The Words of Warcraft: relational text analysis of quests in an MMORPG

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ABSTRACT
As the growth in popularity of massively multiplayer online games and virtual worlds has correspondingly increased research interest in investigating culture in synthetic environments. One representation of culture in games is the narrative provided in MMORPGs' quest sets. Quests -tasks given to players- provide a window into the traits of artificial cultures created for these environments, and researchers have used specific quests to advance arguments about game cultures. We expand on this work by trying to discern cultural traits expressed in the complete quest set for the MMORPG *World of Warcraft*, We subdivide this set into three corpora: two for the quests intended for players in one of the two in-game factions, one for those that can be completed by members of either faction. We then performed relational text analysis on these corpora, looking across them for shared textual relationships. We find that while all three corpora employ diverse terms, locations, and organizations, the only relationships present in any of the corpora at least 5% of the time are those emphasizing the relationships between players, enemies, and quest giving computer-controlled characters. Given the simplicity of these relations, we suggest that text is currently not a method used for sophisticated themes in game worlds, and designers should either rethink their use of it or rely on alternate methods if they wish to convey such themes.

Author Keywords
game culture, game narrative, text analysis, network analysis, quests

INTRODUCTION
The players bases for Massively Multiplayer Online Games (MMOGs) and their role-playing variant (MMORPGs) currently number in the tens of millions and continue to grow [3, 37]. For players and those with whom they associate, these games are supplanting and supplementing traditional forms of socialization and media consumption in their daily lives [33, 47, 51].

Research on online games and virtual worlds has examined facts about and behaviors of player bases [24, 48, 51] as well as game development processes [31]. Recent work in these areas has moved beyond direct analyses of game players and developers to also study the artificial cultures within games and how players perceive them [28-30]. This newer body of research aims to address the more subtle influences that games may have on individuals' cognition and behavior.

Game cultures are composed of the many elements of the game world created by developers and experienced by players. The set includes the world's artificial agents and organizations, text, sound, visual design, and all other features that serve as symbols subject to players' interpretations. One of these is the set of tasks, generally known as "quests", which computer-controlled characters ask players to perform. Researchers have conceptualized and analyzed quests as windows into the characters of virtual agents [28, 38]. Such work is typically oriented towards examining specific quests or quest sets that the researcher considers representative for insight into the world's culture. Thus, research of this type often generalizes about the nature of virtual cultures while leveraging a small amount of text data. An alternative approach used in a variety of domains for analyzing large amounts of text data is relational text analysis (RTA) [1, 17, 20, 44]. In RTA, many different texts are contrasted with respect to their terms, themes, and inner- and intra-textual relationships. While RTA has been previously evaluated and used in the realms of mental modeling, cultural and social analysis, and organizational studies [10, 14, 26], to our knowledge it has not yet been applied to game research.

In this paper, we present a methodology combining network extraction and analysis methods to leverage the corpus of quest text in the MMORPG *World of Warcraft* (*WoW*) and report our findings. We specifically subdivide this primary corpus into three corpora, based on whether or not the quests are available to members of the Horde or Alliance in-game factions or to both them, and examine

Breaking New Ground: Innovation in Games, Play, Practice and Theory. Proceedings of DiGRA 2009

how these sets differ and present different perspectives on the game's narrative and virtual cultures.

We suggest that our analysis's results can be relevant for virtual-world designers and researchers. To designers, our findings can offer a valuable perspective on the expressive power of quests in games and provide guidance relating to the constraints on the images that they can be used to evoke. To researchers, the presented methodology and gained insights provide a new perspective on a domain that has traditionally been reserved for purely qualitative analysis of smaller text sets. RTA can serve as a supplement to such analysis or as a stand-alone method used with larger text sets for approximating the culture to which players are exposed.

BACKGROUND

Massively Multiplayer Online Role-Playing Games (MMORPGs) are role-playing games played by numerous players in a common online space that persists even when a player is offline and in which one's play experience is affected by interactions with other players [13]. MMORPGs are a subset of massively multiplayer online games (MMO or MMOGs, games played online with many other users simultaneously) and virtual worlds (VWs, online environments where individuals interact via some form of avatar). Some examples of MMORPGs are *Ultima Online*, *EverQuest*, and *WoW*; *WoW* currently has the largest user-base of all MMORPGs (11.5 million people as of December 2008) [3, 49]. MMORPGs differ from MMOs and VWs by providing an epic, overarching narrative in which players may occupy a key role, and by providing players with the ability to quantifiably improve their in-game skills and possessions [34]. The unifying aspect of MMORPGs, VWs, and MMOs is the social aspect: all three types provide players with affordances to engage in a variety of social interactions.

Chris Klug, creative director of the MMORPG *Stargate Worlds*, confirmed the importance of MMO developers' using a storytelling method that requires players to create multiple characters of different types if they wish to truly understand the game's storyline (in the style of the film *Rashomon*). As players explore the plot points contained in different quests, they come to new conclusions about the cultures, story, and world created by the game's developers.

Because most MMORPGs come with minimal documentation, it's only through playing or by consulting extra-game material such as third-party strategy guides and websites that individuals learn the fundamentals of the game's narrative. Much of this narrative context is conveyed via quests. Quests or some equivalent task system are present in most if not all MMORPGs. While not required, completing quests is often the most efficient way for players to gain "experience", to earn credits that advance their characters' abilities. Quests also provide in-game currency and other items, some of which are status symbols. They are essentially incentivized chores to be performed that also inform about culture. Even outside of game environments researchers have considered task lists as a way to develop a sense of cultural values [23, 41].

Prior work on quests has taken different directions. In one, researchers have concentrated on quests themselves: Walker Rettberg [45] examined her own reactions to a *WoW* quest chain at the Maclure Vineyard: despite the repetitive and rote nature of the tasks that she had to perform she developed an interest in the unfolding narrative. She later explored *WoW's* quests in greater depth, emphasizing quests' functional nature: given that many players skim quest text for the barest details, only key words and larger motifs may resonate with players. Because of the quests' limited impact it's important that designers leverage *WoW*'s non-textual elements as much as possible to convey meaning [38]. Karlsen compared *WoW's* quests to those in the *Discworld* MUD[25]. (Multi-User Dungeon: MUDs are the text-based ancestors of today's MMORPGs.) While *WoW*'s quests have rote features, Karlsen argued that they are more player-oriented and often more fun than the complicated puzzle quests of *Discworld*, and pointed to *Discworld's* gradual relaxation of rules against databases of quest hints - and eventual maintenance of such a database - as a movement toward player-orientation.

A second direction has been the examination of how quests interact with other game elements to create a coherent theme: Rettberg [39] examined *WoW* as an environment that inculcates the player with capitalist values, conceptualizing quests as a key element of this process. He pointed out that the monthly subscription payment model used by many MMOs (including *WoW*) is an important factor in the design of quest systems: the manner in which players pay for the game informs game designers' decisions about how to structure the play experience in order to maximize profit from players. Thus, an MMORPG built around micropayments for appearance changes such will feature many different outfits for players to buy. In contrast, an MMORPG designed around monthly payments will focus on long-term character development and on providing content that it takes some amount of time to reach. In his interview with us, Chris Klug confirmed that the payment model is a central feature of any MMO design process. MacCallum-Stewart [30] used quests to bolster her discussion of war's ubiquity in *WoW's* culture. She used a player-versus-player combat area, where Horde and Alliance players fight for territorial control, as a case study. She found that the in-game texts in which a member of each faction describes why they fight paints the Alliance in favorable terms, as trying to prevent the Horde from harvesting an ancient forest. However, when considered in the context of the terrain and other game

elements, she argues that the Horde is suffering from a severe resource shortage and thus possibly has a superior justification for harvesting the forest than does the Alliance for preserving it [30]. Langer [29] doesn't make references to specific texts, but uses the general motifs of quests as a factor in her analysis of postcolonial elements of *WoW*'s different cultures. Krzywinska [28] correspondingly used quests in her argument that *WoW* needs to be understood from its mythologies: she concluded that classic images such as the "Hero's Journey" [6] as well as joking references to films and pop culture in quests, character names, and other game elements, hold important semiotic meaning for players and help them to understand *WoW's* world and characters.

The cited prior research supports our thesis that quests are windows into the game's world and how the game's culture and narrative are experienced by players. The study presented herein fits primarily into the first of these two traditions, as we focus on understanding the role of quests in creating a picture of *WoW's* two factions' values. However, we differ from prior work by attempting to look at the complete quest corpora for the two factions as opposed to a selection of texts that we consider as important or representative, even if this decision limits some of our analysis's detail. The oft-used technique of using specific quests as examples of a player's experience disregards some of the reality of the game, from both the player and developer perspectives.

To a *WoW* player, a quest begins when she approaches a character demarcated as a quest giver and clicks on it. This action opens up a dialogue window in which a quest is described in 512 characters or less, and the player decides whether or not to accept the quest. Quest givers are non-player characters controlled by the game (NPCs). If the player accepts, the NPC will have two more messages for her – one for whenever she tries to speak to the NPC before completing the quest, and one acknowledging her success. As with the initial message, these other statements are no more than 512 characters long and are delivered in the context of this particular narrative moment [4]. Completing a quest may unlock further quests that help elaborate the storyline and flesh out the narrative moment. However, while the player cannot disable the display of these text boxes, there is no guarantee that she will actually read them. In-game notifications of the actions needed to complete quests facilitate avoidance of attentive quest reading, as do player-created add-on programs and databases. Such tools are particularly appealing to players of the "achiever" type, as defined by Bartle – those oriented towards completing quests quickly to gain experience and game mastery without becoming invested in plot details [2, 38, 42]. When questing, achievers focus on the specific tasks to be done while disregarding the provided context. Even if a non-achiever wanted to understand the complete plot by finishing all possible quests, *WoW* reduces the player's motivation for completing quests below her level by both diminishing their rewards and suppressing their display. That said, assessing the early gameplay experience through specific quests may be possible because new characters are exposed to a limited quest set in a small set of regions. As the characters level up they can explore more regions, allowing them to choose from a greater variety of quests. As the variety of available quests increases, the ability to generalize about completed quests may decrease.

The MMORPG developer perspective also counsels against using single, select quests when evaluating a game: Blizzard Entertainment has had seven dedicated quest writers working on the different missions for *WoW*. Furthermore, as learned from Chris Klug, quest writing is often one of the last stages in the game development cycle. This is because the actual mechanics are considered more central to the gameplay than are quest details. Moreover, game producers reduce the cost of quest writing by using a fixed set of easy to follow and easy to recognize templates, such as killing a certain number of creatures, finding items, delivering an item to somewhere else, or talking to an NPC in another area. Blizzard has attempted to address this problem, which applies to many other MMOs, by introducing new types of quests in expansion packs [5, 38].

To summarize the lessons learned in this section:

- Quests are part of the game's narrative, and this narrative is a part of the game's culture.
- Any single player is likely to only see a fraction of the full set of quests. Consequently, single quests or small subsets of quests may have little resonance with many players.
- Quest development is often handled by multiple writers and is conducted near the end of the development cycle. This means that many quests are created on deadline and with only minimal vetting for fitting into a game's predefined narrative.

We conclude that specific quests or a sample of quests may have less of an impact on a single player's perception of an MMORPG than the information conveyed in the aggregated set of quest texts. Thus, we argue that a text analysis methodology which operates on the text corpus level presents an appropriate alternative to methodologies that primarily use discrete quests as an analytical unit. While a corpus-centric approach may dilute the importance of idiosyncratic quests that have singularly high resonances for particular players, it facilitates capturing the general import of the quest's content.

In this project we employ the corpus of quests in *WoW* in order to investigate players' understanding of *WoW* from

a factional perspective. In our work we read *WoW's* story, from the players' perspective, as being one of factions. The official "lore" and history developed by Blizzard across the entire Warcraft franchise is primarily about the interactions between the Alliance and the Horde. These are two coalitions of races roughly analogous to the good and evil races of J.R.R Tolkien's books on Middle Earth, although relationships between these groups are more convoluted [29]. However, the Warcraft lore is not simply divided into these specific multiracial groupings, but contains many smaller factions that coexist with the Alliance and Horde and are variously antagonistic, friendly or neutral towards them.

A *WoW* player is slotted into the factional framework of the Horde or Alliance. By carrying out missions for faction members and by fighting enemies he develops an understanding of the factional relationships and also determines his own relationship to them. Given many players' drive to complete quests without noting excessive narrative detail, this factional perception may be limited to the most basic antagonisms.

Traditionally, *WoW's* factions are considered to be those groups with which a player can gain measurable amounts of "reputation", a quantifiable property that can be earned by several means, including: completing tasks such as quests, killing members of opposing factions, and obtaining specific items. Some of these groups have diametrically opposed goals, and a player may be forced to choose one side over the other. During the course of play, however, one encounters many groups with which it's impossible to gain reputation.

Our goal with this study is primarily comparative: we aim to understand if the quests present notably different cultural values and factional relationships for players based on their initial choice of aligning with the Horde or the Alliance, or if essentially the same story and perspectives on in-game cultures are given to everyone regardless of this decision. We specifically intend to look at the similarities and differences present in the texts of quests available only to Horde players, only to Alliance players, and to players of both groups, and to determine how the use of specific terms and their network relationships differ and what these differences mean.

DATA

We obtained the set of quests in *WoW* from Allakhazam, a public online repository of quest information. Allakhazam's data is automatically gathered by an add-on that players may opt to install. The quest data in Allakhazam's repository is composed of the name and text of a quest, an integer range for the appropriate player level, the faction (whether it can be completed by players in the Horde, the Alliance, or by both), the quest giver, and the rewards for completing it. The data furthermore entails a quest's category, e.g. the general locality of the quest or the class of the player, and tags, e.g. whether a quest is a daily or a seasonal one. Since neither the categories nor the tags are applied consistently we disregarded them for this project. The text of each quest is generally stored in three chunks: an introductory text in which the quest is described and framed in the context of the world, one or more progress texts asking how the character has progressed, and a closing text that acknowledges the completion of the mission.

It's important to note that Allakhazam's quest data is imperfect: the logging process introduces discrepancies such as specific player names instead of generic identifiers (e.g. "Bob" instead of "<name>"). Some quests that have been dropped from the game are still in the database. Quests available to more than one faction and that are given by different NPCs can result in duplicate records. At the time of our scrape (March, 2009), we identified 7652 distinct quests, while in July, 2009 Allakhazam has a count of 8173 quests. Wowhead, a rival website that uses similar methods to obtain quest information, reports 8021 quests. No official public tally of the current quest count exists, and quests have been removed and added as patches and expansion packs have been released. However, on March 26, 2009, several news outlets reported Blizzard as giving a current count of approximately 7650 quests [4, 35]. This number was reported around the time of our scrape, suggesting that at the time Allakhazam contained a roughly accurate quest count.

We used a combination of web scrapers (curl) and scripting languages (awk, python) to download and clean our corpus of *WoW* quest texts. We then went through several iterations of vetting and refining the texts as necessary.

METHOD

The heart of relational text analysis is the reductive transformation of a text corpus into networks that consist of nodes and edges. At a minimum, relational text analysis (RTA) involves the following steps [11]:

- Development of a research goal or question. We reported on this step in the previous section, while the following steps are described throughout the rest of the paper.
- Identification and extraction of relevant entities (nodes) and the relations (edges) between them from texts. This process is also known as relation extraction [32].
- Representation of the relational data [11].
- Network analysis of the data [12, 46].
- Interpretation and validation of the results.

Some relation extraction and network analysis techniques treat all nodes as instances of the same class (one-mode networks) [14, 15]. Such networks are often referred to as

semantic networks [22, 44, 50]. Other methods facilitate the classification of nodes (multi-mode networks) and/or edges (multiplex networks) according to pre-defined or data-induced classification schemata [1, 18]. In this project, we use both techniques: we generated semantic networks by treating all nodes as instances of the same node class (one-mode network) and also extracted meta-networks (multi-mode network) by classifying nodes according to a general model of socio-technical systems that has been previously developed and validated [7, 27]. Meta-networks are preferable to semantic networks when different node types allow for meaningfully distinct conclusions about and inferences from the data. While semantic networks can be analyzed with standard social network analytical techniques [12, 46], meta-networks permit the computation of measures that take various node classes into account [9, 27].

To identify nodes that fit into the schema researchers use a combination of predefined positive filters and data-induced lists of terms relevant to the given research question, domain, and corpus. In the general schema used for this research, we employed four types of nodes: agents, groups, events, and locations.

The agent set was composed of NPC and enemy characters ("mobs", an abbreviation of "mobile objects. We acquired the list of agents by scraping data from gamepressure.com, an independently operated *WoW* database. The group set consisted of the various in-game factions and races to which a mob or an NPC could belong, and that we identified by scraping and reading portions of WoWWiki, a player-curated wiki. We started with a baseline list of the factions and those provided in WoWWiki's "List of Race and Class Icons" that we grew as we looked at mobs that had not been classified. We mapped additional mobs to our classification schema by searching a third database, wow-arsenal.com, which helped capture NPCs and mobs that did not directly incorporate faction identifiers into their own names. The remaining set of mobs and NPCs that we could not be labeled as members of a specific group were labeled unclassified_mob and unclassified_npc, respectively. Of the quests that we downloaded, 7108 were attributed to specific quest givers. For these quests, we replaced all first person singular and first person possessive terms in the quest with the quest giver's name. In cases where we could not do that, such terms were simply replaced with the tag "quest-giver". We also replaced any uses of second-person terms with the agent term "player", uses of the third person singular ("he", "her", etc.) with the agent tag "social_entity_s", and uses of the third person plural ("they", etc.) with the group tag "social_entity_p". Lastly, we replaced any references to the second person plural ("we", etc.) with the group tag "social_bonding".

In order to identify and label locations we used a combination of data from Allakhazam, WoWWiki, and Wowhead. Analogous to the game's geography, these sites consider *WoW*'s four continents to be divided into distinct zones, which themselves are divided into subzones. Our final set of locations consisted of 2188 different subzones mapped to 134 distinct zones.

We compiled the set of events and attributes using automated parts of speech tagging [19]. We ranked the set of verbs and attributes by their cumulative frequency across the full set of quests, and screened verbs with a frequency of greater than 5 and adjectives with a frequency greater than 10 for relevant hits. This procedure resulted in a list of 833 events and 917 potential node attributes.

Prior to applying these lists, we prepared the quest data by cleaning HTML from the scraped text, eliminating quests which Allakhazam did not assign to a faction, and removing quests that were corrupted during the downloading process; this reduced the total number of quest texts to be analyzed from 7502 to 6765. We then subdivided these texts into their component sections (introduction, in progress, and completion) as they existed.

Next, we reduced the data to nodes (and associated meta-network classes) derived from terms we had determined relevant. Once the set of relevant nodes is identified and – in the meta-network case – classified, their relationships need to be determined. The various techniques that have been developed for this step exploit lexical [26], syntactic [43], semantic [21], logical [40], and proximal [15] information from the texts. For this project we chose to apply a multi-method technique that combined lexical features (the terms in the positive lists) with syntactic (the grammatical function of a word) and proximal information about text terms. We operationalized proximity as the co-occurrence of relevant terms within a "semantic unit" that we defined to be the full text of each of the quest segments mentioned above [16]. This proximity based approach makes the assumption that words within this semantic unit share a relationship; in this case one of representing a quest. We decided to use the complete texts as our unit in part because of the brevity of each of these messages and in part based on the results of our pre-tests, in which we qualitatively and iteratively vetted the graphs extracted from texts by using various window sizes.

All text-based operations described in this section were performed with AutoMap [8, 16]. The extracted networks were represented in DyNetML [11], an XML derivative designed for storing multi-mode, multiplex data. These data were loaded into and analyzed in ORA, a tool that facilitates the visualization and analysis of rich network data [9].

RESULTS

The 6765 quests we analyzed were distributed approximately equally across the groups: 2270 were available to the Alliance, 2034 to the Horde, and 2461 were available to members of both factions. Indeed, the quests in the last group actually outnumber the faction-specific ones. This means that more than half of the content available to players on one side of the game's primary factional divide is also available to players on its other side, with exactly the same text. Thus, if we are looking at text for context, we must consider that a significant portion of the game is played out in identical areas with duplicate contexts.

The overlapping uses of certain terms extracted from the individual texts in each corpus shows that, even at the word level, the data's distribution is approximately equal across these three corpora (Figure 1). Our term mapping reduced the three sets of texts to 1109 distinct terms, with 900 in common across all three and the rest divided between them.

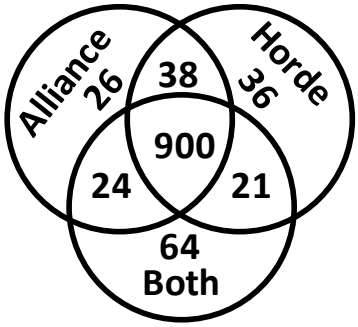

Figure 1: The division of term labels across the various quest text data sets.

The identities and order of the five most frequently used terms across all three sets are the same (Table 1). Even the relative frequencies of terms per text set (computed by dividing a term's cumulative frequency per set by the total terms per text set) are fairly similar. Furthermore, these five terms consist entirely of tags that we have constructed. The dominance of "player" is logical, given that all quests are directed at the player and make prominent reference to them. More revealing is the prominence of unclassified_mob, which suggests several conclusions. First, this catch-all aggregator's prominence in comparison to any of the more refined factional and racial tags we devised suggests the number of mobs that lack factional allegiance (such as bears or spiders). It also points to the large number of quests that are designed around the player's killing of mobs. While playing the game quickly shows that killing mobs is encouraged explicitly through quests and tacitly by their presence across all areas of the game world, it's perhaps surprising that mob descriptions play such a prominent role in the game text too. The prominence of social_bonding and social_entity_p is a good indicator of the validity of a factional approach: NPCs often refer to themselves as members of groups and make explicit references to other groups, this setting up some kind of relationship with them that the player will incorporate into their worldview.

Table 1: The five most used terms across all three text sets, in identical ranked order, and the percentage of each text set that they comprise.

Term	*Horde*	*Alliance*	*Both*
Player	12.6%	12.1%	12.5%
unclassified_mob	10.2%	11.1%	10.2%
social_bonding	5.5%	5.1%	4.9%
social_entity_p	4.5%	3.7%	4.3%
unclassified_npc	1.9%	1.6%	2.2%

Beyond these high frequency terms, several smaller-scale trends in this data exist at the node frequency level: during our manual screening of the node lists generated for each quest set we found that multiple terms connoting violence occur more frequently in Horde than Alliance texts, and slightly more frequently in the Both texts as well. It's also worth noting that the Horde and Both texts have more in common than the Horde and Alliance texts (Tables 1, 2). This suggests that overall there may be more similarity in the quest dialog structures of the quests for the Horde and Both groups than there is in the Alliance quests.

Table 2: Seven different event terms that can be used to connote violence and three percentage of each text set that they comprise. Note the higher percentages for Horde and Both relative to those used by Alliance.

Term	*Horde*	*Alliance*	*Both*
Kill	0.41%	0.30%	0.40%
Destroy	0.32%	0.22%	0.35%
Attack	0.29%	0.23%	0.25%
Battle	0.27%	0.21%	0.23%
Slay	0.27%	0.16%	0.26%
Fight	0.24%	0.26%	0.30%
Defeat	0.17%	0.10%	0.23%
Total	1.97%	1.47%	2.01%
Mean	0.28%	0.21%	0.29%

We also found that the general terms in the Horde and Alliance texts appear to roughly mirror each other, although the Horde texts appear to specifically identify both the Alliance and Horde with greater frequency than do the other two corpora. As shown in Table 3, in general the Alliance and Horde both make references to their own member races and locations a higher percentage of the

time than they do to those of the opposition. Correspondingly, the quests available for both races appear to make more references to some third-party enemy factions such as the Scarlet Crusade. Thus, despite the fact that the terms most commonly used across all of these files still overlap significantly, there are still distinct pockets of individuality within each set.

Table 3: Distribution of a set of general factional, racial, and locational terms across the text.

Term	*Horde*	*Alliance*	*Both*
Horde	0.62%	0.23%	0.08%
Alliance	0.36%	0.27%	0.03%
hellfire_peninsula	0.20%	0.12%	0.02%
howling_fjord	0.14%	0.18%	0.04%
Orc	0.27%	0.19%	0.06%
Dwarve	0.10%	0.12%	0.04%
the_scourge	0.21%	0.18%	0.21%
the_scarlet_crusade	0.01%	0.05%	0.17%

In addition to looking at all terms at once, we also consider them within the context of their ontological classification as events, organizations, and locations. (We disregard agents because we defined only four and they exist within all the quest corpora.) As shown in Figures 2-4, the amount of term overlap when broken down by class varies greatly. While the events used across the three sets are mostly uniform, a reasonable number of locations and a large number of organizations are referred to only within specific corpora.

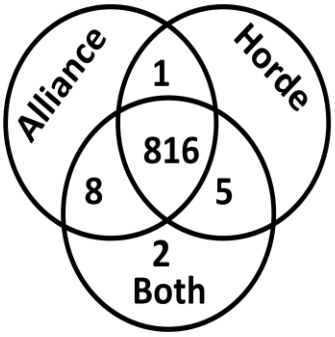

Figure 2 Terms classified as events and their distribution across the analyzed corpora. Note that almost all events are shared in common between the three texts.

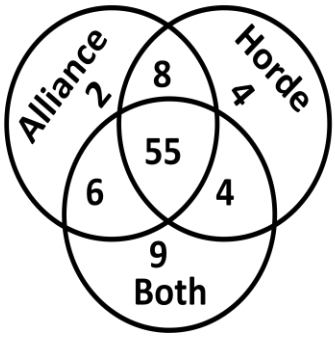

Figure 3 Terms classified as locations and their distribution across the analyzed corpora. Note that most locations are held in common, but a few are confined.

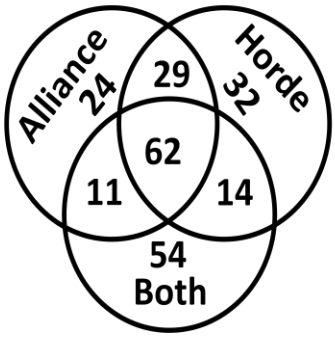

Figure 4 Terms classified as organizations. Note that while the majority of organizations are still used by quests across all corpora, an almost equal number are still confined to but one corpus.

While analyzing data at the term level is helpful, the heart of RTA is looking at the relationships between terms. We consider terms to be nodes in a network and focus specifically on the structure of links connecting the different nodes; links exist between nodes that appear in the same text in order – that is, links have direction, with earlier terms pointing to later terms. By aggregating all of the networks in each of the three corpora and including only those links present in at least 5% of texts in each set (113,101, and 123 texts for Alliance, Horde, and Both respectively), we obtained the three network graphs in Figures 2-4. We decided on the 5% value via experimentation: increasing the percentage cutoff above 5% reduces the edge count to zero almost immediately.

The salient characteristics of these graphs relevant are that they are structurally similar, and that the only nodes present are either the aggregate nodes referring to NPCs, mobs, the first-, second-, and third-person associations, or event nodes, derived from the texts' verbs. The core of the actions in *WoW* appear to be a small set taken by players towards mobs, and the prominent relationships are those

of players to said mobs and the quest givers who direct the player to involve herself with them. These relationships also appear to have no relation to a player's faction: the general structure of the instructions given to players is the same regardless of the specific faction to which the quest is assigned, suggesting the homogenous nature of the bulk of quests and the activities required by them.

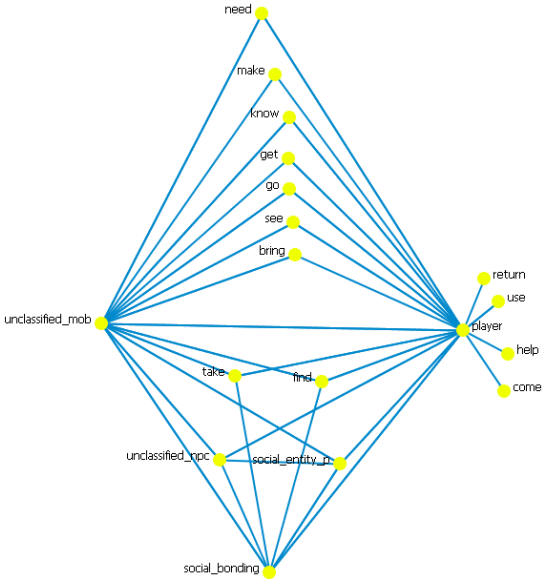

Figure 5: Graph in which all links between nodes are present in at least 5% of parsed Horde quest texts. The leftmost node is unclassified_mob, the central right node is player. The nodes in the upper triangle and to the right of player are all events.

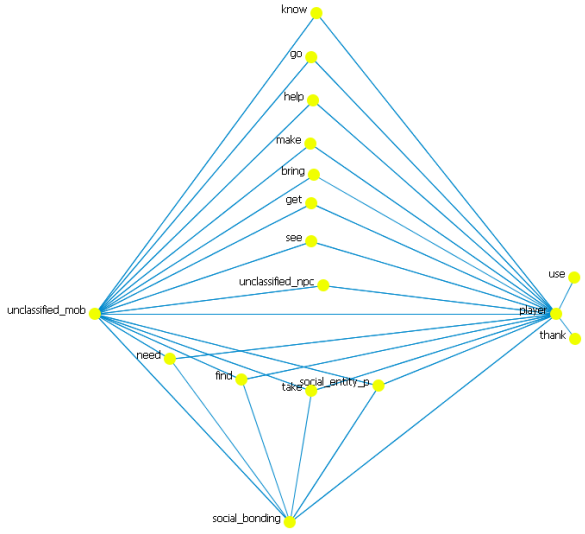

Figure 6: Graph in which all links between nodes are present in at least 5% of parsed Alliance quest texts. The leftmost node is unclassified_mob, the central right node is player. The nodes in the upper triangle and to the right of player are all events except for unclassified_npc, at the triangle's base.

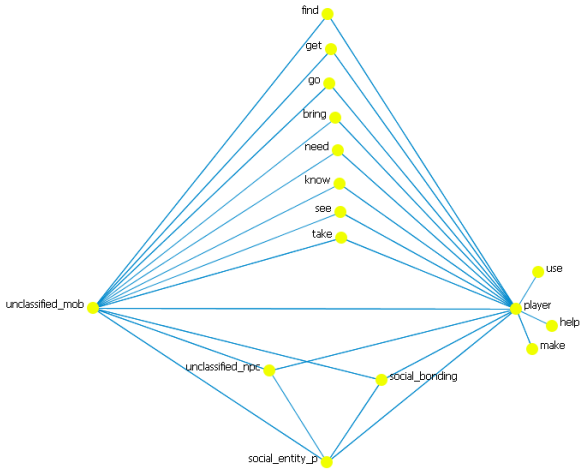

Figure 7: Graph in which all links between nodes are present in at least 5% of parsed Both quest texts. The leftmost node is unclassified_mob, the central right node is player. The nodes in the upper triangle and to the right of player are all events.

When we remove the 5% constraint listed above, the number of links present in the data increases dramatically. Once we look for shared links between the three different corpora (as we did with the individual term data) we see a similar lack of redundancy: large numbers of unique links concentrated within the specific corpora. This dovetails with out examination of the individual concepts, and our note that the concepts themselves also appear to generally be locally concentrated.

DISCUSSION

The central question that we sought to address with our work was how the three different quest corpora (Horde, Alliance, and Both) present different perspectives on the game's virtual cultures.. Several limitations apply to this study. First, our data source possessed a certain amount of corrupt data. Second, the analysis results are impacted by the text coding choices we made, including the predefined filters, semantic unit definition, and window size. Third, we worked with the quest from one specific game so that generalizability of our findings to other games can only be assessed through comparative studies with quests form other games. That said, our results suggest that while in the specifics these three quest corpora differ greatly, their most prominent features are some of the most stereotypically established relationships of the MMORPG genre: a player's taking action towards enemy mobs at the behest of a quest giver.

Several aspects of the data point to the distinctiveness of the perspectives presented at the local levels, the key element being the diversity of organization and location concepts and relations between the several corpora. Furthermore, distinctive differences exist in the language

usage patterns between the texts, such as the greater usage of aggressive terms in the Horde and Both data relative to the Alliance corpus, and the greater rate at which Horde texts specifically name the prominent factions. This suggests that the Horde texts help to define Horde races as generally aggressive and more concerned with factional identification than are members of the Alliance.

While these results highlight the unique aspects of the corpora, when we constrained the texts to only those relationships that occurred in at least 5% of texts, we found that all distinctive features dropped away. All of these specifics are superseded by an overarching general set of relationships between players, their quest givers, the quest giver's specific organization, mobs, assorted NPCs and events. Indeed, the structure appears to confirm the observation made by many MMO players: the core of all quests is a small set of basic tasks that involve disposing of mobs for NPCs, and whatever plot points exist must operate on a smaller scale.

Note that we are not suggesting that the stories of quests don't function as part of the player experience. Rather, we suggest that they have little presence at a macro level: the basic activities of MMO play dramatically supersede them. Correspondingly, we also do not dismiss the validity of the *Rashomon*-style attempt at telling stories in MMOs. Indeed, the diversity of local data appears to support this idea: *WoW* contains numerous factions that have but local presence. But no one story appears to predominate: no narrative idea outweighs the general principle of dealing with mobs at the request of quest-givers.

WoW is the most popular MMORPG currently on the market, and its quest system has played an important role in its success. The game's designers have invested significant time and effort to create an epic world in which many factions vie for authority and develop relationships. Yet this diversity means that the mass of texts only carries the most general of messages. This is not necessarily a hindrance for game designers, but we recommend they consider the limits of the use of quest texts as deliverers of plot content. Without large amounts of repetition quests will only be united in telling players to repeatedly perform general actions, and should correspondingly look to other features of the game world to carry plot points. While quests that follow rote templates are efficient for both players and developers, they can also lead to stagnation of message; varying quest styles and forms may help to alleviate this.

FUTURE WORK

There are several different paths for the advancement of this work. At the broadest level, researchers will hopefully continue investigating the impacts of quests on player understanding of game environments. We also believe that RTA still has applications on *WoW* and other MMORPG's text corpora. In the case of *WoW*, it would be worthwhile to explore the networks generated by alternate ontologies or by more specific subsets of the quest corpora.. For example, *WoW's* quests are expected to be completed at certain levels, which are recorded in Allakhazam. By subdividing the *WoW* corpora into ten level chunks and looking at the distribution of quests across them, we could gain another useful and novel perspective on how players experience quests and, the game world as a whole.

ACKNOWLEDGMENTS

This work was supported by the following grants: MMOG - N00014-09-1-0155, ARI - W91WAW07C0063, ONR - N00014-06-1-0104. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressed or implied, of the Army Research Institute, the Office of Naval Research, or the U.S. government.

We are grateful to Chris Klug for taking the time to talk to us.

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