A Neo-Aristotelian Theory of Interactive Drama

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Introduction

This paper attempts an integration of Murray's (Murray 1998) proposed aesthetic categories for interactive stories and Aristotle's (Aristotle 300 B.C.) structural categories for drama. First, I will present Murray's three categories of immersion, agency and transformation. Then I will present a model of Aristotle's categories relating them in terms of formal and material causation. Within this model, agency will be situated as two new causal chains inserted at the level of character. Immersion and transformation will be shown to be not as central as agency. This analysis provides an answer to the question "What is artificial intelligence good for in interactive drama?" and thus grounds AI research in this area.

Murray's Aesthetic Categories

Murray proposes three aesthetic categories for the analysis of interactive story experiences: immersion, agency, and transformation. In attempting to integrate these categories with Aristotle's categories of spectacle, song, diction, thought, character, and plot, the first thing to note is that these two sets of categories are different in kind. Murray's categories are phenomenological, that is, they relate to the subjective experience of someone playing an interactive story. Aristotle's categories are structural; they describe the parts of a drama and how those parts relate to each other. Aristotle talks very little about the subjective experience that will result from a story put together according to Aristotelian principles, except to mention that the audience will find the experience cathartic - they will experience a pleasurable purgation of emotion. Aristotle also implies that an audience will find stories put together according to his principles understandable (that is, the story will support inferencing), and beautiful. In general, however, Aristotle is relatively weak on a phenomenological description of drama. He does not perform an in depth analysis of what it *feels* like to watch a well made play. But we know from several thousand years of experience that plays constructed along Aristotelian principles do indeed induce powerful (and desirable) subjective effects in an audience, even if Aristotle himself did not articulate these effects.

From the point of view of an author, structural principles can more readily be turned into design guidelines for the construction of a story than phenomenological principles. If an author is told that it is desirable to take an audience on a certain subjective trip, the author still may have no idea how to construct a story so as to induce these effects. But if an author is told that stories having certain parts in certain relationships will be found pleasurable by an audience, the author has concrete guidelines with which she can proceed in the construction of her story. Given this authorial preference for structural principles, I will first elucidate those structural principles that Murray does propose under each of her phenomenological categories. With this clearer picture of Murray's proposed structural principles, we will then be ready to attempt an integration with Aristotle.

Immersion

Immersion is the feeling of being present in another place and engaged in the action therein. Immersion is related to Colridge's "willing suspension of disbelief" - when a participant is immersed in an experience, they are willing to accept the internal logic of the experience, even though this logic deviates from the logic of the real world. A species of immersion is telepresence, the feeling of being physically present (from a first person point of view) in a remote environment. Murray makes several structural suggestions for how an author might induce immersion.

Structure participation as visit. In structuring participation as a visit, the player is presented with a space that they are "just passing through." In real life, when we visit a place, there is an expectation that the actions we can take in the place are somewhat limited. We are guests in the space, being shown around by our hosts. We shouldn't leave our tour group - we shouldn't go wandering off. We shouldn't fiddle with objects in the environment, unless we are explicitly invited to do so. By structuring an interactive experience as a visit, the hope is that an audience will accept the limited interaction available in the space because of the real life social rules implied with a visit. A good example of an experience structured as a visit is the theme park ride. The audience member becomes a voyeur in the visited space.

Agency is already beginning to assert itself as the primary category. The purpose of the visit metaphor is to limit agency (presumably for ease of design and implementation) in such a way that the player is still immersed by the experience. Thus there is the implication that disruptions of agency can disrupt immersion. Murray warns that a visit experience may not offer enough agency, and thus still disrupt immersion.

Use of objects to create belief. Providing the player with objects to manipulate in the environment can increase immersion. By manipulating these objects, the player becomes familiar through personal experience with the internal logic of the environment. In addition, the objects serve as an outlet for agency (again, the implication that the degree of agency influences the degree of immersion).

The game *688I Hunter/Killer* is a fairly pure example of this principle; the manipulation of objects (e.g. control panels, ships logs) is the primary mechanism used to induce immersion.

Structure participation with a mask. The player's avatar can help the player to understand their character and their place in the world, thus increasing the immersion. The author has control over the avatar's physical appearance, semi-autonomous behaviors, and input filtering (Mateas 1997). For example, in *Everquest*, the physical appearance indicates the race and profession, and to some degree, the experience of the player. A set of buttons are provided for activating behaviors in the avatar (e.g. attacking, casting spells). This helps structure the player's expected range of agency. The view of the world depends to some degree on the avatar. For example, a short character such as a dwarf sees the world from close to the ground (in the first-person POV). These properties of the avatar conspire to help the player stay in character, and thus stay immersed in the experience.

Mechanics. Representational worlds require a means to represent and resolve action. Mechanics are the interface mechanisms and environmental rules by means of which action is mediated. For example, in *Grim Fandango*, an object such as a scythe is used in a game situation by selecting it from your inventory and hitting the enter key, not by swinging a real scythe around the room. The interface mechanisms for inventory selection and object application are part of the mechanics of *Grim Fandango*. Murray proposes that interface mechanics are the new *fourth wall* of interactive stories. In traditional theater, the fourth wall refers to the invisible barrier separating the audience members from the action on stage. The fourth wall mediates the theatrical experience in two ways. The actors pretend as if the fourth wall is physically present, as if there is not an audience sitting in chairs watching them. The audience accepts the fourth wall as the boundary between the real world and story world. It is understood that everything happening on the audience side of the wall (such as the consumptive old couple hacking continuously in the second row) is not part of the story. Thus the fourth wall is a magic boundary that allows the real and representational worlds to coexist. Similarly, mechanics are the magical boundary that allow the real world of the player sitting hunched over a computer and the representational world of the game to coexist. But, unlike the theatrical fourth wall, the player of an interactive game is on both sides of the wall at the same time, both player and audience. The interface mechanics must support this two way mediation. Like the fourth wall, mechanics should be transparent - when they become noticeable in themselves, immersion is disrupted.

Agency

Agency is the feeling of empowerment that comes from being able to take actions in the world whose effects relate to the player's intention. This is not mere interface activity. If there are many buttons and knobs for the player to twiddle, but all this twiddling has little effect on the game, there is no agency. Furthermore, the effect must relate to the player intention. If, in manipulating the interface elements, the player does have an effect on the world, but they are not the effects that the player intended (perhaps the player was randomly trying things because they didn't know what to do, or perhaps the player thought that an action would have one effect, but it instead had another), then there is no agency.

Murray's structural treatment of agency is less clear than her treatment of immersion. She offers few clues as to how the author might induce a feeling of agency in the player. In keeping with her focus on a phenomenological treatment, much of the chapter discusses how a player might experience a game. As an example, she discusses how games can be a symbolic, emotional drama for the player. However, there are a few structural elements that can be teased out of her discussion.

Navigation. Providing the player with the ability to navigate around a place is intrinsically pleasurable. However, navigational agency is not dramatic. There is no intrinsic shape to the experience of exploring a space (no dramatic arc). Navigational agency alone is thus an insufficient form of agency for interactive drama.

The Maze. In a maze story, a player finds themselves in a dangerous place, full of dead-ends and wrong turns. The goal is to find the way out. A maze thus adds a higher level form of agency to navigational agency. In addition to exploring the space, the player has the goal to get out. The player's intentions thus include more than the goal of exploration; the player also has the goal to survive. Since agency is action in the world whose effects relate to the player's intentions, it follows that if you introduce new player intentions into an experience, you introduce new opportunities for agency. Simultaneously, however, while introducing higher-level opportunities for agency, the maze also decreases agency. Mazes, almost by definition, consist of one correct path and many incorrect paths. Free-form navigational agency is thus curtailed. The player is not able to go wherever they want whenever they want. Most navigational choices are now likely to lead to failure (a dead end, or death).

The Rhizome. The rhizome is a metaphor for organic networks of ever unfolding relationships. Introduced by philosopher Gilles Deleuze and psychoanalyst Felix Guattari, the rhizome is a post-structuralist concept that is offered as an alternative to the dominant Western conceptual structure of the tree (Deleuze and Guattari, 1987). It serves as a tool to think about those aspects of the world that evade taxonomic definitiveness.

Murray proposes the rhizome as a model for stories that have no preferred viewpoint. In such a story, the player can explore every event from multiple points of view. Closure is never achieved - there is no natural end-point for such a story. Every event can be delved into in arbitrary depth and from arbitrary viewpoints. Every event has an indefinite number of connections with other events. The rhizomic

story is a popular conception among hypertext theorists, who see the medium of hypertext as a way to avoid the authorial imposition of a preferred viewpoint (e.g. Landow 1992).

However, rhizomic stories disrupt agency. Whereas the maze is overdetermined (all choices but those along the preferred path lead to failure), the rhizome is underdetermined. Every player action potentially has an indefinite number of ramifications. All actions are in some sense equivalent. Every intended action may include unintended consequences. Everything may become so interrelated that it becomes impossible for the player to form an intention.

Murray suggests that a story laying somewhere between the maze and the rhizome would induce maximum agency. She terms such stories multi-threaded stories. In a multi-threaded story, there is a small, finite number of points of view through which to view a story. She gives an example of a story in the "violence hub," a web-based collection of hypertext stories focusing on violent incidents. One story describes a convenience store robbery from the point of view of the robber, clerk, owner, and cop, following them back through the events leading to the robbery and up to the moment of violence. Such stories avoid privileging a single voice while avoiding the lack of closure of the rhizome. However, such multi-threaded stories lack the intensification and economy of drama. Throughout her book, Murray makes no distinction between drama and narrative, though she tends to favor narrative structures in her discussions. Multi-threaded stories make use of the extensification of narrative, allowing the player to experience a single event in multiple ways. To the extent that we are interested in interactive *drama* vs. interactive *narrative*, the multi-threaded story may be an inappropriate structure.

Problem solving. Puzzles create agency by providing the player with goals and the means to accomplish them. Murray observes that the journey story (e.g. The Odyssey) is a classic story form organized around solving a series of problems. Since such puzzle-based stories seem to work as non-interactive stories, the implication is that they will work as interactive stories. But puzzles generally require multiple solution attempts, disrupting intensification, force an active reflection on the experience, disrupting enactment, and produce an episodic structure (a sequence of puzzles), disrupting unity of action. To the extent that we want to create interactive drama, as opposed to narrative, puzzles are an inappropriate way to increase agency.

Constructivism. Allowing players to construct their own worlds, full of their own objects, characters, etc., would seem to be the point of maximum agency. Multi-player constructive environments such as MUDs allow players to collaboratively construct their own worlds. Yet such constructive worlds lack any dramatic structure. There is no plot unifying the action.

Transformation

Transformation is the most problematic of Murray's three categories. Transformation has at least three distinct meanings.

- Transformation as masquerade. The game experience allows the player to transform themselves into someone else for the duration of the experience.
- Transformation as variety. The game experience offers a multitude of variations on a theme. The player is able to exhaustively explore these variations and thus gain an understanding of the theme.
- Personal transformation. The game experience takes the player on a journey of personal transformation.

Transformation as masquerade and variety can be seen as means to effect personal transformation. Personal transformation is already present in Aristotle in the form of change in the protagonist.

The transformation structural elements Murray discusses relate almost exclusively to transformation as variety.

Kaleidoscopic narratives. A player can reenter kaleidoscopic narratives multiple times, experiencing different aspects of the story. By exhausting the story, the player is able to eventually gain a God-like view of the theme. The multi-threaded stories discussed above are one form of kaleidoscopic story. Murray offers three hypothetical examples of kaleidoscopic stories about a man committing suicide. In the first form, the mind as tragic labyrinth, the player is inside the protagonists mind, experiencing the obsessive thoughts of failure and depression that eventually end in suicide. Presumably the player navigates these thoughts in some sort of hypertext web. In the second form, the web of mourning, the player navigates around a 3D rendering of the funeral. The player is a voyeur, listening in on the various conversations at the funeral. By listening to the many voices at the funeral, the player gains an understanding of the circumstances that led up to the suicide and the impact the suicide is having on the man's family, friends, and acquaintances. In the third form, Sim Suicide, the player is a deity of limited power manipulating the man's world. By changing the man's circumstances but seeing how it always leads to suicide, the player can again gain a global view of the man's circumstances.

Exhaustively explore formulaic stories. Murray proposes that exploring formulaic stories is a way for us to safely deal with anxieties and desires. After exploring a formulaic story sufficiently, the audience works through the particular issues dealt with by the story. At this point the story is abandoned. Television serials play the same role in society, dealing with current societal issues in a formulaic (and thus safe) manner. Murray's notion of formulaic story is a special case of the kaleidoscopic story.

Refuted closure. Kaleidoscopic stories avoid achieving a definite closure. The work as a whole is understood when the underlying structure of the work is understood, not when the plot is understood. The chief aesthetic pleasure of such a game lies in understanding the game as a

computational artifact, grasping the procedural potential of the game. But again, while such an approach may be appropriate for interactive narrative, for drama, refuting closure will disrupt intensification, the unity of action, and catharsis.

Integrating Agency into Aristotle

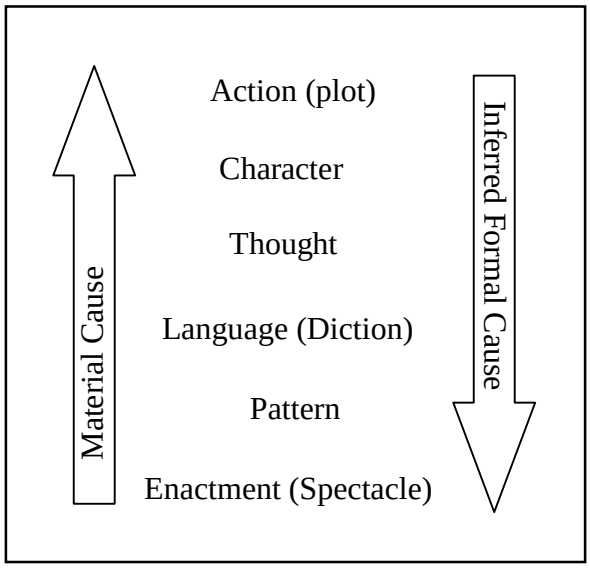
Now, with a more structural understanding of Murray's categories in hand, we are ready to integrate these categories into Aristotle's structural model. First, I will discuss the primacy of agency. Second, I will briefly present an interpretation of the Aristotelian categories in terms of material and formal cause. Finally, agency will be integrated into this model.

Primacy of agency

From a dramatic perspective, agency is the most fundamental category. Immersion, in the form of engagement, is already implied in the Aristotelian model. Engagement is necessary in order for an audience to experience catharsis. In addition, many of the structural elements related to immersion really have to do with agency, that is, controlling the level of agency in order to maintain immersion. Transformation, in the form of change in the protagonist, also already exists in the Aristotelian model. Murray's discussion of transformation as variety, particularly in the form of the kaleidoscopic narrative that refuses closure, is contrary to the Aristotelian ideals of unity and intensification. To the extent that we want a model of interactive *drama*, much of Murray's discussion of transformation falls outside the scope of such a model. For these reasons, agency will be the category integrated with Aristotle.

Aristotelian Drama

Following Laurel (Laurel 1991), Aristotle's theory of drama is represented in the diagram below.



The Aristotelian categories are related via material cause and formal cause. The material cause of something is the material out of which the thing is created. For example, the material cause of a building is the building materials of which it is constructed. The formal cause of something is the abstract plan, goal or ideal towards which something is heading. For example, the formal cause of a building is the architectural blueprints.

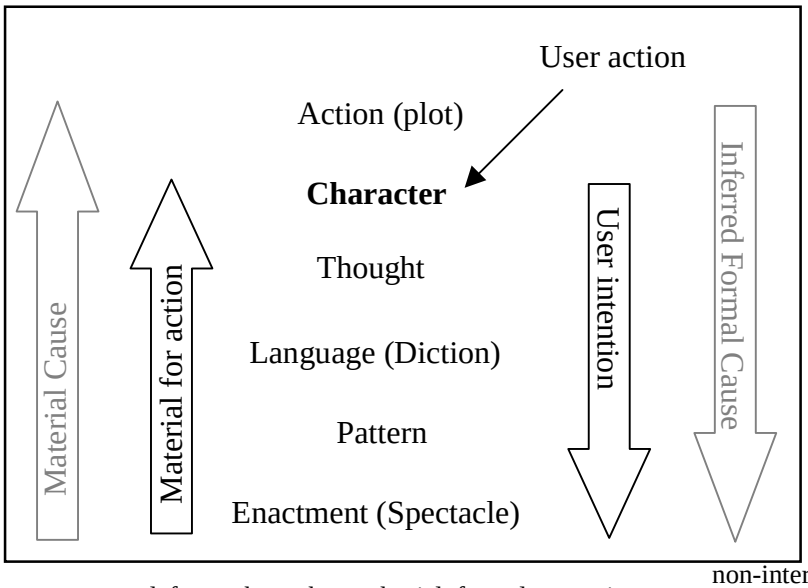
In drama, the formal cause is the authorial view of the play. The author has constructed a plot that attempts to explicate some theme. The characters required in the play are determined by the plot; the plot is the formal cause of the characters. The character's thought processes are determined by the kind of character they are. The language spoken by the characters is determined by their thought. The patterns (song) present in the play are determined, to a large extent, by the character's language (more generally, their actions). The spectacle, the sensory display presented to the audience, is determined by the patterns enacted by the characters.

In drama, the material cause is the audience view of the play. The audience experiences a spectacle, a sensory display. In this display, the audience detects patterns. These patterns are understood as character actions (including language). Based on the character's actions and spoken utterances, the audience infers the characters thought processes. Based on this understanding of the character's thought processes, the audience develops an understanding of the characters, the character's traits and propensities. Based on all this information, the audience understands the plot structure and the theme. In a successful play, the audience is then able to recapitulate the chain of formal causation. When the plot is understood, there should be an "ah-ha" experience in which the audience is now able to understand how the characters relate to the plot (and why they must be the characters they are), why those type of characters think they way do, why they took the actions they did and said what they did, how their speech and actions created patterns of activity, and how those patterns of activity resulted in the spectacle that the audience saw. By a process of interpretation, the audience works up the chain of material cause in order to recapitulate the chain of formal cause.

Interactive Drama

Adding interaction to the Aristotelian model can be considered the addition of two new causal chains at the level of character.

In this diagram, the gray arrows are the traditional chains of material and formal causation. The player has been added to the model as a character who can choose his or her own actions. This has the consequence of introducing two new causal chains. The player's intentions become a new source of formal causation. By taking action in the experience, the player's intentions become the formal cause of activity happening at the levels from language down to spectacle. But this ability to take action is not completely free; it is constrained from below by material



resources and from above by authorial formal causation from the level of plot.

Material resources. The elements present below the level of character provide the player with the material resources (material cause) for taking action. The only actions available are the actions supported by the material resources present in the game. The notion of affordance (Norman 1988) from interface design is useful here. In interface design, affordances are the opportunities for action made available by an object or interface. But affordance is even stronger than implied by the phrase "made available"; in order for an interface to be said to afford a certain action, the interface must in some sense "cry out" for the action to be taken. There should be a naturalness to the afforded action that makes it the obvious thing to do. For example, the handle on a teapot affords picking up the teapot with your hand. The handle cries out to be grasped. In a similar manner, the material resources in an interactive drama afford action. Thus these resources not only limit what actions can be taken (the negative form of constraint) but cry out to make certain actions obvious (the positive form of constraint). Several examples of the material affordances in interactive drama are provided below.

The characters in an interactive drama should be rich enough that the player can infer a consistent model of the characters' thought. If the characters' thought can be understood (e.g. goals, motivations, desires), then this thought becomes a material resource for player action. By reasoning about the other characters' thoughts, the player can take actions to influence these characters, either to change their thoughts, or actively help or hinder them in their goals and plans.

The dialog (language) spoken by the characters and the opportunities for the player to engage in dialog are another material resource for action. Dialog is a powerful means for characters to express their thoughts, thus instrumental for helping the player to infer a model of the characters' thoughts. Conversely, dialog is a powerful means to influence character behavior. If the game makes dialog available to the player (and most contemporary games do not), this becomes a powerful resource for expressing player intention.

The objects available in the game (I place the presence of interactive objects somewhere between spectacle and pattern) are yet another resource for player action.

Finally, the mechanics of interaction (spectacle) provide the low-level resources for player actions. The mechanics provide the interface conventions for taking action.

Formal (plot) constraints. In addition to the material affordances (constraints) from below, the player experiences formal constraints from above. Of course, these constraints are not directly perceived by the player, but, just as in non-interactive drama, are understood by recapitulating the author's chain of formal causation by making inferences along the chain of material causation. In non-interactive drama, understanding the formal chain of causation allows the audience to appreciate how all the action of the play stems from the dramatic necessity of the plot and theme. In interactive drama, the understanding of the formal causation from the level of plot to character additionally helps the player to have an understanding of what to do, that is, why the character they are playing would take action *at all*. Just as the material constraints can be considered as affording action from the levels of spectacle through thought, the formal constraints afford *motivation* from the level of plot. This motivation is conveyed as dramatic probability. By understanding what actions are dramatically probable, the player understands what actions are worth considering.

Agency. We are now ready to propose a prescriptive, structural model for agency. *A player will experience agency when there is a balance between the material and formal constraints.* When the actions motivated by the formal constraints (affordances) via dramatic probability in the plot are commensurate with the material constraints (affordances) made available from the levels of spectacle, pattern, language and thought, then the player will experience agency. An imbalance results in a decrease in agency. This will be made clearer by considering several examples.

Many puzzle-based adventures suffer from the imbalance of providing more material affordances than formal affordances. This results in the feeling of having many things to do (places to go, objects to fiddle with) without having any sense of why any one action would be preferable to another. For example, *Zork Grand Inquisitor* offers a rich world to navigate and many objects to collect and manipulate. Yet, since there is no unity of action, there is no way to relate current actions to the eventual goal of defeating the Grand Inquisitor. This leaves the player in the position of randomly wandering about trying strange

juxtapositions of objects. This detracts from the sense of agency - though the player can take action, this action is often not tied to a high-level player intention. Notice that adding more material opportunities for action would not help the matter. The problem is not a lack of options of things to do, the problem is having insufficient formal constraint to decide between choices.

Quake (and its ilk) induce agency by providing a nice balance between material and formal constraints. The proto-plot establishes the following formal constraints (dramatic probabilities):

1. Everything that moves will try to kill you
2. You should try to kill everything
3. You should try to move through as many levels as possible.

From these three principles, all the rest of the action follows. The material affordances perfectly balance these formal affordances. The player can run swiftly and smoothly through the space. The player can pick up a wide array of lethal weapons. The player can fire these weapons at monsters and produce satisfying, gory deaths. The monsters' behavior is completely consistent with the "kill or be killed" ethos. Everything that one would want to try and do given the formal constraints is doable. There are no extraneous actions available (for example, being able to strike up a conversation with a monster) that are not dictated by the formal constraints.

An interesting thought experiment is to imagine increasing the richness of the formal constraints of a first-person shooter without increasing the richness of the material constraints. This would be the equivalent of trying to add a plot to a first-person shooter. My understanding is that *Halflife* attempts to do this. Not having played *Halflife*, I will nevertheless make the critique that would be implied by my model. By adding a plot without increasing the opportunities for action, the sense of player agency would decrease. As the player fights through the levels, the plot would be slowly unveiled (through cut-scenes or canned dialog). As the plot is revealed, this would create additional dramatic probabilities. But the player would not be able to act on these probabilities. The only actions afforded by the material constraints are to kill and kill again. Other actions suggested by the plot (ask a character for more information, take an alien substance to the lab and test it) would be unavailable. The plot would be like a treat - after killing a certain number of monsters, you get dolled out the next piece of plot. This imbalance would decrease the agency experienced by the player of the game.

In order to invoke a sense of agency, the game must strike a balance between the material and formal constraints. A game that "works," that is, that successfully invokes a sense of agency, inhabits a "sweet spot" in design space. Trying to add additional formal constraints (more plot) or additional material constraints (more actions) to a balanced game are likely to move it out of the sweet spot.

Relationship to Immersion and Transformation

Agency was taken as the fundamental Murray category to integrate with Aristotle. In this section, I examine what the new, integrated model has to say about immersion and transformation.

Immersion. Three ways of inducing immersion are to structure participation with a mask (an avatar), structure participation as a visit, and make the mechanics (interaction conventions) seamless. These three mechanisms can be viewed in turn as a way to provide material and formal constraints, as a design suggestion for balancing the constraints, or as a design suggestion for providing effective material constraints at the level of spectacle. Agency is a necessary condition for immersion.

An avatar can provide both material and formal constraints on a player's actions. The avatar can provide character exposition through such traits as physical mannerisms and speech patterns. This character exposition helps the player to recapitulate the formal, plot constraints. Though both input and output filtering (e.g. the characters in *Everquest*), the avatar can provide material constraints (affordances) for action.

A visit is one metaphor for balancing material and formal constraints when the material opportunities for action are limited. From the formal side, the conventions of a visit tell the player that they won't be able to do much. Visits are about just looking around, possibly being guided through a space. Given the limited expectations for action communicated by the formal constraints, the game designer can get away with (and in fact, must only) provide limited material means for action.

The mechanics provide the material resources for action at the level of spectacle (the interface can be considered part of the spectacle). Providing a clean, transparent interface insures that agency (and thus immersion) will not be disrupted.

Transformation. Most of Murray's discussion of transformation examines transformation as variety, particularly in the form of the kaleidoscopic narrative. Agency, however, requires that a plot structure be present to provide formal constraints. An open-ended story without a clear point of view may disrupt the plot structure too much, thus disrupting agency. One way to support the exhaustive exploration of an experience would be to have a story in which each run-through has a clean, unitary plot structure, but which allows the player to experience the game multiple times with different, unitary plot structures. In such a game, small changes in the player's choices early on could result in experiencing a different unfolding plot. The trick would be to design such a game so that, once the end occurs, the entire experience has dramatic necessity. That is, one does not want explicit branch points. The story should have the dramatic probabilities smoothly narrowing to a necessary end. Early choices may result in different necessary ends - later choices can have less effect on changing the whole story, since the set of dramatically probable events has already significantly narrowed.

What's this got to do with AI?

The neo-Aristotelian model of interactive drama provides guidance for AI research aimed at enabling this medium. The model both indicates why AI techniques will be necessary (probably accepted as automatically true by the attendees of a AAAI symposium!), and specific guidance on the direction AI research in this area should take.

The primary heuristic offered by the model is that to maintain a sense of player agency in an interactive experience, material and formal constraints must be balanced. As the sophistication of the theme and plot of an experience increases, maintaining this balance will require characters whose motivations and desires are inferable from their actions. In addition, these characters will have to respond to the player's actions, including dialog spoken by the player. Building interactive characters with these capabilities will require AI techniques. An interactive drama system must communicate dramatic probability (likely activity given the plot) while smoothly narrowing the space of dramatic probability over time. A system capable of such drama management will also require AI techniques.

Besides indicating that AI will be a necessary ingredient in interactive drama, the model begins to provides specific directions for research. The function of interactive characters is primarily to communicate material and formal constraints. That is, the player should be able to understand why characters take the actions they do, and how these actions relate to the plot. Sengers (Sengers 1998A) provides a nice analysis of how this focus on agents as communication vs. agents as autonomous, independent entities, results in changes in agent architectures. When the focus changes from "doing the right thing" (action selection) to "doing the thing right" (action expression), the technical research agenda changes (Sengers 1998B). The neo-Aristotelian model indicates that action expression is exactly what is needed. The drama manager as well must focus on communicating plot level constraints (dramatic probability) through coordinating story action. Most work in deliberation (e.g. planning and game-playing) focuses on making sure a goal is achieved in the face of hostile interference. A focus on communicating with the world as opposed to controlling the world may change the technical research agenda of such deliberative systems. Weyhrauch (Weyhrauch 1997) built a system that attempts to subtly influence a player in order to make a good story happen. Yet even in this work, the focus is on *control* versus *communication.*

Conclusion

In this paper, Murray's phenomenological categories of immersion, agency and transformation were examined for their structural implications. Agency was then integrated into the Aristotelian structural model to yield a proposed Aristotelian interactive poetics. Finally, some of the AI implications of the model were discussed.

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