

Cross-format analysis of the gaming experience in multi-player role-playing games

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ABSTRACT

Forming one of the major genres of games, Role Playing Games (RPGs) have proven an extremely portable concept, and the games are situated across various cultural and format-related boundaries. The effect of porting RPGs between formats is however a subject of which very little is known. This paper presents results of an empirical study of multi-player RPGs, evaluating how the transference between formats affects the player experience; including the effect of including a human game master in computer-based RPGs. The tabletop format emerges as the consistently most enjoyable experience across a range of formats, even compared to a computer-based RPG directed by a human game master.

Author Keywords

Cross-platform games, role-playing games, computer role-playing games, game master, gaming experience.

1.0 INTRODUCTION

The Role-Playing Game (RPG) is one of the major genres of games, and has proven an extremely portable concept - from the physically embodied live action and tabletop formats to the various digital, mobile and even enhanced and augmented reality formats. In contemporary society, RPGs are everywhere and are utilized for personal enjoyment and satisfaction, as well as on the job, in training, teamwork and simulation exercises.

The fictional worlds of RPGs might be inhabited by a single player, a small community, or be massively multiplayer online worlds where thousands interact in real-time. Games are increasingly distributed across formats [8,17]. The fictional world of the *World of Warcraft* Massively Multiplayer Online Role-Playing Game, for example, can be accessed as a MMORPG, as a single player RTS (*Warcraft*) or in tabletop format. Players can even go outside the RPG formats and enjoy the *Warcraft* game world in card games and tabletop strategy games. Other games that cross formats include the *Vampire the Masquerade* and *StarCraft*, as well as the *Forgotten Realms*

world originally developed for the *Dungeons & Dragons* Pen-and-Paper (PnP) RPG.

RPGs are solidly situated in culture and society, having in the past 30 years grown from tabletop war games, medieval reenactments and early text-based digital games and MUDs [1,13] to a mainstream cultural phenomenon spanning Western and Eastern societies and evidenced by the millions of players in MMORPGs. Character-based storytelling is at the heart of RPGs, and the games tap directly into various universal myths and legends [10], with RPGs across game formats set in fantastic worlds inspired by traditional Western mythology as well as Asian, Arabic, Nordic and many other cultures. Generally speaking the PnP format of RPGs involve a degree of collaborative interactive storytelling hitherto unsurpassed by any digitally based system, and this greater degree of collaborative storytelling is generating interest in RPGs as a source for experiences applicable to interactive storytelling systems, e.g. in relation to the next generation of CRPGs and interactive entertainment generally.

Pen-and-Paper RPGs [4,10,21] provided a template for early developers of digital games outside the arcade arena who wanted to port their experiences from the tabletop to the digital medium [13]. Since those early days an ongoing debate has continued as to how successful this format transfer has been. Computer-based RPGs (CRPGs) lack the flexible storytelling of PnP-based stories due to technical challenges [3]. It can be argued that CRPGs reduce the need for players to exercise their imaginations with creative construction of mental representations of the game characters and environment, since the systems' graphics provides this. This reduced use of imagination and reduced flexibility in storytelling seem to be key factors in the debate on format transfer [19].

Most studies on RPGs have been confined to one specific format, with a few exceptions exploring how these games operate in multiple formats [e.g. 8]. It would be expected that RPGs change as they cross between formats (e.g. tabletop to digital). As noted by [5]: "Every transplanted game loses something in the translation [...] this is because

Situated Play, Proceedings of DiGRA 2007 Conference

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any game that succeeds in one technology does so because it is optimized for that technology; it takes maximum advantage of the strengths and avoids the weaknesses”.

RPGs, which have proven an extremely portable game concept, provide different gaming experiences depending on the format, e.g. the physical dimension of LARPs as compared to the virtual world of MMORPGs and CRPGs [11]. Not only the game format impacts on how RPGs are played and experienced, but various other factors as well, not least the number of involved players.

Similarly, there have been very few studies of the actual playing experience of RPGs – especially for the group-based versions - although some highly useful work has been conducted outside the research/industry environment by players and hobbyists [e.g. 2,7]. There is also a lack of formal investigation into the effect of transferal between formats on the playing experience. The same is true for the study of proximate causes for any variations outside the actual format of the RPG, i.e. gender, experience and notably age. [8] Reported an average age of 30 for computer game players. As the market for interactive entertainment broadens, adults and young adults become an increasingly important market for current and next generation interactive entertainment, which warrants studying how they experience RPGs.

The impact of not having a human Game Master (GM) in CRPGs and the limits this places on storytelling and reactive game play are fairly self-evident to players, however, the effect on the actual playing experience has not been investigated in detail. With games such as *Neverwinter Nights I & II*, *Vampire the Masquerade: Redemption*, the RTS *WarCraft III*, as well as in the upcoming *R2*-expansion to *The Saga of Ryzom*, toolkits have been introduced that to a greater or lesser extent allows one of the game players to take control of the virtual (game) world. Control, not only in the sense of designing levels, as is common in FPS games such as *Quake*, *Doom*, *Unreal* and *Half-Life*, but also in the sense of directing the game in real-time, as GMs do in PnPs. [7,21], The toolkits can allow the GMs to control non player characters (NPCs), entities and objects, adding or removing these to the game world in real time and thereby affecting the experience of those playing the game. The *DM Client* toolkit shipped with *Neverwinter Nights* is probably the most widely used example of a toolkit with GM control capability with hundreds of player-designed game modules available online and a user community that is five years old and very active.

This paper presents the results of a comprehensive empirical study on multi-player RPGs, featuring over 150 hours of recorded game play and more than 50 adult participants. The study evaluates: 1) How the transference of an RPG between the tabletop to the digital format affects the player experience, in terms of the overall quality of the gaming experience as well specific aspects of thereof, such as temporal dissociation and narrative engagement.

Similarly, whether age, experience and gender has an impact on the gaming experience in any or both of the PnP and CRPG formats. Furthermore, the study addresses: 2) The extent to which the presence of a human GM in CRPGs affects the overall quality of the gaming experience.

2.0 APPROACH AND METHOD

One of the primary considerations in the study of RPGs, as outlined in the introduction, is the variety of formats represented within the genre. The most widely played formats remain the traditional PnP, the single- or multiplayer CRPG and more recently the MMORPG. Of these three RPG formats, the PnP and CRPG provide the best opportunity for cross-platform study as multiple features are shared between them, alleviating the difficulties with controlling the variable factors involved in empirical study. Furthermore, the **number of players** simultaneously involved in a RPG appears to have a substantial influence on how these games are experienced and the game mechanics employed. As the purpose of the current study is to focus on a comparison of multi-player game formats it was decided to constrain the number of players per game therefore not to include investigations of massively multi-player RPGs (MMORPGs and LARPs) or single player CRPGs, but rather to focus the study on a comparison of PnP and CRPG formats.

2.1 Assumptions and challenges

One of the basic assumptions of empirical research is that the sample is representative of the population. For RPGs, this can be a problematic assumption due to the broad range of these games, even within the restrictions of group-based PnPs and CRPGs. Additionally, if the role of the GM in these games is to be part of the investigation then there is the further consideration of differing GM roles and different levels of authorial control of the game narrative. Sometimes the GM is all-powerful but in other cases the function of this role may be limited or even shared between all participants [20,21]. It is therefore difficult to evaluate whether a given game is representative of the entire spectrum of the genre. In the current study, care was therefore taken to ensure that the RPGs adopted were among the most widely used fictional worlds, rules systems and game setups.

There may be factors in the play experience that are not attributable to the game format. As observed in the PnP and CRPG experiments conducted for this study, the way RPGs in any format are played vary substantially from group to group, not just format to format. The two RPG formats involve complex communication patterns, multiple participants controlling fictional characters operating in a fictional world that for PnPs is partly based on individual constructive imagination as well as complex rules systems. A core challenge in the current study is to ensure that the PnP and CRPG formats chosen are as alike as possible in all aspects not directly linked with the variations in game format, e.g. same groups across all formats, same group

sizes. Similarly, as PnPs provide each participant with their own mental images of the game world, the CRPG utilized should present each participant with their own monitor, rather than utilize a shared monitor (where movement of avatars can be restricted). Furthermore, the underlying rules systems should be as identical as possible, and the game stories feature similar themes. By aligning these variables across formats, it is easier to draw reliable results about the effect of porting between the two RPG formats. Finally, a high level of detail was necessary, in order to be able to measure and evaluate a sufficiently high number of variables that can impact on the playing experience. This meant that a large-scale study is logistically impractical, as players would need to physically play all three game formats (PnP, CRPG and CRPG with a human GM), and each of these for long enough that the players had time to develop an understanding of their characters, the CRPG interface, etc. The players would need to answer a number of questions in order to develop a sufficiently high degree of data precision. Within these constraints, 51 adult players were included in the study in 10 separate game groups, and each group played together in the three different formats.

2.2 Design of the empirical framework

The primary challenge in designing the experimental approach was the need to create a joint framework for addressing the research questions, and to design and test a reliable measurement of the overall enjoyment derived from the gaming experience.

There are various approaches to empirical data collection in games and virtual environments [e.g. 14,15,23]; however, the approach used in this study is questionnaire-based data collection and analysis. In designing the questionnaires, the recent work of Newman [16] was utilized as a starting point. The study investigated the experience of interacting with role-playing-based digital content in various online communication environments, and developed a questionnaire-based method for evaluating the user experience. The framework utilized was based around the FUN unification model [see also 12 for related work], which provides a model for measuring and evaluating a comprehensive range of user responses in a joint framework; and tested across three different digital formats.

2.3 Evaluating the gaming experience

The gaming experience evaluation questionnaire (the Response Questionnaire), evaluates a variety of experience factors. A broad measure of the gaming experience quality (called the FUN construct) can be derived from the averaged value of five sub-constructs, which target specific aspects of the gaming experience and are derived from the averaged values of specific questions [Table 1].

Temporal Dissociation (TD): The degree to which the player felt time passing quickly, suggesting a high level of engagement in the activity.

Focused Immersion (FI): The degree to which the player felt immersed in and focused in the game. FI is also utilized in the Predisposition questionnaire.

Heightened Enjoyment (HE): The degree to which the player enjoyed the gaming experience. The questions associated with the HE sub-construct directly allowed the players to state their enjoyment of the experience.

Narrative Engagement (NE): This sub-construct captures the degree to which players felt they were actively engaged with and joined in the game.

Intention to Revisit (IR): The degree to which the player, given the opportunity would want to revisit the experience. This was not included in the FUN construct in [16]; however, in this study it was decided to include it as IR was shown both in the original study and the current to correlate with FUN across all game formats.

The Response questionnaire was adapted from [16] and modified to address the specific situation of the current experiment. A distinct advantage of using the response constructs of the FUN model is that due to the breadth of the component questions, any signal that emerges from a study utilizing the FUN construct has to be very strong. In other words, for a variable to register in correlation with FUN it has to be present to a substantial degree and with the majority of the players involved in the experiments.

2.4 Game selection and setup

Since one of the aims of this study is to evaluate the effect of integrating a human GM in a group-based CRPG environment, a game that permitted a choice of playing with or without a GM was necessary. This leaves only a few commercial products and *Neverwinter Nights* was deemed the most suitable from a range of candidates including (The *Might and Magic* series, *Baldur's Gate*, *Morrowind*, *Oblivion* and *Summoner*). As *Neverwinter Nights* is also typically representative of the CRPG genre featuring a fantasy game world, character-based development, integrated *Dungeons & Dragons* 3rd Edition rules (the D20 system) and multi-player capability, it became the game of choice for this experiment.

Examination and play testing of a range of other CRPGs such as *Baldur's Gate* and *Oblivion* did not reveal game play variations that were substantial enough to warrant running additional games experiments. In order to limit the number of possible variables involved in the experiments, the PnP game modules were similarly styled on the same rule system, genre and story scenario (themes of reversal and revenge). In all three game sessions, the players were situated around a table with full verbal and visual communication access and in the CRPG and CRPG GM games each player had their own computer. Note that some CRPGs, e.g. the PS2 game *Champions of Norrath*, allow multiple players to play using a shared monitor. The PnP and CRPG GM sessions consisted of five players and one GM, while the regular CRPG sessions did not feature a human GM. The same group of players carried over through the game formats to avoid bias caused by changing

	Statements	SC	Correlation to FUN		
			PnP	CRPG	CRPG GM
1	Time went by very quickly while I was playing the game	TD	0.71***	0.80***	0.90***
2	I lost track of time while I was playing the game	TD	0.77***	0.80***	0.80***
3	I was absorbed in what I was doing while playing the game	FI	0.80***	0.82***	0.86***
4	I noticed things going on around me while I was communicating with the other players/ the GM	FI	0.23	0.28	0.29
5	I had fun playing my character	HE	0.63***	0.58***	0.81***
6	The interaction with the other participants gave me a lot of enjoyment	HE	0.65***	0.54***	0.69***
7	<i>The chat system in Neverwinter Nights is relatively easy to comprehend and use</i>	HE	NA	0.30*	0.52**
8	<i>I prefer talking to the other players, rather than using text and chat systems</i>	HE	NA	0.24	0.4*
9	I felt I was joining in with the story of the game.	NE	0.76***	0.63***	0.75***
10	I was able to participate in and contribute to the collaborative story	NE	0.64***	0.52***	0.65***
11	I was able to be spontaneous and imaginative communicating with the other participants	NE	0.59***	0.59***	0.62***
12	I found it difficult to participate with the other players	NE	0.41**	0.52***	0.57***
13	I would like to play this kind of game again in the future	IR	0.50***	0.52***	0.67***
14	I enjoyed just watching and listening to the other players	HE	0.33*	0.25	0.47**
15	I enjoyed the conflict solving elements of the game	NE	0.66***	0.59***	0.78***
16	I was one of the players that really drove the story forward	NE	0.63***	0.47***	0.43*
17	I could easily become interested in the adventures of the group of characters	IR	0.49***	0.73***	0.87***
18	I enjoyed the inter-personal aspects of the game story	NE	0.65***	0.41**	NA
19	I found the whole idea of playing a fictional character a bit silly	NE	0.23	0.52***	0.80***
20	I am not really interested in what happens to my character	IR	0.47***	0.58***	0.67***

Table 1: Correlation of the modified Response Questions to the FUN construct for the RPG experiments. Pearson correlation Coefficient probabilities calculated based on the same degrees of freedom as for Table 2: * p>0.05 / ** p<0.01 / *** p<0.001. Questions in grey shaded rows have been added to the Response Questionnaire of [16] in this study to increase the evaluation of narrative engagement in RPGs. Questions in italics assess the use of chat-based communication in Neverwinter Nights. SC = Sub-construct.

group composition. Similar experimental setups and general research conditions were utilized in all three experiments.

36 Australian and 15 Danish players volunteered to participate in the experiments, as well as five highly experienced PnP and CRPG GMs. Only the Australian players participated in the CRPG GM experiments. All game participants were adults (18-54 years of age, 28.8 average). None of the participants had any prior knowledge of the game experiments.

The game sessions were run over two days, with the PnP sessions run one day, and the CRPG sessions on a different

day. With a game session lasting between 3-7 hours, this approach was necessary to avoid tiredness in the players.

With the huge variation of how group-based RPGs are designed and played, there are in all likelihood aspects that have not been captured in the current model, and despite the broad scope of the empirical framework utilized for this study, it must be stressed that the conclusions presented here will not be the final word on the issues under investigation.

2.5 Experiment procedure and data collection

An initial pilot test of all three experimental formats was performed prior to running the experiment game sessions.

The experiments were conducted at the ICT Innovations Center at the Macquarie University (Sydney, Australia) (Figure 2), and at the Center for Computer Games Studies, IT University (Copenhagen, Denmark). During the entire duration of the experiments, a researcher was present to help the players with any technical difficulties, e.g. with the *Neverwinter Nights* interface, however, the researcher would keep out of sight when not directly helping the players. The researcher also gave each of the player groups a comprehensive introduction to the game controls before the start of the CRPG experiments, thus minimizing frustration caused by interface problems (Figure 1).

The game sessions were recorded on video and audio, and logs extracted of the in-game chat in the CRPG sessions. Before and after each game session, the players were asked a series of questions in questionnaire format. After each session the participants completed the Response Questionnaire as well as other questionnaires not utilized in this paper. The player groups were also interviewed about their experiences during game session, which was discussed among the participants and the investigators.



Figure 1: Players involved in a PnP RPG game. Cameras are placed outside the gaming room behind one-way mirrors to minimize interference.

3.0 DATA EVALUATION

This section presents an overview of the data evaluation and analyses performed. Initially the individual questionnaires were evaluated and the statistical strengths of the constructs and sub-constructs are tested. Each question is correlated with its relevant construct (FUN, IT, NT) or sub-construct (TD, FI, HE, NE, IR). Factor analysis (e.g. PCO) and Cluster analysis were employed to assay the factor structure of the data and to assist in re-assigning or eliminating uncorrelated questions.

These results are applied to locate correlations between the response sub-constructs, as well as any correlations between the FUN construct. The general experience of the

three game formats is also evaluated, and ANOVAs applied to assess the variance of the constructs.

3.1 The Response Questionnaire

The Response questionnaire varied slightly between the three formats [Table 1], notably in two questions about the HCI not being included in the PnP experiments (where computers are not utilized). One question, Q9, correlated with $p < 0.01$ for the CRPG GM experiments, compared to $p < 0.001$ for all other questions across all three formats. Q19: “I found the whole idea of playing a fictional character a bit silly”, was similarly problematic. This question ranks substantially lower in correlation than the other nineteen (Q19 was not included in the CRPG GM questionnaire as it would be repeating it for the same format). The question did foster some discussion of a general humorous nature, among some of the game groups. Most of the players did not find the idea of role-playing a fictional character the least bit silly, but acknowledged that they at one time or another role played some very silly characters. It is possible this dichotomy impacted on the ways players answered this question. In general the correlations across all three game formats for individual questions to the corresponding sub-construct are significant for $p < 0.001$.

The individual questions also generally correlate surprisingly strongly with the FUN construct, suggesting a high degree of internal correlation in the response data.

Only one question did not correlate significantly in any of the three RPG formats (Q4). It correlates well with its sub-construct, FI, however, which would be reduced to one question if Q4 was removed. As the effect of Q4 on FUN is negligible, but important to FI, it was therefore retained within the analyses. As Q4 correlates roughly equally with all three game formats, it does not bias the results relating to FUN. Questions 7, 8, 14 and 19 were likewise retained in the analyses although they showed non-significant correlation in one of the three formats, since all correlated strongly with their respective sub-constructs. Question 8 could in hindsight have been formulated more precisely, as its current form does not directly ask for feedback on the quality of the gaming experience but rather whether the player prefers talking over text-chat. As it is, however, it provides some indication about whether the participants prefer to talk or text-chat when playing CRPGs. Given the added freedom and responsiveness of the GM-mediated CRPG, the higher correlation between FUN and Q8 for this format appears consistent with the greater motivation for spontaneous communication, which is better facilitated verbally than via text-chat.

The correlations between the Response sub-constructs and FUN [Table 2] were generally significant for $p < 0.001$, with one exception: NE-FUN, which only correlated with $p < 0.05$ in the PnP sessions only. This lower correlation is an effect of the relatively lower correlation of Q19 to the sub-construct. If Q19 is removed from the NE sub-construct, it

correlates with FUN at Pearson's correlation coefficient = 0.800 ($p < 0.001$). Q19 was retained within the NE sub-construct as it does not correlate better with any other sub-construct, and because the correlation between it and NE is significant for $p < 0.05$.

The internal consistency of the FUN construct was further tested by assembling the sub-constructs into two constructs, ITr (Immersive Tendencies indicated by responses) and NTr (Narrative Tendencies indicated by responses). Correlations between the sub-constructs and these two constructs were all significant for $p < 0.001$, as well as correlations between ITr and NTr and FUN – across all three game formats. Finally, the ITr and NTr constructs also correlate significantly within each game format for $p < 0.001$ [Table 2].

Table 2: Correlations between Response and FUN.

	TD	FI	HE	NE	IR	FUN
ITr_{PnP}	0.866	0.728	0.722			0.930
NTr_{PnP}				0.832	0.849	0.845
FUN_{PnP}	0.797	0.660	0.700	0.413* (0.800)	0.624	
ITr_{CRPG}	0.915	0.782	0.586			0.936
NTr_{CRPG}				0.921	0.935	0.884
FUN_{CRPG}	0.858	0.657	0.639	0.815	0.827	
ITr_{CRPG GM}	0.918	0.893	0.811			0.968
NTr_{CRPG GM}				0.961	0.972	0.933
FUN_{CRPG GM}	0.879	0.831	0.832	0.894	0.909	

Table 2: Correlations between Response sub-constructs and FUN. Pearson correlation coefficient probabilities calculated from correlation r-values with 49 degrees of freedom ($n=51$) for PnP and CRPGs, and 32 degrees of freedom ($n=34$) for CRPG GM experiments. * $p < 0.05$ all others $p < 0.001$. If Q19 is removed FUN_{pnp}-NE correlates with 0.800 ($p < 0.001$). Notes: The response constructs ITr (IT response subconstruct) and NTr (NT response subconstruct) correlate as follows: ITr-NT_p PnP = 0.589 / ITr-NT_p CRPG = 0.663 / ITr-NT_p CRPG GM = 0.814.

The degree of correlation between the questions, sub-constructs, constructs and the FUN construct observed across the three RPG formats are of unexpected strength, and lend a substantial credit to the use of the Response questionnaire in evaluating the experience of playing RPGs across formats. Furthermore, the correlations of the questions to the FUN construct and to the response sub-constructs [Table 2] lend credit to the notion that the FUN construct is measuring a single, coherent construct describing the overall enjoyment the player experience from playing the game.

The strong correlations evident for the FUN construct occurred across a range of FUN responses from 1.66 to 4.86,

with standard deviations below any critical level [Table 3]. The mean FUN values above the average for the scale (3.0), however the degree varies between game formats. This is discussed in more detail below.

Table 3: Range and means of the FUN construct of the three experimental setups. StDev = Standard Deviation.

	FUN _{min}	FUN _{max}	StDev	Mean
PnP	2.13	4.7	0.55	3.98
CRPG	1.79	4.38	0.68	3.22
CRPG GM	1.66	4.86	0.81	3.44

The players featuring low or high fun in any of the three game formats were examined as a separate group in order to investigate if there were any patterns in this regard, however no significant relations between having very high or very low FUN in any of the formats impacting on a different format were located.

The data-driven structure of the Response Questionnaire data was investigated, with however no consistent results across methods, which would seem to be in line with the high degree of correlation between the question components, however a more likely explanation is that the small sample size prevents reliable results from being obtained using factor analysis [18] or e.g. cluster analysis.

3.2 Comparison of the gaming experience

What was the most fun - playing a PnP or a CRPG? If we simply consider the mean values of the Response sub-constructs, and FUN, for the two games formats. The resulting pattern is clear as PnP rates higher than CRPG for all of these variables except one: Focused Immersion. This pattern is confirmed by a one-way ANOVA, which indicates that there is a high degree of variance between the involved variables [Table 4]. The mean of the Focused Immersion (FI) sub-construct is higher for the PnP games than the CRPG; however, the ANOVA reveals that this is not likely to be a significant pattern. This is supported by the correlation ($p < 0.05$) between FI for PnP-CRPG. However, a correlation between the PnP and CRPG GM formats is not significant (0.013), and as the variables in general correlate between the CRPG and CRPG GM game formats, the apparent link between FI in PnPs and CRPGs is highly tentative. The distribution of FUN ratings is also different between the three formats (Figure 2).

	Mean PnP	Mean CRPG	Mean CRPG GM	PnP-CRPG	PnP-CRPG GM	CRPG-CRPG GM	F [PnP-CRPG]	p [PnP-CRPG]
TD	3.98	3.47	3.41	0.182	0.172	0.735***	5.96	1.65*10 ⁻²
FI	3.33	3.16	3.47	0.322*	0.013	0.430**	1.421	0.236
HE	4.27	2.92	3.29	-0.056	-0.016	0.470**	91.025	2.44*10 ⁻¹⁵
NE	4.09	3.11	3.51	0.189	-0.072	0.613***	37.554	1.95*10 ⁻⁸
IR	4.21	3.42	3.5	0.365*	0.316	0.594***	20.568	1.66*10 ⁻⁵
FUN	3.98	3.22	3.44	0.232	0.050	0.675***	38.33	1.36*10 ⁻⁸

Table 4: Correlation of responses across the three RPG Response sub-constructs: Means and correlations between the three game formats are shown. Results of one-way ANOVAs for PnP and CRPG responses is included to the right. Pearson correlation coefficient probabilities calculated from correlation r-values with n=50 for PnP/ CRPG and n=34 for CRPG GM. * p>0.05 / ** p<0.01 / *** p<0.001.

In the CRPG sessions, the pattern is very different, describing a much wider distribution of FUN ratings (StDev = 0.68). Finally, the pattern for the CRPG GM sessions appear to include elements of both of the other two, with the very broad distribution of the CRPG sessions (StDev = 0.81), and maximum FUN ratings that even top that of the PnP [Table 3].

In general, the FUN ratings in the PnP games were above the median 3.0, with very few players rating below and narrow distribution (StDev = 0.55). In the CRPG sessions, the pattern is very different, describing a much wider distribution of FUN ratings (StDev = 0.68). Finally, the pattern for the CRPG GM sessions appear to include elements of both of the other two, with the very broad distribution of the CRPG sessions (StDev = 0.81), and maximum FUN ratings that even top that of the PnP [Table 3].

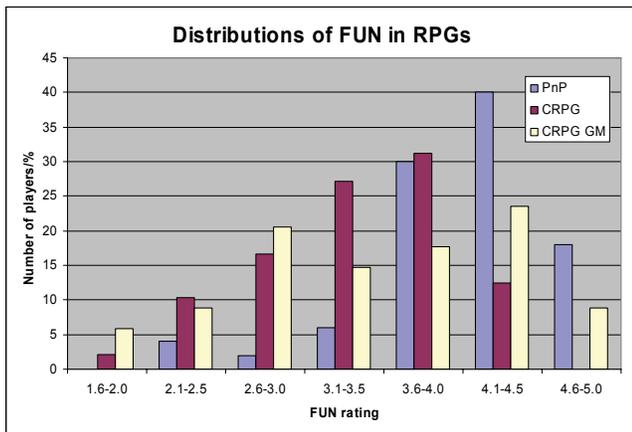


Figure 2: Distributions of FUN in the three game formats.

The distribution of FUN ratings is also different between the three formats (Figure 2). In general, the FUN ratings in the PnP games were above the median 3.0, with very few players rating below and narrow distribution (StDev = 0.55). In the CRPG sessions, the pattern is very different, describing a much wider distribution of FUN ratings (StDev = 0.68). Finally, the pattern for the CRPG GM sessions appear to include elements of both of the other two, with the very broad distribution of the CRPG sessions (StDev =

0.81), and maximum FUN ratings that even top the PnP [Table 3].

3.2 Experience, age and gender

Correlations between gaming experience and FUN varied in value between the three game formats. For the PnP games, previous experience was clearly not relevant to the FUN value; however, in the CRPG sessions the previous experiences with this game format did correlate with the FUN values, if rather weakly compared to the correlations for GD and SYMPA. The correlation between CRPG experience and FUN is likely related to having less trouble using the interface and chat system. The pattern is however not similar for the CRPG GM sessions, indicating that the presence of a human GM, who in *Neverwinter Nights* to some degree can adapt the game play to the experience level of the players, will make prior experience with the game system less important.

Age and gender respectively showed no correlation with the FUN construct [Table 5]. The relationship between gender and FUN was analyzed manually as the 0/1 data derived from gender are not suitable for correlation analysis. No patterns between gender and FUN were found, although interestingly nine of the 12 players with the highest calculated FUN rating across game format were females (above 4.0 FUN for PnP, 3.5 for CRPG).

Table 5: Age and experience

	AGE	EXP _{pnp}	EXP _{crpg}	EXP _{tot}
FUN_{pnp}	-0.09	0.26	0.18	0.26
FUN_{crpg}	-0.15	0.18	0.39**	0.34*
FUN_{crpg gm}	-0.17	0.25	0.30	0.29

Pearson correlation (r-values) for the three RPG formats and a range of possible determinant factors: Age, game experience (EXP_{pnp}, EXP_{crpg}, EXP_{tot}). For PnP n=51, CRPG n=50, CRPG GM n=34. * p<0.05; ** p<0.01; *** p<0.001. Combinations use lowest value of n.

3.3 GMs in CRPGs

The ability to let one of the players take control of the game world is a rare feature in contemporary computer games. In the current experiments, the individual players did not have

the direct ability to create content, however, the game was run by a player who did - the GM. It was hoped that a comparison of the FUN responses between CRPG and CRPGGM would evaluate the net effect of including the GM. The pattern is however not consistent. The five Response sub-constructs are with one exception (TD) consistently higher in the CRPG GM situation when compared to the regular multiplayer CRPG setup [Table 6]. Similarly, the FUN, ratings are consistently lower for the CRPG games i.e. no GM. The differences between the mean values of each of these variables is however small when compared to the differences between the PnP and CRPG/CRPG GM formats (on average 22% and 14.1% respectively, as compared to the CRPG variables rating only 6.3% less than CRPG GM variables [Table 7].

Table 6: Percentage differences in response subconstruct scores across the three RPG formats.

	PnP vs. CRPG/%	PnP vs. CRPG GM/%	CRPG vs. CRPG GM/%
TD	14.70	16.72	1.76
FI	5.38	-4.03	-8.93
HE	46.74	29.79	-11.55
NE	31.51	16.52	-11.40
IR	23.10	20.29	-2.29
FUN	23.99	15.70	-6.69

Includes the fun reported by the players themselves when rating how fun the game was on a Likert scale (1-5). Calculations based on mean values of the variables.

Table 7: Examples of questions evaluating the effect of the inclusion of a human GM in *Neverwinter Nights*.

<i>I had fun playing the game</i>	PnP	4.75	CRPG	4.00	CRPG GM	4.15
<i>The presence of a human GM [in Neverwinter Nights] encouraged me to role play my character</i>						4.03
<i>The presence of a human GM made the game [Neverwinter Nights] more fun to play</i>						4.26
<i>The group of players role played more in the GM-mediated version of Neverwinter Nights</i>						4.35

Numbers are averages from a scale of 1-5 (average 3.0).

The differences between the CRPG and CRPG GM situations are emphasized by the straight feedback from the players [Table 7]. The players were asked to rate their CRPG GM experience in relation to the CRPG, and the results provide support for the beneficial effect of including a GM in the CRPG format, with average scores consistently above four on a five-point Likert-type scale.

4.0 RESULTS AND DISCUSSION

Role-playing games are found across a range of formats, situated in different cultures and technologies, and yet very little is known about the actual experience of playing these games across the various formats. This study focused on evaluating the gaming experience of RPGs across the two dominant formats – multi-player Pen-and-Paper RPGs and digital RPGs. The gaming experience of the two formats have been evaluated, and the effect of including the hallmark Game Master from PnPs in a CRPG situation has been analysed in terms of the effect on the overall gaming experience. Two key findings emerge from these discussions:

1) GMs in CRPGs: The inclusion of a GM in a CRPG context appears to improve the playing experience in relation to a standard CRPG; however the effect was not strong enough to result in large variances in the values of the calculated variables. This conclusion is however supported by the evaluation provided by the players themselves, which provide support for the positive effect on enjoyment and role-playing, when including a GM in the CRPG environment. A commonly voiced problem with the otherwise applauded *DM Toolkit* of *Neverwinter Nights* is that it does restrict the operational space of GMs, relative to the almost complete freedom that GMs enjoy in the PnP format.

2) PnPs vs. CRPGs: PnPs consistently emerged as the most enjoyable and immersive of the three RPG formats, even in randomly assembled groups of players, and across age, gender and experience categories. This was the case across most of the sub-constructs measured, i.e. both in terms of heightened enjoyment and temporal dissociation as well as narrative engagement. This strongly suggests that the tabletop format is a key resource for investigation of the social operation of group-based games as well as a resource in the development of interactive storytelling systems.

This study has presented part of the results of the empirical experiments conducted, focusing on evaluating the impact of the format on the gaming experience. However, much work remains to be done in order to propose explanations for the causes of the observed differences. Much work remains to be done, notably the examination of the details in the relationship between players and the fictional characters in RPGs, and the impact of the group interaction and dynamics on the gaming experience. The relationship between the player and the character may be important to the gaming experience, although not necessarily in the same way in the different RPG formats. Similarly, the level of collaboration between the players would be expected to impact on the gaming experience, though possibly in different ways depending on the format. Future work will address the investigation of these factors and their impact on the players' experience of RPGs, drawing on the communication transcripts and game logs from the experiments to evaluate the experience of the player groups.

5.0 ACKNOWLEDGEMENTS

The authors would like to extend their sincere gratitude to the ICT Innovations Center of the Macquarie University, Sydney, as well as the Center for Computer Games Studies, IT University, Copenhagen, for hosting the experiments and providing necessary equipment. The authors would also like to express their heartfelt gratitude to the more than 50 volunteer players and GMs who participated in the experiments. Dr. Doris McIlwain, Macquarie University, provided valuable help with analyses and questionnaire design. Anders Tychsen received financial support from the Macquarie University PGRF and the Division of ICS PGRF. The experimental work was approved by the Macquarie University Ethics Review Committee (HE23SEP2005-D04313).

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