

Coordinated Action in the Massively Multiplayer Online Game World of Warcraft

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In tandem with the technological advancement of immersive virtual environments, digital games have evolved into complex social worlds where people play collaboratively to achieve individual- and group-oriented goals. The massively multiplayer online games genre has received international attention for the large numbers of users that commit a significant amount of time and effort to online play. Play styles within such game worlds are diverse, but “raiding” is generally considered among gamers and scholars alike to be the most challenging form of collaborative play. Like other forms of social activity, raiding is predicated on players’ abilities to successfully coordinate individual lines of action. Yet the vast majority of raiders are not physically copresent during their collaborative efforts. Using Couch’s theory of coordinated action as an interpretive frame, we explore the computer-mediated process of raiding in the massively multiplayer online game World of Warcraft by analyzing ethnographic data and audio/visual recordings of gameplay. Our study expands Couch’s theory of coordinated action in two ways. First, we demonstrate how individuals and groups simultaneously engage in multiple forms of coordinated activity (e.g., conflict and cooperation). Second, we reveal two semiotic layers of coordinated action — the “subject-subject” (i.e., intersubjective) layer that is facilitated through the game’s user interface, and the “subject-object” layer that comprises players’ interactions with the user interface itself. Our study thus considers the potential of Couch’s theory for the study of computer-mediated communication and nonhumans in interaction.

Keywords: coordinated action, social interaction, computer-mediated communication, nonhuman other, MMOGs, raiding, user interface, World of Warcraft

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Players' actions toward the earliest video arcade and computer games were typically seen as unilateral and asocial. Social activity surrounded gameplay; for example, players competed for high scores or played together in two-player mode. Yet players' actions with the machine and its software were more or less autocratic: "action taken by one toward another wherein the other is treated solely as an object" (Couch 1986:120). Today, digital games are immersive, interactive environments where users play together by the thousands in real time, developing expertise in a variety of social worlds as they strive to achieve individual- and group-oriented goals. The newest generation of digital games, called massively multiplayer online games (MMOGs), has exploded in popularity in the past decade along with advances in graphics and sound technology, computer processing power, and internet speed (Williams and Smith 2007). MMOGs such as *World of Warcraft* (Blizzard Entertainment 2004), *Star Wars: The Old Republic* (BioWare 2011), and *EVE Online* (CCP Games 2003) are popular online game worlds where people engage in distinctly social activities. These activities, along with other technological advances, create environments in which computer games themselves function as significant others.

Most symbolic interactionist research on social activities is predicated on Mead's (1934) conception of the social act, which involves "the co-operation of more than one individual, and whose object as defined by the act . . . is a social object" (p. 7). Studies of social action have focused primarily on face-to-face situations, whether data were collected ethnographically or under controlled conditions such as a laboratory. When research takes mediated objects or processes into account, it is often in terms either of the qualitative properties of information or of users' interpretive experiences (e.g., Altheide 2002; Denzin 1987; Gottschalk 2010). Rarely is the digital object itself framed as the other with whom a person coordinates social action. One consequence is that activities between person and digital objects are rarely seen as social (Cerulo 2009); only the interactions and experiences contextualized by/around the object are. In this article, we explore the extent to which contemporary MMOGs facilitate user interactions with digital objects as well as with other users who are virtually copresent. We accomplish this by focusing on a complex social activity called "raiding" in the MMOG, *World of Warcraft*. Utilizing Couch's (1984, 1986; Miller, Hintz and Couch 1975) theory of social action and Bastien's (1995; Bastien and Hostager 1992, 1993) extensions of Couch's research paradigm, we study how players coordinate their actions with computer-controlled others as well as with each other. We integrate online ethnographic methods in the "Chicago School" interactionist tradition with "New Iowa School" interactionist methods of video recording in laboratory-like conditions to study social action. Our goal is to further generate discussion about coordinated action in digitally mediated environments with an emphasis on MMOGs.

COORDINATED ACTIVITY IN WORLD OF WARCRAFT

MMOGs are culturally rich virtual environments that afford a remarkable visual and auditory experience. Blizzard Entertainment's *World of Warcraft* (hereafter,

WoW) is the exemplar of MMOGs—it achieved initial success upon its release in 2004 and has maintained a global base of more than 10 million active subscriptions since 2008, topping 12 million at one point (Blizzard Entertainment 2010). WoW's virtual world persists and evolves whether or not a particular player is online. Users access the virtual world through a computer with an internet connection and immerse themselves in a Tolkienesque fantasy environment that is populated by thousands of other users and tens of thousands of computer-controlled characters, called Non-Player Characters (NPCs), many of which are humanoid in appearance and behave in a way that mimics sentience. Like in any other “social world” (Fine 1983; Strauss 1978), behavior in WoW involves a process of learning to make sense of the social objects that populate the symbolic environment. The most significant of these objects is the user's unique in-game character. This is an anthropomorphic representation of the player through which she interacts in/with the online world. If a user wants to move from one place to another, she must walk, run, or take conveyance such as a horse or a dragon. To this extent, MMOGs are more or less similar to many non-game-based virtual worlds such as Second Life (Linden Lab 2003). There are two distinct differences between MMOGs and non-game-based virtual worlds worth mentioning, however. First, MMOGs often have strong top-down narrative structures that shape players' experiences. Unlike Second Life, where a user may create and then develop a character (or avatar) in almost any way she wishes, WoW places limits on how characters are created and then played (see Bainbridge 2010b, ch. 1; MacCallum-Stewart 2008; Tronstad 2008). Once created, a character will explore the virtual world through interaction with other characters—both NPCs and player-characters. All characters in the game will either be friendly, neutral, or hostile; the game limits how one's character can interact with others depending on these and other global definitions. Second, narratives are designed in such a way that players are forced to engage, from the very beginning, in social activities with virtually copresent others. Through the screen, players see and hear other characters, establish reciprocal relations with them, and eventually locate themselves alongside them in the game's living history. The lived, social reality of the game world is thus a rich semiotic layer in which users interact (Weninger 2006). Much of a user's early contact will be with NPCs, who help establish the user's frame of reference vis-à-vis in-game behavior (Krzywinska 2006; Shibutani 1955). Users' actions are predicated on coordination with NPCs and other player-characters, as well as on instrumental interaction with a second semiotic layer: the computer screen itself, along with the mouse, keyboard, speakers, and other pieces of hardware (Kirschner and Williams Forthcoming). *On* the screen and *through* the screen, a symbolic universe emerges, and many WoW players dedicate themselves to mastering both layers of gameplay.

WoW objectifies the complexity of these semiotic layers through game design. In order to advance through the game, players must learn to associate specific meanings with images/sounds that are seen/heard through the screen/speakers. There is neither a single, preferred way to play WoW, nor a way to finish or “win” the game. However, players do share a focus on “leveling up” or improving

their character's status, abilities and power through the accumulation of ever more powerful armor and weapons, fighting skills, and recognition of accomplishments (Bainbridge 2010a; Barnett and Coulson 2010; Klastrup and Tosca 2009). Blizzard regularly creates new content and challenges for players, much of which channels players' progression through a social filter: "as a player gains in levels, quests become increasingly difficult to accomplish alone, reaching a point where a coordinated group of players is required to move further" (Ducheneaut 2010:135).

Although there are many types of social activity in WoW, we focus on a particularly complex type called "raiding." Raiding refers a process whereby groups of players¹ enter restricted, challenging areas of the gameworld² and, through careful planning and coordinated action, learn to overcome powerful enemies that players refer to as "bosses." Once defeated, the bosses' lairs or corpses are "looted" for rare and powerful items such as weapons and armor, which players equip on their characters. Raiding represents the most complex form of simultaneous interactions between groups of players and the design structure of the game. Unlike other collaborative spaces in virtual worlds, raid areas are structured so that groups must progress through a series of bosses, each with a unique set of abilities and conditions that are designed to frustrate players' efforts. Despite individual players' efforts to maximize skill and knowledge, a single moment of bad judgment, misstep or miscommunication often results in the group failing to achieve its goals and having to begin again after paying (in time and virtual gold) for their failure by repairing armor and weapons and replenishing supplies. Raiding thus requires that players constantly (re)define situations by considering their own knowledge, goals, and actions and by learning to anticipate, interpret, and efficiently respond to actions initiated by the game itself, while also taking into account the imagined knowledge, goals, and lines of action of other players. More than any other form of MMOG play with perhaps the exception of player-versus-player content (see Jørgensen 2008), raiding requires that players commit to maximizing their knowledge of character-abilities and to learning the most efficient methods for accomplishing social activity.

As with other complex forms of coordinated action, raiding requires a flexible combination of roles to succeed. That flexibility is shaped by a core feature of MMOGs—character class.³ In WoW, a character class is an archetype such as warrior, priest, or hunter, each of which may specialize in one of several areas of expertise that define the character's primary role-identity. There are three primary role identities in raiding: tank, healer, and DPS (damage per second). Tanks, like the military vehicle from which the role takes its name, are heavily armored characters that hold an enemy's attention, or "aggro" (aggression). A tank holds aggro by using abilities that generate high "threat," a game mechanic that determines who the enemy attacks—the character with the highest threat receives the brunt of the enemy's attention. Tanks take constant damage and therefore need constant healing. Healers are tasked with keeping tanks and other raid members alive. "DPS" refers to characters capable of dealing large amounts of damage who are primarily responsible for draining the boss's health. DPS are typically subdivided into some

combination of melee versus ranged and physical versus magical damage. As our description suggests, MMOGs are designed with diverse sets of reciprocal role opportunities during play.

The most difficult aspect of raiding is not eliminating bosses *per se*, but rather coordinating player action during encounters. Only when players are able to synchronize their characters' respective role performances can they defeat bosses and obtain rewards. Raiding is not something players simply "do." Many players will encounter the same boss dozens of times before successfully defeating it. Bosses are reanimated by the game each week, offering repeated opportunities for players to hone strategies and build teamwork in order to smoothly progress through the instance. Weekly repetition results in the appearance or feeling of routinization where "respective identities and roles [become] essentially given and unproblematic, so that negotiation is mainly a matter of all recognizing the governing occasion or situation" (McCall 2003:331). This should not imply, however, that the success of social activity is guaranteed. In order for a raid to succeed, players must coordinate their individual lines of action on a moment-by-moment basis.

Couch (1984, 1986) theorized six elements of sociation through which individuals coordinate activity. (1) Copresence is a necessary element of sociation that must pre-exist the other elements. Couch's laboratory settings ensured physical copresence as a matter of course, but copresence comes in multiple forms. Individuals make themselves virtually copresent through various mediated forms such as the telephone (Ball 1968) and answering machine (Raz and Shapira 1994), CB radio (Smith 1980), internet fora (Williams and Copes 2005), televideo (Waskul 2002), and, most recently, virtual worlds (Johnson, Hyysalo, and Tamminen 2010). Once copresence is established, participants (2) must reciprocally acknowledge each other's attention and then (3) organize their own behaviors according to the information gleaned from that attention. (4) Participants must also project future lines of action for others to perceive, which (if detected and accepted) are necessary to establish congruent functional identities. These identities facilitate (5) the establishment of a shared focus that, once recognized by all other participants, facilitates (6) concerted behavior toward a social objective. These elements of sociation are not only opening steps toward coordinated activity (Miller et al. 1975); they are processes in which interlocutors constantly engage in order for coordinated activity to persist. It is important to note that each element may be realized in various ways, depending on the type of social activity in which people are engaged. To the extent interactants have shared history, they may assume attention and responsiveness, develop a shared focus simultaneously with reciprocal attentiveness, or cooperate without explicit negotiation of the elements of openings, as is often the case with practiced sports teams. Couch (1986) composed a list of seven forms of social activity: the chase, conflict, competition, social panic, accommodation, mutuality, and cooperation. Two of these forms—conflict and cooperation—are particularly germane to the study of raiding (see Table 1). Conflict exists between the raid party and the NPCs (bosses and their support staff) who, controlled algorithmically by computer software, engage in lines of action that

TABLE 1. Forms of Social Activity and Elements of Sociation

Elements of Sociation					
Forms of Social Activity	Attentiveness	Responsiveness	Functional Identities	Focus	Objective
Conflict	<i>Reciprocal</i> Each party acquires information about the other and both are aware of their relatedness.	<i>Bilateral</i> Each party responds only by acting toward or with respect to the other, but not with each other.	<i>Incongruent</i> Each party projects forthcoming lines of action that are detected and rejected by the other.	<i>Other</i> Each party simultaneously attends to some event or object, but the focus of each group on that event or object differs.	<i>Personal</i> Each party is aware of the focus of the other but acts based on their own focus toward the event or object.
	<i>Acknowledged</i> Each party acquires information about the other. Both are aware of their relatedness, and inform the other of their awareness.	<i>Mutual</i> Each party indicates to one another that the activity of the other is of some significance and the integrity of the other will be respected.	<i>Congruent</i> Each party projects forthcoming lines of action that are detected and accepted by the other.	<i>Shared</i> Each party simultaneously attends to some event or object and each is aware of the other's focus of attention.	<i>Social</i> Each party is aware of the other's attention toward a shared focus and each informs the other that they will cooperate to achieve the social objective.

attempt to eliminate the raid. Cooperation must be established and maintained among members of the raiding party in order to eliminate bosses and collect loot.

The process of aligning actions among raid members is neither easy nor stable, especially when copresence is computer-mediated. Raid members engage in individual lines of action that each other player must perceive and interpret as she plans her own future actions. As Bastien and Hostager (1992) found in their study of jazz musicians, performers similarly perceived and interpreted others' lines of action, which were communicated via "visual signals to underscore . . . changes . . . or giving verbal instructions" (p. 98). In MMOGs such as *WoW*, visual and verbal signals are also crucial. Players coordinate with one another based on what they see occurring on the computer screen and what they hear through the speakers. Conflict and cooperation serve as the theoretical frame through which we analyze players' raiding activities. After next describing our methods of data collection, we will explore how raid members coordinate their activities with NPCs and other players' characters, with special attention paid to how this is accomplished through *WoW*'s user interface.

METHODS

One of the key differences between the so-called "Chicago" and "Iowa" Schools of symbolic interactionism has been framed in terms of data collection. The former is known for naturalistic inquiry, while the latter has emphasized experimental design in laboratory settings. How do players perform complex roles in MMOGs? How do they align their actions on a moment-by-moment basis? How do they interpret and communicate information through the user interface (hereafter, UI)? Such questions could be answered using methods developed in either tradition; we argue that the study of MMOGs allows for the merging of both methodological perspectives.

Using ethnographic methods including participant observation, writing personal diaries and field notes, and collecting audio and video recordings, we participated in the social world of raiding. We had been playing *WoW* recreationally since 2005 and were familiar with many aspects of the game. Having created multiple characters, each of us played at least three different classes to the maximum available level (at the time of our research, level 80). However, neither of us had more than casual experiences raiding. In *WoW*, players often band together in associations called "guilds," which provide social and technical support to players with shared interests (Williams et al. 2006). While chatting with other top-level characters one day in November, 2009, Patrick was introduced to the leader of an established raiding guild, The Cleaning Crew (a pseudonym). After a half-hour voice-chat interview with The Cleaning Crew's guild leader and her assistant (during which [the first author] talked about his interest in the game, his past experiences with raiding and with other guilds, and his long-term gaming partner, David), we were both invited to join. This guild became a home away from home, a research site, and the locus of our engagement with the game. We joined as novice raid members and eventually took on dual identities in the guild as players/researchers. During

approximately 50 hours of guild-based play between November 2009 and January 2010, we developed reputations as relatively trustworthy raiders, which, along with our researcher identities, facilitated our becoming active in guild life. Between January and April 2010 we participated in weekly ten- and/or twenty-five-person guild and non-guild raids, which resulted in more than 100 hours of participant observation while raiding and an additional 200 hours spent in the gameworld. Raiding took place in the Crusaders' Coliseum, Vault of Archavon, Onyxia's Lair, Ruby Sanctum, Eye of Eternity, and Icecrown Citadel, which at the time of the research were the newest and most difficult instances in the game.

Relevant to this article, we recorded audio/visual data from January 2010 through April 2010 for every raid; because the video data were massive, we recorded only encounters with raid bosses ($N = 52$ videos averaging 4 minutes and 49 seconds). Watching videos of ourselves later (i.e., observing the participant observers) was not only a reflexive exercise, but allowed us a very detailed examination of audio/visual aspects of player interaction. It also facilitated our thinking about player interactions in raids as we could literally watch raid members' role performances. Because of the computer-mediated nature of MMOG-play, we were able to record the naturally occurring interactions among players in and around raids. In doing so, we succeeded in creating detailed audio/visual records that allow for the careful (re)examination of empirical social activities. Videotaping experimental participants provided Couch and his colleagues and students with "a multisensory shareable and empirical record of the social act . . . in all its complexity" (Bastien and Hostager 1993:204). But one problem with this approach was the lack of access to the interpretive processes of participants vis-à-vis the activity recorded. As long-term players with literally several thousand hours of combined play experience in WoW and more than one hundred hours spent raiding during this study, we were able to fill in this interpretive gap by functioning as participant observers in the sociological sense, as well as "participant informants" and "learned practitioners"—insiders who had internalized the roles and norms relevant to the social world of raiding. Thus, like Bastien and Hostager, "we found a naturalistic and consequential site of professional cooperative social activity in context that allowed for laboratory-like conditions" (p. 208).

AUDIO/VISUAL REPRESENTATIONS OF COORDINATED ACTIVITY

In digitally-mediated social worlds like MMOGs, the UI mediates and organizes the symbolic interaction through which players coordinate their actions. Consider a short video extracted from one of our play sessions, where a raid party of 25 players, including the authors, is engaged with a boss named Lady Deathwhisper, the second boss in Icecrown Citadel.⁴ The goal of the encounter is to first destroy a magical shield that surrounds and protects her while fending off a series of minions that she summons to aid her, and then to eliminate her. She constantly attacks the raid group, either directly or by taking control of players' characters and forcing them to attack other raid members. Those characters must be subdued, but not killed, by

other players until the effect wears off. While destroying her shield, the raid must also deal with her minions putting a curse on magic-using characters, preventing them from casting the same spell more than once every fifteen seconds. During the first half of the video, you can see characters standing and moving around in various directions. You can see projectiles of various colors and shapes moving back and forth among the characters. You can see numbers appear, which represent the damage inflicted by one author's character on some of those enemies. You can see some colored effects surrounding certain characters, watch one player's character become mind-controlled and subsequently get frozen in a block of ice by an ally, and perhaps even notice that a few characters have red writing above their heads, marking them as enemies. It is hard to say much more because the UI is initially turned off (see Video S1; <http://www.youtube.com/watch?v=BEcs4KZdWGk>).

However, twenty-three seconds into the video we turned the visual UI on. Now things are quite different. In fact, the viewer may be overwhelmed by the appearance of so much information at once. Non-MMOG players are likely to understand little of what is occurring despite the UI's appearance. Players, on the other hand, learn to interpret this dizzying array of input/output data from the UI as they play. The UI is more than just graphical; it serves an instrumental function, allowing players to connect to their characters and thus to "construct meaning and interpret [cues] as a [series of] orderly event[s]" (Hung 2009:7). Without the UI, players are disoriented, losing almost all ability to interact with the game and with one another. Note also that the audio is muted, so there is still another (hidden) layer of interpretable information. Both the video and audio layers are significant to the collaborative action of players because they mediate the intricacies of the raid experience. What players learn to experience while interacting *with* the computer screen—the movements of enemies and allies, the patterns and colors of objects in the gameworld, the windows of scrolling text—as well as *through* the computer screen and speakers—sounds of battle, computer-generated voices of enemies, fellow players communicating with one another—often appear *in situ* as unitary social events, but sociologically speaking, they are not. The following analysis draws upon Couch's (1984, 1986) theory of sociation vis-à-vis two forms of social activity—conflict and cooperation—to frame our interpretation of the elements that comprise such social events. These two forms best describe the social actions of players and NPCs within the context of raiding. In order to contextualize our analysis for you, we have posted a second video online showing a failed attempt to defeat Lady Deathwhisper. Some actions/events discussed below can be observed in the video and we provide time stamps to help you find the original data (Video S2; <http://www.youtube.com/watch?v=yJLbkkpJSLI>).

COORDINATING CONFLICT: SUBJECT-OBJECT INTERACTION

Right down to the MMOG's name, the significance of conflict is evident in WoW. As players, we were socialized from the very beginning to understand that this fantasy

world was a land plagued by centuries of wars among various racial and political factions. Also from the beginning, we were encouraged to accept and engage in the virtual killing of others—animals, humanoids, demons, and other supernatural beings—as part of everyday life. Conflict is typically a symmetrical form of social activity; both parties expect that they have the potential to either win or lose an encounter with the other. As a social activity, conflict requires mutual attentiveness, social responsiveness, and the establishment of functional but incongruent identities (Couch 1986). Each party will likely have its own focus and objectives. Interaction with the other is collaborative, but not cooperative. Significantly, conflict-based interaction emphasizes players and objects in the gameworld signaling each other in meaningful ways.

Attentiveness

In conflict-based situations, attentiveness among copresent parties is reciprocal—each party acquires information about the other and both are aware of their relatedness to one another. In WoW, raid instances and the NPCs that inhabit them were designed to be attentive to players who enter. More specifically, there were programmed rules that determined how NPCs would attend to players' characters, for example if we performed an offensive action against an NPC, or if we moved to within a certain distance of an NPC's position. In these circumstances, NPCs never ignored players unless there was a "bug" or glitch in the software. Attentiveness was programmed into the NPCs. We entered instances fully expecting specific NPCs to be present and attentive to our activities. Sometimes we selectively avoided some NPCs as we ventured through the instance; i.e., we could sometimes reject the conditions for mutual attentiveness. But once an NPC had announced its attentiveness to the raid, we were obliged to reciprocate.

Responsiveness

In order to engage in coordinated activity, each party must respond to the attentiveness of the other. In conflict situations, responsiveness is bilateral—parties respond by acting *toward* or *with respect to* the other, but not *with* the other. NPC responsiveness took the form of engaging in behaviors to eliminate members of the raiding party. These were pre-programmed actions that we learned to anticipate as we engaged with the NPCs week after week. The responsiveness of the raiding party to NPCs was much the same—players targeted enemy NPCs and began eliminating them. *How* players responded to specific enemies was important. Some NPCs were best approached by melee or physical attacks, while others were better dealt with by ranged or magical attacks; some NPCs were best handled in groups, while others were best singled out and eliminated one at a time; some NPCs were best responded to where they were encountered, while others were best coaxed to a more suitable

location. In short, responsiveness was not automatic—players had to decide in what way they would respond.

The responsiveness of NPCs was communicated visually and aurally. Most NPCs were stationed in small groups or followed set patrol paths. If players ventured too close, NPCs would engage immediately in aggressive behavior. NPCs might move toward players' positions, begin hurling objects or begin swaying in place while colored effects, indicating the casting of magical spells, surrounded them. For example, Lady Deathwhisper signals her responsiveness to raiding parties by casting a magical shield around her body, which is easily visible to players [Time = 0:21]. Audio further signified responsiveness, working simultaneously “as support for gameplay by providing the player different kinds of information that needs to be comprehended . . . [and] also by providing an understanding for how the game should be played, and how to behave in a specific in-game context” (Jørgensen 2008). Audio is neither produced nor interpreted in isolation, but rather in situationally relevant ways. Players must learn to correctly identify, interpret, and orient themselves to specific audio cues in order to effectively act. Players without access to audio⁵ missed these communicative signals, which could negatively impact concerted behaviors. The UI provided redundancies to alleviate such problems, however. When first signaling our engagement with Lady Deathwhisper, she not only yelled, “*What is this disturbance? You dare trespass upon this hallowed ground? This shall be your final resting place!*,” but repeated the message in textual form as well [Time = 0:21]. In the lower-left corner of the screen was the “social window,” an area for textual interaction among players and between the game and players. The window worked like an instant messaging service with various channels players could join. By default, any verbal statements made by NPCs to players were also displayed there. Text that appeared in the social window was color-coded to help players recognize who was communicating with them. In raid instances, NPC communications were always in red and thus the appearance of red text on the screen further signaled the NPC's responsiveness. For players who relied on additional software (“add-ons” or “mods”)⁶ for enhanced visual signaling of in-game events, other visual signals might be provided. For example, the add-on called Deadly Boss Mods signaled NPC responsiveness by displaying a countdown timer, enemy status bar, and notifications such as “<Deadly Boss Mods> *Lady Deathwhisper engaged. Good luck and have fun! :)*” (See Figure 1 for these visual and textual examples, as well as Video S2 [Time = 0:21]).

Functional Identities

Coordinated activity requires that involved parties express identities that are functional vis-à-vis the situation. When two parties are in conflict with one another, those functional identities will be incongruent and each party will project forthcoming lines of action that are rejected by the other. By the time a player enters a raid instance for the first time, she will have already internalized the functional identities



FIGURE 1. An encounter with Lady Deathwhisper in Iccrown Citadel, World of Warcraft.

of her own character and of enemy NPCs, and know them to be incongruent. Because raiding is rooted in the idea of overcoming enemies, members of the raiding party entered the instance self-identifying as the (eventual) victors. Negotiation was impossible because enemy NPCs were programmed to reject the identity of the raid party as “victor.” Thus, there were only two possible but incompatible futures—success or failure.

The UI signaled the incongruity of functional identities primarily through visual means. The mouse cursor offered one of the most basic examples. The cursor was similar to that on a typical computer screen, except that it changed shape when players interacted with different NPCs to convey situationally relevant information. By default, the cursor appeared as a gauntleted hand. Whenever we saw another character, we could quickly ascertain whether it was a friend or an enemy by moving our cursors over the unidentified other. The gauntlet would remain unchanged if the other was an ally, but changed to a sack of coins to signify a friendly merchant or to a sword to signify an enemy. What the cursor represented was “fact” as much as perspective. Our ability to interact with others in the virtual world was hardcoded into the game’s design, and an NPC identified by the sword-shaped cursor could never behave as friend or ally. The UI signaled functional identities in other ways as well. For example, when we clicked on a target character, that character’s portrait would appear in the upper left-hand corner of the screen, alongside our characters’ self-portraits. Enemies’ names would have a red background there, and their floating names (visible above the character) would also be red (see Figure 1).

Focus

Focus has to do with the events and/or objects toward which parties coordinated their actions. During conflict, each party may simultaneously attend to the same event or object, but the focus of each group on that event or object differs. Often, each party will focus on doing something “*to*” each other instead of “*with*” each other (Miller et al. 1975:481). Alternatively, each party may simultaneously focus on different events or objects that are situationally relevant. During raids (in fact, in any encounter with hostile NPCs in the game), NPCs would typically focus on whoever posed the most threat, but there were moments when other factors determined an NPC’s focus. For example, Lady Deathwhisper would cast magical bolts at random players or at many players simultaneously during the fight. She also repeatedly summoned two types of minion to aid her: Cult Adherents and Cult Fanatics [Time = 0:28, 1:28, 2:28]. The former had to be eliminated by characters with ranged attacks, while the latter had to be beaten in hand-to-hand combat. When seven of these NPCs appeared at once, individual raid members had to determine which to focus on and which to ignore. Multiple tanks needed to aggravate these minions enough to establish high threat before DPS characters could safely attack them. To add to this complex scenario, Lady Deathwhisper repeatedly used a spell called Death and Decay to damage players, which was visible as a large green circle

on the floor [Time = 1:04]. We had to learn to focus on its appearance, even as we continued to focus on the boss and her summoned minions and/or on our fellow players (depending on whether we were playing one of our tank, DPS or healing characters). We also had to keep in mind that the only way to win the encounter is to destroy Lady Deathwhisper herself. Her summoning of minions or casting of Death and Decay had to be framed as an event that momentarily deserved more focus than the boss. When the minions were eliminated, we had to quickly re-focus on the boss until the next summoning or casting event occurred [Time = 1:24].

Visual representations of players' and NPCs' statuses and notifications of objects and events provided cues that players learned to focus on. The UI, and especially add-ons like Deadly Boss Mods, helped keep track of multiple foci by providing auditory, visual, and textual signals for each object or event, often in advance. A five-second warning for Lady Deathwhisper's summoning of her minions occurred as a loud gong sound, as text across the center of the screen stating "new adds soon," as a countdown bar near the bottom center of the screen, and as text in the social window [Time = 2:23]. These were all cues for tanks to move immediately toward the areas where the minions would appear in order to establish high threat, while DPS characters knew they could continue to focus on the boss for five more seconds. When the green Death and Decay circle appeared under our characters' feet, its damaging effects were visible numerically above our characters' heads and in the character portrait pane in the top-left of the screen. If we allowed our focus to stray or did not respond quickly and precisely enough, our characters often died, reducing the raid's overall chances of success [Time = 1:04]. Visual, auditory, and textual signals communicated by enemy NPCs and/or the UI functioned as proactive and/or consequential cues that demanded evaluation. We acted on the basis of what had happened before and what would likely happen next, what our focus was on at a particular moment and where it should go next, and so on.

Objective(s)

Objectives in conflict situations are personal rather than shared among the competing parties. Each party is aware of the focus of the other but acts based on its own focus toward events and/or objects. In WoW, programming determined the focus of NPCs, and their objective was always the same: eliminate any threatening entity that is copresent. At first blush, it seems obvious that the raid party's objective would be the opposite: eliminate the enemy boss. After all, it was only through "downing the boss" that players could loot the highly-prized items such as armor and weapons that waited. These items were a necessary part of the raid party's progression as subsequent bosses are typically more difficult to overcome. But the implicit assumption that the raid's objective was coherent or unified is false. For a raid party comprised of zero-history players, or one whose members had little or no experience with a particular boss, social objectives ranged from learning how the enemy acts throughout an encounter (but expecting to be beaten) to "one-shooting"

the boss (i.e., defeating the boss on the first attempt). Individual members of the raiding party also had their own personal objectives: to win a particular item from the loot; to outperform other players in damage or healing done; or to earn a particular achievement. Getting all members of a raiding party to share a single objective was sometimes difficult, especially when the group was comprised of random players (Eklund and Johansson 2010). To shed more light on these ideas, we need to shift our attention away from conflict between NPCs and the raid party toward cooperation among members of the raid.

COORDINATING COOPERATION: SUBJECT-SUBJECT ACTIVITY

Conflict may be the name of the game in WoW, but many users report that the social, cooperative nature of gameplay is the strongest pull factor supporting their continued participation (Ducheneaut and Moore 2005). Collaboration was definitely a draw for us from the beginning. From 2005 until 2010, the idea of adventuring through a virtual world, meeting friends and foes upon the way, and developing characters that could persist for years was exciting. As we developed our favorite characters to become raid-ready in 2010, the nature of “collaboration” took on new meaning; it meant not only honing our skills as players who often worked together to quest in the world, but learning to utilize them in very precise ways depending on group needs and goals. Both of us had learned through years of interacting with other players why raiding was supposed to be so much fun. One reason was the rare loot to be won that, when equipped, marked one’s character as a cut above the rest (Tronstad 2008). The other reason was the thrill of being part of a group that, only together, could conquer the most adrenaline-pumping areas of Azeroth. As with conflict, there remains an important degree of interaction between player and game, yet such interaction implicitly supports the subject-to-subject interaction among players in order to synchronize individual lines of action. As Couch (1986:127) noted, “cooperative action is future-centered [and] directionality or structure is given to the joined activities by the projection of a social objective.” Social objectives therefore, although last in the list of Couch’s elements of sociation, are already on players’ minds as they begin forming the raiding party that will eventually enter an instance.⁷ In this section we analyze Couch’s elements of sociation as they relate to (1) the formation of raids, which typically occurs in virtual safe zones such as cities where no enemies are present, and (2) the moment-by-moment coordination of the raid’s activity during boss encounters. To highlight how social objectives are defined in advance of any boss encounter, we begin with that element before returning to the order in which we presented the elements in the previous section.

Objective(s)

In a cooperative situation, each party is aware of the other’s attention toward a shared focus and each informs the other that they will cooperate to achieve the

social objective. Although the idea of winning loot seemed a personal, bordering on selfish, objective sometimes, that was not necessarily the case. For tightly-knit guild parties, the objective of a raid may be to collect and equitably distribute the loot among all raid members in order to prepare the guild for future, more difficult encounters. Once they collected all the gear they needed from particular bosses, such parties might continue to fight that boss each week with new objectives, such as attaining in-game achievements (Yee 2004) or bringing “alts” (alternate characters) into the instance to replay the content with different role-identities. Individual players were typically drawn by the lure of winning items for themselves and/or by the opportunity to hone skills to improve their chances of being invited to join an elite raiding guild. The Cleaning Crew’s weekly raids focused on Icecrown Citadel and were made up of roughly twenty guild members each week, supplemented by random players. The objectives of guild raids were social in nature and usually explicated by the guild leader.

In addition to the weekly guild raid, the authors regularly organized PUGs (“pick-up groups”) to raid the Vault of Archavon.⁸ PUGs are improvised parties (see Eklund and Johansson 2010), typically with a mixture of zero-history and shared-history participants, though there are expectations for “a basis of commonly held structural knowledge that the actors have gained independently of the other interactors. This is described by Katovich as being situated in a world of superpersonal social facts, and represents a common history . . .” of individual raid knowledge and experience (Bastien and Hostager 1992:94; see also Katovich 1986). PUGs were often problematic because the shared-history participants expected a smooth and efficient raid, whereas the zero-history participants did not always meet performance expectations. Coordinating activities was difficult due to differences in players’ personal objectives, preparedness, and skill: “the least knowledgeable player sets the creative limit of the whole group” (Bastien and Hostager 1992:102). To the extent that the objectives of raiders were situationally diverse, cooperation in coordinating social activity was rarely guaranteed. PUG raids were almost always driven by personal objectives but subsumed under nominal raid leaders’ threats of withholding loot to those players who did not cooperate (see Figure 2). More than just killing the boss, there were moment-by-moment “micro-objectives” which had to be incorporated into play. Raid parties whose members treated the encounter as having a single unitary objective (kill the boss) regularly failed because the encounter proved too complex. Players had to attend to micro-objectives that together comprised the larger social objective of victory.

Attentiveness

The search for a group that will cooperate in coordinating individual lines of actions toward a social objective begins with acknowledged attentiveness, whereby each person acquires information about the other, establishes their relatedness to one another, and informs the other of their awareness. Technically, all raids are formed



FIGURE 2. "Raid warning" announcing that cooperative action is required by all players to receive loot.

the same way, but we will focus on PUGs, because their formation was most available for observation and recording, and because the basic elements of coordinated action had to be explicitly negotiated due to the relative lack of a shared history.

One of us would assume the nominal role of “raid leader” and begin inviting other players to the raid party by posting text messages in social channels such as General (/1), Trade (/2), Looking for Group (/4), and Guild (/g). Such messages functioned as initial calls to coordinated action that required acknowledgement. Most often, interested players would send a private reply to us that included her character’s class, specialization, and perhaps additional information such as the DPS she could produce or some proof that she was adequately prepared. Players who wanted to join a raid might advertise themselves in the same public chat channels in the hopes of being invited to a raid party. In these cases, we could acknowledge our attentiveness by sending a private message to the player or by sending an invitation to join the raid, at which point the invitation notification served as acknowledged attentiveness. This had to be repeated many times over until the raid party (either ten or twenty-five people in size) was filled with the right number of tanks, healers, and DPS while also ensuring an even spread among classes.

Once the raid group was assembled and inside the instance, attentiveness had to be re-established and reciprocally acknowledged before boss encounters would commence. It was not uncommon for a half hour or more to pass between sending out invitations and the party actually being virtually copresent and ready to engage a boss. Players regularly walked away from their computers to fulfill bodily needs (food or smoke breaks, toilet, and so on). And because players were not physically copresent, it was not obvious which players might be AFK (“away from keyboard”). Tanks often signaled attentiveness by moving into position. Other characters would move in circles or jump repeatedly to signal that the player was sitting at the keyboard and paying attention to the screen, or make statements like “let’s pull it!” [Time = 0:14]. Once a raid leader assumed that everyone was virtually copresent and ready to begin, she would typically request acknowledgement of attentiveness by typing “/readycheck” into a command line, at which point the system would send an “Are you ready? Yes/No” dialog window to all raid members. Green check marks would appear for those who responded affirmatively, while a red X would appear for all negative responses as well those who failed to answer within thirty seconds. This was sometimes the last communication before engaging enemy NPCs and ensured that attentiveness was active and current. Nothing ended encounters faster than someone “pulling” the boss only to learn the tank was AFK.

Responsiveness

Cooperation requires not only that people attend to one another, but that they also maintain mutual responsiveness, through which individuals indicate that the activity of the other is of some significance and the integrity of the other will be respected. In terms of conflict, we noted that NPCs’ responsiveness to raid

members was programmed and therefore predictable. Cooperative responsiveness among players was less certain. For highly-skilled and coordinated raiding parties, individual actions appeared almost as programmed as the NPCs' behaviors. Watching video tutorials produced by elite raiding guilds and posted online, we were rarely able to find examples of players who were unresponsive to other raid members. Observing audio/video recordings of our own raids, however, we were able to identify moments when players were unresponsive to the situation, visible by the lack of movement of the character. Unresponsiveness was sometimes unintentional, as when players were unexpectedly disconnected from the game and had to reestablish their internet connection. Other times, outside intrusions (receiving a phone call or being interrupted by a physically copresent other) caused role conflicts and players temporarily abandoned their in-game identity. Data transmission might also lag, resulting in players' screens momentarily freezing. A player's delayed response because of lag or a moment of unresponsiveness, even on the magnitude of tenths of a second, can cost the raid its victory.

"One is responsive to another when one builds one's acts off the prior, simultaneous, or anticipated acts of another, and in the process of so doing informs the other participant(s) of that fact" (Miller et al. 1975:482). Mutual responsiveness was visible via the immediate and continuous plying of one's trade during boss encounters. Any action initiated by a player had a corresponding audio and/or visual signal observable through the speakers/screen. The visual animations and sounds surrounding a character served as "proof" of players' responsiveness to the actions of other players as well as to the larger situation. When the raid leader would announce, "Hit it!" [Time = 0:18], it was expected that all characters would engage the boss together. Seeing a character standing motionless was an indication that the player was not responding to the fight emerging around her. Each player had to indicate that other players' actions were worthy of attention by responding in a situationally-appropriate way, which was measurable by the type of animations visible on screen. Disruptions to mutual responsiveness were sometimes signaled through talk ("Why didn't you let me get aggro on the adds?") [Time = 0:42], as were accounts intended to repair the shared definition of the situation ("sorry lag").

Functional Identities

Identities connect people by bringing together past experiences, situational definitions, and future-oriented objectives (Katovich 1987). Congruent functional identities are established when an individual projects forthcoming lines of action that are detected and accepted by the other. This definition refers on the one hand to the imputation of a sequence of forthcoming actions by participants within an emerging definition of the situation, and in this sense the establishment of functional identities serves as part of the opening to social action (Miller et al. 1975). In the case of raiding, we found that the significance of congruency began long before the

boss encounter because the necessity of functional identities is hard-coded. To build a raiding party, the leader must (1) be aware of the ideal raid composition vis-à-vis the bosses to be encountered, (2) understand the abilities, strengths and weaknesses of every character class and how they work together, (3) be adept at communicating effectively so as to manage many individual lines of action, and (4) know the history of players and guilds in her realm in order to make informed decisions about who should (not) be invited (Williams, Kirschner, and Suhaimi Forthcoming). In short, raids were firmly rooted in the coherence of future-oriented, congruent, functional identities which, once agreed upon, had to be adhered to in order for the raid to succeed. The roles enacted via functional identification were tied to players' character classes. A priest or mage could never function as a tank, no matter how much a player might desire to enact such an identity. The roles enacted via functional identification might occasionally change before or during an encounter. For example, some encounters required more or fewer tanks or healers and so the functional identities of a few characters were renegotiated.⁹ There were also moments during boss encounters when everyone in the raid was healthy and smart healers knew they could momentarily attack the boss. In such cases, the change in functional identities was congruent with the larger cooperative definition of the situation.

The functional identities of players were visually apparent. The UI gives raid leaders and tanks access to a set of icons (e.g., a white skull, red X, yellow star, and so on) that could be placed above NPCs' and player-characters' heads, and these were used as standard forms of identification [Time = 0:03, 1:38]. When multiple NPCs needed to be eliminated, these icons could be placed on enemies to communicate how each should be treated. One of the authors raided as a warlock (DPS) and he learned that when a purple diamond icon appeared above an enemy, the leader was indicating that his role was to control that NPC and keep it from attacking other raid members. The other author spent a great deal of time healing. Icons were often placed above the tanks to help healers identify them, but the author came to be very proficient at picking out the two or three tanks among twenty-five characters by looking for certain contours of armored shoulders or for shields being wielded defensively.

Because so many things happen so quickly during a boss encounter; because players control their characters with keyboard and mouse; and because there are several different types of roles that must function cooperatively to ensure success, talk was the most efficient way of maintaining congruent functional identities. Voice communication did not compete with our visual attention. Text was constantly scrolling upward, and early on we failed to notice text messages on a screen full of competing stimuli. Players generally recognize voice communication's importance, suggesting that voice is "superior for joint task coordination, problem solving, and dealing collectively with dynamic situations" (Williams, Caplan, and Xiong 2007:444). Being able to hear teammates increased feelings of group membership, perceived likability, and willingness to trust, all of which are important for cooperative gameplay (Chen 2009).

Focus

Along with facilitating maintenance of congruent functional identities, voice chat allowed players to efficiently communicate shifts in focus. Each individual simultaneously attends to some event or object and each is aware that others' focus of attention is similarly placed. Miller et al. (1975) and Couch (1984, 1986) imply a single object of focus, but our data suggest that foci may be distributed among individuals who are coordinating their activity cooperatively. When raiding, we encountered a variety of audio-visual stimuli, *some* of which demanded our focus. Because we fulfilled different roles (one author was usually DPS, the other usually a healer), we had to learn to selectively focus on specific signals in order to help the larger group succeed. Not only was focus distributed and selective, but that distribution and selection was tied directly to functional identification. Raid parties did share a focus broadly (i.e., elimination of bosses), and there were moments in a fight when everyone's focus was on the same object/event, such as when a boss dealt immense damage to a particular area that everyone had to vacate. Otherwise, focus was split according to role-identity.

Tanks focused on threat values and the position/orientation of enemy NPCs; healers focused on raid members' health bars; DPS focused on enemy NPCs. When there were multiple targets, everyone needed to know which must be targeted (and in what order) and which avoided. There were a few times when one of our characters would generate more threat than the tanks. In those moments, the edges of our screens would glow red, signaling us to shift our focus to threat avoidance tactics until threat values returned to normal. But there was more than this to watch for. In the Lady Deathwhisper encounter, Cult Adherents would randomly cast a curse on magic-wielding player characters. We previously discussed the requirements of focus vis-à-vis conflict, but there are also cooperative-based requirements for focus to attend to. Mages and druids are the only two classes that can decurse a character; they must therefore watch for the appearance of the curse icon on themselves and others. Mages and DPS druids had to maintain focus on both the enemy boss, her attacks on the raid, and on the status of other players. If another player was cursed, a mage or druid had to shift her focus to deal with it. Different classes had to pay attention to different objects and events that varied across the temporal and spatial dimensions of the encounter. Most stressful was the raid leaders' jobs, who had to observe and signal, typically through talk, all the various actions and events that required shifts in focus [Time = 1:21].

Through the social window, players could maintain "side involvements" (Goffman 1963) before, after, and sometimes during boss encounters. Using the "/w" command, for example, allowed us to "whisper" to each other about sociological insights emerging during play without catching the attention of other players. One of the authors was promoted during the study to a guild officer and was subsequently required to maintain a separate set of interactions, sometimes during boss encounters. The raid leader(s) and other guild officers would send messages back and forth

commenting on individuals' performances. We regularly discussed players whose actions warranted future invitations to the raid, to the guild, or their addition to a "do not invite" list. Such side involvements represented additional foci, and each was similarly dependent upon the elements of sociation described above.

DISCUSSION

The study of coordinated action as put forth by Carl Couch has been used extensively for the study of face-to-face interaction. In this article, we have shown how individuals coordinate their behavior in digitally-mediated environments. By distinguishing between conflict and cooperation as two forms of social activity, we were able to highlight how coordination involved human users' interactions with each other as well as with the game's user interface (including its representations of objects in the gameworld). We presented data collected from ethnographic fieldwork that spanned approximately 300 hours of social interaction in the massively multiplayer online game, *World of Warcraft*. Part of our ethnographic approach involved the collection of data using audio/visual technologies in ways that parallel the laboratory research of Couch and his colleagues and students. As such, our data were amenable to analysis using Couch's theory of coordinated action. Our study presents one way forward in the study of concerted behavior in virtual worlds generally and MMOGs in particular. Data collected by videotaping naturally-occurring interaction led Couch to focus on the sequential elements of sociation that opened social activity (see Miller et al. 1975). The present study more or less presented the elements of sociation in the same order in which Couch discussed them, but our data show that these elements need not be limited to tight, micro-temporal analyses. On the contrary, we have shown how raiding as a social activity relies on the overlap and constant (re)negotiation of elements. We have also highlighted, by framing raiding as a simultaneously conflictual and cooperative activity, that the elements of sociation may be invoked to explain coordinated action as a multi-dimensional concept. Part of the reason for our ability to explain it this way is based on our deep reservoirs of knowledge about *WoW* and raiding. This knowledge extends beyond having been participant observers for several months; it is grounded in the thousands of hours spent developing competence in practically every aspect of the game over more than half a decade.

In MMOGs such as *WoW*, players are bombarded with information. This has two sets of repercussions: one for the player and another for the researcher. The amount and frequency of data moving across the screen and through the speakers can make it difficult for the novice player to decide what is important. But there is no simple distinction between novice and expert; with experience comes increasingly complex social activities that bring more information to the screen. Most players, ourselves included, worked just to keep up with it all. This returns us briefly to the element of focus. Players split their focus during raiding in multiple ways. They focus on multiple co-occurring conflictual actions/events designed to kill their characters

while also focusing on the cooperatively-oriented actions of fellow players. Focus also gets split between what is perceived as occurring *on* the screen (notifications, text messages, cooldown and countdown bars, relative locations of various characters) and what is imagined/perceived as occurring *through* the screen (the heat of battle, the frenzied dances of friends and foes, the back-and-forth flows of destructive and healing energy). The confusing bundle of visually and sonically dazzling stimuli must be made meaningful, interpreted, and acted toward. This applies to scholars as well as players. The incredibly rich layers of audio/visual data demand a careful analytic approach. Since virtual worlds are entirely human-made, we assumed everything was made with intended meaning. This is where audio/visual recording becomes useful as “Level I data,” because it captures players’ actions in/with the virtual environment and can be replayed repeatedly in the search for patterns of action. This becomes especially useful when researchers either rely on or serve as “participant informants,” who become a source of “Level II data” that link insiders’ cognition with recorded behaviors (Bastien and Hostager 1993).

Players’ behaviors are predominantly social. In MMOGs, many of the computer-generated actions that appear on the screen are social, too. In our analysis we provided many examples of “subject-object” interaction communicated through the game’s native UI and add-ons (each of which has audio and visual components) that are relevant to coordinated action. To the extent that the UI responds to players’ inputs and signals actions that require player responsiveness, the UI as “‘thing’ becomes [UI as] ‘other’ and influences human behavior” (Owens 2007:570; Mead 1934). We also identified “subject–subject” interactions facilitated by the computer’s internet connection that support tightly synchronized raiding activities. But the technology alone does relatively little to ensure successful coordination. Rather, players learn to use the screen instrumentally but also to see through it, transporting their virtual selves into the virtual social world and committing to a fantastic, shared definition of the situation. Raiders realize that a haphazard or lackadaisical approach to collaborative gameplay can generate negative ripples in the social fabric of the raid and can promote indignation, bickering, and sometimes even the permanent disbanding of a stable group. To avoid such problems, players must be able to imagine encounters from multiple perspectives, taking themselves as objects, and trusting that other players possess a similar level of reflexivity in their role performances. Being self-conscious of an individual act and imagining its effects on, and the potential responses to it by other people makes it a social act (Mead 1934). Imagine a healer cursed by Lady Deathwhisper’s minions and a dying mage running toward one another in the midst of battle. The mage, knowing he is almost dead, may assume the healer sees his depleted health bar and is running toward him to heal. The healer, knowing she cannot heal the mage since her healing spells are temporarily unavailable because of the curse, may assume that the mage is running toward her because he sees that she is cursed and intends to remove it. Each is making an assumption of the other’s intentions through role-taking, imagining the other player is acting toward the visual symbol of low health or of being cursed.

The positive resolution to this scenario is equal part cognitive and behavioral. Each player must first have the vocational competence necessary to define the situation as one of mutual need, which can only happen by interpreting the signals being communicated through the computer screen. Additionally, both players must realize that there is a specific order in which aid must be dispensed, which can only come through tapping into their professional knowledge.

For those who put in the long hours, the coordinated activities of raid members result in evolving sets of interpersonal and digital-media competencies. These include the growth of professional knowledge and the ability to collaborate with others in computer-mediated contexts. Each aspect of gameplay (moving, using abilities, reading a map) relies on a skill set integral to social roles, which users learn, refine and modify over time. A holistic sense of expertise develops as they practice “chaining together these small actions into temporally and componentially longer sequences of action” (Reeves, Brown, and Laurier 2009:214). Virtual-worlds research is a dynamic and growing interdisciplinary area in the social sciences and humanities, and sociological concepts and theories can play an important role in how virtual worlds come to be understood (Williams 2009). As this study suggests, it is necessary to pay close attention to how users interact *with* virtual worlds as well as *within* them. To the extent that digitally mediated social action is already a normal part of many people’s everyday lives, it behooves us to develop systematic approaches to its study.

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NOTES

1. Only top-level characters are able to participate in raids, and the “top level” changes over time as Blizzard releases new content to maintain players’ commitment to the game. The average time it took a player’s characters to achieve maximum level in the original version of WoW was nearly 400 hours of gameplay (Ducheneaut et al. 2006; for a more recent discussion see Lewis and Wardrip-Fruin 2010). Beyond the commitment needed to reach top level, raiding itself is time consuming, usually requiring three to five hours of dedicated playtime per gaming session, additional time spent preparing (i.e., acquiring virtual food, potions, enchantments, scrolls, and other items to increase characters’ capabilities), and hours of weekly play in order to earn the virtual gold necessary to fund players’ efforts.
2. Raiding is done in “instances,” special areas of the gameworld that may exist in hundreds of permutations simultaneously. To enter Azeroth, the virtual world in WoW, one must log in to a specific realm. There are hundreds of realms hosted on servers and each functions as a copy of Azeroth, offering players a more-or-less identical play experience vis-à-vis the gameworld. In addition to the realms are “instances,” which replicate raiding areas of Azeroth. A dozen

raid parties may form in the same realm simultaneously, but when players from each party enter the raid area, they are transferred to unique copies. This allows raid parties to adventure with their own objectives in mind and without having to worry about competing raiding parties in the area.

3. There are ten unique classes in WoW. For an introduction to each, go to <http://us.battle.net/wow/en/game/class/>
4. We provide a link to the video, which is available online, after this brief description. Note the video does not have sound because we want to highlight the visual aspects of the encounter first.
5. WoW has three audio channels: (1) sound, (2) music, and (3) ambience. (1) Sound refers to aural signifiers that accompany player and/or NPC actions. For example, when a player's attack is blocked by an enemy, the game produces a sound that mimics a sword hitting a shield. (2) Musical scores accompany different spatial areas of the game. (3) Ambience refers to sounds that help characterize a particular area. For example, players in a forest will hear birds chirping or the sounds of running water from a nearby stream. Some players prefer to listen to music or to chat with other players and therefore lower or minimize in-game audio.
6. "Add-ons" or "Mods" refer to additional pieces of software that are run in conjunction with the game client and which add specific functionalities to the gameplay experience. Add-ons are not necessary for raiding, but they reduce some aspects of audio-visual complexity and many players prefer to use them. One of the best-known add-ons for raiding is called "Deadly Boss Mods," which makes certain invisible mathematical routines in the game visible to players. For example, Lady Deathwhisper summons minions to her aid every sixty seconds until her shield is destroyed, but the game does not provide a timer. Deadly Boss Mods can display multiple timers to help players keep track of various events and processes that occur during an encounter.
7. Actually many raid groups do not even make it to the instance. As will be described below, the availability of players with the proper knowledge, skills, equipment, and time to raid fluctuates by time of day and day of the week. Many groups fail to find enough players to fill the roster and subsequently never set out to raid.
8. PUGs were typically comprised of players who were not members of guilds or of a steady group of raiders, whose offline schedule prevented them from playing during peak raiding times during the week, or who had multiple top-level characters that they wished to raid with.
9. Paladins and druids, for example, can function effectively as tanks, healers and DPS, provided that the character has the appropriate sets of weapons and armor.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Video S1: 25-player raid engaged with the boss Lady Deathwhisper. Play begins with the User Interface hidden, but subsequently made visible, to highlight visual layers of information.

Video S2: Unsuccessful 25-player raid encounter against Lady Deathwhisper, the second boss in the Icecrown Citadel raid instance.

Figure S1: An encounter with Lady Deathwhisper in Icecrown Citadel, World of Warcraft.

Figure S2: “Raid warning” announcing that cooperative action is required by all players to receive loot.

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