Towards Design Principles for Humor in Interactive Emergent Narrative

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ABSTRACT
Humor is an essential part of storytelling, but it has not been studied in the field of interactive emergent narrative. We begin with an overview of various theories of humor and use them to examine examples of humor within the digital media field. This juxtaposition aims to bring together concepts from both fields in order to find a feasible direction. We hope to contribute a framework of humor that can be used in the near future for an interactive emergent narrative project. Our conceptualization of humor frames it in terms of “pleasant surprises” which enable players and other emergent AI actors to stretch the boundaries between plot and discourse.

Keywords
Humor, interactivity, emergence, narrative, AI, games

INTRODUCTION
Interactive emergent narrative is a field of digital media that focuses on the creation of dynamic stories that readers can directly influence. The concept formed around the metaphor of "Hamlet on the Holodeck," where the Holodeck is a machine in the "Star Trek" TV show that allows users to enter simulations of reality (Murray 1998). If someone were to enter the story of Hamlet and convince him to kill himself during his "to be or not to be" soliloquy, wouldn’t this completely destroy Shakespeare’s intended narrative? But, if they were explicitly disallowed from doing so, could this experience be considered "interactive" in the first place? These questions, and more, must be solved if the holodeck is ever to become reality.

As a culmination of many separate fields, interactive emergent narrative is still in its early stages. The three keywords "interactive", "emergent", and "narrative" each represent distinct approaches with their own set of problems and considerations. Interactivity focuses on questions of agency and game design, incorporating readers/viewers in a way that is not possible with linear mediums such as novels or films (Mateas & Stern 2005). Emergence refers to behaviors that "emerge" from a system’s sets of rules rather than the creator’s explicit directions: one of the most

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relevant applications of emergence in narrative is simulating characters through their personalities and emotions (Gratch & Marsella 2004). Narrative, being the oldest and most established area of the three, needs to be adapted and recontextualized for a new medium in order to see which lessons still hold true (Grip 2014).

Within the field of narrative as applied to digital media, researchers find topics that are applicable to interactive emergent experiences. This can include metaphors and analogies (Zhu & Ontanon 2014), temporality (Porteous et al. 2011), or themes (Mitchell 2016). In this paper, we will focus on humor and its relationship to interactive emergent narrative. Are there existing forms of humor that are best suited for interactive emergent narrative? How can a system create humorous scenarios? What does it mean for a scenario to be humorous?

Many current advances in interactive emergent narrative focus on dramatic situations leaning towards tragedies rather than comedies. *Façade*, one of the most influential projects in interactive emergent narrative, pits the player in an apartment with an arguing married couple, and allows the player to interfere or defuse the situation (Mateas & Stern 2003). Although amusing moments can accidentally happen in *Façade*, the narrative progression is designed to lean heavily towards a tragic end, with their argument reaching a peak and the player caught in the crossfire: they may even kick the player out of the room entirely.

But is this inherently a tragedy? In a linear medium, it would seem so, but as a game, players have made a sport of being kicked out in the most awkward ways possible, such as flirting with a spouse in front of the other or saying absolutely nothing through the whole encounter (Northernlion 2010). This situation represents a divide between the established theories of humor in narrative versus the uncontrolled freedom that comes with interactive emergence. Traditional literature may use the distinction between comedies and tragedies as a cornerstone for other theoretical concepts. However, interactive emergent narrative may defy this foundation by breaking these terms, forcing us to redefine them or reject them outright.

By developing our understanding of humor in this new medium, we can build systems that create more well-rounded stories. Even if we are not making pure comedies, we can still inject humor into other types of stories. Through this, we hope to bring computational drama managers a step closer towards the level of quality that we expect from human authors.

This paper will begin with an overview of humor within traditional forms of entertainment media, and how current approaches to humor may need to be adapted for interactive emergent narrative. Next, we will discuss examples of humor in interactivity, humor in emergence, and humor in interactive emergence, and identify which characteristics of humor can be generalized. Finally, we will conceptualize a theoretical framework for a drama manager that focuses on humor, and discuss how it could be used and implemented in an interactive emergent narrative system.

PLOT VS DISCOURSE IN HUMOR

In narrative, we use the terms "plot" and "discourse" to refer to the events of a story and the way they are told respectively (Chatman 1978). These terms are echoed across other fields, such as "fabula and syuzhet" from Russian folktale analysis (Propp 2010), and paradigmatic vs syntagmatic analysis from semiotics (Peradotto 1977). These terms can also be applied to humor.

Some forms of humor are told primarily through the plot, where the events of the narrative have inherent humor independent of how they are told. This would include

films, TV episodes, skits, or stand-up routines. Most other views of humor focus on the discourse and the presentation. People will often say that comedy is all about timing (Attardo & Pickering 2011), which is discourse. An expert human comedian could take any plot, no matter how boring, and turn it into a funny stand-up set with skillful discourse.

If we define plot as a sequence of causally related events (Forster 1927), we can use this definition to establish a distinction between plot-based humor and discourse-based humor. However, even these definitions become weakened in humor. For example, the TV show "Family Guy" stylizes its humor through many vignette cuts that act as short skits scattered in the overarching plot, and yet they have a plot within themselves. In one scene, a character experiences misfortune and claims that his day has been "ruined like a pizza place ruins a salad," at which point the camera cuts to a pizza place ruining a salad.

We will define plot-based humor as a comedic situation which directly influences the high level progression of the story, and discourse-based humor as any such situation which does not. This distinction is necessary because in interactive emergent narrative, we must approach these two topics separately. Although discourse is vitally important in comedy, it also lends itself to extremely difficult problems with natural language generation: it is already difficult enough to generate realistic speech, much less humorous speech. Plot is also difficult to conceptualize, but it is the backbone upon which a narrative is built. In an interactive emergent narrative, it would be wise to relieve as much burden from the discourse as possible.

In order to delineate the separate layers of plot in an experience such as "Family Guy," we define a plot event as a turning point from which a character may not return (Yorke 2014). When Stewie claims that his day has been ruined, the skit about the pizza place's salad does not cause him to experience a plot event. This allows us to understand these one-off jokes as discourse rather than plot.

When it comes to interactive emergent narrative, we need to identify a plot-based approach to humor. How can a sequence of causally related events be inherently humorous? When interactivity and emergence are introduced into the picture, can plot even be kept distinct from discourse?

DISCOURSE-BASED HUMOR

Communications, philosophy, psychology, literature, and more have all approached humor from separate perspectives. Current theories of humor focus on the end user's experience and perspective, but other theories come from content creators such as comedians who need to intentionally create humor. Four major theories have emerged from past research, but they primarily apply to discourse-based humor since they focus on single humorous events rather than humor over a long period of time. The incongruity, relief, and superiority theories stem from classical philosophy (Morreall 1986), whereas benign violation is a recent theory that has entered popular culture (McGraw & Warren 2010).

Incongruity

Incongruity theory states that something is funny if it defies our original expectations. In the *Façade* example discussed above, it would be incongruent for a grown man to enter a married couple's apartment and remain absolutely silent. But in terms of the player's experience, everything is congruent: the player is acting according to their objective (getting kicked out) and the characters are also acting according to their objectives (have a nice evening). Incongruity is another way of describing surprise, which is an emotion evoked in the reader and is therefore discourse.

Benign Violation

Benign violation theory identifies the intersection between acceptable and unacceptable behavior, and posits that humor exists at the boundary. Drawing something inappropriate on a classroom chalkboard would be an example: although it is a violation, it is also benign, therefore it is funny. Benign violation is suitable for explaining pranks or other one-off moments. However, in games and interactive media, we must re-evaluate what it means for something to be "benign." All entertainment is inherently benign because it is separated from reality, and yet entertainment is only meaningful when the user invests deeply enough that it is no longer benign (Juul 2011). In video game streaming culture, viewers find great joy in watching players fail, especially when the players themselves are severely distressed (Gamers React Comp 2017).

Relief

Relief theory focuses on the ways in which humor is used to defuse tense situations. This includes nervous laughter, and is likely the closest of the major theories to explain humor from a narrative creator's perspective. In Romeo and Juliet, Romeo and his friends engage in lighthearted banter with each other just before they meet and kill Tybalt, demonstrating the relationship between relief and tension. Relief theory is discourse because it is used to regulate the reader's sense of tension rather than the events of the narrative: the Mercutio banter scene could be removed without significantly altering the plot of Romeo and Juliet.

Superiority

Superiority theory extends from the concept of schadenfreude, the pleasure of witnessing someone else's displeasure. By laughing at others or being laughed at, we establish hierarchy levels and social power structures. It remains to be seen how this sociological approach applies to humans that are dealing with nonexistent simulated characters. Superiority theory is too volatile to be used in this context, at least until further research explores the connections between fiction, sociology, and interactivity.

PLOT-BASED HUMOR

The writers on "South Park" use a narrative format that they called "therefore/but" (Stone & Parker 2015). This principle states that events in a story should be connected by either the word "therefore" or the word "but", but never "and then." EM Forster's classic king/queen example states that "the king died, and then the queen died" is not a story, but "the king died, and then the queen died of grief" is a story. Under the therefore/but system, the latter might be reworded as "the king died, therefore the queen died of grief."

"Therefore/but" reflects the same direction as Forster's principle of causally related events. In a way, the "therefore/but" structure is hardly even a theory of humor at all, but rather a theory of narrative in general. Under this perspective, Stone and Parker do not focus on being humorous: they focus on telling a solid story, and the humor will follow.

Other "plot-based humor" approaches are similar to standard narrative approaches. Kaplan defines comedy as "the art of telling the truth about what it's like to be human," (Kaplan 2013) which is suspiciously removed from the typical perception of comedy. Several theater improv games revolve around assigning roles to participants which drive them towards comedic interactions, even though the participants are only acting according to their roles. One game is set in a law firm, with a trio of lawyers who are all late for the most important case of their lives, and must hurry to leave the

room. However, each lawyer has some kind of nervous tic which prevents them from leaving the room first: one of them fears that the first one to leave will be fired, the other loves balance and wants to be in the middle, and the third is obsessed with the number 2 and wishes to be second in everything he does. When the participants act out these roles, they will naturally create humorous situations through their desire to accomplish their goals of leaving the room, but also not being the first to leave the room. They will try to trick the others into leaving first, or they will pick up someone else and throw them out the door. Through it all, one of the most important factors is that the participants are not trying to be humorous, and that the humor comes out of their interactions.

However, is humor such a natural extension of narrative? The three-lawyers improv game is for all practical purposes a variation of the prisoner's dilemma, which could hardly be thought of as comedic. Techniques such as "therefore/but" can lead to cohesive narratives with character motivations, but they do not automatically result in humor. Just like how the South Park "therefore/but" structure is analogous to the "king died, therefore the queen died of grief" story, the lawyers improv game is analogous to the prisoner's dilemma.

Both of these approaches still need to be tweaked in order to become humorous, possibly by using several of the other discourse-based approaches described above. South Park uses superiority heavily by featuring characters whose primary purpose is to be belittled, rather than to incite plot events. The lawyers improv game starts from an incongruous setting (lawyers being irrational), but if the same objective-based characterization is used in a more serious setting, it loses its humor.

Neither the discourse-based humor approach nor the plot-based humor approach seem to match the level of specificity needed to translate humor into interactive emergent narrative. Discourse-based humor focuses too much on one-off gag jokes rather than long-running storylines. Plot-based humor is almost the opposite, being nearly indistinguishable from standard approaches to narrative design and tweaking the setting in the hopes that humor will emerge from the scenario.

EXAMPLES OF HUMOR

These examples of humor are derived from digital media, spanning the three fields of interactivity, emergence, and narrative, as well as relevant intersections between them.

The Stanley Parable (interactive)

Interactive games will commonly offer dialogue choices to the player, where they may choose to say or do one thing over another. As a common example, a non-player character may ask the player to do a favor for them, and the player may choose to either say yes or no. Sometimes, this may involve humor, such as in *Divinity: Original Sin 2* where characters with the "jester" trait can say amusing things in dialogue (Larian Studios 2017). The game takes place in a fantasy world where you might encounter a talking severed head on a pole: if you talk to it, a jester can say that they need to head off. Many games will use these comedic one-liners as pure discourse, where the story progresses as normal whether the humorous option is selected or not.

The Stanley Parable is a game where the player controls a man named Stanley, who works at a boring job, as one day he discovers that the building he is working in is completely empty (Galactic Cafe, 2013). As he explores the building, a voice narrates his journey, which implicitly offers choices to the player. In one scene, Stanley is walking down a hall and the narrator says that Stanley took the first door to the left.

However, the player may continue walking straight instead, which prompts the narrator to say:

"Stanley was so bad at following directions, it's incredible he wasn't fired years ago."

In another scene, Stanley passes a broom closet, and the player may choose to go inside of it, prompting the following response:

"Stanley stepped into the broom closet, but there was nothing here, so he turned around and got back on track.

There was nothing here. No choice to make. No path to follow. Just an empty broom closet. No reason to still be here.

It was baffling that Stanley was still just sitting in the broom closet. He wasn't even doing anything. At least if there was something to interact with, he'd be justified in some way. As it is, he's literally just standing there, doing sweet FA.

Are you... Are you really still in the broom closet? Standing around doing nothing? Why? Please offer me some explanation here; I'm- I'm genuinely confused.

You do realize there's no choice or anything in here right? If I said 'Stanley walked past the broom closet' at least you would've had a reason for exploring it to find out. But it didn't even occur to me, because literally, this closet, is of absolutely, no significance to the story, whatsoever. I never would've thought to mention it."

The player may continue to stand in the broom closet, vexing the narrator even further. On a higher level, the game deals with questions on the nature of free will in a world where every possibility has a prewritten conclusion and every action prompts a quip from an omniscient narrator.

Based on our previous definitions, this would be discourse-based humor because the broom closet has no bearing on the plot, and is funny precisely because the narrator is so confused over why the player would do something with no bearing on the plot. Yet when it comes to interactive narrative, this itself is the plot: whatever the player does is the plot, because they are the main character. Why would standing in the broom closet be any less relevant than any other choice when they are all irrelevant? Under our previous definition of a plot event as a point of no return, nothing in *The Stanley Parable* is a point of no return because the game can always be exited and restarted, and the narrator draws attention to this fact.

Sunspring (emergence)

Emergence takes many forms, but primarily focuses on creating rules and interactions that enable new and unexpected results. A classic example of emergence is Conway's game of life, which came from the field of mathematics (Gardner 1970). This "game" simulates the growth of a society through overcrowding and underpopulation in a Go-style fashion. Through a limited set of rules, Conway's game of life allows many different patterns, such as "gliders" which move spontaneously or "guns" which create gliders. While the game of life is interesting from a mathematical/mechanical perspective, it does not help us in terms of humor and narrative.

In the field of digital media and interactive narrative, emergence is seen as a possible answer to the "narrative paradox," the conflict between player agency and a coherently organized plot (Aylett 1999). For example, if the player is talking to a character, they might be given the options to either agree or disagree with that

character, and both paths are scripted. However, what if the player wanted to turn around and walk away, or start screaming incoherently, or say nothing? Under the interactive approach, the writers would need to create new storylines for every outcome, which can become an exponential amount of effort. Emergence offers the possibility that the characters, instead of having scripted lines of dialogue, would have their own personalities and determine how they are supposed to respond. This way, players can have a wider range of actions without dramatically increasing the writer's workload. This view, although promising, has turned out to be much more difficult than expected, as emergence can lead to its own problems (Louchart & Aylett 2003).

Most applications of emergence in game-based narrative are inherently tied to interactivity, because emergence is a way to enable a wider range of interactivity. However, other fields have examples of pure emergence in entertainment, such as neural network algorithms. These are a subset of machine learning that use artificial intelligence to learn from a large dataset and apply it in new contexts. For example, *Sunspring* was written by a neural network AI that was given movie scripts and asked to write a science fiction short film (Brannan 2016). In a simplified sense, the AI, jokingly named Benjamin, "averaged together" all of the scripts it had read. *Sunspring* is emergent because Benjamin created it through rules rather than an explicit direction from its human creators, and yet it is also noninteractive.

Humor in *Sunspring* is largely accidental, as characters say nonsensical lines such as "Nothing is going to be a thing." However, this cannot be cleanly classified as discourse-based humor, because these lines are still related to the plot. Even though the lines that the characters say are nonsense, the plot governing their goals and overall story direction is also nonsense.

Middle Earth: Shadow of War (interactive emergent narrative)

Interactive emergent narrative is still a budding field, with *Façade* being one of the most well-researched implementations. However, outside of digital media, many other experiences could be categorized as interactive emergent narrative, such as improv or sports. The designer Chris Crawford famously declared that interactive emergent narrative was the "dragon" of the gaming industry that he needed to slay (Crawford, 1992), but as it turns out, slaying a dragon is rather difficult.

Middle Earth: Shadow of War is a video game set in Tolkien's "Lord of the Rings" universe (Monolith Productions 2017). The game follows a ranger named Talion as he wanders around Mordor fighting orcs. Each orc has a personality and remembers all of its past encounters with Talion, and adapts to the player's tactics. This behavior is part of the Nemesis System, which is *Shadow of War*'s primary contribution to interactive emergent narrative, and the most significant implementation in a AAA game. Humorous situations can occur in *Shadow of War* through this system, such as this one:

"I snuck into a heavily guarded orc fortress, intending to cause as much chaos as I could without being seen. There are many ways to do this: releasing untamed caged animals, or destroying hornet nests so that the insects would attack orcs. One of the most insidious approaches is to poison nearby barrels of grog, a type of orcish alcohol commonly left in the open for passing orcs to drink from.

Although poisoning grog is effective, it is also risky because it requires me to get close, where I could be spotted. After I poisoned a nearby barrel, I tried to sneak away, but a powerful warchief spotted me, breaking my cover. His followers saw me and chased me down, and I had to run away. The warchief, satisfied with his victory,

decided to celebrate by drinking some grog. But he died, because the barrel he drank from was the one I had just poisoned."

Stories like these are rare in Mordor. The Nemesis System is designed to create long epic clashes with villains who you have built up a history with, and focuses more on heroism and desperation than humor. This direction attempts to create dramatic situations like those shown in Tolkien's universe, such as Eowyn vs the Witch King or Gandalf vs the Balrog.

Plot-based humor, such as the poisoned grog scenario described above, is largely accidental. However, the Nemesis System uses discourse-based humor to accentuate these epic clashes, such as an orc who carries a lute and sings all of his battlecries in verse as he fights. This acts as a way of injecting humor into emergence without dramatically altering the direction of the narrative.

One of the central problems with emergence is that creators cannot control the direction in which it will go. Paradoxically, this is the very purpose of emergence, for systems to do things that were unintended by the creators. In order for a creator to push an emergent system in a certain direction, they must design it with an overarching theme that guides its rules. For example, in *Shadow of War*, you can never negotiate with an orc, or surrender to one. Just as the Nemesis System limits its ruleset in order to narrow down the possible emergent behaviors to a specific battle fantasy, what would it take to create humor instead?

THEORETICAL DIRECTION

All of the examples discussed above represent tension between the traditional definitions of plot and discourse in narrative. Our preliminary theory of humor for interactive emergent narrative is that humor exists at the boundary between discourse and plot. The player pushes the boundaries of the system to see how much they can do before they affect the overarching plot. However, the overarching plot is also dynamic due to emergence, constantly changing to adapt to the player's actions.

Actions must rest in a careful balance in between discourse and plot, so that they are neither irrelevant nor story-warping. The player must be invested enough to engage with this balance, constantly testing their limits rather than being a passive observer. In *The Stanley Parable*, if the player does everything as the narrator tells them to, they will experience a typical but boring story about escaping from the office building. They have not exercised their full power as an interactive agent in an emergent system, so the humor is lost on them. Likewise, with the jester jokes in *Divinity: Original Sin 2*, the player quickly discovers that these jokes have no effect on any plot events, and so they become pure discourse.

On the other hand, designers must expect players to push their system, and create contingency plans to deal with such players. In *Shadow of War*, you can "shame" an orc that you have defeated, letting them live rather than granting them an honorable death. A player who wants to test their limits might take a specific orc and shame them repeatedly to see how the Nemesis System reacts. The designers anticipated this, and if an orc is shamed too much, they can become deranged, gaining strength at the cost of losing their sanity and sense of tactics. Players delight in "breaking" the experience, doing what is wrong, and defying the rules that they are meant to follow.

When a seemingly inconsequential action leads to a plot event, players develop an understanding of how the system works. In design, we call these glimpses of revelation "aha moments," where the phrase "aha" itself is an expression of laughter and joy. However, any designed experience only has so many "aha moments" until

the player has fully understood everything there is to understand. Emergent systems offer the possibility of extending these "aha moments" as far as the player can go, but they must deliver this promise. They must allow players to think that they are breaking the system without actually letting them break the system.

Proposed Example

Our concept uses the concept of rules that are made to be broken. These rules are maintained with abusable rigidity, so that players can experience the joy of testing their boundaries. In this interpretation, humor is closely related to the emotional state of pleasant surprise, such as when a player exclaims "I can't believe that worked!" If a player in *The Stanley Parable* makes the narrator furious by standing in the broom closet, or if a player in *Shadow of War* indirectly kills their target with poisoned grog, they are pleasantly surprised. But the surprise is not completely unexpected: it is a lingering hope, a feeling of "I wonder if this will work," a sense of curiosity based on the player's past experiences.

An interactive emergent narrative might might include such a rule in an otherwise normal setting. For example, imagine if the player acted as a worker in an ordinary white-collar office, and the administrators, seeking to improve workplace morale, decide to give a bonus to anyone who gives another worker a compliment. However, since the administrators are very busy, they set up an automated invoice system which listens to workplace chatter, detects compliments, and deposits a bonus in the compliment giver's account. At first, the player might simply act nicer, but eventually they will learn that this rule can be abused by complimenting the same person repeatedly. Logically, it would be silly to receive multiple bonuses for doing such a thing, but the player wonders how the system would actually respond. When the player receives all of their bonuses, they are pleasantly surprised, and also gain a greater understanding of their new boundaries.

The workplace quickly devolves into a frenzy of compliments, as workers discover that constantly complimenting each other is more profitable than actually working. Some workers (or the player if they are clever) will shout generalized compliments to the entire office, gaining a bonus for each worker within earshot. Other scenarios might include workers recording themselves saying compliments and playing the recordings on loop, or workers shouting over each other because the system can only detect the loudest voice at any given time, or a new hire who is unaware of the compliment bonus and assumes that everyone is simply very nice. The ridiculousness of the situation is punctuated by the player's complicit role in this escalation.

With this example, the setting (white-collar office) and breakable rule (bonus for compliments) would need to be determined by a human author. However, the resulting interactions could feasibly be simulated by multiple players, as if playing an improv game. In order for AI characters to behave in realistic manners, they would need the ability to test their boundaries in the same way that the player does. This is essentially self-directed machine learning, which is under rigorous study and is not quite technically possible at this point in time. However, the AI characters could behave in pseudo-realistic manners. For example, once the player figures out that they can record their compliments, this could trigger an event which enables the AI characters to "notice" the player doing this action, and start using it themselves. This semi-regulated structure is similar to the one used in *Façade* (Mateas & Stern 2003), where the drama manager drives the characters towards key events called "beats." Just as with the therefore/but structure and the lawyers improv game, we find crossovers between techniques to tell dramas and techniques to tell comedies.

CONCLUSION AND FUTURE WORK

As interactive emergent narrative approaches the brink of feasibility, we must also consider how to improve upon it once it becomes technically possible. There are many aspects of great human literature which have not been studied in the this field, due to the deeply subjective nature of artistic appreciation. However, by building upon previous theories in established fields, we can identify points of interest that are relevant to digital media. Humor is commonly thought to be an ephemeral, personal quality, but it can be studied, learned, and converted into formulas.

In this paper, we establish the current theories of humor in terms of discourse and plot. Our examples of humor in digital media show that the standard differentiation between discourse and plot become disrupted with the introduction of interactivity. We establish a new direction of humor which incorporates interactivity, focusing on the emotion of "pleasant surprise" in order to bring about humor. Finally, we present a theoretical example of how such a direction could work, and the technical constraints we would need to set in place. Through this, we hope to pave the way for humor to be integrated in the interactive emergent narrative design process within the near future.

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