What Is at Play? Meta-techniques in Serious Games and Their Effects on Social Believability and Learning

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Abstract. We discuss several examples of meta-techniques, used in Live Action Role Play to communicate information outside the story world, and suggest that they may be used to make non-player characters more socially believable by providing players with insight into what is at play in characters' minds. We discuss how the use of these techniques could influence player immersion and how this may impact the learning effects of serious games.

1 Motivation

Social believability of non-player characters is important for games that center around social interaction, either for entertainment (e.g., Façade and Prom Week [14, 15]) or for educational purposes. In this paper we focus on the latter type of systems, of which the aims range from teaching children about bullying or conflict [1, 2] to training interpersonal interaction skills of adults for war negotiations and job interviews [18, 19]. As part of our own research, we are currently working on a serious game for police officers that will allow them to train their social skills through interaction with virtual agents. Our approach is based on research on interactive storytelling, specifically the *emergent narrative* approach taken in the Virtual Storyteller (VST) system [17]. At the basis of emergent narrative lie principles from improvisational theatre (improv) and role playing games [12]. In both improv theatre and Live Action Role Play (LARP)[3] the distinction between player and character is a key notion. That is, players adopt a character role and act *in character* (IC), i.e., as if they are that character, while at the same time reasoning about the story (or game) *out of character* (OOC), i.e., as themselves. In the VST, the non-player characters are equipped with OOC reasoning capabilities, allowing them to make decisions about the story and their character's properties [17]. Recently, we proposed that OOC reasoning by character agents could be used to train police officers' social awareness in our

[3] LARP is a form of role playing that involves physically acting out the player's role in a real (rather than an imagined or virtual) environment.

serious game [10]. In this paper, we expand on this idea by discussing several *meta-techniques* used in LARP. Meta-techniques offer LARP players (LARPers) the means to make decisions outside the story world that may have some effect inside the story world. For example, they may agree OOC to start a conflict between two characters or they can exchange what their characters are thinking. We believe these techniques may also be useful for other purposes and in other types of games—specifically those featuring social interaction—and we examine how they may improve social believability in these games.

Below we first define and describe several of these meta-techniques in Section 2, and then discuss their possible effects on social believability in Section 3. We close with an overview of open questions that may be addressed in future work in Section 4.

2 Meta-techniques in LARP

There is no single agreed-upon definition of meta-techniques in LARP, but, at their core, it can be said that meta-techniques are used to communicate information that is only available to the players and not to the characters. This distinction is very similar to that made between IC and OOC reasoning used in the VST. The communicated information may reflect thoughts about story progression on a player level or it may for example detail the thoughts of a character. Meta-techniques can also be used to provide additional story content such as characters' thoughts or content that does not fit within a LARP's space/time continuum.

As Sawyer notes in his discussion of metacommunication during children's play [16], there is no strict borderline between being in- or out-of-character: the character and player frames can be blended. The same goes for meta-techniques—which can also be seen as a form of metacommunication—as LARPers need to take both frames into account during their decisions [13]. Meta-techniques differ as to how much they intrude into the character frame, depending on the way in which they are used. Before playing a LARP, the organizers and players may agree on the use of meta-techniques—there are LARPs that do not involve any at all. These LARPs try to maintain a *360° illusion* [7] as everything happens in the character frame without any intrusion of meta-techniques.

There is no complete compendium on possible meta-techniques, yet some LARPs use them more extensively than others. From the LARPs "Mad About the Boy" and "A Nice Evening with the Family" we draw the concepts and examples below [3, 5].

Black box An area that is shielded from a LARP's common role-playing space, and which can be used by players to use various meta-techniques in a non-intrusive manner, that is, without disturbing others' play. The black box is mostly used to enact scenes that do not fit into the LARP's time/space continuum, for example flashbacks.

Flashback/flashforward Flashbacks may be used by players to enact scenes that happened in the past (before the LARP's time frame). For example,

these can be used to let the players give themselves or others more insight into their characters' motivations or relations to other characters. Flashforwards, on the other hand, act as sneak peeks into possible futures. For instance, a player might want to know how things could turn out if he or she took a particular decision during the LARP.

Inner monologue Players speak out their characters' inner thoughts out loud for other players to hear. This also gives insight into characters' motivations.

Act breaks It may be agreed upon by LARPers to break the LARP into several acts. In between these acts, act breaks can be used to let players discuss the events that occurred during the previous act and how things may or should turn out during the next. For example, the act breaks may be used to decide whether the LARP's story should conform to a specific story arc. Then, taking this knowledge into account, players could act in ways that would for example provoke a conflict when the story arc calls for it.

Meta hour Similar to act breaks, the meta hour is a meta-technique during which the activity in the LARP is paused. Then, scenes that took place during the LARP can be re-enacted in isolation so that all players can witness these events.

Run-time game mastering Like non-live action role playing games [4, 12], a LARP may include players that do not act out character roles but instead direct or 'master' the LARP. This can happen in a variety of ways, for example by 'shadowing' players and acting as their inner voice, speaking aloud the players' thoughts so that they must act accordingly. Similarly, a game master (or a pair of them) may act as a player's personal angel and devil, feeding good and evil options to that player. Alternatively, game masters may manipulate the environment or even the player directly, for instance by shifting around objects in the world or by steering a player toward a relevant position in the world.

3 Meta-techniques and Social Believability in Serious Games

Social believability can be approached at the level of speech and animation of virtual characters, aimed at creating virtual agents that show the same verbal and nonverbal behaviours as we would expect from real humans. For example, we have begun looking into theories on 'stances' and politeness to inform agents' social behaviour [11]. Another approach we envisage is to incorporate meta-techniques from LARP in games to achieve social believability. Rather than letting characters display social signals in-character (which is a challenging task [20]), meta-techniques may be used to convey their mental states out-of-character. This can be seen as an extension of 'explainable artificial intelligence' [9] as characters will be able to explain to players how actions and events affected their own behaviour. For example, the use of flashbacks can give insight in the emotional states and social attitudes of a character. The inner monologue meta-technique can also be implemented as a game mechanic that explains what is

going on in the character's mind without having to actually show it in character. Virtual agents that act as a devil/angel couple could give advice to players on certain situations that involve social dilemmas. This pair of agents could then function similarly to tutoring agents in that they give suggestions to the player, spelling out what players' options could be. For example, in the case of (criminal) youths, the couple could mention two alternative choices: giving in to peer pressure or obeying the demands of a police officer. Act breaks and meta hours can be used in games to actively discuss what is going on in inside the characters' minds, letting players reflect on the emotional and social motivations for both their own and the virtual characters' actions.

The use of meta-techniques to improve social believability in games may have several interrelated effects. An increase in social believability may influence players' feelings of both presence and immersion. That is, because the characters in the game are more believable, it may be easier for players to feel as if they are present in that virtual environment and, subsequently, it may improve their immersion [6]. When the purpose of the game is to simulate social situations (as in our social awareness game), increased social believability of the characters is likely to increase the players' degree of learning from their social interactions in the game. When players are feeling like they are present in the virtual environment and are immersed in the game, the learning effect may be even greater, as the social situations will seem more real to players.

As we discussed above, meta-techniques are usually used to communicate information on a 'player' level—that is, out-of-character. For example, an act break might be incorporated during the game as a questionnaire about players' feelings about other characters. Because this questionnaire is not part of the story world, players are forcefully cast out of their character role. This is likely to reduce the players' feelings of presence in the story world and their immersion in the game. Both Jennett et al. and Lukka point out that such switching between IC and OOC roles may lead to confusion and may disrupt immersion [6, 13].

Yet there are different ways to implement meta-techniques, with some being less intrusive than others. It seems that for many intrusive techniques, which take players out of their character roles and thus also out of the story world, non-intrusive counterparts can be found that allow the player to stay immersed within the story world as much as possible. For example, a less intrusive employment of the act break meta-technique would be to include scenes within the story in which players and NPCs discuss their relationships to other characters. These scenes could for instance take the form of in-character sessions with a therapist. Another non-intrusive meta-technique would be implementing the angel/devil couple as actual characters in the game who give advice to players. The inner monologue technique could simply be implemented as a character that is talking to itself (which just might happen to be overheard by other characters).

In short, a concern with intrusive implementations of meta-techniques is that they may lead to a decrease in presence and immersion, while non-intrusive implementations do not suffer from these effects. However, it is not *a priori* clear how the reduced immersion caused by intrusive meta-techniques will af-

fect learning. The *Lemniscate Model* for serious games emphasises that, at key points during gameplay, players should be 'pulled' out of their character frame to actively reflect on what has happened [8]. Indeed, this model advocates intrusive use of such learning moments to make players aware of how their attained knowledge relates to the world outside of the game. In other words, intruding on the player's feelings of presence and immersion may lead to better learning than when reflection is not that explicit. Yet this may not necessarily be the case for social awareness games, because becoming aware of social behaviour may be done best by feeling as present in the virtual world as possible. So it seems that, in the context of social awareness games, the intrusive use of meta-techniques may have both positive and negative effects on learning. Thus, while the way in which meta-techniques should be implemented is clearly dependent on the context and the purpose of games, the question remains how these implementations should be carried out to allow for the most enjoyable or efficient (in terms of learning) experience.

4 Open Questions and Future Work

As this paper is a first foray into the possibilities of meta-techniques from LARP for games and how these could influence social believability, we are left with several lines of research. First of all, we need to investigate how social believability can be increased through the use of both intrusive and non-intrusive implementations of meta-techniques. This should be done by developing and testing them for their effects on social believability. Related to this, user studies need to be carried out to determine how the degree of intrusion of meta-techniques relates to player presence, immersion and learning when taking game genre into account. Another open question is whether the learning effects in games that focus on simulation (which would call for non-intrusive meta-techniques) differ from those in games that less closely mimic the real world and that could include more explicit reflection (through intrusive meta-techniques).

Overall, we expect that more research into techniques used in improv and LARP will yield valuable insights into the creation of believable characters. We believe that the use of meta-techniques is a sound step towards letting characters appear more socially believable, as players may receive better insight into what is at play in characters' minds.

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