

Designing Story-Centric Games for Player Emotion: A Theoretical Perspective

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Abstract

Narratives are powerful because of their impact on our emotional experiences. Recent years have witnessed significant advances in affective computing and intelligent interaction, presenting a broad range of opportunities for enhancing the design, implementation, and adaptivity of interactive narratives. This paper presents preliminary work examining story-centric games and interactive narratives from the perspective of psychological theories of emotion, with a particular focus on player affect. We examine the sources and duration of player emotion, social facets of emotion, players' individual differences in emotion, and meta-emotions. Recommendations and future directions for research on player emotion in interactive narratives are discussed.

Introduction

Emotion is deeply engrained in human experiences of narrative (Immordino-Yang, McColl, Damasio, and Damasio 2009). Yet, our understanding of players' emotional experiences in interactive narratives is limited. Interactive narratives present opportunities for players to become active participants in rich, engaging story experiences. Furthermore, intelligent narrative technologies enable interactive story designers to create experiences that dynamically adapt and respond to individuals (McCoy et al. 2014; Rowe, Mott, and Lester 2014; Yu and Riedl 2015; Poo Hernandez, Bulitko and Hilaire 2014). Recent work on intelligent narrative technologies has spanned a broad range of topics, including data-driven techniques for drama management (Rowe, Mott, & Lester 2014; Yu and Riedl 2015), planning techniques for plot-centric story generation (Ware and Young 2014; Porteous et al. 2015), and playable social simulation models (McCoy et al. 2014).

While these and other advances represent significant contributions to the design and understanding of intelligent narrative technologies, relatively little is known about the underlying psychological processes that mediate human experiences of interactive narratives, particularly player affect. There are a broad range of open questions about the relationships between psychological theories of emotion and emotion theories from the arts, and how these two bodies of knowledge can be harnessed to enable novel narrative experiences.

The past decade has witnessed significant advances in computational models of emotion (Calvo, D'Mello, Gratch and Kappas 2015). There is a rich and growing literature on computational models of emotion for virtual characters (Louchart and Aylett 2008; Marsella and Gratch 2009; Dias and Paiva 2013), but affective computing research on player emotion in interactive narratives is still in its nascent stages. The OCC model of emotion is a commonly used theory for modeling agent emotions in intelligent narrative technologies, including recent work on moral emotions for virtual characters (Battagliano, Damiano, and Dias 2014) and character emotion in story generation (Sarlej & Ryan 2014). Recent work has also begun to investigate computational models of emotion to inform drama management decisions (Hernandez, Bulitko, and Hilaire 2014). In this paper, we contribute to this literature by presenting preliminary work examining *player affect* in interactive narratives from the perspective of psychological theories of emotion. We survey several prominent theories of emotion and highlight connections to their manifestation in player experiences with story-centric games (e.g., *Dragon Age*, *Uncharted*). We focus on the sources and duration of player emotion, social facets of emotion, and meta-emotions. We use story-centric examples to illustrate the design and computational challenges of intelligent narrative technologies that foster rich affective experiences, and

outline directions for future work on theoretically grounded models of player emotion for interactive narrative.

Definition and Sources of Emotion

Emotions are stimuli-driven psychological processes, meaning that they arise from events in the real or virtual world (Gross, 2015; Pekrun & Perry, 2014). That emotions stem from specific events differentiates them from other psychological states such as *attitudes* and *moods* (Gross, 2010). Attitudes are a relatively stable bias to feel, act, and behave in a certain manner based on persistent beliefs (Gross, 2010). For example, a belief that video games incite violence creates obstacles for a prospective player to enjoy a game (even if there is no observable violence). Moods are less stable than attitudes and are often unanchored to specific events or objects (Gross, 2010). In the context of story-centric games, a player might wake up feeling irritable, having little patience for the exposition-heavy monologue or side-quest presented by a non-player character. Emotions, on the other hand, are the shortest lived of the affective states. They are generated based on events that have just transpired, and they are related to the goals an individual holds.

Gross (2015) observes that an emotion is expressed if one attends to the event or object in question and then appraises it to be of relevance to a goal one holds. For example, a threatening antagonist might be spawned in order to trigger fear, anxiety, or surprise in the player. But an emotion would not be triggered by the antagonist's emergence if the player failed to *notice* it and *appraise* it to be of relevance to a goal they held, such as moving to a specific location or protecting another character. If the antagonist does not appear to be obviously threatening—a non-threatening antagonist likely constitutes a failure to elicit the desired emotion in a prior narrative event—then the player would potentially dismiss it, and no emotion would be generated. Similarly, if the player has a different goal than the one intended by the game designer—the player wishes to show her prowess by dispatching the antagonist with an underpowered weapon—then the player may also experience a different emotional response than the one intended.

Appraisals and Goal Congruency

Attending to a narrative event, such as the arrival of an antagonist, is something one typically does or does not notice. An individual's judgment of whether the antagonist stands to negatively impact their goal, on the other hand, is a more complex question. Specifically, the elements behind the cognitive processing of a stimulus that determine its goal congruency or non-congruency have been theorized to have several components. A goal is a psychological component that is common to emotions as well as mo-

tivation, although the relationships between these processes differ. Specifically, goals influence appraisals, which in turn produce emotions, while motivation shapes goal direction, intensity, and persistence in goal pursuit (Pekrun & Linnenbrink-Garcia, 2014). Accordingly, goal-related components span the motivation and emotion theoretical literature. The control-value theory of achievement emotions highlights the importance of feelings of control (e.g., presence or absence) over activities deemed to be important (Pekrun & Linnenbrink-Garcia, 2012; Pekrun & Weinar, 2014). Although control-value theory has been developed and validated primarily in educational contexts, the insight it provides regarding specific appraisals, their inter-relationships, and influence on emotions elicited from stimuli that arise at different points in time are highly relevant to research on interactive narrative. Questions about players' appraisals of interactive narrative events can take a range of different forms: is relief experienced in the aftermath of a supposedly important accomplishment? Or are players left feeling disappointed that no praise was heaped upon their character?

Duration of Emotional Experiences

Emotions were described earlier as the shortest of the affective processes. But *how fast* is fast? The answer comes from Ekman's (1992) theory of basic emotions where he described emotions as having both a rapid duration and quick onset. Specifically, Ekman's early work revealed that emotions manifest in behavioral and physiological expressions in a matter of milliseconds to a number of seconds (Ekman, 1992; Ekman & Friesen, 1978). As a product of emotions' capacity to be evoked and expressed rapidly, it naturally follows that they can vanish as quickly as they appear. The driving factor behind an emotions' duration is whether it is repeatedly evoked. This can be either by the same or a different stimulus. In the context of intelligent narrative technologies, this translates into moment-to-moment attention to the desired emotional signature of an unfolding story. For example, if an interactive narrative designer aims for the player to experience sadness following the death of an important non-player character, the non-player character's demise alone might not be enough to engender the desired emotional response. It might, for example, be necessary for a non-playable (NPC) character companion to comment on the tragedy and lack of justice visited upon their ally (see *social emotions* below).

It might seem that there is tension between appraisal models of emotion generation and claims that emotions change rapidly; at first glance, appraisal seems like a deliberative process that is too slow to underlie rapid emotional dynamics. But in reality, most appraisals occur automatically rather than deliberately. When an important event occurs in an interactive narrative, we do not consciously

stop to ask: how is this related to my goal of reaching the next location or protecting a particular character? Nor do we perform explicit appraisals, such as: how confident am I that I can change the outcome of this conflict? As argued by Ekman (1992), appraisals often occur automatically.

Social Impacts on Emotion

In thinking of emotions as expressions, it is worth considering the role of other people in their generation. One of the central tenants of Ekman's theory of basic emotions is that emotions have distinctive, universal signals that are recognizable across cultures and contexts (Ekman, 1992). It is the reason that NPC facial expressions enrich believability and narrative communication. Some theories of emotion go farther than pointing to the evolutionary advantage of being able to recognize and adaptively respond to emotions. Social constructivist perspectives emphasize the interpersonal communication value of emotions and highlight interpersonal emotional expressions as stimuli for emotions in others (Gross & Barrett, 2011). A subset of emotion theories propose that emotional expressions are socially learned rather than innate as proponents of the basic theory of emotions purport (Ekman, 1992). Whether or not emotions are innate or socially learned, research has shown that there are cultural differences in their expression and regulation (Butler, Lee, & Gross, 2007). Therefore, what can be taken away from this perspective is that others, including NPCs, can influence players' emotions, as can culture. The latter also points to the importance of diverse samples in intelligent narrative technology studies.

Individual Differences and Emotion

Cultural differences are only one potential source of variance in the emotions experienced by players. Research in affective computing has shown that characteristics of users including gender, personality, motivational orientations, and typical emotional responses to related situations (trait emotions) are related to the emotions players experience (Harley et al., 2015). These findings underscore the importance of considering individual differences in players' affective responses to elements of narrative. This can manifest in interactive narratives in several possible ways. Allowing players to choose the gender, ethnicity, age, or culture of their avatars in narrative-centered games is one approach to fostering positive emotions. Providing diverse responses in interactive character dialogues may also help players with different personality trait dispositions feel like they are able to express themselves better than in more constricted (e.g., "accept" vs. "decline") conversations.

Meta-Emotions

Meta-emotions are emotions that are triggered by experiencing other emotions (Bartsch, Vorderer, Mangold, &

Viehoff, 2008). Unlike emotion regulation strategies, which are about strategically advancing a more adaptive emotional state than the current or anticipated state, meta-emotions (also referred to as secondary emotions) take preceding emotions (referred to as primary emotions) as cues to emerge. As such, they are similar to social emotions, except that they stem from inner, rather than outer, emotional stimuli. In the context of story-centric games, meta-emotions may be the consequents of affective reactions to story events. For example, a player who feels joy (secondary emotion) in response to a prior experience of fear (primary emotion) triggered by events in a horror-genre narrative is experiencing meta-emotion; likely resulting from appraising the primary experience of fear as aligned with his goal(s) of playing the game (thus joy follows). Deliberately accounting for the second-order emotional effects of story events is a valuable strategy for reasoning about the emotional trajectories of players.

Designing Story-Centric Games for Emotion

By summarizing prominent theories and research on emotions, this paper points to several directions for future research on player emotions in story-centric games and interactive narratives. First, attention should be paid to how players interpret and appraise events within interactive narratives. Are players suspending their disbelief and accepting the narrative importance of events? Do players perceive that they have agency within the story world? Are players over or under-confident about their ability to steer events in the storyline? Second, there is demand for continuous attention and planning for players' emotions, given how quickly emotions change. Emotions have short half-lives—if it is important that a player remain in a certain emotional state, then the narrative should trigger it repeatedly. Third, social cues, even from virtual characters, can serve to evoke emotions. This can, and often is, used to the advantage of narratives to evoke emotions. However, there are also differences in terms of how emotions are expressed across cultures and individuals. It can therefore be important to consider demographic variables in understanding players' responses to narrative events and overarching story structures. Finally, considering transitions between primary and secondary emotions can provide alternative and more genre-appropriate pathways for having the player reach the desired affective state (e.g., suspense or fear may lead to enjoyment in the horror genre). Research on player emotion must also leverage theoretical insights with methodological and analytical advancements in order to accurately detect and interpret player emotion (Harley, in press). Fortunately, a number of reviews of emotion measurement exist to provide insight and guidance on the topic (see Calvo & D'Mello, 2010; Harley, in

press). Given the inextricable link between emotions and player experience, understanding and exploiting emotion is critical to fully realizing the potential of intelligent narrative technologies.

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