h 26-40h 41h+	1 to 10 hours /w 10 to 16 hours /w 17 to 25 hours /w 26 to 40 hours /w 41 hours /w or more

Table 1: Active variables in the MCA

¹ Respondents were assigned a value on the basis of a hierarchical clustering conducted on a distance matrix computed through an optimal matching analysis of the ordered preference sequences. On sequence analysis, see, for one, Abbot and Tsay (2000).

We point out that the population of WoW players, and more importantly, that of our sample deviates strongly from the general population. Female players account for only 13.2% of the sample, and students (middle-school to post-secondary education) for at least 51.4%. Accordingly, the mean age is 23.6 years (standard deviation 7.1). Among those who are not students, only 15.7% earned less than a high school diploma, and 24.2% only that degree: the large majority is thus composed of at least university, college or vocational school graduates. Finally, excluding students, most respondents belong to the upper-middle or middle-class (28.3% and 32.6% respectively).² Respondents were recruited worldwide, since the survey was available in both French and English, but the majority live in France (46.8%) and the USA (11.8%). The UK, Canada and Belgium each accounted for around 4% of the sample, and other nationalities featured at more than 1% are: Norway, Sweden, Australia, Germany, Denmark and Switzerland, all of which are western countries with similar economies.

Given this wide diversity of demographic background, one could have expected great variations in the results of statistical analysis, should it be applied to various sub-samples (i.e. by country). This is far from being the case: the MCA, and subsequent analyses, that are presented in this chapter were also performed on various sub-samples: only male players; only French players; only students; only non-students; and every combination of the three categories (gender, nationality, student vs. non-student). In all cases, the overall structure remained the same (axis, discriminating variables and modalities), while only the proportion of players adopting a particular practice varied from one subpopulation to another. We thus only present the statistical work conducted on the sample as a whole, which allows a more in-depth analysis due to its larger sample size. Because missing data to at least one of the active variables were frequent (due to the fact that the survey was self-administered, online, and rather long), we imputed missing values using the regularized iterative MCA algorithm described in Josse et al. (2012) and implemented in the R package *missMDA*.

Only the first three axes of the MCA results will be discussed further. They account for 8.4, 7.6 and 6.7% of the total inertia respectively, and there is a clear step downward starting from the fourth axis, at 4.4%, followed by a slow decline (the tenth axis still carries 3.3% of the overall variance).

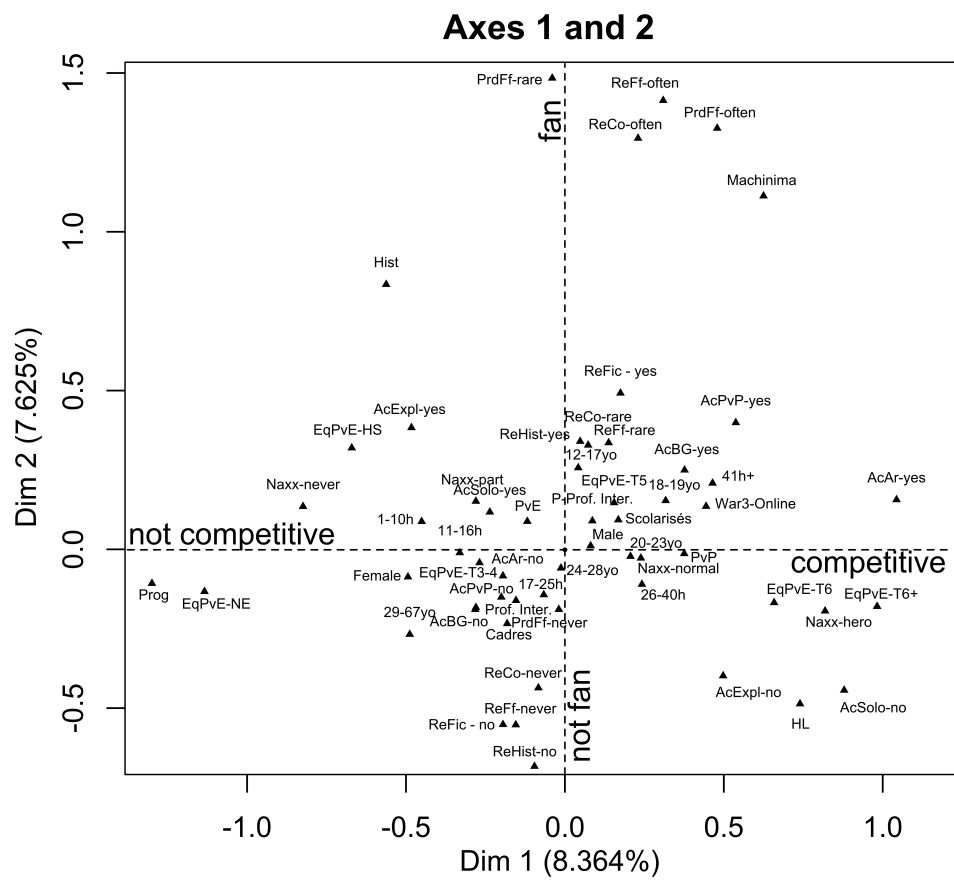
The first axis was mostly determined by participation in raids (collective trials) and by equipment (character's belongings) variables. It opposes, on the plus side, the highest level of equipment obtained (T6, T6+), completion of the most difficult raid (Naxx-hero), a preference for high-level and oppositional play, as well as time-consuming play (41h a week or more); and on the minus side, the absence of equipment and raid success, a preference for in-game characters, and solitary play.

The second axis was mostly structured by cultural variables, whether they measure the production or reception of game-specific cultural goods. On the plus side feature the reading and writing of fanfiction (short stories and novellas produced by the players where the action is set up in the game world), the consumption of comics, machinima (movies generated inside the game-world), and texts of virtual world history, as well as a preference for the game's story³. On the minus side is the absence of reception and production practices, as well as a preference for high-level play.

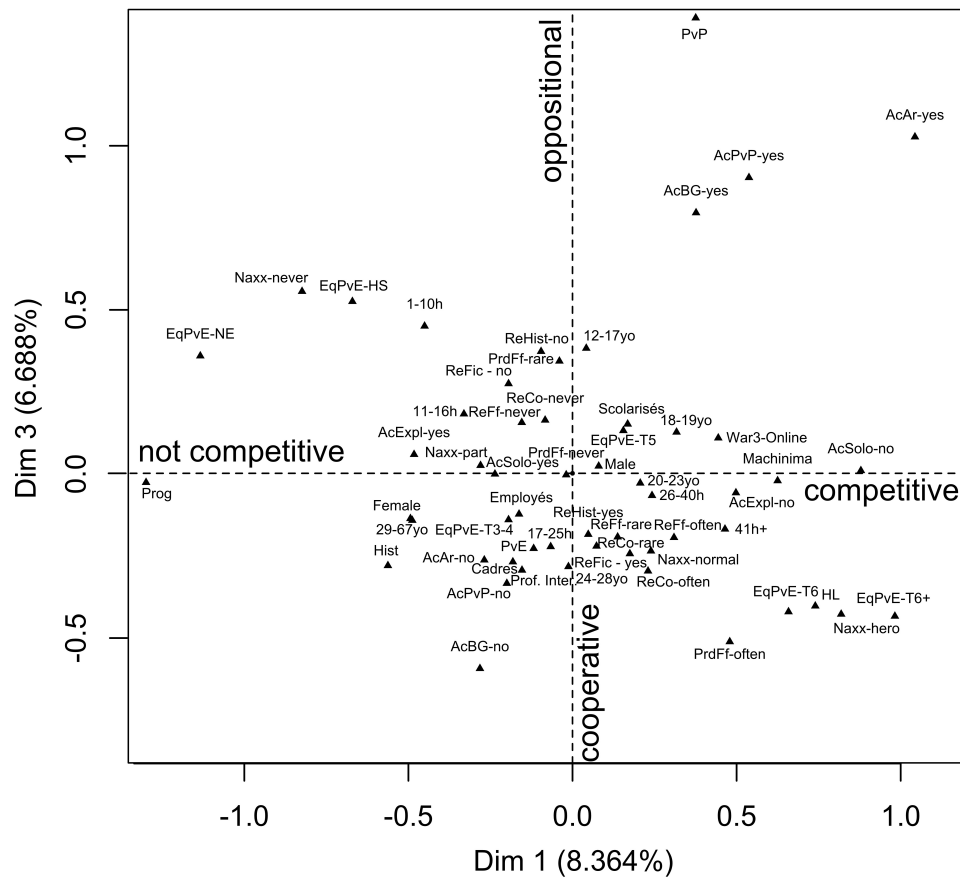
Finally, the third axis shows the confrontation of oppositional and cooperative modes of play. On the plus side are the preference for PvP (fighting other players), the participation in battlegrounds and arenas (both typical of oppositional play), and the absence of PvE (fighting the game world) equipment. On the minus side are a preference for high-level (usually synonymous, in the players' dialect, of cooperative high-level play), success in raids, and the absence of arena and battleground fights.

² Based on the French classification of occupations by INSEE.

³ The Game's Editor invest in the story-telling of the world – often referred to as “the background” of the game –, on the website, but also with other products such as novels and comic books, parallel to the game itself.



Axes 1 and 3



The overall structure measured by the three first axes thus seems clear. Practices are polarized by competition. But this does not mean that all practices are competitive. Some players are engaged in competitive play, while others are exploring the game and its stories – which they share and create. Beyond “competition”, the analysis reveals two different philosophies of confrontation: some prefer to fight other players, while others would rather cooperate to vanquish digital creatures – the monstrous simulated bodies controlled by artificial intelligences.

The first axis can be interpreted as that of involvement in competition vs. disinterest for competition. On the right are the players with the highest in-game economic capital, i.e. the best available equipment, who spend a significant amount of time playing, and have achieved the most difficult tasks. They are deeply involved in the gameplay. They try to achieve the topmost goals and collective trials offered by the online game. On the left, in-game economic capital is rare, the players have few achievements, and they prefer solo and exploration play. This second orientation towards the game is less structured than the competitive one, nonetheless a word exists, indicating it’s a stable inclination: these players are said to be – and often call themselves: “casual gamers”.

The second axis is that of fandom. We follow the rich literature on fan culture (Fiske 1992) to describe this inclination as a culturally active, productive engagement with cultural goods. The axis opposes fans to non-fans. Fans are deeply engaged in game-specific culture, and many among them actually participate in its production, which occurs mostly outside the game space, on other websites. Non-fans are removed from this aspect of the game, whether less implicated or engaged elsewhere – in the rationalizations, calculations and optimizations of competitive play.

The third axis draws a line between two styles of competitive play: one where players directly oppose other players (PvP), and the other where they cooperate against the artificial intelligence (PvE). In the latter, competition between players still exists, but only indirectly: the guilds (institutionalized groups of players) compete for who will be first to earn the highest achievements.

It should be noted that the results of this analysis are of interest not only because of what they show, but also because of what does not appear. Competition, fandom, and confrontation are not the only dimensions of play that ethnographic research reveals. For instance, some players value activities such as crafting and trading virtual items or playing the game in order to keep in touch with far away friends and relatives. However, multiple iterations of MCA have never put forward those dimensions of the game, and in the end, the variables describing them have been dropped from the analysis. Those activities were not differentiating enough to appear in the results – which means they are either too common or too rare, at least in the surveyed population.

On the other hand, the MCA clearly shows the multidimensionality of the actual practices in the game studied. Indeed, by its openness, the game space offers a wide range of choices, rather than a closed formal system of strict rules. Nonetheless, given players don’t play at everything and tend to orient themselves towards the activities that are the most meaningful to them – which vary among players. The most discriminating choices are represented by the three axes: competitive or casual, fandom or not fandom, duelling (PvP) or coping with adversity (PvE). The cross-tabulation of these choices allows us to identify play styles, and to position them in the social space of the game.

This result is corroborated by other methods. We studied several such online-games over the past ten years, adding ethnographical observations and in-depth interviews of players to quantitative analysis. In each case, surprisingly, a given game was played in different ways by different players. However, ethnography also reveals that players do not always notice how different their choices and practices are from that of their neighbours. Part of the explanation is that each kind of practice is partially

invisible to outsiders. Players share the same game space, but it's only part of their activities. In fact, an extensive part of play activity is situated outside of the interface –guild forums, performance measurement websites and software, films on YouTube, etc. In that context, different orientations towards the game lead to different sets of tools, some being shared by different play styles. The more a particular practice is developed, the more it requires additional tools, the more practitioners of other styles ignore these extensions and subtleties. The game editor gives room to those different styles: he or she encourages certain forms of players' appropriation, allows the use of "logs" (game session data) by competitive players, as well as some forms of copyright infringements from the fans, and occasionally communicates about major fan creations.

However, since the game universe allows a variety of styles, and since the editor supports them, the system of rules favours certain styles over others by setting up systems of rewards only for some actions. Particularly, players can measure their in-game economic capital (equipment, money, character strength...) or show off their symbolic capital (prestigious guild membership, rare outfits...), but similar rankings do not exist on such a scale for alternative dimensions of play. The competitive orientation towards the game is thus the most favoured: it relies on tools explicitly built into the game. This is not very surprising given the affinity between game and competition – noted much earlier in the work of Huizinga (Huizinga 1944). Fans act on a less institutionalized market. They have informal criteria they can use to determine what fanfiction is of quality, what machinima is best, but due to a lack of organized recognition inside of the game world, their style seems to lag behind the competitive style. Casual players, whose practice of the game does not take into account its specificities, play by no recognized standards and are mostly ignored or frowned upon by fans and competitive players.

The result here designates a social space structured by the prominent position of a particular orientation towards the game. That position is guaranteed by the rules. The editor and the system of rules play an institutional role here, very similar to that of school and educational textbooks in social reproduction (Bourdieu and Passeron 1977). In summary, play styles have very different (institutionally regulated) access to public existence, hence different legitimacies.

How does a player end up at one or the other pole of this social space? The addition of supplementary variables might shed light on this process. The supplementary variables considered here are mostly demographical: gender, highest educational degree obtained (excluding players still in education), occupation (coded with the INSEE PCS system), age, highest educational degree and occupation of the player's father. We also added, however, a couple of variables more specific to game culture: previous familiarity with a Real Time Strategy game (here, *Warcraft 3*, a game created by *WoW*'s editor and set up in the same imaginary world) and time when respondent first played *WoW* (the game being, at the time, about three years old).

Since the coordinates of modalities are dependent on the size of the category, and since, except for gender, the categories for supplementary variables are quite equally distributed, the graphical projection of these variables did not, at first glance, show much correlation. However, a closer look at their correlation with the first three axes does shed some light on the association between socio-demographic and game culture variables on the one hand, and play styles on the other hand⁴.

Not surprisingly, age and gender both play a significant role. Female players are more likely to play casually, and whenever they are competitive players, to favour cooperation rather than opposition. The youngest players are more likely to be fans (especially the youngest teenagers, aged 12 to 17) and more likely to favour PvP over PvE, which denotes a very specific engagement with culture (cultural goods being central to the life of teenagers, as has been repeatedly demonstrated), and the weight of

⁴ Only the supplementary modalities that are correlated with one of the first three axes ($p < 0.05$) are hereafter mentioned.

life constraints, since PvE play imposes a lot on players (availability in the evening for guild raiding, capacity to socialize inside the guild, etc.). On the other hand, the oldest players play more casually and are less likely to be fans (a time-consuming style). Between those two categories, young adults, aged 18-19, and less markedly, 20-23, usually hold the most powerful positions in the game. They are more likely to be competitive players, and cooperative at that.

Previous game experiences as well as the length of *WoW* experience both correlate with the three axes. Previous online experience on *Warcraft 3* (a game that could be played online or offline) is more likely to be found among the competitive, fan, and oppositional players. It is also correlated with the date of first play: *Warcraft 3* players adopted *WoW* earlier than others – in fact, the first game was a major gateway into the second. This result suggests there is such a thing as a ludic career: in-game socialization produces lasting effects on the way one plays the given game and other games (Coavoux 2010b).

Finally, occupation and level of education mainly oppose players who are still studying and all others. Students are significantly more represented on the plus side of all three axes: they are more competitive, more likely to be fans, and more oppositional than the others. Lifestyle seems to be the explanation here. Students have more available time, and fewer constraints other than familial ones, especially for those living with their parents. We can also observe slight variations along class lines. The “cadres” (upper-middle class) are less likely to be fans and, along with the “professions intermédiaires” (middle-class), less likely to favour cooperation rather than opposition.

Studying the diversity of play styles

The social study of video game play has not yet attracted many scholars, as we have argued in the first section. Moreover, academics most often focus on the games rather than the players. It is our opinion that such a player-centred perspective is necessary to make sense of games as cultural artefacts. Such a perspective should focus on the diversity of play styles. Geometric data analysis is helpful in describing and making sense of this diversity. It points to the various play styles, and gives indications as to their relationships. A relational approach is necessary, since no style can be understood without a reference to the competing styles.

To study players rather than games, a shift of focus from motivations to practices is also necessary. Games are things people do, and a theory of action that relies on intentions and motivations fails to account for it. The value of games is constructed through the activities of players. This means that the sociologist should follow the players wherever they go. Games do not stop when the device is turned off (Zabban 2009): they go on in everyday conversations (Boullier 2004), on the Internet or in other cultural practices.

Indeed, video games belong to a larger culture in which they should be positioned (Bourdieu 1984). They are closely associated with other cultural practices, from non-digital games to movies and music (Berry 2009). The theory of practice, and its central concept of habitus, can help us understand how this association is formed (Berry 2011).

Finally, this perspective cannot be achieved without a combination of quantitative and qualitative analysis (Coavoux 2010c). Although not emphasized in this chapter, the interpretations we were able to make of the MCA results would not have been possible without the ethnographical work the three of us conducted and described elsewhere (Berry 2009; Boutet 2008, 2012b).

References

- Abbot, Andrew, and Angela Tsay. 2000. "Sequence Analysis and Optimal Matching Methods in Sociology: Review and Prospect." *Sociological Methods Research* no. 29 (3):3-33.
- Berry, Vincent. 2009. *Les cadres de l'expérience virtuelle : Jouer , vivre , apprendre dans un monde numérique*.
- . 2011. "Sociologie des MMORPG et profils de joueurs : pour une théorie sociale de l'activité (vidéo)ludique." *Revue des sciences sociales* (45):78-85.
- Bogost, Ian. 2006. *Unit Operations. An Approach to Videogame Criticism*. Cambridge: MIT Press.
- Boullier, Dominique. 2004. "La fabrique de l'opinion publique dans les conversations télé." *Réseaux* (126):57-87.
- Bourdieu, Pierre. 1984. *Distinction : a social critique of the judgement of taste*. Cambridge, Mass.: Harvard University Press.
- . 1991. "Social Space and the Genesis of 'Classes'." In *Language and Symbolic Power*, 229-251. Cambridge, Mass: Harvard University Press.
- Bourdieu, Pierre, and Jean-Claude Passeron. 1977. *Reproduction in Education, Society, and Culture*. London, Beverly Hills: Sage Publications.
- Boutet, Manuel. 2008. "S'orienter dans les espaces sociaux en ligne. L'exemple d'un jeu." *Sociologie du travail* no. 50:447-470.
- . 2012a. "Jouer aux jeux vidéo avec style." *Réseaux* no. 173-174 (3):208-234.
- . 2012b. "Un rendez-vous parmi d'autres. Ce que le jeu sur Internet nous apprend du travail contemporain." *Ethnographiques.org* (23).
- Coavoux, Samuel. 2010a. "L'espace social des pratiques de *World of Warcraft*." In *Les jeux vidéo comme objet de recherche*, edited by Hovig Ter Minassian and Samuel Rufat, 253-280. Paris: Questions Théoriques.
- . 2010b. "La carrière des joueurs de *World of Warcraft*." In *Les jeux vidéo au croisement du social, de l'art et de la culture*, edited by Sylvie Craipeau, Sébastien Genvo and Brigitte Simonnot, 43-58. Nancy: Presses Universitaires de Nancy.
- . 2010c. "The Quantitative-Qualitative Antinomy in Virtual World Studies." In *Utopic Dreams and Apocalyptic Fantasies. Critical Approaches to Researching Video Game Play*, edited by Talmadge J. Wright, David G. Embrick and Andras Lukacs, 223-244. Lanham, MD: Lexington Press.
- Drachen, Anders, Alessandro Canossa, and Georgios N. Yannakakis. 2009. Player modeling using self-organization in Tomb Raider: Underworld. Paper read at Computational Intelligence and Games.
- Everett, Anne. 2005. "Serious Play: Playing with Races in Contemporary Gaming Culture." In *Handbook of Computer Game Studies*, edited by Jeffrey Goldstein and Joost Raessens, 311-326. London: MIT Press.
- Fiske, John. 1992. "The Cultural Economy of Fandom." In *The Adoring Audience. Fan Culture and Popular Media*, edited by Lisa Lewis, 30-49. Londres: Routledge.
- Hall, Stuart. 1980. "Encoding/Decoding." In *Culture, Media, Language: Working Papers in Cultural Studies*, 128-138. London: Hutchinson.
- Hoggart, Richard. 1957. *The uses of literacy : aspects of working-class life with special references to publications and entertainments*. London: Chatto and Windus.
- Huizinga, Johan. 1944. *Homo Ludens : a study of the play element in culture*. London: Routledge and Kegan Paul.
- Josse, Julie, Marie Chavent, Benoit Liquet, and François Husson. 2012. "Handling Missing Values with Regularized Iterative Multiple Correspondance Analysis." *Journal of Classification* no. 29:91-116.
- Kallio, Pauliina Kirsi, Frans Mäyry, and Kirsikka Kaipainen. 2011. "At Least Nine Ways to Play: Approaching Gamer Mentalities." *Games and Culture* no. 6 (4):327-353.
- Kline, Stephen, Nick Dyer-Witheford, and Greig de Peuter. 2003. *Digital Play. The Interaction of Technology, Culture, and Marketing*. Montréal: McGill - Queen's University Press.
- Nardi, Bonnie. 2010. *My Life as a Night Elf Priest. An Anthropological Account of World of Warcraft*. Ann Arbor: Michigan University Press.

- Pearce, Celia. 2009. *Communities of Play. Emergent Cultures in Multiplayer Games and Virtual Worlds*. Cambridge: MIT Press.
- Raessens, Joost. 2005. "Computer Games as Participatory Media Culture." In *Handbook of Computer Game Studies*, edited by Jeffrey Goldstein and Joost Raessens, 373-388. London: MIT Press.
- Richard, Birgit, and Jutta Zaremba. 2003. "Gaming with Grrls: Looking for Sheroes in Computer Games." In *Handbook of Computer Game Studies*, edited by Jeffrey Goldstein and Joost Raessens, 283-300. London: MIT Press.
- Swidler, Ann. 1986. "Culture in Action: Symbols and Strategies." *American Sociological Review* no. 51 (2):273-286.
- Taylor, T. L. 2006. *Play Between Worlds : Exploring Online Game Culture*. Cambridge, Mass.: MIT Press.
- Triclot, Mathieu. 2011. *Philosophie des jeux vidéo*. Paris: Zone.
- Tuunanen, Jaane, and Juho Hamari. 2012. Meta-synthesis of player typologies. Paper read at DiGRA Nordic 2012 : Local and Global - Games in Culture and Society.
- Williams, Dmitri, Nick Yee, and Scott E. Caplan. 2008. "Who plays, how much, and why? Debunking the stereotypical gamer profile." *Journal of Computer-Mediated Communication* no. 13 (4):993-1018.
- Yee, Nick. 2006. "Motivations for Play in Online Games." *CyberPsychology & Behavior* no. 9 (6):772-5.
- Zabban, Vinciane. 2009. "Hors jeu ? Itinéraires et espaces de la pratique des jeux vidéo en ligne." *Terrains & Travaux* (15):81-104.