

Communication in Multi-player Role Playing Games – The Effect of Medium

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Abstract. The Pen-and-Paper role-playing game is a successful example of collaborative interactive narrative. Meanwhile, computer-based role-playing games, while structurally similar, offer quite different narrative experiences. Here results are presented of an experimental study of role-playing gamers in Pen-and-Paper and computer-supported settings. Communication patterns are shown to vary significantly on measures such as the share of in-character statements and the share of dramatically motivated statements. These results are discussed in the light of differences between the two gaming forms and finally some design implications are discussed.

Keywords: Role-playing games, communication, computer-mediated communication, narrative, player behaviour.

1 Introduction

Pen-and-Paper Role-Playing Games (PnPs) are often, with good cause, heralded as one of the most successful instances of interactive narrative. PnPs have been converted to computer platforms with great structural faithfulness and yet the gaming experience is different, for instance in terms of the story development process.

Although rules and narrative settings are similar, the two game forms differ in key aspects. Computer role-playing games (CRPGs) offer a virtual representation of the fictional game world whereas PnPs do not. In PnPs, the participants must work together to uphold a shared understanding of events taking place in a shared, imagined game world. Meanwhile, in CRPGs the fictional game world is visually presented by a virtual reality engine, as witnessed by games such as *Neverwinter Nights* or *Vampire the Masquerade: Redemption*. This engine (typically) replaces the human Game Master (GM) common to most PnPs as the arbiter of rules and communicator of game state.

What would be the expected communicative effect of these differences? As the computer takes over all technical aspects of the game (processing of rules, managing and updating the game state etc.) one might expect the CRPG players to be freed of the need to communicate on non-dramatic matters. That is, one might expect them to display a higher percentage of dramatically motivated communication, i.e. more

“role-playing”. As will see in the following, however, the opposite seems to be the case as the communication between CRPG players in the study was almost purely functional.

We begin by discussing the motivations for studying RPGs and briefly outline previous work. This is followed by an examination of the RPG genre and of differences between game forms. We then describe the experimental design, present results and offer a discussion of the findings.

Why Study Communication in RPGs?: Role-playing games (RPGs) provide a basis for studying the communicative structures between multiple participants in an immensely popular game form spanning different media platforms; RPGs are represented in both table-top form, physical and virtual media, as well as in forms involving from a single to thousands of players interacting simultaneously. PnPs and CRPGs present an opportunity to study directly the effect of changing the media of expression of a popular game genre on the communication between the participants and between the participants and the game world.

However, the communication which takes place in these games is under-explored. Basic data on the communicative activity of playing multi-player games in any medium, is, with certain exceptions ([2], [6], [9], [11], [12], [16], [21]), mostly absent in the academic literature. The game genre is receiving an increasing amount of attention in academia and industry alike. The main reason for this interest is that PnPs represent one of the most successful examples of interactive narratives and thus has become a core area of study in the attempt to develop interactive storytelling engines [9], [13], [19].

Furthermore, the potential benefit to the design of communication interfaces in computer games resulting from studies of multi-player communication is substantial. Results in this area hold the promise of providing an improved understanding of social gaming dynamics. Lastly, while techniques like focus groups and beta-testing have traditionally been employed by the games industry to test early-stage games in development, analysis of the communication of players engaged in the gaming activity facilitates the gathering of unbiased test data (i.e. for calculating learning curves).

Aims of This Study: This study presents a comparative quantitative analysis of the verbal communication in a PnP and a CRPG. The analysis is based on video tapes and transcriptions of verbal communication in two sets of game sessions (three PnP and three CRPG sessions). This study seeks, at a general level, to map and catalog the communication that occurs in the two game types. On a more specific level, the study aims at producing a coding system that allows for the direct comparison of the communicative statements and actions of the game players across the two game types, and thus across a media change – i.e. from a pen and paper to electronic game format.¹

For this paper, we shall specifically direct attention to the use of dramatic additions to action and environment descriptions in the two game forms.

While RPGs have been used as the basis for the empirical experiments, the methods are likely to be relevant to the study of multi-player games outside the role-playing genre.

Previous Work: While the communicative patterns of RPG play to date have been only sporadically studied, [15] presents communication coding schemes for the study

¹ For discussions of the differences between PnPs and CRPGs see [1], [3], [5], [7], [17].

of multi-player gaming to gauge the effects of different conflict types. More generally, [8] videotaped and analyzed the behaviour of video game players in naturalistic settings. While offering observations on communicative behaviour, this study sought primarily to identify the role of emotions in video game play.

With the aim of providing applicable models, [19] reviewed the functionality of the GM and general communication patterns in RPGs across media platforms. Similarly, [7] developed models of the communication channels in multiplayer PnPs. Also, [3], [4], and [10] have developed general models of the multi-player PnP situation, including studies of communication pathways and social interactions. [20] Analysed the impact of various technologies on PnPs and other multi-player table-top games, including virtual realities. Additionally, there is a substantial amount of material viewing CRPGs from the development and design perspective, e.g. [5], [9], [13], and [14] conducted initial studies of the structure of the development of the interactive narrative in PnPs. The vast majority of publications on RPGs do not have an empirical element.

In summary, models and theoretical frameworks for the understanding of role-playing have been offered and empirical work has begun to emerge. To date, this work has been too fragmented to allow for much generalization and common methodologies have not yet been formulated.

2 Method

This study utilizes general communications terminology. A few games specific terms are defined here as their meaning varies in the literature:

Statements and utterances: In this study, the basic unit being coded is an utterance. An **utterance** is defined as consisting of: 1) A subject who performs the communication 2) The content of the communication and 3) An object or objects to whom the communication is addressed. For instance, the GM could describe an object to one of the players in a PnP. This definition of an utterance allows for application to both asynchronous and synchronous communication. In this study, all communication is synchronous. A **statement** is the entire verbally expressed communication by a participant, e.g. up to several sentences (the dialogue), before communication is initiated by another participant. A statement can contain multiple utterances.

In game and out of game: An utterance (or statement) from a participant in a multi player game can be classified as “in-game” (IG) or “out of game” (OOG). An utterance that is IG relates to the game or game content, for example a rules question, a character action description or similar; while an utterance classified as being OOG does not relate to the game or gaming activity. For example, asking what the time is; where the bathroom is etc.

In character and out of character: An utterance (or statement) from a participant can be “in character” (IC) or “out of character” (OOC). In character utterances are typical of PnPs, where the players sometime talk as if they were embodying their characters using a first person perspective, for example: “I run over to the door, and look out of it. What do I see?”. Players can also describe the actions of their characters in third person, e.g.: “my character runs over to the door, looking out. What does he see?” Both of these types of utterance are in this study coded as IC, because

both involve a player describing a character action or communication directly. OOC utterance could for example be rules questions, or comments about the interface with the virtual world in a CRPG. An OOC utterance can be both IG and OOG (an IC utterance cannot be OOG).

2.1 Game Selection

Initially, single-group multi-player PnPs and CRPGs were selected as the two target game types for this study. Presumably the narrative context of the chosen game scenarios will impact on the participant communication, and care was therefore taken with selecting the two scenarios. *What a Lovely War!* Produced by Sven Münthers (et al.) in 2003, was chosen as the PnP scenario. It utilizes simple rules (the *Traveller Light* D20 system). The rules concern combat and skill use, comparable to CRPGs, while the interaction with Non-Player Characters (NPCs) and overall was controlled almost exclusively by the GM (outside the rules framework). The scenario allows for a substantial player influence on the game play, and features a relatively linear storyline, thus allowing comparison with the storyline in the CRPG of the study.

The CRPG chosen for this study was the PS2 game *Champions of Norrath*. The game features elements common to the console CRPG form, e.g. action-driven gameplay, a linear storyline, and a generally collaborative environment. Although *Champions of Norrath* has a network game mode it is typically played by one to four players on a single monitor. The latter form was used in the study ensuring that all players had the same visual image of the virtual world.

Recruitment: The players for both the PnP and CRPG game sessions were recruited at the IT University of Copenhagen and the University of Copenhagen in 2004 and 2005, as well as among the Danish RPG community. Their age varied between 18-35 years (only one was below 20). For the CRPG players, almost all were university students, with a substantial amount of games experience. For the PnP RPG players, experience varied. Both sexes were represented, with about 2/3 male and 1/3 female.

Experiment procedure: In total, five PnP sessions were run with the chosen scenario (an expansion of these experiments involving over 50 players and three different RPG platforms is being conducted at Macquarie University). The participants were divided into groups of five players depending on their experience level. Two groups consisted of experienced players, two of a mixture of experienced and inexperienced players, and one group of relatively inexperienced players. All had previously played PnPs. For this study, one session of each type of group was transcribed and coded (session 1=experienced, session 2=inexperienced, session 3=mixed).

The game sessions were managed by highly experienced GMs, in two cases the primary author of the scenario. Each GM utilized the scenario as a blueprint to run the game. The scenario contains 5-10 general plot points, each describing the general properties of a particular scene. The conditions necessary to progress to the next scene were loosely defined, and substantial variation was observed between the sessions as to how the players progressed through the narrative, e.g. in jumping or altering scenes. The GMs had the freedom to alter the game narrative on the fly, however they were asked to attempt to maintain the general storyline of the scenario. This was in order to provide a similarity with the strictly linear storyline of *Champions of Norrath*.

The GMs performed exemplarily in keeping the players onto the pattern of the overall frame for the storyline, without at any time forcefully limiting player freedom.

Each game session was videotaped, and participants interviewed before and after each session in order to get feedback on the playing experience, the interests of the players in RPGs etc. Sound was recorded using a tabletop microphone. The tapes were copied to digital format and transcribed using transcription software.



Fig. 1. A PnP session (left) and a CRPG session (right) with superimposed game visuals

In the CRPG part of the experiment, six sessions were held. For this analysis, three sessions were selected based on the relative similarity of the players in terms of playing skill (and hence progress in the game in the given time). Two of these had three players, while one had four. The groups were only introduced to the game in very general terms and played it for approximately 45 minutes each. A researcher was present during the sessions not interfering but answering questions posed by players. Such questions turned out to be very rare as almost all players preferred to work out game controls etc. themselves. The sessions (Figure 1) were videotaped and the verbal communication was later transcribed and analyzed.

Coding: The basic approach towards developing a usable coding scheme was iterative. An iterative process has the advantage that it allows for testing a theoretically based scheme in practice of the coding hierarchy before the actual coding is initiated. With each iteration the system (comparable to a prototype in an Rapid Application Development process) is refined, until a saturation level is reached where no new codes appear from the testing. Initially codes were developed deductively from theory and models, and inductively from categories that arose from an initial test coding of the transcribed games sessions. The coding scheme was then tested in a pilot study, where approximately 20% of the total amount of transcription to be analysed was coded, resulting in a refinement of the system. As the system was saturated, the iterative process was stopped, and the finished coding scheme applied to the transcribed game sessions. The coding scheme is designed to specifically code utterances and to be applicable to the communication by the participants in multiplayer PnPs and CRPGs. The coding scheme was applied to the transcriptions using *nVivo*, a software package for the analysis of qualitative data. For each of the two game types, three sections of the sessions were coded as shown in Table 1.

Table 1. The scenes coded

	Scene type	What a Lovely War!	Champions of Norrath
Scene 1	Non-stressful planning and prioritizing	Players receive and don equipment	First extended shopping scene
Scene 2	Non-threatening combat scene	Players fight aliens	Players eliminate goblin invaders
Scene 3	Possibly dangerous combat scene	Players raid alien military base	Players fight goblin overlord and his pets

In both game types the length of these scenes varied somewhat. Though such detailed analysis was not conducted for this paper, the choice of sections of different type and temporal position facilitates closer subsequent examination of variation in communication patterns. Also, the coding scheme allows for tracking individual contributions meaning that communicative variations may be traced to single participants breaking the overall pattern, if that is the case.

Pros and Cons of Utterance Model: Basing the coding system on utterances generally leads to a high degree of precision and resolution of transcribed material. However, by using utterances as the basic unit of communication and by favouring relatively literal interpretations of these utterances, broader context-dependent meanings may be lost. More concretely, a player repeating a question to another player who did not hear it the first time is counted as the same type of utterance twice. Pilot testing indicated, however, that the statistical imprecision imposed thereby is of very limited magnitude in the two game forms. It is also possible to combine analysis of utterances with a context analysis, which is an approach utilized in this study. While context analysis does not reveal repetitions as in the example above, it is useful to assess general communication patterns and locate problems with an utterance-based coding hierarchy. The actual narrative progression was not measured or analyzed (this is a subject of a study currently in development).

2.2 Coding Hierarchy

Typically each utterance was given 3 codes: I) A **content code**, under one of the four general categories formed by combining the IG/OOG and IC/OOC groupings (IG+IC, IG+OOC, OOG+IC [not possible in practice], OOG+OOC). For example the utterance: “I run towards the door, readying my weapon”, is spoken IC, and thereby also IG. It is furthermore a “character action description”, and given the appropriate code. II) A **receiver code**, which defines to whom the utterance is directed. Utterances can either be directed at one other player (including the GM in PnPs), more than one player, or the entire group. III) A **drama code** indicating whether the speaker phrased his or her utterance in a functional or expressive manner. A statement was coded as either “purely functional”, “dramatically embellished”, or “purely expressive”. As defined above, statements can include several utterances, thus requiring multiple codes. Similarly, utterances can have several components requiring several codes, e.g. a player describing both a character action and providing an environmental description at the same time.

2.3 Data Treatment

For all statistical evaluations of the data, care was taken to check whether a result was the result of a single aberrant game session or player. Some variation caused by individual player styles and similar was expected, however, both the CRPG and PnP sessions showed a substantial degree of internal similarity across individual coding categories, with less variation than expected.

Chi-square tests were employed to calculate the probability that the observed patterns were caused by random variation rather than an expression of dependency. In all these cases, the probability of randomness was greatly below the nominal 5% cut-off value. For example, for the content code category “Ask for Info”, there was only a 8-10% variation between the PnP RPG and CRPG sessions. However, with a significance (p) = 0.00063 the statistical probability of this pattern arising randomly is extremely small. Not all content codes were used in the six investigated game sessions, and some only to a very small degree. For example, the “ask for advice” and “ask for help” categories were used from 0-3 times in the CRPG sessions and 0-4 in the PnP sessions. If the accumulated frequency of a coding category was less than 10, it was omitted from the statistical analysis because of the resulting high degree of uncertainty such an analysis would carry. For CRPGs, six content code categories had a sufficient frequency to be included in the analysis (Figure 2). For the PnP this number was ten (Figure 4). Twenty-two codes were defined during pilot test coding; however, not all of these occur in the transcription segments of the current project.

3 Results and Discussion

Due to space constraints, analysis at the level of the individual players is omitted from the data presented here, and emphasis placed on patterns at the level of the individual game sessions, with respect to: A) The content and purpose of the communication of the players in the two game forms; B) The frequency of InG/OoG utterances; C) The frequency of IC/OOC utterances, and; D) The use of dramatic embellishment.

Communication content: There is a marked difference in frequency and category of the content codes employed by the participants in the two game forms (Figures 2 & 4). The variations appear to be related to the game format and media of expression. Notably, the most frequent codes utilized by the PnP players were “environment description” and “character action description” (CAD), with “ask for info” as a close third. The two former represent specific instances of the more general “give info” codes, which explains the low frequency of these codes in the PnP. This result would seem well in line with these games being based on a shared imagined game world, which without a visual reference requires players to announce the actions of their characters to the other players, and require running updates about the game world state and the environment their characters act in.

For the CRPG sessions, the most frequent codes centre on information requests and provision: “Ask for info” rates at 25-28%, with the “give info” codes taking up even bigger chunks (Figure 2). Obviously in collaborative CRPGs, there is less need for describing character-avatar actions, and providing environment descriptions is not immediately necessary when the game world is visually provided. However, a high amount of communication still centres on keeping the players organized, reflected in

the “give info” categories, with utterances warning about the presence of opponents, replies to rules questions and interface questions being very common in the CRPG sessions investigated. Many statements indicate a player drawing attention to a feature of the game space which, while visually represented by the engine, may have escaped the attention of other players (coded as “give info”). There is some variation in the distribution of the two “give info” categories. However, when the two are combined the result is very similar for the CRPG sessions (51-55%), indicating that total information provision (as well as the requests for information, varying from 25-28%), is comparable.

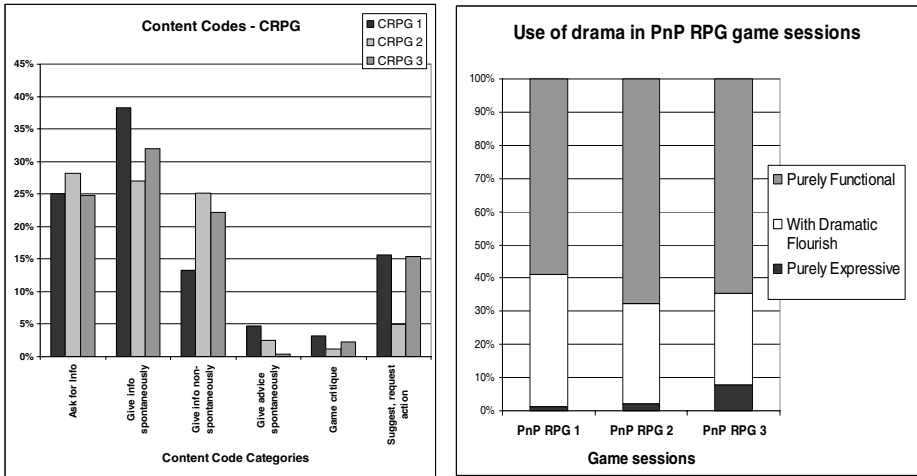


Fig. 2. and Fig. 3. Figure 2 content coding results of the three CRPG sessions; Figure 3 shows the variation in the use of dramatic expression² in the PnP sessions

In comparison, the high frequency categories of the CRPG (information related communication) has a much lower frequency in the PnP, with “Ask for info” rating 8-10% lower being the one that is closest to the CRPGs. This variation can probably be explained by the high frequency of the environment descriptions and CADs of the PnP which serve to provide information about the game world and its development (Figure 4). Unlike CRPGs, PnPs do not have interface or gameplay issues that form a substantial part of the information requesting/providing communication in CRPG sessions. Instead, the bulk of the communication in PnPs is tied up in describing the game world state and the events taking place in the game world.

In and Out of Game: The amount of OOG communication in the game sessions investigated was virtually nil, with typically 0-2 OOG utterances for each session. This indicates that there is little difference in the level of engagement of the players in the two game forms. In both circumstances, the limited amount of OOG talk points to the fact that the players are engaged in the game play. It should be noted that the

² In the figure, “dramatic flourish” indicates a functional statement containing at least an element of dramatic expression, i.e. “I draw my sword. The light reflects on the blade”.

amount of OOG talk in the very beginning of the CRPG sessions (not included in this analysis) was substantially higher until the players figured out the basic controls. These OOG-heavy minutes of game time would not substantially alter the analysis, however. For PnPs, the amount of OOG-communication was constant throughout the game sessions. However, PnPs feature a “premise-building” phase before the actual game starts, where the players discuss rules, characters etc. This interval is comparably to the first phase of the CRPG sessions, but takes place before the game starts [18], and are thus not included in this analysis.

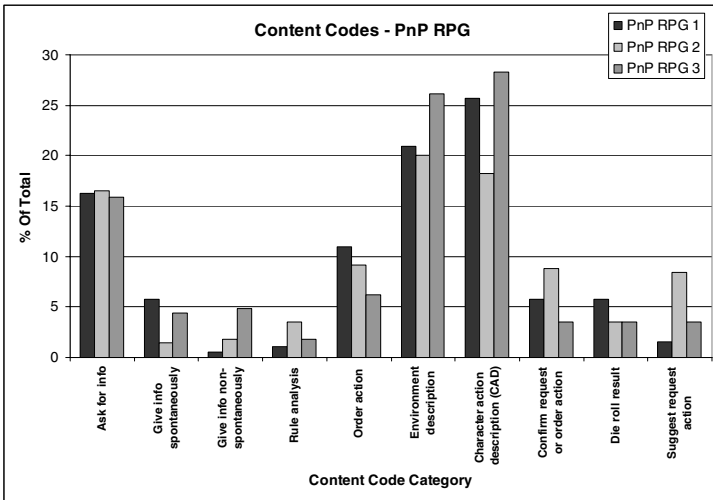


Fig. 4. Content coding results of the three PnP sessions

In and out of character: In comparison to the OOG-IG communication rates, the amount of OOC and IC communication varies substantially, with the rate of IC communication being substantially higher in the PnP (Figure 5). Likewise, internally in the game sessions there is a high degree of variety, with a rate of 39-51% (46% average) as compared to 15-33% (21% average) for CRPGs. In conclusion, players of PnPs are more prone to communicate IC although there is substantial variation, presumably related to the different player preferences. The difference is linked with the need for CADs in PnPs, which would normally rate as IC communication, and the difference between the two RPGs related to the basic format of the games. While the basic format of CRPGs do not prevent role-playing (the players are free to communicate IC), the format does not seem to encourage or facilitate it.

The use of drama: In addition to the level of IC communication, the use of dramatic flourish and expressive statements to enhance the drama can be used as a measure of the amount of actual role playing taking place in RPGs. While the purely functional statements about game rules, the actions of opponents etc. dominate in both game forms (Figure 3), the amount varies greatly between PnP and CRPG, and even between game sessions of the same type. Only three utterances with dramatic flourish were registered for the CRPG sessions, while 28-40% of all utterances in the PnP

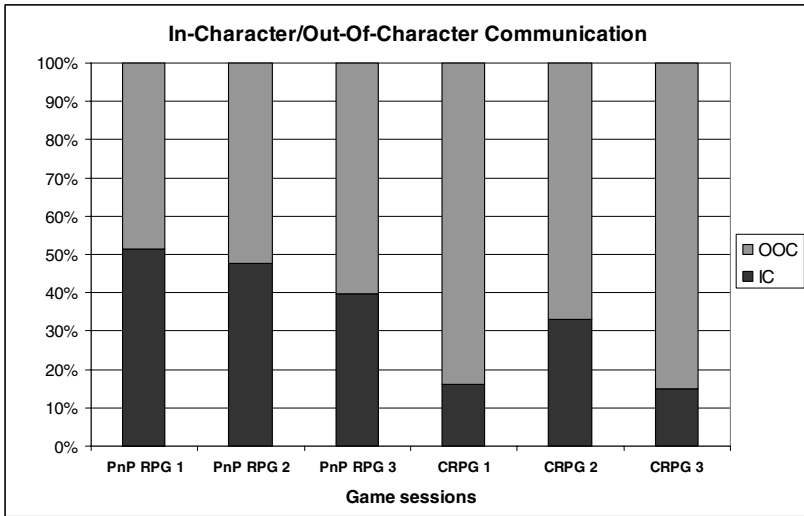


Fig. 5. In-Character (IC) and Out-of-Character (OoC) communication in the six game sessions

sessions used dramatic embellishment. However, even in the PnP sessions it was rare to see utterances which seemed to have purely dramatic purposes (that is, not *also* serving as a warning against enemies, describing a character action) (1-8%).

4 Discussion and Conclusions: Changes Across Media

In this study, a coding scheme for studying communication across media has been developed and successfully implemented in a study of a PnP and a CRPG. A communications based framework appears to be a viable approach to the study of the effect of media of expression on multi-player games.

The cross-session consistency of results indicates that the differences in communication patterns between the two investigated RPGs are not related to the players, but caused by the differences in the two investigated game forms.

CRPG communication focuses on the asking for and receiving of game-related information (Figure 2), and PnP communication focuses on describing and updating the imagined game world and the actions of the player characters in it (Figure 4). There are other differences as well, e.g. the presence of game criticism in the CRPG, and the use of “order action” statements in the PnP (almost absent in the CRPG). This latter feature of PnPs appears related to the need for managing the game flow in a game form where the players are free to act in whatever fashion allowed by their characters and the world fiction.

The results presented here lend empirical credit to certain traditional ideas of communication in PnPs and CRPGs. For example, that the amount of role playing (IC/OoC rates, the use of dramatic embellishment) in PnPs is higher than in CRPGs. The high amount of dramatic statements in PnPs is linked with a need to visualize the fictional world, which appears to encourage the use of dramatic statements. In PnPs

the players are responsible for creating the drama, while in CRPGs the game to some degree takes care of this, e.g. via sweeping scenes and dramatic combat. However, this apparently also affects role-playing internally in the group – while in PnPs dramatic statements are used, this is less marked in CRPGs, where the players distance themselves from the virtual world.

When it comes to the engaging qualities of the two game forms, CRPGs do not; however, appear to be more engaging or immersive than PnPs, despite the presence of a virtual reality (OoG/IG rates).

The majority of the communication between the CRPG players concerned group management, geographic orientation and interface orientation difficulties. These would appear to be areas where the game designers of multiplayer CRPGs could focus, for instance by providing player tools for pointing out geographic locations, for assigning orders and keeping track of the status of other character-avatars. Problems were also observed with the provision of information from the game, e.g. via cutscenes and NPCs, to the players. Often information provided was to be used later in the game. As the players often asked each other questions about information provided previously in the game, it would appear that a better strategy from a design perspective is to provide information as it is needed. Of course, these conclusions are based on observations of *Champions of Norrath* play only, but the game is a fairly representative member of the multi-player console CRPG genre.

Summing up, although the two forms share structural features, the effects of switching from PNP to CRPG are substantial. A future analysis of the player level data will hopefully shed more light on detailed social dynamics and their relationships to media.

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References

1. Bøckman, P., Hutchison, R. (eds.): Collected papers for Knutepunkt 2005 – the 9th annual Nordic Conference on larp. Knutepunkt, Oslo (2005)
2. Ducheneaut, N., Moore, R.J.: The Social Side of Gaming: A Study of Interaction Patterns in a Massively Multiplayer Online Game. CSCW2004, Chicago (2004)
3. Edwards, R.: GNS and Other Matters of Role-playing Theory. Adept Press (2001)
4. Fine, G.A.: Shared Fantasy: Role-Playing Games as Social Worlds. University of Chicago Press, Chicago (2002)
5. Hallford, N., Hallford, J.: Swords & Circuitry: A Designer's Guide to Computer Role Playing Games. Prima Tech, Roseville, CA (2001)

6. Holmes, R.M., Pellegrini, A.D.: Children's Social Behavior During Video Game Play. In: Raessens, J., Goldstein, J. (eds.): *Handbook of Computer Game Studies*. The MIT Press, Cambridge, Massachusetts (2005)
7. Kim, J.: *Story and Narrative Paradigms in Role-Playing Games*. Vol. 2006 (2003)
8. Lazzaro, N.: *Why We Play Games: Four Keys to More Emotion in Player Experiences*. Game Developers Conference 2004, San Jose (2004)
9. Louchart, S., Aylett, R.: Solving the narrative paradox in VEs – lessons from RPGs. IVA 2003. Springer Verlag, Kloster Irsee, Germany (2003) 244-248
10. Mackay, D.: *The Fantasy Role-Playing Game: A New Performing Art*. McFarland & Co., Jefferson, N.C. (2001)
11. Manninen, T.: *Virtual Team Interactions in Networked Multimedia Games - Case: "Counter-Strike" – Multi-player 3D Action Game*. Proceedings of PRESENCE2001 Conference, Temple University, Philadelphia (2001)
12. Manninen, T., Kujanpää, T.: *Non-Verbal Communication Forms in Multi-player Game Session*. In: Faulkner, X., Finlay, J., Détienne, F. (eds.): *Proceedings of HCI 2002 Conference*. Springer-Verlag (2002) 383-401
13. Peinado, F., Gervás, P.: *Transferring GMing Laws to Interactive Digital Storytelling*. In: Göbel, S., Spierling, U., Hoffmann, A., Iurgel, I., Schneider, O., Dechau, J., Feix, A. (eds.): *TIDSE 2004: 2nd International Conference on Technologies for Interactive Digital Storytelling and Entertainment*. Springer Verlag, Darmstadt, Germany (2004) 48-54
14. Salen, K., Zimmerman, E.: *Rules of Play - Game Design Fundamentals*. MIT Press, London (2004)
15. Smith, J.H.: *Plans and Purposes: How Video Game Goals Shape Player Behaviour*. PhD-Thesis. Center for Computer Games Research. IT University of Copenhagen.
16. Tosca, S.: *The EverQuest Speech Community*. In: Mayrä, F. (ed.): *CGDC 02 Conference Proceedings*. University of Tampere, Tampere (2002)
17. Tosca, S.: *Role-playing in multiplayer environments. Vampire: The Masquerade. Redemption*. Computer Games & Digital Textualities, Copenhagen, Denmark (2001)
18. Tychsen, A.: *Role Playing Games - Comparative Analysis Across Two Media Platforms*. Proceedings of the Interactive Entertainment Conference 2006, Perth, Australia (2006)
19. Tychsen, A., Hitchens, M., Brolund, T., Kavakli, M.: *The Game Master*. 2005 Interactive Entertainment Conference (2005) 215-222
20. Tychsen, A., Pagden, N.: *Making Magic! Enhancing PnP RPGs with computing technology*. Playing Roles seminar, Tampere, Finland (2006)
21. Wright, T., Boria, E., Breidenbach, P.: *Creative Player Actions in FPS Online Video Games*. *Game Studies* 2 (2002)