Real Story Interaction: The Role of Global Agency in Interactive Storytelling

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Abstract. Interactive Storytelling (IS) is a promising new entertainment technology synthesizing pre-authored narrative with dynamic user interaction. Research on user experiences in IS is sparse. The current experiment tested whether different player expectations regarding the impact of their actions yield different user experiences by framing user agency as "local" vs. "global" in the introduction to the story. Local agency influences character behavior and story events, whereas global agency influences story development and outcomes. A between-subject design involved $N = 46$ participants playing the interactive story "Dinner Date". Findings suggest that experiential qualities (autonomy, flow, curiosity) reached higher levels when players believed to have an impact on the story outcome (global agency). Enjoyment did not differ between conditions. Systematic gender differences in user experiences are discussed.

Keywords: Interactive Storytelling, User Experience, Global Agency.

1   Introduction

Interactive Storytelling is a new promising field in interactive entertainment media. In a digital interactive story the player creates or influences a dramatic storyline by either controlling a protagonist or by issuing events as a director. IS envisions uniting two popular entertainment concepts: interactivity and narratives, thus producing a shift of focus from linear narratives to non-linear, interactive narratives. However, little is known about the user experience of playing such interactive stories. Popular works in the field (e.g. [1]) point out to the concept of agency as being crucial for meaningful interaction in interactive stories. Agency, the sense of control, can be experienced on a local and global level: Local agency focuses on what the user can do in a particular scene and environment setting. On a global level users have influence on the evolvement of a story, also including the ending. To perceive meaningful interaction, it is crucial for players to perceive the consequences of their actions. Generating feedback about local agency is relatively easy since it happens almost immediately after the user action. In contrast, generating feedback about global agency is hard. In

Interactive Storytelling systems, complex algorithms compute how single local actions have impact on a global scale, rendering it almost impossible to the user to differentiate the effect of all his inputs. Nevertheless, Interactive Storytelling differentiates itself from traditional video games by focusing on the influence that users have on the evolving story (e.g., global agency). So, to really appreciate IS for what it is, users should be aware of their global agency. In an experimental study, we investigated whether (1) focusing players' attention to their local vs. global influence on a narrative influences their experience of playing an interactive story and whether (2) providing feedback signals about successful user interventions on a local or global scale make perceptions of agency tangible. Players used the interactive story "Dinner Date", where they assumed the role of the subconscious of a character desperately waiting for his dinner date to arrive. For half of the respondents, potential agency was framed as merely local (influencing character behavior and local events), whereas for the other half, potential agency was framed as global (influencing story development and outcomes). To make perceptions of agency tangible, we added sound signals when, supposedly, user actions yielded significant impact.

2 Method

A total of 46 university students (18 males, 28 females; average age $M = 20.96$ years, $SD = 2.64$ years) played the interactive story "Dinner Date". In this system, users interact with a protagonist who is waiting for his dinner date to arrive, by pointing his attention to different objects present in the virtual environment. By directing his attention, thoughts and actions of the protagonist are triggered, leading to a new situation where, again, influence can be exerted. Participants were randomly assigned to one of two introductions. In the local agency introduction, participants were told that, by focusing the protagonist's attention, they could influence immediate character behavior and local story events. In the global agency introduction, they were told that they could influence the development of the protagonist's "life story" and future. Dinner Date provides hardly any feedback on user agency – feedback on user influence on a local level is ambiguous at best (the protagonist seems to mull around in circles, despite users' attempts to change his line of thought), whereas feedback on global agency (story outcomes, future events) is non-existent. To make agency tangible in both conditions, we introduced sound signals (beeps) that supposedly give feedback about user actions having a significant impact on either local events (in the local agency condition) or global events (in the global agency condition). After carefully reading the introductions, participants played Dinner Date for about 20 minutes. Subsequently, they completed a pre-established and validated questionnaire on user responses to interactive stories [3], which includes short scales in the following order: positive and negative affect, suspense, aesthetic pleasantness, system usability, curiosity, local agency, global agency, flow, enjoyment, presence, character believability, effectance, identification, user satisfaction, autonomy. All measurement dimensions were measured with a 5-

point-Likert scale using between two and five items each. Reliability scores (see Table 1) for all scales were acceptable. Finally, participants received credit points or 10 EUR as compensation, were debriefed and dismissed.

3 Results

Within-subject comparison by means of independent samples T-tests reveals that framing agency as local vs. global before play indeed affected user experiences (see Table 1 for results). First, a manipulation check showed that users in the global agency condition perceived significantly more global agency. Furthermore, when playing under the assumption of having global agency, participants were significantly more curious about the story progress, experienced significantly stronger flow, and significantly higher autonomy. Finally, participants in the global agency condition perceived the protagonist as significantly more believable. Prior research [2] showed significant gender differences in preferences for local vs. global agency in interactive storytelling environments whereas men tend to enjoy the perception of empowerment associated with global agency, women tend to enjoy the character involvement provided by local agency. Looking at gender differences using a factorial ANOVA in the current data set, we found that effectance was higher for male players in the global agency condition than in the local agency condition ($M = 3.60$, $SD = .65$ vs. $M = 2.75$, $SD = .67$), while female players showed inverted effects ($M = 2.92$, $SD = .71$ vs. $M = 3.12$, $SD = .77$; $F(1, 42) = 2.98$, $\rho = .017$). In addition, identification was higher for female players in the global agency than in local agency condition ($M = 3.02$, $SD = .76$ vs. $M = 2.64$, $SD = .96$), while for male players it was the other way round ($M = 2.70$, $SD = 1.00$ vs. $M = 3.51$, $SD = .47$; $F(1, 42) = 5.54$, $\rho = .023$). This finding puts earlier findings in a new perspective: it seems that men dissociate more from a protagonist when they have power over his providence, while women identify stronger when they feel more responsible for the protagonist's fate.

4 Discussion

The experiment showed the impact of induced perceptions of global agency on users' experiences of interactive storytelling environments. Results showed IS was more reciprocal (autonomy), interesting (curiosity), and immersive (flow) for participants in the global agency group. However, experience dimensions such as presence and suspense were not affected by the manipulation. Moreover, general enjoyment and affect did not differ between groups, so we must conclude that playing IS under the assumptions of global (vs. local) agency is different, but not necessarily better. Possibly, these non-findings can also be explained by the rather sad and contemplative nature of the Dinner Date environment. Analyses of gender differences showed, in line with prior research, that male participants experienced more effectance in the global agency condition, while for women it was vice versa. Women maintained character identification (in fact,

Table 1. Comparison of user ratings between local agency and global agency group.

Experience dimension	Reliabilities	Local Agency		Global Agency		
		M	**SD**	**M**	**SD**	ρ
System usability	$\alpha = .89$	3.65	.89	3.87	.88	.41
User satisfaction	$r = .48$	3.26	.76	3.37	.71	.62
Presence	$\alpha = .81$	3.31	.80	3.44	.54	.52
Character believability	$r = .36$	3.19	.77	3.65	.68	.04*
Effectance	$\alpha = .76$	2.98	.74	3.19	.71	.34
Autonomy	$\alpha = .80$	2.16	.72	2.65	.75	.03*
Local Agency	$\alpha = .73$	3.00	.75	3.40	.82	.08
Global Agency	$\alpha = .74$	2.55	.78	3.39	.80	.00*
Curiosity	$\alpha = .73$	3.40	.57	3.78	.52	.02*
Suspense	$\alpha = .64$	3.75	.70	3.67	.43	.69
Flow	$\alpha = .72$	2.77	.67	3.12	.36	.01*
Aesthetic pleasantness	$\alpha = .72$	3.00	.66	3.03	71	.89
Identification	$\alpha = .82$	2.98	.90	2.89	.86	.74
Enjoyment	$r = .79$	3.36	.76	3.36	.69	1.0
Affect: positive	$\alpha = .77$	2.03	.50	2.22	.74	.33
Affect: negative	$r = .38$	3.52	.71	3.43	.77	.69

Note: [*] significant difference at $\rho < .05$. Reliabilities of scales with only two items were assessed using Pearson's r correlations (all significant at $\rho < .05$).

it got stronger) when they felt in charge of the character's fate, while men tended to dissociate. A general problem for IS environments is that they revolve around the idea of granting users global agency on story progress and outcomes, yet it is very hard to give users feedback about such agency. We introduced a new way of making perceptions of global agency tangible by providing sound signals when such agency was achieved. Although our design does not grant testing the impact of the sound signals itself, we did achieve higher levels of perceived global agency in the global agency condition, which means that – to some extent – our participants found this agency tangible. Future research could use a feedback vs. no-feedback experimental design to assess to what extent direct feedback on global agency adds to IS users' experiences.

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