The Role of Micronarrative in the Design and Experience of Digital Games

Jim Bizzocchi, Michael Nixon, Steve DiPaola, and Natalie Funk
School of Interactive Arts & Technology, Simon Fraser University
250 - 13450 102 Avenue
Surrey, BC V3T 0A3 CANADA
+1 778.782.7474
jimbiz@sfu.ca, michael_nixon@sfu.ca; sdipaola@sfu.ca, nfunk@sfu.ca

ABSTRACT
Designing robust narrative experience in games is a complex and demanding task. The need to balance authorial control with player interactivity necessitates structurally flexible storytelling tools. One such tool is the micronarrative - an internal unit of narrative progression and coherence. This paper explicates relationships between the size, form, and experience of narrative units within electronic games. It identifies three design properties that enhance the utility and effectiveness of micronarratives within game experience: micronarratives are hierarchical, modular, and accumulative. The analysis is based on close readings of two commercial game titles, *NHL 12* (Electronic Arts Canada 2012) and *Deus Ex: Human Revolution* (Eidos Montreal 2011).

Keywords
game narrative, micronarrative, close reading, *NHL 12*, *Deus Ex: Human Revolution*

INTRODUCTION
The dramatic arc provides a useful template for the presentation of narrative experiences within digital games. Within a game's overall narrative arc, there are a number of smaller narrative arcs, each with its own narrative progression and cohesion. The smallest of these subsidiary arcs are "micronarratives" – quantum units of self-contained narrative coherence and flow that are critical to the formation of narrative meaning (Jenkins 2004, Bizzocchi 2007). Recognizing the versatile dynamics of the narrative arc, even short ones, leads to the observation that essential narrative pleasures can be experienced at various levels of scale.

Narrative units share three properties that support the development of the overall story experience within the game. These various narrative groupings are hierarchical, modular, and accumulative. They are hierarchical in that there are narrative units of different scales, often nested within each other in complex patterns. Narrative units range from the game-long story framework that forms the backbone of the experience, down through all varieties of game levels, missions, and side quests, which are in turn made up of a number of individual micronarratives. Naturally, due to the nature of interactive narratives, different players can experience these narrative arcs in different orders. This requires a modularity of design, as narrative elements will be encountered in various orders depending on the interactive decisions of the player. Finally, incidents that occur

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in a story gradually and incrementally create a higher-order meaning in the recipient's mind. Events do not negate each other, but rather add to one another in a cumulative manner as the game is played and the story builds.

Our methodology for this exploration is the use of textual analysis - close reading - in order to understand the poetics of game narrative (Bizzocchi and Tanenbaum 2011). We develop what David Bordwell calls "descriptive poetics" rather than "prescriptive poetics" (Bordwell 2008). Our analysis doesn't privilege specific design tactics, but it does identify broad design channels for the creation of more robust interactive narratives.

NARRATIVE PLEASURES DEFINED

Implicit in the discussion of structuring narrative is the result that recipients can derive varying degrees of value from their participation. Therefore, it is meaningful to identify narrative pleasures – the enjoyment obtained by the recipients – to determine the effects of different structures. M.L. Ryan provides a useful definition of narrative, calling it "a cognitive construct with an invariant nucleus of meaning. […] A narrative is the use of signs, or of a medium, that evokes in the mind of the recipient the image of a concrete world that evolves in time" (Ryan 2005). She proposes the following requirements:

> (1) for a representation to be called narrative, it must create a world and populate it with characters and objects;
>
> (2) this world, moreover, must undergo changes of state that are caused by either accidental happenings, or deliberate human actions: and
>
> (3) the text must allow the reader to reconstruct an interpretive network of goals, plans, causal relations, and psychological motivations around the narrated events. (Ryan 2004)

Ryan's formal definition is similar to traditional critical definitions of plot: "the organization of incidents in a narrative or play" (Beckson and Ganz 1975, 187). Beckson and Ganz also quote E. M. Forster, "a plot is also a narrative of events, the emphasis falling on causality" (Forster 1927). Causality is therefore the critical element for both authorial expression and narrative meaning.

The narrative arc describes how recipients typically experience a narrative, as it is the "framework for the sequence of events that make up the plot we see, and the story we imagine" (Bizzocchi 2007). The representation of a series of events and the causal connection running throughout is therefore integral to narrative. 'Event' is the key word here, though some people prefer the word 'action' (Abbott 2008, 12). This concept is deeply rooted, first appearing in Aristotle's foundational text on narratology – *Poetics*: "Tragedy is an imitation, not of men, but of action and life, and life consists in action …" (Aristotle 1997)

A popular scheme that describes drama is Freytag's Pyramid (Freytag 1894), as shown in Figure 1.

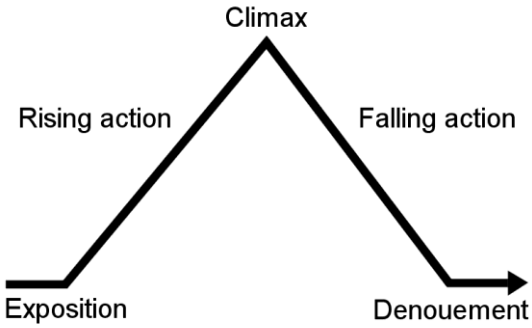

Figure 1: Freytag's Pyramid provides the basic pattern for drama

A more contemporary version of these dynamics is the following formulation derived from the narratology of cinema: setup, complication, development, resolution, and denouement (Thompson 1999, 28–29).

Since narratives emphasize causality, narrative arcs of any scale whet our desire to know what happens next, as Barthes explores in *The Pleasure of the Text* (Barthes 1975a, 19). Recipients derive pleasure from uncertainty as the gap between cause and effect is "opened and closed, again and again, until the resolution of the story" (Haralovich and Trosset 2004, 9). Ignorance is the traditional position of a narrative's recipients, as they lack certain knowledge of the consequences of plot events. Manipulating the audience by controlling what they know in order to build anticipation is a useful technique.

Ryan states that readers must perform acts of interpretation to complete the narrative reconstruction. Zimmerman's model of narrative interactivity agrees, and his foundational interactive mode is cognitive interactivity (Zimmerman 2004), which involves "the psychological, emotional, hermeneutic, semiotic, reader-response, Rashomon-effect-ish, etc. kind of interactions that a participant can have with the so-called 'content' of a text." While this is a (necessarily) messy list that crosses disciplines and decades of scholarly work, it serves to recognize the cognitively rich process of interpretation.

SITUATING MICRONARRATIVE

The pursuit of narrative's atomic units is seen in Barthes' structuralist writings, as well as those of Tomashevsky and Propp, and appears under many names. A thorough definition of micronarrative is currently difficult to find in the literature, and terms proliferate designating similar phenomena in interactive media. Our adoption of the term micronarrative is based on the definition introduced by Henry Jenkins in 2004 and expanded in Bizzocchi's 2007 analytical framework for game narrative.

To better understand micronarrative, it is useful to start with Vladimir Propp, who categorized the plots of Russian folktales and introduced the principle of 'functions' to describe patterns of events in stories. According to Propp, the grand arc of a fairy tale generally begins with a villainy or deprivation among the protagonists, then continues through several functions and terminates in a marriage. Propp writes that a "Function is understood as an act of character, defined from the point of view of its significance for the course of the action" (Propp 1968, 21). An example of a function might be the giving of a gift to the hero. The donor of the gift might be an old friend or a wise man, but the

event pattern is what remains consistent. Functions can be grouped together to create a unit he calls a 'move', which makes a subsidiary arc.

In Barthes' structural analysis of narrative, linguistics becomes a model for 'sketching out' a theory that can be used to classify the components of narrative and reveal its "hierarchy of levels or strata" (Barthes 1975b, 243). Later in the article, he highlights "micro-sequences" where "the fine grain of the narrative texture is made" (p. 253). Barthes then discusses the nested nature of narrative units in a sequence ('a small number of nuclei'), in analyzing a scene from a James Bond novel. He writes,

> Because it is self-contained with regard to its functions, and bracketed under a name, the sequence can be apprehended as a unit, ready to function as a simple term in another, broader sequence. Take the following micro-sequence: extending one's hand, shaking hands, releasing the handshake. This Greeting becomes a simple function: looked at in a certain light, it assumes the role of an index (du Pont's flabbiness and Bond's shrinking from it). Considered as a whole, however, it constitutes one term along a broader sequence, subsumed under the name of Encounter, whose other terms (drawing near, stopping, hailing, greeting, settling down together) can be micro-sequences on their own. A whole network of subrogations thus binds together the narrative, from the smaller matrices up to larger functions. (pp. 254-255)

Inspired by Propp, Bremond and Cancalon adopt the function as the basic atomic unit of narrative. Consequently, a mini arc (termed as 'elementary sequence' by Bremond) is created from a three-function sequence that: 1) represents an act to be carried out or even foreseen; 2) shows the achievement of the actual event; and 3) closes the process with the attained result. This is visualized as progress from Virtuality to Actualization/Non-actualization, to Goal Attained/Unattained. Bremond claims that narrative can be broken down into

> a hierarchy of enclaved sequences, always the same, which exhaustively determine the field of the narratable. The linking of functions in the elementary sequence, then of elementary sequences in a complex sequence, is both free and controlled at the same time: free (for the narrator must at every moment *choose* the continuation of his story) and controlled (for the narrator's only choice, after each option, is between the two discontinuous and contradictory terms of an alternative). (Bremond and Cancalon 1980, 406).

Bremond and Cancalon assert that narrative elements can be satisfactorily codified in this way, in the sense that they represent human behavior patterns in similar fashion to the approach taken in anthropology.

Jenkins highlights the various ways in which a game environment contributes to narrative pleasure. Discussing what he calls "enacting stories", he posits the term 'micronarrative': "Narrative can also enter games on the level of localized incident, or what I am calling micronarratives. We might understand how micronarratives work by thinking about the Odessa Steps sequence in Sergei Eisenstein's Battleship Potemkin," Jenkins writes, citing the famous example of the mother and the baby carriage as one of these 'micronarrative'

units. He notes that the scene "deals with the same kind of material as most games – the steps are a contested space with one group (the peasants) trying to advance up and another (the Cossacks) moving down" (Jenkins 2004, 125). He reminds us that "even games that do not create large-scale plot trajectories may well depend on these micronarratives to shape the player's emotional experience" (p. 125).

Bizzocchi also asserts that micronarrative is evidenced in gameplay and furthermore that "one can frame game design as a process that sets the stage and the conditions of a series of micro-narrative events that are triggered and completed (or not) by the player's success or failure in the moment of play" (Bizzocchi 2007, 7).

A related set of concepts and terminology is introduced by C. Hargood, who extends Tomashevsky's structuralist writings on thematics, by borrowing Features, Motifs and Themes as basic components of storytelling. The conceptual model for Hargood's project is based on 'natoms' and 'nolecules' at the fine-grained narrative structural level; and the thread and braid at the integrative storytelling level. Hargood writes that "A natom, or Narrative Atom, describes a segment of narrative from which a story is composed. These are the finest granularity of media available to a given system, so could be a paragraph of text, a scene from a film, or a photograph. These natoms may be rich with features, both machine-discoverable or authored, that may suggest motifs. In turn, these motifs can connote broader themes" (Hargood, Jewell, and Millard 2012, 3). This means that a narrative may consist of groups of natoms and nolecules which represent their own subplots. Similarly, other authors have recognized the value of identifying modular units of narrative in creating generative story structures.

Mateas and Stern based their story-game Façade around the atomic unit of 'beats' within scenes (Mateas and Stern 2000). Their computational drama manager generates continuous action by integrating a player's response to beats. Beats are the smallest unit of dramatic value change (e.g. the measure of love one character has for another). They are the fundamental unit of plot/character interaction and also player interaction. Beats bear a strong resemblance to our concept of micronarrative, although the latter distinctly indicates the completion of a narrative arc.

With this background of micronarrative concepts and structures, we now proceed to a more detailed look at the dynamics of narrative processes within our selected game titles.

NHL 12

NHL 12 (Electronic Arts Canada 2012) is an ice hockey video game that allows players to take control of a team for stand-alone games or an entire simulated season, role-playing manager, coach, and individual athletes. While the role of manager is largely abstracted into analyzing performance statistics and making trades, the other roles are performed in the visual virtual environment of the hockey arena. There, players manage the arena presence and performance of their team, choosing which athletes take the ice, their general autonomous tendencies, and crucially, controlling the puck-holder's actions.

For a long time, fans and commentators have been constructing narratives around the performance of sports teams, and *NHL 12* leverages this tradition to improve the quality of the game player's immersion. As Church puts it, "as franchise and season modes are added to sports games and team rivalries and multi-game struggles begin, story takes on a larger role in such games" (Church 1999, 377). This level of granularity foregrounds the sports story, and justifies the popular full season mode of play. Competing for a whole

season allows major story arcs to emerge with their most natural and obvious culmination in the Stanley Cup finals. To use Jenkins' terminology, the quest for the Stanley Cup is the story that the player enacts, while the action on the ice leads to emergent narratives that mingle the game player's actions with the abilities of the virtual hockey players.

These emergent narratives are critical story elements enabling player enjoyment, even as they eventually contribute to the higher-level narratives. Church further states:

> The story in a game of NHL 99 is the scoring, the missed checks or the penalty shot. While this story is somewhat basic, it's completely owned by the player. Each player makes his or her own decision to go for the win by pulling the goalie, or not. And, most importantly, the decision and resulting action either works or does not, driving the game to a player-driven conclusion (Church 1999, 377).

Conceptualizing narrative in terms of these small units provides the structure for experiencing the narrative qualities of an individual hockey game within *NHL 12*. We can thus examine common scenarios in the game in terms of how players' actions reproduce the three narrative stages. Every time the player's team takes possession of the puck, a new micronarrative arc begins. The next stage is complication, as the player moves the designated hockey player into a scoring position and struggles with the opposition for a clear shot. Ultimately, this arc will be resolved with either a successful goal or the defenders taking possession of the puck. This micro-arc is repeated many times within a game period, with differing outcomes each time contributing to a larger story arc. Game player performance is thus deeply connected, and more likely to be memorable.

Stories at the micronarrative level mimic hockey's characteristics. Successfully repeating rapid sequences of game actions allows the game player to control both the puck and the camera view. This matches the high-tempo nature that the game of hockey is known for (Montgomery 2006). It also means that players are in control of the narrative arc when they are successful, and lose some control when they are not. This makes the success of these moment-to-moment actions the focal point for narrative engagement in the player's mind.

Naturally, these low-level sequences occur within the formal contexts of the hockey game, which is officially divided into three periods of twenty minutes each (although the video game allows each period to be played in as few as four minutes). Game play within a period is summarized and interpreted during the intermission. While in live games, commentators provide this, the video game presents players with a textual scouting report offering high level advice based on their play, thereby scaffolding the general tenor of the game player's performance into the higher levels of narrative.

Narrative elements such as "dramatic structure, themes and texturing" have been identified as core elements for enhancing the "emotive qualities of simulated sports commentary" (Rhodes, Coupland, and Cruickshank 2010). Such systems must recognize the key connections between game events, emphasizing the importance of causality. This requires a deep level of analysis that incorporates both global and local hockey contexts. This means that the micronarrative contained within each hockey play also contributes to the generation of themes that come to characterize that period, and eventually, if continued and thereby enhanced, that game or season. While *NHL 12* does relatively little to connect game stories to the ongoing season, this remains a strong component of player

enjoyment as they reflect on how well "their guys" are doing and their combined performances.

NHL 12 shows how dramatic micro-arcs can emerge from continuous gameplay and directly reflect player activity with relatively little support from the game itself. Occurring within the formal time constraints of a hockey game, these organic moments reflect the sport's lively characteristics. They also draw on the tradition of storytelling that surrounds sports commentary and fandom. For example, as Brodie exclaims in *Mallrats*, "Look at the score. I'm only in the middle of the second, and I'm winning 12 to 2. Breakfasts come and go, Rene. Now, Hartford – the whale – hey, they only beat Vancouver once... maybe twice in a lifetime" (Smith 1995). Fortunately for the success of the game, the designed narrative arc of the quest for the Stanley Cup stimulates player interest.

DEUS EX: HUMAN REVOLUTION

Deus Ex: Human Revolution is a cyberpunk-themed action role-playing video game that is a prequel to the original Deus Ex (Ion Storm 2000). Gameplay revolves around four developed "pillars": Combat, Stealth, Hacking, and Social. Players move the augmented protagonist through a complex story world using whichever combination of these approaches they deem appropriate. In contrast to *NHL 12*'s emergent narrative arcs, *Deus Ex: Human Revolution* has a deep, strongly designed plot embedded in a complex storyworld that players must navigate to reveal. As a result, player freedom is mainly expressed in the customization of the protagonist and his abilities.

The larger story arc in *Deus Ex: Human Revolution* first introduces the protagonist Adam Jensen, a security specialist for a high-profile cybernetics manufacturer in Detroit, who is slowly uncovering a conspiracy concerning his place of employment. In much the same way that a mystery novel engages the reader in deducing "whodunit", the player becomes involved in gathering evidence through Jensen's actions to unravel a horrific event that shattered his life, leaving him empowered (or disfigured, depending on one's views of transhumanism, a strong overarching theme in the game) in a way that is echoed in the controversies and conflicts playing out in the storyworld.

At the next level, the player is led through subsidiary arcs manifesting as chapters that unfold in several 'hub' locations: Detroit, Singapore, and various corporate headquarters. During these chapters, the player can freely explore certain sections of a city, interact with denizens, and through the diegetic menu in Jensen's cybernetic interface, select missions and secondary objectives whose key locations are helpfully pinpointed on Jensen's map.

Early missions in the game (organized as Main Missions and Side Quests) include the rescue of hostages, confronting thugs, infiltrating buildings, acquiring evidence, and questioning key NPCs. Many mission subtasks are interdependent and must be performed in a particular logical order. For instance, in order to acquire an important evidence tape, Jensen must locate an informant, resolve their subquest by traveling to another part of town and confronting drug dealers, then return to collect the tape and finally deliver it elsewhere. In some cases, the subtasks are optional, but reward the player with experience points exchangeable for upgrades to Jensen's cybernetic enhancements.

While completing the missions, the next level of subsidiary arcs present puzzles and obstacles. Hacking computers, doors, security systems, cameras and turrets initiates a

mini-game involving strategically capturing networks of nodes. Failing the mini-game results in gameplay consequences: security lockdowns and hostile guards forestall Jensen. To confront physical obstacles, it is crucial for the player to explore the gameworld for alternate entry points through rooftops, manholes and fire escapes, or disabling lethal electrical fields. The game's design ensures that missions have a variety of potential solutions, supporting players' experimentation with Jensen's skillset. This reinforces the designed gameplay pillars, so that a stealth enthusiast can use cloaking and hacking to access an area, while alternately, strength enhancements (punching through walls) enable a brawler. Most zones provide a lookout point where enemies can be observed from afar and players may plan their timing. This has a significant influence on the pacing of the story and the resulting player experience – one may go in quietly or with guns blazing, with a moment of calm before the storm. Intense action alternates with silent, slow reconnaissance. Playing a pacifist even has specific rewards in the gameplay.

Figure 2: Jensen's cybernetic upgrades allow the player the promise of more granular control over dialogue choices. (*Deus Ex: Human Revolution*. Eidos, 2011)

Another type of subsidiary arc relies on RPG-style interaction with key NPCs, as shown in Figure 2. Some missions require persuading or exchanging information with key characters, using a menu of potential responses that offer cajoling/provoking, aggressive/calm, friendly/aloof interaction choices. The player can thereby invest in roleplaying their own interpretation of Jensen's character and attitude, increasing the level of immersion in the story. Furthermore, a failed persuasion attempt may result in a building remaining off-limits and affecting the flow of the story. Dialogue choices can have varying impact, with successful negotiation unlocking clues or items, and failure literally closing doors. Beyond that, the dialogue between characters actively encourages reflection on ethics and morality – although it doesn't necessarily change outcomes.

Finally, proceeding to a more granular level of narrative arc, the moment-to-moment actions manifest – sneaking around a guard, exchanging fire with thugs, and using lethal

or nonlethal takedowns. These moments can have profound impact that belies their brevity. In one dramatic situation, a hostile gang member must be non-lethally subdued while Jensen is actively attacked by other gang members. A chain of events can occur that quickly causes the mission to fail. Multiple tactics are possible in the situation, from relying on stealth and silent takedowns, using a flash grenade, or luring the hostile thugs out individually to be subdued.

Narrative is additionally communicated in *Deus Ex* through ambient story cues in the environment itself. Rich background information about the fictional universe is available through reading computer terminal emails, digital newspapers and e-books, 'pocket secretaries' (futuristic tablets), and diegetic TV broadcasts. Once read, the story text is updated in the quest database for review at any time. Hacking fetches additional information of tactical use, such as the location of key objects and potential investigations.

THE PROPERTIES OF MICRONARRATIVE

The dramatic arc provides a useful template for fulfilling narrative experiences within digital games. Within a game's overall narrative arc, there are a number of smaller arcs, each with its own narrative progression and cohesion (Jenkins, 2004). These subsidiary units of narrative coherence and flow "still include all of the elements of the full narrative arc: setup, complication-development, resolution" (Bizzocchi 2001). Recognizing the functionality of narrative arcs, even the short ones, leads to the observation that narrative pleasures are experienced at many levels.

These subsidiary narrative arcs share three properties that collectively support the overall experience of story within games: they are hierarchical, modular, and accumulative. The subsidiary units are hierarchical in that they consist of further narrative arcs of different scales recursively nested. Due to the nature of interaction within games, players experience these narrative arcs in different orders. Thus, a modular design must allow narrative components to be experienced in variable succession. Finally, events that occur in a story stack upon their antecedents, accumulating meaning in the recipient's mind. Incidents do not truly supersede each other, but rather contribute to the overall experience of the narrative.

Hierarchical

Narrative structures of different scales are nested within one another. The scope and complexity of each level varies depending on the game; however, it's important to note how smaller narrative arcs are integrated into the larger ones.

Both of our examples share a commitment to the hierarchical structuring of the narrative arc at different orders of magnitude. In both cases the fundamental narrative unit is the individual game: *Deus Ex: Human Revolution* and *NHL 12*. Focusing a lens from the macro to the micro level, consider the largest meta-arc, from which medium-level subsidiary arcs are revealed. Each of these subsidiary arcs in turn derives existence from a number of more granular and limited micronarrative gameplay-story arcs.

A multi-game franchise like *Deus Ex* develops a complex overarching meta-narrative game story, full of internal references and allusions that provide a rewarding experience for players of the series. *Deus Ex: Human Revolution* is a "prequel" to the original *Deus Ex*, and the subsequent *Deus Ex: Invisible War*. As such, *Deus Ex: Human Revolution* both extends and benefits from the combined narrative reach of the overall franchise

meta-arc. Surprisingly, *NHL 12* does less than it could with the ongoing meta-narrative of the franchise. While athletes possess attributes that are the result of their performance over time, with statistics recorded from actual history, the game makes only occasional references to events from previous seasons in the form of colour commentary. An even more significant difference is the omission of the video game player's specific accomplishments within the continuity of the story from one year to the next: everything is "reset" based on the previous real-world hockey season. However, *NHL 12* does incorporate another meta-arc that goes beyond the winning and losing of an individual game. The player can take a "manager" role, and compete for the Stanley Cup over the course of a season of separate games.

The most significant narrative level within games is the primary arc – the individual game story that forms the backbone of actual gameplay. This is the level at which, taking *Deus Ex: Human Revolution* as an example, Adam Jensen, the newly hired security director at Sarif Industries, becomes embroiled in the global politics of the human enhancement movement. Within *NHL 12*, each individual game played between two hockey teams is the context for real-time gameplay.

Drilling down within representative games, the primary arc is constituted of subsidiary medium-level units, formally represented as levels or missions (or chapters, quests, periods, etc.) which serve to guide the player through the larger story. Within these missions, smaller but still internally coherent sequences then manifest. In the case of *Deus Ex: Human Revolution*, these include main missions and side quests encountered by the player. The subsidiary units in *NHL 12* are the three periods, true to the original hockey experience. The period will begin with a static condition (e.g. the score of each time, the performance of each player so far) that then evolves. The subsidiary narrative unit in this case is time-delimited – each period represents twenty minutes of a simulated hockey broadcast, though real-time console play may be compressed.

As we continue to drill down, each subsidiary narrative unit in turn is made of smaller micronarrative segments. In *Deus Ex: Human Revolution*, as players try to complete each objective, the scenarios they encounter form smaller but distinct micronarrative arcs. For example, players can choose whether to attack some guards blocking their progress or to sneak through an air vent. This choice and the subsequent challenge faced form a small but complete arc. Within *NHL 12*, a parallel is the level of continuous gameplay, as each team battles for the puck and a dominant position on the ice. The interactions between the gamer's role-playing of individual athletes and the ensuing play strategies create a variety of micronarrative arcs.

These narrative units are both dynamic and nested. Each interactive narrative layer has its own scale, with each layer bubbling up into the next. In hockey, this structure reflects the dynamic of the sport itself. Individual hockey plays determine the outcomes of each period, which in turn culminate into the game outcome. A series of matches determines the ultimate story of the season campaign. Similarly in *Deus Ex*, the individual challenges determine the success of the mission, and the mission progression determines Jensen's fate. At all levels of scale, there is a shared dynamic between two pleasures – the immediate challenge of winning and losing, and the more mediated pleasure of context and story. The larger units (hockey campaign or *Deus Ex* franchise) may foreground the narrative side, while the smaller units (game encounter or hockey play) starkly emphasize winning and losing – but at all layers both story and gameplay meaningfully intertwine.

In *Deus Ex*, the details of narrative layers are carefully authored, while *NHL 12* relies on fast-paced action and the human proclivity to make narrative sense of ordered game events. In both cases, the power of emergent narrative has been deliberately enabled through designing variable character interactions (Louchart and Aylett 2004). It is clear that players are deriving meaning even from brief sequences, which then are incorporated into the larger experience of an integrated game narrative.

Modular

Due to the nature of the interactive process, narrative sequences can be experienced differently. This requires a modularity of design in order to reconcile individual variability with ongoing narrative cohesion. Eric Zimmerman sees this use of flexible narrative components as integral to the expressive nature of digital interactive media. He states that "using the computer to combine and recombine small local elements" is intrinsic to computing (Zimmerman 2000). Recombinant algorithmic processes allow for varying orders of presentation and thereby support the modular nature of micronarrative.

The concept of memorable moments also leads to a broader understanding of the dynamics of the modular nature of micronarrative. Memorable moments become freestanding narrative units. They begin as part of a broader whole, firmly embedded in the matrix of the complete work. The consciousness of the viewer (or in some cases the larger audience) extracts these moments and preserves them on their own. These memorable moments have a remarkable power to hold our imagination. Donaldson also stresses the relationship between narrative structure and memorable moments, noting how certain moments of Shakespeare's works resonate very strongly in the popular consciousness (Donaldson 2000).

Recognizing the granularity of micronarrative is critical. It allows for a finer degree of description, and therefore, analysis of game narrative. This will support the critical discourse around interactive narrative. Granularity of narrative object also has practical implications for the development of interactive story. As has been noted, there are three conditions needed to realize the goal of recombinant narrative: a system or an engine to carry out the process, discrete and portable narrative objects, and an understanding of the poetics of recombinant story (Bizzocchi 2001). Finer units of narrative are integral to this development. The finer the unit of narrative that can be identified and parsed, the richer the number of narrative experiences that can be combined and recombined.

The primary unit of granularity for *Deus Ex: Human Revolution* is actually geographical. The objectives in assigned missions require navigation to specific city locations accessed by overcoming barriers such as locked doors or guards. A given play-through of the game represents a player's unique path through the storyworld. Each game location therefore instantiates a micronarrative arc, with divergent spatial and temporal parameters. While the game encourages certain paths, a player's investigation can uncover others. This also means that as a player visits locations and completes objectives found therein, she is also advancing the narrative arc supported by the given quest. In fact, many quests can be active at the same time, and so the player's overall narrative arc is a recombination of various quest activities.

Deus Ex: Human Revolution also demonstrates a fairly typical outcome of the modular property of interactive narrative. The resolution of one narrative arc can preclude or subsume others. In this case, killing Zeke Sanders, the hostage-taker early in the game, prevents him from approaching you later with important information. *NHL 12* illustrates

this point as play expeditiously proceeds and game actions decisively result in specific scenarios, while precluding others. For example, if my team scores in the first minute of play, I immediately preclude a shutout for the opposing goalie.

Accumulative

The design of effective micronarrative units must support the accumulative nature of experience. Plot events do not merely supersede, but mesh together to develop the overall narrative flow. The accumulative property directly influences the reception and integration of the story into the mind of the player. For instance, if a character is introduced into the narrative in one scene and removed in another, this will typically be read as death or some kind of loss as the player tries to make sense of the plot events.

An example of how recombinant narrative arcs accumulate meaning can be found in the surrealist games of the 20's and 30's, such as the exquisite corpse (Gooding 1991). These games broke story down to a low level of quantum (the word) and recombined them into nonsensical narratives. The enjoyment is derived from the way in which these narratives were surprising and amusing due to their combination of non sequitur with moments of random clarity. Even if different quanta contradict each other, that contradiction becomes part of the narrative rather than cancelling each other in some mathematical sense.

Within *Deus Ex: Human Revolution*, players are given objectives in order to complete missions and quests. This relatively high level of authorial control characterizes the game, and provides the player with readymade purpose. As the player navigates through the cities, they may choose to follow the missions strictly, or complete objectives on their own terms. While doing so, each completed micronarrative integrates itself into the player's personal narrative experience. For example, during the first mission in the Sarif manufacturing plant, the player may choose to avoid the guards entirely and seek an alternate entry, to subdue guards quietly with lethal or non-lethal takedowns, or to storm into the scene with guns blazing to instigate a dramatic showdown. Each of these cases allows for a different roleplaying of the Jensen character, and further customization that deepens player immersion as well as constraining the possible paths that branch from these choices.

Designers of interactive narrative experiences must account for this accumulative property if they want to mitigate potentially nonsensical results. In order to accommodate multi-linear possibilities, they need to design narrative modules that support multiple connections. The different pillars of game-play in *Deus Ex: Human Revolution* allow players to approach each objective using their own preferred tactics. However, if they fail to use stealth to avoid a guard, they must quickly transition into combat. Each obstacle is therefore designed to accommodate this kind of flexibility and still maintain narrative coherence. Depending on how successful the player's attempt at stealth is in one region, neighboring regions become alerted and so each one must be designed around this vital interdependency.

CONCLUSION

Carefully harnessing narrative arcs within the design of an interactive narrative can be an efficient engine for the creation of satisfying narrative works. A caveat with this model is that its power depends in large part on tight control over the design and implementation of details. As we examine smaller individual moments of user actions that occur in the context of explicit interaction, however, the concept of a localized arc takes on considerable force, freeing us from a white-knuckled grip on the reins. The changing

context for play is constantly set up with fresh complications and challenges, the user's interaction itself is an instantiation of the narrative development phase, and intermediate successes and failures act as interim resolutions and localized climaxes.

By focusing on the use of micronarratives, one can frame game design as a process that sets the stage and the conditions for a series of events that are triggered and completed (or not) by the player's success or failure in the moment of play. In this framing, we no longer draw a distinction between game and narrative, but we see the two conjoined in an ongoing process of engagement. Insofar as this view is accurate, we have added to the two classic narrative modes of diegesis – the story as told, and mimesis – the story as shown. In moments of micronarrative engagement within an immersive interactive experience, we are engaged in praxis – the story as enacted (Bizzocchi 2001).

The two games that we have examined show two different approaches to interactive narrative. *Deus Ex: Human Revolution* uses relatively tight authorial control to guide players through a narrativized virtual environment. On the other hand, *NHL 12* provides a loose overarching narrative context in which players' continuous actions rapidly complete micronarrative arcs. In both cases, we see how small units of narrative meaning have three important properties. They are hierarchical: each game relies on narrative layers of varying scales. They are modular: the games rely on the recombinant property of digital media. They are accumulative: narrative experiences build on each other to create the overall experience. These dynamic relationships are necessary for the integration of narrative coherence and the pleasure of story within a medium that is predicated on player choice and interactive variability.

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